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Pradeep P. Bhat
Mohit Bajaj
J. Ravi Prakash
Matteo Pasquali
- 124e** **Secondary Cohesion and Chemical Potential Models for Diffuse Interfaces**
Ludwig C. Nitsche
Anh Nguyen
Geoffrey Evans

- 124f** **Capillary-Driven Flow in Supported Capillary Pipes**
David B. Thiessen
Jorge Bernate
Philip L. Marston
- 124g** **Dynamics of Thin Free Falling Viscous Films**
Ramesh Raju Mudunuri
Vemuri Balakotaiah
- 124h** **Effect of Insoluble Surfactant on the Selective Dip-Coating of Chemically Micropatterned Surfaces**
Naveen Tiwari
Jeffrey, M. Davis
- 124i** **Effect of Surfactants on the Breakup of a Shear-Thinning Jet**
Zhengjun Xue
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Carlos Corvalan
Paul E. Sojka
Osvaldo H. Campanella
- 124j** **Stalactite Growth as a Free-Boundary Problem**
Martin B. Short
James C. Baygents
Raymond E. Goldstein

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Chair: James P. Oberhauser

Vice Chair: Michael Mackay

- 129a** **Ergodicity-Breaking and Conformational Hysteresis in Polymer Dynamics near a Surface Stagnation Point**
Victor A. Beck
Eric S. G. Shaqfeh
- 129b** **Dynamics of Chain Stiffening of a Semiflexible Bead-Rod Polymer**
Inuka D. Dissanayake
Panagiotis Dimitrakopoulos
- 129c** **Development of Mesoscopic Models for Non-Newtonian Flow Calculations**
Patrick T. Underhill
Patrick S. Doyle
- 129d** **Lattice Boltzmann Simulations of Non-Newtonian and Viscoelastic Flows**
Haigang Chen
Woo Tae Kim
Qian Guo
Myung S. Jhon
- 129e** **The Dynamics of a Model for Nematic Lcps in a Simple Shear Device: the Ericksen and Deborah Number Cascades**
D. Harley Klein
Carlos J. Garcia-Cervera
Hector D. Ceniceros
L. Gary Leal

- 129f** **Electrophoretic Cells with Non-Newtonian Buffers and Joule Heating: an Efficient Approach for Velocity Profile Prediction**
Mario A. Oyanader
Pedro E. Arce
- 129g** **Generalized Hydraulic Calculation Method for Non-Newtonian Flow in Eccentric Annuli**
Ali A. Pilehvari
Robert W. Serth
- 129h** **Viscoelastic Nonlinear Traveling Waves and Drag Reduction in Plane Poiseuille Flow**
Wei Li
Michael David Graham
- 129i** **An Exponential Mapping for the Conformation Tensor for Flow of Viscoelastic Fluids; Application in Turbulent Channels**
Kostas D. Housiadas
Antony Beris
- 129j** **A Numerical Study of Mixing in Drag-Reduced, Turbulent Flows of Polymer Solutions**
T. Vaithianathan
Lance R. Collins
Ashish Robert
James G. Brasseur

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Chair: Katherine S. Ziemer

Vice Chair: Jason F. Weaver

- 135a** **Control of Defect Concentrations in Silicon through Surface Chemistry**
Ramakrishnan Vaidyanathan
Kapil Dev
Richard D. Braatz
Edmund G. Seebauer
- 135b** **Analysis of Chemical Reactions between Radical Growth Precursors Adsorbed on Plasma-Deposited Silicon Thin-Film Surfaces**
Tamas Bakos
Mayur S. Valipa
Dimitrios Maroudas
- 135c** **Adatom-Pair Chain Structures: Metastable Precursors to Island Formation on the Ge-Si(100) 2x_n Alloyed Surface**
Kyle J. Solis
Lance R. Williams
Brian S. Swartzentruber
Sang M. Han
- 135d** **Organic Functionalization of Semiconductors Using Amino Acids; Quantum Resonance Coupling**
Guillaume Dupont
Gang Zhang
Charles Musgrave

- 135e Sic Surface Preparation by Hydrogen Cleaning for High-Temperature, High-Power Device Integration**
Trevor L. Goodrich
Joseph Parisi
Katherine S. Ziemer
- 135f Kinetics and Mechanism for Alkyl Monolayer Growth on Hydrogenated Si Surfaces**
Madhava Kosuri
Henry Gerung
Qiming Li
Sang M. Han
Paulo E. Herrera-Morales
Jason F. Weaver
- 135g Growth of Sic on the Si (001) 1x1 Surface Using Monomethyl- and Dimethyl-Silanes**
Charter D. Stinespring
C.Y. Peng
A.A. Woodworth
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Chair: J. Il Siepmann

- 138a The Solubility of N₂ & O₂ in Liquid CO₂ near the Critical Point**
Steve Gerdemann
Thomas Ochs
Danylo Oryshchyn
Cathy Summers
- 138b Determination of Inorganic Salt Solubility by Headspace Gas Chromatography**
Xin-Sheng Chai
Christopher L. Verrill
- 138c Henry's Constants of Volatile Organic Compounds in Aqueous Electrolyte Solutions**
Amy S. Teja
James Falabella
Xin-sheng Chai
- 138d Statistical Associating Fluid Theory Coupled with Restricted Primitive Model to Represent Aqueous Strong Electrolytes: Multiple-Salt Solutions**
Xiaoyan Ji
Sugata P. Tan
Hertanto Adidharma
Maciej Radosz
- 138e Generalized Cubic-Plus-Association Equation of State**
Hong Wei Xiang
Francois Montel
Alain Graciaa
Bruno Mendiboure
Christelle Miqueu

- 138f** **Generalized Svrc-Qspr Predictions of Saturated Liquid and Vapor Viscosities**
Ajay Jagadeesan
Srinivasa S. Godavarthy
Rob L. Robinson
Khaled A. M. Gasem
- 138g** **Molecular Modeling of Phase Behavior and Structural Properties for Acetone-Chloroform-Methanol Binary Mixtures**
Ganesh Kamath
Jeffrey J. Potoff
- 138h** **A New Method to Calculate the Melting Temperature of a Binary Mixture**
Pankaj A. Apte
Isamu Kusaka
- 138i** **Cosmo, Cosmo-Rs, Cosmospace, Cosmotherm, Cosmo-Sac, Cosmo-Rs(OI), Etc.: Definitions, Differences and Comparisons**
Andreas Klamt
- 138j** **A Cosmo-Based Model for Predicting Properties of Pure and Mixture Systems**
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Stanley I. Sandler

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Chair: Thomas M. Truskett

Vice Chair: Ravindra S Kane

- 139a** **Simulations of Adsorption Properties for Charged Polypeptides on Hydrophobic Chromatography Surfaces**
Kosta Makrodimitris
Alexander Freed
Matthew Dalton
Erik Fernandez
John O'Connell
- 139b** **Role of Aggregation Conditions in Structure, Stability and Toxicity of Intermediates in the Beta Amyloid Fibril Formation Pathway**
Sungmun Lee
Theresa A. Good
- 139c** **Deactivation of Enzymes in Concentrated Salt Solutions: an Investigation of Hofmeister Effects**
James M. Broering
Andreas S Bommarius
- 139d** **Determination of the Effects of Carbohydrates on Protein Stability and Structure**
Thomas F. O'Connor
Pablo G. Debenedetti
Jeffrey D. Carbeck
- 139e** **Molecular Simulations of Multicomponent Bilayers. the Effect of Disaccharides, Cholesterol and Lipid Composition on Membrane Properties**
Emmanouil Doxastakis
Manan Chopra
Juan J. De Pablo

- 139f** **Effect of Protein Crystal Size, Cooling Method and Soak Time in Cryoprotectant Solutions on Cryoprotection and X-Ray Data Quality**
Unmesh N. Chinte
Binal N. Shah
B. Leif Hanson
Constance Schall
- 139g** **Interaction between Model Proteins and Charge-Nanopatterned Surfaces: a Novel Multicanonical Simulation Approach**
Charles R. A. Abreu
Fernando A. Escobedo
- 139h** **Molecular Modeling of Cellulose Hydrolysis: the Hydrated Cel7a Linker Peptide**
Tauna Rignall
Clare McCabe
Mike Himmel
- 139i** **Investigating Molecular and Phase Stability of Protein Solutions by a Coarse-Grained Modeling Strategy**
Jason K. Cheung
Vincent K. Shen
Jeffrey R. Errington
Thomas M. Truskett

Session 140 - Transport Processes in Nanoscale Systems

Chair: Marc-Olivier Coppens

Vice Chair: Joel Plawsky

- 140a** **Multiscale Models for Diffusion-Controlled Selective Catalytic Oxidation in Nanopores**
Simon E. Albo
Linda Broadbelt
Randy Snurr
- 140b** **Atomistic Simulation of Nanoporous Layered Double Hydroxide Materials and Their Properties**
Muhammad Sahimi
Theodore T. Tsotsis
Nayong Kim
- 140c** **Microscopic Mechanisms of Molecule Migration in Nanochannels**
Rajesh Khare
Michael Graham
Juan De Pablo
- 140d** **Modeling of Transport of Nanoparticles across a Lipid Bilayer**
Ryan A. Tasseff
Dmitry I. Kopelevich
- 140e** **Anisotropic Thermal Transport Estimation in Semiconductor Thin Films Via Lattice Boltzmann Method**
Sartaj S. Ghai
Woo Tae Kim
Cristina H. Amon
Myung S. Jhon

- 140f** **Ballistic Heat Transport in One-Dimensional and Quasi-One-Dimensional Nanostructures**
Chia-Yi Chen
Dmitry I. Kopelevich
- 140g** **Superheated Homogeneous and Heterogeneous Bubble Nucleation Rates Using Npt and Np_{zz}T Molecular Dynamics: Effects of Surface Interactions**
Brian Novak
Edward J. Maginn
Mark J. McCready
- 140h** **Transport of Gases through Nano Composites of Natural Rubber Latex Membranes**
Ranimol Stephen
Sabu Thomas

Session 141 - Water Soluble Polymers

Chair: Sandra Greer

Vice Chair: David A. Putnam

- 141a** **A Novel Evaporation Cell to Study Gradient-Driven Water Transport through Hydrogel Membranes with Zero External Mass-Transfer Resistance**
F. Fornasiero
A. Sutarman
J. Prausnitz
C. Radke
- 141b** **Molecular-Based Study of the Solvation Behavior of Short-Chain Poly-Electrolytes in Aqueous Solutions. LI-Pss Versus LI-Pps**
Ariel A. Chialvo
J. Michael Simonson
- 141c** **Fundamental Studies of Polymer Physical Entanglement Interactions with Monodisperse, Random-Coil Protein Polymers**
Jennifer S. Lin
Nicolynn E. Davis
Annelise E. Barron
- 141d** **Engineering High Oxygen Affinity Oxygen Carriers**
Andre Palmer
Julie Eike
- 141e** **Investigation of the Properties of Cellulose-Based Polymers in Aqueous Solution by Molecular Simulation**
Jonathan Moore
Robert Sammler
- 141f** **Effect of the Hydrophobic Helix Length and Side Chain Chemistry on Biomimicry in Peptoid Analogues of Lung Surfactant Protein C**
Nathan J. Brown
Shannon L. Seuryneck
Cindy W. Wu
Annelise E. Barron
- 141g** **Density Functional Theory for Polyelectrolytes near a Charged Surface**
Zhidong Li
Dapeng Cao
Jianzhong Wu

141h **A Monte Carlo Study on Structural Properties of Dendrimer-Polymer Conjugates**
Shing Bor Chen
Tong Zhou

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Chair: Sachin Velankar

Vice Chair: Michael R. King

144a **Turbulent Poiseuille-Couette Flow**

Nicholas Spencer
Dimitrios V. Papavassiliou

144b **Inertial Lag and Bessel Composite Function of the Third Order and First Kind Solution to the Dissolving Pill Problem**

Kal Renganathan Sharma

144c **Reynolds Stress Closure for Strongly Swirling Flows**

Karuna S. Koppula
Charles A. Petty
Andre Benard

144d **CFD Analysis of the Transient Flow in a Low-Oil Concentration Hydrocyclone**

Emilio E. Paladino
Liliane T. Schwenk
Giovani C. Nunes

144e **CFD Simulations of Flow in Fixed Beds of Cylindrical Particles**

M. Ertan Taskin
Anthony G. Dixon
Hugh Stitt

144f **Dip-Coating of Chemically Micropatterned Surfaces in the Presence of Soluble Surfactant**

Naveen Tiwari
Jeffrey M. Davis

144g **Extended Operability Range for Casting by Single Roll Melt Spinning**

Cormac J. Byrne
Paul H. Steen
Steven J. Weinstein

144h **Velocity and Torque Measurements of Ferrofluid in Spin-up Flow**

Arlax Chaves
Carlos Rinaldi

144i **Determination of Shear on Cells Grown in Culture Dishes on a Shaker Table Using Computational Fluid Dynamics**

R. Eric Berson
M. Keith Sharp

144j **Microscale Heat Transfer and Fluid Flow in an Evaporating Moving Extended Meniscus**

Sashidhar S. Panthamgam
Joel L. Plawsky
Peter C. Wayner Jr.

- 144k** **Development of a Microfluidic Rheometer for Measuring the Complex Viscosity of Complex Fluids**
Jai A. Pathak
Robert F. Berg
- 144l** **Elastic and Surfactant Effects on Dynamics of Drops Translating in a Microfluidic Device**
Eric C. Beaugard
Michael R. O'Connor
Nivedita R. Gupta
- 144m** **Particle Motion in Microfluidic Contraction and Expansion Flows**
Mona Utne Larsen
Nina C. Shapley
- 144n** **Microchip Measurements of Intrinsic Viscosity of Polymers and Biopolymers**
Jinkee Lee
Anubhav Tripathi
- 144o** **Microstructure of Multiphase Fluids in Homogeneous Shear Flows**
YoChan Kim
Charles A. Petty
Andre Benard
- 144p** **Concentrated Suspension Flow through an Abrupt Expansion Measured by Nmri**
Tracey Moraczewski
Nina C. Shapley
- 144q** **Particle Migration Patterns Observed in Oscillatory Flow by Nmri**
Chunguang Xi
Nina C. Shapley
- 144r** **A Multi-Fluid Model of Superheated Fast-Fluidized Beds Based on Cluster Characteristics**
Weikai Gu
John C. Chen
- 144s** **Scalable Drag Law for Bubble Columns**
Andrey Troshko
- 144t** **On the Relative Motion of Two Spherical Bubbles Rising in Line and Interacting by a Laminar Wake**
Jorge Ramírez Muñoz
Alberto Soria
Elizabeth Salinas-Rodríguez

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Chair: Paschalis Alexandridis

Vice Chair: Vinay K. Gupta

- 147a** **Aggregation Properties of Inorganic Electrolyte-Sds-Peg Ternary System**
Yun Fang
Shengyou Huang
Fangbo Chen
Guoqiang Ren

- 147b** **Characterization of Asphaltenes and Resins Separated from Water-in-Crude Oil Emulsions Formed in Kuwaiti Oil Fields**
Adel Elsharkawy
Tahar Al-sahaf
Mohammed Fahim2
- 147c** **Displacement of Fibrinogen from the Air/Aqueous Interface by Dilauroylphosphatidylcholine Lipid**
Tze Lee Phang
Scott McClellan
Elias I. Franses
- 147d** **Design of Corrosion Inhibitors for Carbon Steel Materials Using a Combined Density Functional Theory - Green's Function Approach**
Liuming Yan
Jorge M. Seminario
- 147e** **Preparation of Aminosilane Self-Assembled Monolayer for Immobilizing DNA**
Chun-Yi Lin
Bing-Hung Chen
Yu-Lang Lee
Chien-Hsiang Chang
- 147f** **Thermodynamic Insights of the Solubilization of an Epoxy Resin in Water by Means of a Non Ionic Surfactant Synperonic. Study of the O/W Microemulsion**
Avendano Gomez Avendano Gomez Juan Ramon
Del Rio Garcia Del Rio Garcia Jose Manuel
Ballesteros Limas Roberto
- 147g** **Semi-Analytical Prediction of the Shape Change of Electrolyte Droplet on the Electrode Including the Ion Number Constraints**
Jin Seok Hong
In Seok Kang

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Chair: Michael L. Greenfield

Vice Chair: Shekhar Garde

- 148a** **Accurate Ab Initio Thermochemistry Via Various Reaction Schemes**
David R. Urban
Ilie Fishtik
Jennifer Wilcox
- 148aa** **Measurement and Modeling of Glass Transition Temperature of Cryoprotected Protein Crystallization Solutions**
Binal N. Shah
Constance A. Schall
- 148ab** **Response Surface Model on the Determination of Partial Molar Volume, Partial Molar Refraction, Electronic Polarizability and Molecular Radii from Dilute Multi-Component Data Alone**
Marc Garland
Martin Tjahjono

- 148ac** **β -D Galactose Pentaacetate - Supercritical Carbon Dioxide as a Novel Binder-Binder Removal Agent for Metal Casting Operations: Phase Behavior of the Binary System and Thermodynamic Modeling of the Phase Equilibria**
Cerag Dilek
Charles W. Manke
Esin Gulari
- 148ad** **Gas Hydrate Equilibria in Porous Media with Pore Size Distributions**
Sangyong Lee
Jae W. Lee
- 148ae** **Mass Transfer of a Methane Hydrate under Controlled Conditions of Water**
Keiichi Ogasawara
Akihiro Yamasaki
Fumio Kiyono
- 148af** **A Comparison of Variable Reference Potential Models for Gas Hydrates**
Gerald D. Holder
Yi Zhang
Robert P. Warzinski
- 148ag** **Prediction of the Dissociation Condition of a Simple Hydrate Phase on an H-Lw-V Line in Isochoric Operation**
Fumio Kiyono
Hideo Tajima
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- 148b** **Extension of the Trappe-Ua Force Field to Thiols, Sulfides and Disulfides**
Jeffrey J. Potoff
Nusrat Lubna
Ganesh Kamath
- 148c** **Nucleation for Confined Lennard-Jones Fluid by Density Functional Theory**
Dong Fu
Lili Liang
- 148d** **Bulk and Interfacial Properties of Simple Confined Fluids**
Sang Kyu Kwak
Jayant K. Singh
- 148e** **Monte Carlo Simulation of Polymers within a Lattice**
Erin N. Sawardecker
Marta Sales-Pardo
Luis A. N. Amaral
- 148f** **Thermodynamically Consistent Adaptation of Scaled Particle Theory to an Arbitrary Equation of State: Hard Sphere Fluid Properties and a New Reference System for Solvation Theories**
Daniel W. Siderius
David S. Corti

- 148g** **The Effects of Disperse Attractions on Transport Properties Using Step Potential Equilibria and Dynamics (Spead)**
Zeynep N. Gerek
Neil H. Gray
Richard Elliott
- 148h** **First-Order Mean Spherical Approximation and Its Application to the Critical Region**
Yiping Tang
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- 148i** **Thermodynamic Expression of Electrolyte Solution**
Shuzo Ohe
- 148j** **Helical Structure from an Isotropic Homopolymer Model**
Victor R. Vasquez
Leo Lue
James Magee
Jim Warwicker
- 148k** **Equation of State for Hard-Spheres and Hard-Chains in the Glassy Region**
S. M. Waziri
Esam Z. Hamad
- 148l** **Thermodynamic Characterization of Milspec Hydrazine**
Danielle L. Sanchez
Tim Jobe
Robert Rakoff
D.B. Wilson
Martha Mitchell
- 148m** **Global Parameter Optimization for Equations of State**
Christopher Emborsky
David Miller
Sharon Sauer
- 148n** **Generalized Equation of State for the Perturbed-Chain Statistical Associating Fluid Theory**
Hong Wei Xiang
Francois Montel
Alain Graciaa
Christelle Miqueu
Bruno Mendiboure
- 148o** **Incorporating Cross-Association in Aqueous Hydrogen Fluoride Mixtures**
Barath Baburao
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- 148p** **Saft1-Rpm Equation of State: Application to Phase Equilibria and Thermodynamic Properties of Carbon Dioxide + Aqueous Electrolyte Solutions**
Xiaoyan Ji
Sugata P. Tan
Hertanto Adidharma
Maciej Radosz

- 148q** **Triangular-Well of Variable Width: Theory and Molecular Simulation**
Felix F. Betancourt-Cárdenas
Luis A. Galicia-Luna
- 148r** **Experimental Vapor-Liquid Equilibria for the Carbon Dioxide + Octane, and Carbon Dioxide + Decane Systems from 313 to 373 K**
Rodrigo Jiménez-Gallegos
Luis A. Galicia-Luna
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- 148s** **The Solubility, Compressed Liquid and Saturation Density of Phenol in Supercritical CO₂**
Abel Zuñiga-Moreno
Luis A. Galicia-Luna
- 148t** **A New Algorithm for Calculating CO₂-Crude Minimum Miscibility Pressure**
Adel Elsharkawy
- 148u** **Experimental Determination of the Liquid Phase Composition in the System CO₂ / Methyl-diethanolamine / H₂O**
Reda Sidi-Boumedine
Elise PROVOST
Walter FURST
Viep Hoang-Dinh
Jean-Louis PEYTAVY
- 148v** **Diffusion and Viscosity in Gas-Expanded Liquids**
Malina E. Janakat
Christopher L. Kitchens
Jason P. Hallett
Xiuyang LU
Natalie B. Maxey
Megan Donaldson
Charles L. Liotta
Charles A. Eckert
- 148w** **Friction Theory and Free-Volume Theory Coupled with Statistical Associating Fluid Theory in Viscosity Modeling: Pure N-Alkanes**
Sugata P. Tan
Hertanto Adidharma
Brian F. Towler
Maciej Radosz
- 148x** **An Eos-Based Viscosity Model for Polymer-Solvent Mixtures**
Edmundo Etchechury-Alvarez
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- 148y** **Thermodynamics of Water Interaction in Stratum Corneum by Using Isothermal Calorimetry**
Santosh Yadav
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- 148z** **Modelling of Nanocapsules Formation: Phase Separation during Mass Transfer Processes**
Hassou Maria
Yann le Gorrec
Christian Jallut
Françoise Couenne
Melaz Tayakout

Session 167 - Ionic Liquids: Thermodynamics and Transport

Chair: Edward J. Maginn

Vice Chair: Cor J. Peters

- 167a** **How to Tailor Ionic Liquids for Separation**
Carsten Jork
Wolfgang Arlt
- 167b** **Gas Solubilities in Tunable Ionic Liquids**
Jessica L. Anderson
JaNeille K. Dixon
Mark J. Muldoon
Edward J. Maginn
Joan F. Brennecke
- 167c** **Solubility and Diffusivity of Hydrofluorocarbons in Room-Temperature Ionic Liquids**
Mark Shiflett
Akimichi Yokozeki
- 167d** **Thermodynamic Modeling of the Phase Behavior of Binary Systems of Ionic Liquids and Carbon Dioxide with the Gc-Eos**
Bianca Breure
Susana B. Bottini
Esteban A. Brignole
Cor J. Peters
- 167e** **Computational Screening of Ionic Liquids for Aromatic Extraction Using Cosmo-Rs**
K. Z. Sumon
Esam Z. Hamad
- 167f** **Molecular Dynamics Study of Pyridinium- and Triazolium-Based Ionic Liquids**
Cesar Cadena
Edward J. Maginn
- 167g** **Electrolytic Conductivities of Hydrophobic Room-Temperature Ionic Liquids**
Joseph W. Magee
Jason A. Widegren
Eric M. Saurer
Kenneth N. Marsh
- 167h** **Compressed Liquid Densities for the Binary Mixture [Emim] Chloride + Octane and for the Ternary Mixture [Emim] Chloride + Octane + CO₂**
Abel Zuñiga-Moreno
Octavio Elizalde-Solis
Luis A. Galicia-Luna
- 167i** **Ionic Liquids Based on Phosphonium, Imidazolium and Ammonium Cations as Pvc Plasticizers: Liquid Leaching, Solid Migration and Cytotoxicity Studies**
Mustafizur Rahman
Christopher S. Brazel

Session 171 - Microfluidics and Low-Reynolds-Number Flows

Chair: Victor M. Ugaz

Vice Chair: James F. Gilchrist

- 171a Electrokinetic Transport in Nanoscale Fluidic Channels**
Dimiter N. Petsev
Anthony L. Garcia
Linnea K. Ista
Michael J. O'Brien
Steven R. J. Brueck
Gabriel P. Lopez
- 171b Engineering on the Pore Scale: Partitioned Injections for Electrophoretic Separations**
Todd M. Squires
Max Narovlyansky
George M. Whitesides
- 171c Pulsed Electrohydrodynamic Jetting for "Drop-and-Place" Particle Manipulation**
Chuan-Hua Chen
Dudley A. Saville
Ilhan A. Aksay
- 171d Many-Particle Hydrodynamic Interactions in Parallel-Wall Geometry: the Role of the Far-Field Flow**
Sukalyan Bhattacharya
Jerzy Bławdziewicz
Eligiusz Wajnryb
- 171e Flow Dynamics in Injection Molding with Microfeatures**
Goujun Xu
Xin Hu
Kurt W. Koelling
L. James Lee
- 171f Chaotic Mixing in a Microfluidic Device Driven by Oscillatory Electroosmotic Flow**
Frederick R. Phelan Jr.
Jai A. Pathak
D.J. Ross
J. Obrzut
- 171g Gravity-Driven Motion of a Drop or Bubble near an Inclined Wall at Low Reynolds Number**
Andrew J. Griggs
Alexander Z. Zinchenko
Robert H. Davis
- 171h Microfluidic Interfacial Tensiometry**
Steven D Hudson
Joao P. B. T. Cabral
Jai A. Pathak
Wenhua Zhang
Kathryn L. Beers
- 171i Empirical Validation of the Hydraulic Design of a Silicon Carbide Micro-Channel Reactor for the Si Process**
Merrill A. Wilson

Hydrodynamic Dispersion in Narrow Microchannels: Shape Matters!

*Armand Ajdari
Nathalie Bontoux
Howard A. Stone*

Session 172 - Modeling of Interfacial Systems

Chair: Paul R. Van Tassel
Vice Chair: Elias I. Franses

- 172a** **A Model for Rupture of Thin Equilibrium Films Due to Random Mechanical Perturbations**
*Zebin Wang
Ganesan Narsimhan*
- 172b** **Monte Carlo Simulation of Equilibrium Reactions at Vapor-Liquid Interfaces**
Heath Turner
- 172c** **Nano-Colloidal Brushes in Non-Adsorbing Polymer Solutions**
*Alberto Striolo
Sergei A. Egorov*
- 172d** **A Monte Carlo Study of Chain Conformation in a Cylindrical Confinement**
Shing Bor Chen
- 172e** **A Nonlinear Two-Phase Model to Relate Semiequilibrium Dialysis and Ultrafiltration Results for Arsenic Solutions**
*Hatice Gecol
Erdogan Ergican*
- 172f** **Generalized Svrc-Qspr Predictions of Interfacial Tensions**
*Ajay Jagadeesan
Srinivasa S. Godavarthy
Rob L. Robinson
Khaled A. M. Gasem*
- 172g** **Effect of Metal Adsorption on the Band Structure of Semiconducting Nanotubes**
*Luis A. Agapito
Jorge M. Seminario*

Session 186 - Stability and Nonlinear Hydrodynamics

Chair: Panagiotis Dimitrakopoulos
Vice Chair: Vittorio Cristini

- 186a** **Dynamics and Breakup of Stretching Bridges of Surfactant-Laden Liquids**
*Ying-Chih Liao
Elias I. Franses
Osman Basaran*
- 186b** **Capillary Puddle Vibrations Linked to Defects in Planar-Flow Melt Spinning**
*Eric A. Theisen
Cormac J. Byrne
Paul H. Steen
Steven J. Weinstein*
- 186c** **Competitive Displacement of Thin Liquid Films on Chemically Patterned Substrates**
*Richard D. Lenz
Satish Kumar*

- 186d** **Influence of Boundary Slip on the Dynamics and Stability of Thermally Driven Climbing Films with Significant Gravitational Counterflows**
Jeffrey M. Davis
- 186e** **Linear Stability Analysis of Electrically-Driven, Viscoelastic Jets**
Colman P. Carroll
Yong L. Joo
- 186f** **Nonlinear Particle Segregation Instabilities in Micro-Vortices and Burger Dynamics**
Diana S. Hou
Zach Gagnon
Hsueh-Chia Chang
- 186g** **Transitional Pathway to Turbulence Found in Elastic Fluids**
Bruce A. Schiamborg
Laura T. Shereda
Hua Hu
Ronald G. Larson
- 186h** **Thixotropy and Shear-Induced Microstructure of Shear-Thickening, Nanoaggregate, Fumed Silica Dispersions**
Caroline H. Nam
Norman J. Wagner
- 186i** **Study on Taylor Vortex Formation in a Liquid Gap with Significant Boundary Effects**
Rensheng Deng
Ye Chyn Mak
Chi-Hwa Wang
Kenneth A. Smith

Session 190 - Templated Synthesis

Chair: Paschalis Alexandridis

Vice Chair: Alexander Couzis

- 190a** **Templated Synthesis of Compound Semiconductor Nanostructures Using Lyotropic Liquid Crystals**
Georgios Karanikolos
Paschalis Alexandridis
Nga-Leung (Vera) Law
Athos Petrou
T.J. Mountziaris
- 190b** **Preparation and Characterization of Silica Films with Aligned Cylindrical Mesopores on Porous Substrates**
Venkat R. Koganti
Stephen E. Rankin
- 190c** **Silica Coating on a Bionanorod**
Elizabeth S. Royston
James N. Culver
Michael T. Harris

190d Multi-Scale Assembly of Silica Sphere Particles through Aerosol Assisted Process

*Qingyuan Hu
Zhiwang Wu
Jibin Pang
Eric J. Hampsey
Yunfeng Lu*

190e Sonication and Electrodeposition of Rhodium: Effects on Plating Efficiency and Surface Morphology

*Michael D. Hatton
Dr. Stephanie Farrell
Dr. Robert Hesketh*

190f Synthesis and Characterization of Novel Metal-Organic Framework Structures

*Zheng Ni
Richard I. Masel*

Session 192 - Transport in Nanoporous Materials

Chair: Randy Snurr

Vice Chair: Karl Johnson

192a MD Simulations of Water and Sodium Counter-Ion Diffusion in the Pores of Beta - Lactoglobulin Crystals

*Kourosh Malek
Theo Odijk
Marc-Olivier Coppens*

192b Pore Accessibility and Ion Transport in Ordered Mesoporous Silica Thin Films Determined by Electrochemical Methods

*Ta-Chen Wei
Hugh W. Hillhouse*

192c Spatially Resolved Measurements of Transport of Guest Molecules in Nanoporous Molecular Sieve Membranes

*Weontae Oh
Sankar Nair*

192d Multiscale Modeling for Bridging Disparate Scales of Diffusion in Polycrystalline Microporous Membranes

*Mark A. Snyder
Dionisios G. Vlachos*

192e Transport of CO₂ and N₂ through Single-Walled Carbon Nanotube Membranes

*Anastasios Skoulidas
David S. Sholl
Karl Johnson*

192f Computer Simulations of Adsorption and Transport of a Quaternary Mixture Including Hydrogen in Zsm-5 and Silicalite

*Martha C. Mitchell
Marco Gallo-Estrada
Venkata Krishna K. Upadhyayula
Tina M. Nenoff*

- 192g** **The Role of Diffusion in Separation of Gas Mixtures Using a Range of Zeolite Membranes: a Molecular Dynamics Study**
Wei Jia
Sohail Murad
- 192h** **Modeling Permeation in Nanoporous Media with Lattice Density Functional Theory**
Daniel Matuszak
Gregory L. Aranovich
Marc D. Donohue

Session 217 - In Honor of John Anderson - I

Chair: Darrell Velegol

Vice Chair: Peter N Pintauro

- 217a** **A Hydrodynamic/Brownian Motion Model of Thermal Diffusion in Liquids**
James R. Bielenberg
Howard Brenner
- 217b** **Inducing a Sol-Gel Transition in Clay Suspensions Using Added Nanoparticles**
John Y. Walz
Jason Baird
- 217c** **Effects of Particle Concentration on Efficiency of Chemical Mechanical Planarization**
Yuri Solomentsev
- 217d** **Tirm of Ac Electrically Driven Motion of a Single Microparticle near Platinum and Indium-Tin-Oxide Electrodes**
Dennis C. Prieve
Paul J. Sides
James D. Hoggard
Jeffrey A. Fagan
- 217e** **Diffusioosmosis of an Electrolyte Solution along a Plane Wall**
Hsien C. Ma
Huan J. Keh
- 217f** **Porous Polyurethane Foam Scaffolds for Bone Tissue Engineering**
SA Guelcher
Jeffrey O. Hollinger
- 217g** **Engineering Membranes for Environmental and Energy Applications**
Jian Zou
Jin Huang
W.S. Winston Ho
- 217h** **Electrokinetics and Australia**
Lee R. White

Session 221 - Microscale Flows

Chair: Victor M. Ugaz

Vice Chair: James F. Gilchrist

- 221a** **Polymer Chain Dynamics in Viscous Flow through Ordered Arrays of Posts**
Victor A. Beck
Eric S. G. Shaqfeh
Nerayo P. Tecler
Susan J. Muller
- 221b** **Concentration Effects on Chain Migration in Microfluidic Flow**
Yeng-Long Chen
Juan P. Hernández-Ortiz
Hongbo Ma
Michael D. Graham
Juan J. de Pablo
- 221c** **Brownian Dynamics Simulations of Shear-Induced Migration of DNA Molecules in Dilute Solutions near a Solid Boundary**
Chih-Chen Hsieh
Nobuhiko Watari
Ronald G. Larson
- 221d** **Electrostatic Bounds on the Hydrodynamic Friction and Mobility of Arbitrarily Shaped Bodies in Stokes Flow**
Jerzy Blawdziewicz
Eligiusz Wajnryb
J. A. Given
J. B. Hubbard
- 221e** **Hysteresis, Force Oscillations and Non-Equilibrium Effects in the Adhesion of Nanoparticles to Atomically Smooth Surfaces**
German Drazer
Joel Koplik
Boris Khusid
Andreas Acrivos
- 221f** **Detachment of a Large Particle from a Microchannel**
Nimisha Shukla
Kimberly H. Henthorn
- 221g** **Dynamics of Micron-Scale Objects in Shear Flow over Nanotextured Sensor Surfaces**
Jeffrey M. Davis
Ranojoy D. Duffadar
Maria M. Santore
E. Bryan Coughlin
- 221h** **A Method for Measuring Simultaneously the Fluid and Particle Mobilities under Strong DC and Low-Frequency Ac Fields**
Anil Kumar
Andreas Acrivos
Zhiyong Qiu
Boris Khusid
Mike Yeksel

- 221i** **A Rapid Micro-Fluidic Bacteria Trap Based on High-Peclet Momentum and Particle Flux Coupling in Vortex Flows**
Zachary R. Gagnon
Hsueh-Chia Chang
- 221j** **Transport Coefficients and Orientational Distributions of Rodlike Particles with Magnetic Moment Normal to the Particle Axis under Circumstances of a Simple Shear Flow and an External Magnetic Field**
Akira Satoh
Masataka Ozaki
Teppei Ishikawa
Tamotsu Majima

Session 231 - Particulate and Multiphase Flow

Chair: Nina C. Shapley

Vice Chair: Eric M. Furst

- 231a** **Validation Study of Bubble-Column Simulations for Uniform and Non-Uniform Aeration Conditions**
Sarah M. Monahan
Rodney O. Fox
- 231b** **A Lattice-Boltzmann Method for Gas-Liquid Interfaces with Application to the Hindered Rise of Bubbles with Moderate Reynolds Numbers**
Xiaolong Yin
Donald L. Koch
Rolf Verberg
- 231c** **Boundary-Integral Calculations for the Emulsion Flow through a Granular Material**
Alexander Z. Zinchenko
Robert H. Davis
- 231d** **Rheology of Semi-Dilute Suspensions of Polystyrene Ellipsoids at High Peclet Numbers**
Jonathan Bricker
Jason E. Butler
- 231e** **Rheology and Structure Formation in Sheared Suspensions of Elastic Particles**
Kenneth Higa
Jonathan Higdon
- 231f** **Accumulation of Particles at an Advancing Meniscus: Viscous Miscible Fingering in the Converging Parallel Plate Geometry**
Arun Ramachandran
David T. Leighton
- 231g** **Evolution of the Flow of a Concentrated Suspension through an Annular Expansion Measured by Nmri**
Tracey Moraczewski
Nina C. Shapley
- 231h** **Secondary Flow Behavior and Charged Particle Transport in Bifurcations**
Fong Yew Leong
Chi-Hwa Wang
Kenneth A. Smith

231i Rheology of a Dilute Suspension of Non-Spherical Particles in Parallel-Wall Geometry

*Mauricio Zurita-Gotor
Jerzy Blawdziewicz
Eligiusz Wajnryb*

231j Dns of Dense Suspensions: Instabilities in Liquid-Fluidized Beds

*Jacobus J. Derksen
Paul E. Kelly
Sankaran Sundaresan*

Session 238 - Thermodynamic Properties and Phase Behavior: Part III

Chair: J. Ilja Siepmann

Vice Chair: Clare McCabe

238a Area 1a Keynote Address: Thinking like a Molecule-- Simulating Protein Aggregation

Carol K. Hall

238b One Step Mechanism for the Nucleation of Insulin Crystals

*Luis F. Filobelo
Oleg Galkin
Peter G Vekilov*

238c Modelling of Strongly Polar and Polarizable Fluids and Their Mixtures

*Matthias Kleiner
Gabriele Sadowski
Joachim Gross*

238d Phase Behavior of Dipolar Fluids from the Saft-Vr Equation of State

*Honggang Zhao
Clare McCabe*

238e Assessing the Van Der Waals and Platteeuw Theory of Gas Hydrate Thermodynamics Using Monte Carlo Calculations of Hydrate Free Energies

*Scott Wierzchowski
Peter A. Monson*

Session 253 - Colloidal Hydrodynamics

Chair: Eric M. Furst

Vice Chair: Nina C. Shapley

253a Concentration Fluctuations in Dilute Suspensions of Orientable and Deformable Particles under Sedimentation

*David Saintillan
Eric S. G. Shaqfeh
Eric Darve*

253b Effects of Particle Shape on Colloid Rheology and Shear Thickening

*Norman J. Wagner
Ron Egres*

253c Dynamics of Concentrated Suspensions of Rigid and Semi-Rigid Brownian Fibers

*Philip D. Cobb
Jason E. Butler*

- 253d** **Jamming in Carbon Nanotube Suspensions**
Erik K. Hobbie
- 253e** **Hydrodynamic Reversibility in Suspensions**
David J. Pine
Jerry P. Gollub
- 253f** **Hydrodynamic and Brownian Fluctuations in Colloidal Suspensions**
Ard Louis
- 253g** **Local and Large-Scale Structure in Sheared Suspensions and Their Impact on Macroscopic Properties**
Yevgeny Yurkovetsky
Jeffrey F. Morris
- 253h** **Linear and Non-Linear Microrheology of Colloidal Suspensions**
Eric M. Furst
Alexander Meyer
Myung Han Lee
- 253i** **Dynamic Criterion for the Equilibrium Percolation Threshold of Weakly Attractive Colloids**
Samartha G. Anekal
Pradipkumar Bahukudumbi
Michael A. Bevan
- 253j** **Magnetorheological Measurements in Suspensions of Magnetic Nanoparticles**
Carlos Rinaldi

Session 254 - Complex and Bio-fluid Dynamics I

Chair: Patrick Doyle

Vice Chair: Victor Breedveld

- 254a** **Hindered Transport in Biological and Biomimetic Materials**
William M. Deen
- 254b** **Multipole Flows in Poroelastic Media and Neural Tissues**
Keith B. Neeves
William L. Olbricht
- 254c** **Cell Depletion in Synthetic Micro-Thrombosis: on the Enhanced Fåhræus Effect**
Magalie Faivre
Manouk Abkarian
Kimberly Bikraj
Howard A. Stone
- 254d** **Controlling the Motion of Cells along a Compliant Substrate by Tailoring Its Mechanical and Topological Properties**
Rolf Verberg
Alexander Alexeev
Anna C. Balazs
- 254e** **Hydrodynamics of Actin-Based Propulsion**
Alexander M. Leshansky

254f **Shear and Extensional Rheology of Polymer Solutions: Brownian Dynamics Simulations at Finite Concentrations**
Christopher G. Stoltz
Juan J. De Pablo
Michael D. Graham

254g **Brownian Dynamics Simulations of Polymer Blend Droplets**
Bharadwaj Narayanan
Victor Pryamitsyn
Venkat Ganesan

254h **Rheology and Flow-Induced Structure in a Polystyrene-Polyisoprene Biocontinuous Microemulsion**
Kristin L. Brinker
Wesley R. Burghardt

254i **Rheology and SANS of Block Copolymer - Protein Nanocomposites**
Danilo C. Pozzo
Lynn M. Walker

Session 265 - In Honor of John Anderson - II

Chair: Darrell Velegol

Vice Chair: Peter N Pintauro

265a **Appreciating Anderson's Etchings: Mica Membranes as Metaphor**
Stephen L. Matson

265b **Particles Slowly Coating a Surface**
Eduardo D. Glandt
Panu Danwanichakul

265c **Automation in Pharmaceutical Process Research and Development**
Paul F. McKenzie
John J. Venit

265d **Characterization of Gel-Filled Porous Membranes Using Moment-Based Interpretation of Transport Measurements**
Ruth E. Baltus

265e **Measuring Charge Nonuniformity on Colloidal Particles**
Darrell Velegol
Joseph F. Jones

265f **Vesicles and Micelles in Mixtures of Surfactant and Amino Acid Hydrotropes**
Eric W. Kaler
Yamaira I. González

265g **Protein-Polymer Interactions and Flavor: a Microfluidic Study**
Paulina A. Achurra
Channing R. Robertson
Alice P. Gast

Session 269 - Multiscale Modeling: Thermodynamic and Mesoscale Properties

Chair: Hank Ashbaugh

Vice Chair: Mikhail A Anisimov

- 269a** **An Application of Mean-Field Perturbation Theory for the Adsorption of Water Molecules in Nanoslit-Pores**
Rasesh Kotdawala
Nikolas Kazantzis
Robert Thompson
- 269b** **The Role of Critical Cavities in Homogeneous Bubble Nucleation**
Mark J. Uline
David S. Corti
- 269c** **Viscosity of Hydration Water under Subnanometer Confinement between Mica Surfaces**
Yongsheng Leng
Peter T. Cummings
- 269d** **Molecular Models of Wetting of Porous Solid Surfaces: Understanding Superhydrophobicity**
Fabien Porcheron
Peter A. Monson
- 269e** **Polyhedral Oligomeric Sislesquioxanes in Solution: Insights from All-Atom Molecular Dynamics Simulations**
Alberto Striolo
Clare McCabe
Peter T. Cummings
- 269f** **Molecularly Fine Tuning the Self-Assembly Micellar Systems through Global**
Naveed Aslam
Aydin Sunol

Session 310 - Complex and Bio-fluid Dynamics II

Chair: Victor Breedveld

Vice Chair: Patrick Doyle

- 310a** **Live-Cell Microrheology**
Denis Wirtz
- 310b** **Tracer Microrheology of Polymer Solutions at Elevated Temperature and Pressure**
Shaun A. Tanner
John H. Van Zanten
- 310c** **Structure and Dynamics of Salt-Responsive Polyelectrolyte Solutions**
Jun Sato
Victor Breedveld
- 310d** **Microrheology of Evolving Extra-Cellular Matrices**
Patrick Doyle
Thierry Savin
- 310e** **Forced Unfolding of Protein Domains Determines Cytoskeletal Rheology**
Brenton Hoffman
Gladys Massiera
John Crocker

- 310f** **Collective Dynamics in Suspensions of Swimming Particles**
Juan Hernandez-Ortiz
Christopher G. Stoltz
Michael D. Graham
- 310g** **Flow and Confinement Effects on the Evolution of Surfactant Mesophases**
Matthew Kerby
Jinkee Lee
Arijit Bose
Anubhav Tripathi
- 310h** **Microfluidic Rheometry in Complex Fluids Using Flow-Induced Birefringence**
Jai A. Pathak
Steven D. Hudson
- 310i** **Reversible Change of Nanostructures in Sodium Lauryl Ether Sulfate Systems**
Jingshan Dong
Alon V. McCormick
H. Ted Davis
David Gohl

Session 324 - Fundamentals of Interfacial Phenomena I

Chair: Vinay K. Gupta

Vice Chair: Jan Sefcik

- 324a** **The Interactions between Deformable Interfaces: Detailed Experimental Studies Using Afm and Theoretical Modeling on the Nanoscale**
Raymond R. Dagastine
Tam T. Chau
Geoffery W. Stevens
Steven Carnie
Derek Y.C. Chan
Franz Grieser
- 324b** **High-Speed Imaging of Particle-Bubble Interaction**
Zachery I. Emerson
Gopal A. Krishnagopalan
Steve R. Duke
- 324c** **Sequestration of Amitriptyline by Liposomes**
Marissa Fallon
Anuj Chauhan
- 324d** **The Effect of Nonadsorbing Macromolecules on the Particle Dynamics near an Interface**
Ratna J. Oetama
John Y Walz
- 324e** **Mapping Potential Energy Landscapes on Patterned Surfaces Using Diffusing Colloidal Probe Microscopy**
Hung-Jen Wu
William N. Everett
Michael A. Bevan
- 324f** **Adsorption of Peptides on Solid Surfaces: an Interaction Site Model Study**
Daniel Forciniti
Amol Mungikar

Mechanical Properties of Peo/ Ppo/ Pluronic Interfaces

*Jeffrey Martin
Sachin Velankar*

Session 337 - Novel Numerical Methods in Fluid Mechanics

Chair: Dimitrios V. Papavassiliou

Vice Chair: Nikolas Kazantzis

- 337a** **A Novel Efficient Pseudospectral Method for the Dns of Turbulent Flow in a Wavy Channel**
*Luo Wang
Antony N. Beris*
- 337b** **Interfacial Dynamics in Stokes Flow Via an Efficient, Fully-Implicit, Time Integration Algorithm: Droplets and Membranes**
*Jingtao Wang
Yechun Wang
Walter R. Dodson
Panagiotis Dimitrakopoulos*
- 337c** **Computing Three-Dimensional, Steady-State, Incompressible Flows Using a Parallel, Higher-Order, Mixed-Formulation, Galerkin Finite Element Method**
*Yong-II Kwon
Paul Sonda
Andrew Yeckel
Jeffrey J. Derby*
- 337d** **A Finite-Element Phase-Field Method for Simulating Interfacial Dynamics in Complex Fluids**
*Pengtao Yue
Chunfeng Zhou
James J. Feng
Carl F. Ollivier-Gooch
Howard H. Hu*
- 337e** **Turbulent Internal Flow Simulation Via the Lattice Boltzmann Method**
*Stephen Vinay
Richard C. Bauer
Stuart T. White
Woo Tae Kim
Myung S. Jhon*
- 337f** **The Effect of the Choice of the Primitive Variables on the Numerical Efficiency of Highly Transient Flows**
Haroun Mahgerefteh
- 337g** **Computational Modeling of Hydrodynamic Interactions between Two Vesicles Rolling on an Elastic Substrate in Shear Flow**
*Alexander Alexeev
Rolf Verberg
Anna C. Balazs*

Session 338 - Thermodynamic and Transport Properties in Supercritical Fluids

Chair: Ram Gupta

Vice Chair: Mark C. Thies

- 338a High Pressure Viscosity and Density of Pmma + Acetone + CO2**
Erdogan Kiran
Kun Liu
- 338b Supercritical Reaction Calorimetry: a Novel Route to Supercritical Fluid Reaction Monitoring**
Charalampos A. Mantelis
Frédéric Lavanchy
Thierry Meyer
- 338c Sld Adsorption Model of Pure Coalbed Gases on Dry Argonne Premium Coal Matrices**
Khaled A. M. Gasem
James Fitzgerald
Arunkumar Arumugam
Rob L. Robinson
- 338d Thermophysical Properties of Gas Expanded Liquids**
Christopher L. Kitchens
Jason P. Hallett
David Bush
Jie Lu
Charles L. Liotta
Charles A. Eckert
- 338e Solubility of Metal Complexes in Supercritical Carbon Dioxide Solutions**
Brandon Smeltzer
Sermin G. Sunol
Haitoi Li
Aydin Sunol
- 338f Novel Surfactants with Biodegradable Tails for the CO₂-Water Interface**
Balaji S. Bharatwaj
LIBO WU
Sandro R. P. Da Rocha
- 338g Extrapolation of Molecular Simulation Data: Application to Supercritical Fluids**
Marcelo S. Zabaloy
Victor R. Vasquez
Eugenia A. Macedo

Session 342 - Biomolecules at Interfaces I

Chair: James W. Schneider

Vice Chair: Maria M. Santore

- 342a Assembly State-Dependent Insertion of Amyloid-Beta Protein into Lipid Monolayers**
Eva Y. Chi
Canay Ege
Ka Yee C. Lee

- 342b** **Mobility of DNA on Supported Lipid Bilayers**
Chakradhar Padala
Richard Cole
Sanat K. Kumar
Ravi S. Kane
- 342c** **Non-Natural, Helical Peptoid Mimics of Lung Surfactant Protein B: Interactions with a Lipid Film**
Shannon L. Seuryneck
Ann Czyzewski
Nathan J. Brown
Lauren Floyd
Annelise E. Barron
- 342d** **Stabilization of Model Membrane Systems by Disaccharides. Quasielastic Neutron Scattering Experiments and Atomistic Simulations**
Emmanouil Doxastakis
Victoria Garcia Sakai
Satoshi Ohtake
Janna K. Maranas
Juan J. de Pablo
- 342e** **Overcoming Mass Transport Limitations in Plasmon Resonance Biosensor**
lixiao Zeng
Xuerong Li
Athar H. Chishti
Christos G. Takoudis

Session 355 - Fundamentals of Interfacial Phenomena II

Chair: Vinay K. Gupta

Vice Chair: Jan Sefcik

- 355a** **Structuring of Nanoparticles and Micelles Confined between Surfaces**
Aysen Tulpar
Babak Fazelabdolabadi
Paul R. Van Tassel
John Y. Walz
- 355b** **Dynamics of Microparticles at Oil-Water Interfaces**
Sowmitri Tarimala
Chih-yuan Wu
Lenore L. Dai
- 355c** **Spreading Characteristics and Microscale Evaporative Heat Transfer in a Moving Meniscus Containing a Binary Mixture**
Sashidhar S. Panchamgam
Joel L. Plawsky
Peter C. Wayner Jr.
- 355d** **Spreading and Two-Dimensional Mobility of Long-Chain Alkanes at Solid/Gas Interfaces**
Hans Riegler
Paul Lazar
Hauke Schollmeyer

355e Ionization of Self-Assembled Surfaces of Bowl-Shaped Cavitands

*Vinay K. Gupta
Justine Molas*

355f Dynamic Behavior of Interfacial Properties in Photoresponsive Surfactant Systems

*Bradley A. Cicciarelli
T. Alan Hatton
Kenneth A. Smith*

355g A Molecular Dynamics Study of the Wetting of Hydrophobic Substrates by Aqueous Surfactant Solutions

*Jonathan D. Halverson
Joel Koplik
Alexander Couzis
Charles Maldarelli*

Session 357 - Imaging of Surfaces

Chair: Eric M. Furst

Vice Chair: Bing-Hung Chen

357a Probing the Chemistry and Structure of Interfaces Utilizing Synchrotron Based Surface Science

*Joseph L. Lenhart
Daniel Fischer*

357b Measurement of Lipid and Protein Adsorption to the Air-Water Interface Using Quantitative Brewster Angle Microscopy

*Jonathan G. Fernsler
Patrick C. Stenger
Joseph A. Zasadzinski*

357c Studying Surfactant Aggregates on Metals by Atomic Force Microscopy

*Hannes C. Schniepp
Ho C. Shum
Dudley A. Saville
Ilhan A. Aksay*

357d Image Analysis Methods for the Study of Biomolecular Complexes Using Afm

*Agnes Ostafin
Fei Liu*

357e Probing Effect of Rifampicin-Impregnated Silicone on Staphylococcus Epidermidis Biofilm Formation

*Xuemei Liang
Anfeng Wang
Ting Cao
Haiying Tang
Steven O. Salley
James P. McAllister
K.Y. Simon Ng*

357f Probing the Adhesion Force between E.Coli and Modified Silicone Rubber Surfaces

*Ting Cao
Haiying Tang
Anfeng Wang
Xuemei Liang
Gregory W. Auner
Steven O. Salley
K. Y. Simon Ng*

357g Morphology and Amine Accessibility of (3-Aminopropyl)Triethoxysilane Films Prepared on Glass Surfaces

*Mark W. Vaughn
Wei Wang*

Session 360 - Interfacial and Electrochemical Phenomena in Microfluidics and MEMS Devices

Chair: Sammy S. Datwani

Vice Chair: Carlton F. Brooks

360a Vapor Phase Lubrication for Mems Devices

Andrew J. Gellman

360b High Temperature in-Use Stiction of Cantilever Beams Coated with Perfluorinated Alkylsiloxane Monolayers

*Joelle Frechette
Carlo Carraro
Roya Maboudian*

360c Phase Separation of Immiscible Liquids Using Capillary Forces for Extraction in Continuous Flow Microchemical Systems

*Jason G. Kralj
Hemantkumar R. Sahoo
Martin A. Schmidt
Klavs F. Jensen*

360d Total Internal Reflectance Microscopy on a Microfabricated High-Throughput Glass Chip: Application to Cholesterol-Modulated Antibody Binding to Supported Lipid Membranes

*Kwon Hon Cheng
Brian Cannon
Mark W. Vaughn
Juyang Huang
Nolen Weaver
Qiaosheng Pu
Shaorong Liu*

360e A New Electroosmotic Pump and Its Applications

*Ping Wang
Zilin Chen
Hsueh - Chia Chang*

360f Electrokinetic Transport with Stokes Flow in Lab-on-a-Chip under Asymmetric Surface Conditions

*Myung-Suk Chun
Tae Seok Lee
Kangtaek Lee*

- 360g** **An Electric Circuit Model for Electrical Field Flow Fractionation**
Joseph J. Biernacki
P. Manikya Mellacheruvu
Satish M. Mahajan
- 360h** **Measurement of Electrophoretic Mobility of Ionic Surfactant**
Do Jin Im
In Seok Kang
- 360i** **Self-Propelling Semiconductor Devices Demonstrate New Electroosmotic Motility Principles**
Suk Tai Chang
Orlin D. Velev
Vesselin N. Paunov

Session 368 - Polymerization and Polymer Processing in Supercritical Fluids

Chair: Ruben G. Carbonell

Vice Chair: Suresh L. Shenoy

- 368a** **High Pressure Crystallization of Polymers in Dense Fluids**
Erdogan Kiran
Wei Zhang
Jian Fang
- 368b** **Rheology of Reactive and High-Viscosity Polymers with Supercritical Carbon Dioxide**
Matthew D. Wilding
Donald G. Baird
- 368c** **Structure and Rheology of Supercritical CO₂ Exfoliated Polymer/Clay Nanocomposites**
Steven E. Horsch
Ganapathy Subrahmanium
Esin Gulari
Rangaramanujam M. Kannan
- 368d** **Property Prediction of Poly(Propylene) Plasticized by CO₂**
Hiroshi Inomata
Yusuke KOIZUMI
Katatsu HIROSE
Yoshiyuki SATO
Hideo Ohyabu
- 368e** **Foaming of Ps/Clay Nanocomposites in Supercritical Carbon Dioxide**
Sharath Kumar Nirmal Kumar
Shunahshep R. Shukla
Kurt W. Koelling
- 368f** **Impacts of Phase Morphology on Polymer Blends Foaming Using Supercritical CO₂**
Jiong Shen
Xiangmin Han
James Lee
- 368g** **Novel Dynamic Microcellular Polystyrene Processing in Supercritical CO₂**
Nan-Qiao Zhou
Chang-Yun Gao
xiang-Fang Peng

Session 376 - Solid-Liquid Interfaces I

Chair: Surita R. Bhatia

Vice Chair: Van N. Truskett

376a Layer-by-Layer Film Formation Kinetics under an Applied Electric Potential Measured by Optical Waveguide Lightmode Spectroscopy

A. Pascal Ngankam

Paul R. Van Tassel

376b Influence of Physical and Chemical Heterogeneity Shape on Thin Film Rupture

Anuj Chauhan

David Simmons

376c Reactive Surface Micropatterning by Wet Stamping

Christopher J. Campbell

Stoyan K. Smoukov

Kyle J.M. Bishop

Bartosz A. Grzybowski

376d Effects of Catalyst Introduction Methods on Metal Pattern Structure and Selectivity Using Dendrimer/Polyelectrolyte Multilayer Coated Substrates

Troy R. Hendricks

Ilsoon Lee

376e Surface Diffusion of DNA Oligonucleotides on Patterned Silane Surfaces

Travis J. Crites

James W. Schneider

376f Loosely Packed, Hydroxyl Terminated Sams on Gold

Bradley Berron

Miles Barr

Kane G. Jennings

376g Physically Self-Assembled Monolayers (Psam'S) of Lecithin Lipids at Hydrophilic Silicon Oxide Interfaces

Tze Lee Phang

Elias I. Franses

Session 389 - Biomolecules at Interfaces II

Chair: James W. Schneider

Vice Chair: Maria M. Santore

389a Insulin Stability and Fibrillation with Surfaces: Role of Surface Wettability

Ananthakrishnan Sethuraman

Arpan Nayak

Tara Morcone Snyder

Georges Belfort

389b Interfacial Concentration Dependence in Unfolding Proteins Using Afm

Nishant Bhasin

Dennis Discher

- 389c Protein Adsorption Behavior and Control on Photopolymerized Scaffold Materials for Tissue Engineering**
*Clifford L. Henderson
Benita Comeau
Benjamin Katz*
- 389d Protein Interaction Forces at High Salt Measured Using Atomic Force Microscopy**
*Bryan Berger
Raymond R. Dagastine
Stanley I. Sandler
Eric W. Kaler
Abraham Lenhoff*
- 389e Proteolytic Degradation of Immobilized Proteins at the Solid/Liquid Interface: Implications for Detergency**
*Ladan Lynn Hagar
Clayton J. Radke
Harvey W. Blanch*
- 389f Mechanisms of Competitive Adsorption of Albumin and Sodium Myristate at the Silicon Oxide/Aqueous Interface**
*Scott McClellan
Elias I. Franses*
- 389g Adsorption Thermodynamics of Short-Chain Peptides on Charged and Uncharged Nanoscale Polymer Films**
*Nripen Singh
Scott Husson*

Session 404 - Fundamentals of Interfacial Phenomena III

Chair: Vinay K. Gupta

Vice Chair: Jan Sefcik

- 404a Wetting Kinetics of a Thin Film under Evaporation in Air: Pinning of the Contact Line**
*Parthasakha Neogi
S Saritha*
- 404b Measurements of Surface Properties with Oscillating Supported Bubbles**
*Ying-Chih Liao
Elias I. Franses
Osman Basaran*
- 404c Direct Measurement of Multi-Dimensional and Multi-Body Colloidal and Surface Interactions**
*Michael A. Bevan
Hung-Jen Wu
William N. Everett*
- 404d Lateral Drop Adhesion**
*Preeti S. Yadav
Prashant Bahadur
Rafael Tadmor*
- 404e The Adsorption Mechanisms of Micelle-Forming Polyelectrolyte/Neutral Diblock Copolymers**
Ryan Toomey

404f Ophthalmic Drug Delivery of Timolol by Soaked Contact Lenses

*Chi-Chung Li
Anuj Chauhan*

Charge Instability Induced Breakups of Droplets Containing Ionic Solutes and Suspended Nanoparticles

*Asit K. Ray
Kuo-Yen (Fred) Li*

Session 421 - Solid-Liquid Interfaces II

Chair: Surita R. Bhatia

Vice Chair: Van N. Truskett

421a Microscopic Structure of the Electric Double Layer at the Cassiterite Surfaces

*Lukas Vıcek
Peter T. Cummings*

421b Wettability Alteration for Gas Condensate Reservoirs by Surfactant Treatment

*Bhargaw Adibhatla
Kishore Mohanty*

421c Solidification Vs. Precipitation: Comparison between the Morphology of a Growing Interface by Two Different Mechanisms

*Saurabh Agarwal
Ranga Narayanan
Lewis E. Johns*

421d Mineral Salt Crystallization on Ro Membranes and Surrogate Surfaces

*Wen-Yi Shih
Yoram Cohen*

421e Investigation of Solid/Liquid Interfaces by Sum-Frequency Spectroscopy: Nitrile Adsorption and Hydrogenation on Model Supports and Catalysts

*S. Beau Waldrup
Christopher T. Williams*

421f Synthesis and Characterization of Nicop Alloys Via Electrodeposition

*Noppadon Sathitsuksanoh
Kanchan Mondal
Shashi Lalvani*

Hydrophilic Zeolite Coatings for Improved Heat Transfer at the Liquid-Solid Interface

*Ronnie A. Munoz
Derek Beving
Yushan Yan*

Session 422 - Thermodynamics Under High Pressure

Chair: Sandro R. da Rocha

Vice Chair: Cor J. Peters

- 422a** **Studying Thin Polymer Films under High Pressure Carbon Dioxide Using the Quartz Crystal Microbalance**
Yazan Hussain
Vito Carla
Christine Grant
Ruben G. Carbonell
- 422b** **Evaluation of the Phase Equilibria of Gas Condensates and Light Petroleum Fractions Using the Saft-Vr Approach**
Lixin Sun
Honggang Zhao
Clare McCabe
- 422c** **Molecular Simulation of Hydrogen Sulfide**
Jeffrey J. Potoff
Nusrat Lubna
- 422d** **Thermodynamic Model for the Solubility of Light Hydrocarbons in Aqueous Sodium Chloride Solutions up to 600 K and 2 Kilobars, and 5 NaCl M**
Renee J. Perez
Robert H. Heidemann
- 422e** **Solubility of Surfactant Templates in Supercritical Carbon Dioxide Solutions**
Brandon Smeltzer
Sermin G. Sunol
Aydin Sunol
- 422f** **Calculation of Solubility of Hydrogen in Hydrocarbons at High Pressures**
M.-R. Riazi
Y. A. Roomi

Session 453 - Colloidal Phenomena with Supercritical Fluids

Chair: Sandro R. da Rocha

Vice Chair: Michael Cheung

- 453a** **Stable Dispersions of Nanoparticles in Dense CO₂ Using Non-Fluorinated Ligands**
Philip W. Bell
Madhu Anand
M. Chandler McLeod
Xin Fan
Robert M. Enick
Christopher B. Roberts
- 453b** **The Removal of Ion-Implanted Photoresist from Microelectronic Devices Using Supercritical Carbon Dioxide**
Pamela M. Visintin
Michael B. Korzenski
Thomas H. Baum
Koichiro Saga
Hitoshi Kuniyasu
Takeshi Hattori

- 453c** **Monodisperse Core-Shell Silica Nanoparticle Dispersions in Liquid CO₂**
Stephanie S. Adkins
Jasper L. Dickson
Keith P. Johnston
- 453d** **Microencapsulation of Hydrophilic Additives into Colloidal Polymers with the Aid of Compressed Carbon Dioxide**
Matt Yates
X Chen
Z Dong
N Finn
W Yin
- 453e** **Formation Mechanism and Properties of Nanoparticles Produced by Supercritical Fluid Extraction of Emulsions**
Boris Y. Shekunov
Pratibhash Chattopadhyay
Jeff Seitzinger
Robert Huff
Adam Gibson
- 453f** **Electrostatic Stabilization of Inorganic Particles and Water Droplets in Supercritical Carbon Dioxide**
Won Ryoo
Griffin Smith
Mehul N. Patel
Keith P. Johnston
Roger T. Bonnecaze
- 453g** **Catalysis and Recycling of Metal Nanoparticles Stabilized by Microemulsions**
Chien M. Wai
- 453h** **Dynamic Biomolecular Interactions at the Aqueous Interface with Compressed and Supercritical Fluids**
Geoffrey D. Bothun
Jason A. Berberich
Barbara L. Knutson

Session 482 - Transport at Interfaces I

Chair: Anuj Chauhan

Vice Chair: Elias I. Franses

- 482a** **A Transport Theory and Validating Experiments for the Adsorption of Surfactant from Micellar Solutions to an Initially Clean Air/Water Interface Including the Direct Adsorption of Aggregates**
Fenfen Huang
Charles Maldarelli
Alexander Couzis
Ponisseril Somasundaran
- 482b** **Modeling of Adsorption Dynamics at Air-Liquid Interfaces Using Statistical Rate Theory (Srt): Non-Ideal Surfaces**
Mohammad E. Biswas
Ioannidis Chatzis
Marios A. Ioannidis
Pu Chen

- 482c** **The Effect of Serum Proteins and Hydrophilic Polymers on the Transport of Model Lung Surfactant**
Patrick C. Stenger
Jonathan G. Fernsler
Joseph A. Zasadzinski
- 482d** **Competitive Adsorption of Fibrinogen and Dipalmitoylphosphatidylcholine at the Air/Aqueous Interface**
Sook Heun Kim
Elias I. Franses
- 482e** **Drying and Swelling of Surfactant Films**
Zhiyong Gu
Paschalis Alexandridis
- 482f** **Construction of Extracellular Matrix Mimics and Their Effect on the Kinetics and Thermodynamics of Receptor-Ligand Binding on Supported Lipid Bilayers**
Jessica M. Tucker
Todd M. Przybycien
Robert D. Tilton
- 482g** **Submonolayer Coverage of Long Chain Alkanes at SiO₂/Air Interfaces: Molecular Mobility and Aggregation Behavior**
Hans Riegler
Ralf Koehler

Session 508 - Materials Synthesis and Processing with Supercritical Fluids I

Chair: Christopher B. Roberts

Vice Chair: Veera Boddu

- 508a** **CO₂-Induced Plasticization and Viscosity Reduction in Pharmaceutical Polymers**
Dehua Liu
Hongbo Li
David Tomasko
Geert Verreck
Albertina Arien
Peeters Jef
Brewster Marcus
- 508b** **Supercritical Carbon Dioxide Exfoliated Polymer Nanocomposites**
Steven E. Horsch
Gulay K. Serhatkulu
Rangaramanujam M. Kannan
Esin Gulari
- 508c** **Pore Expansion in Cationic Fluorinated Surfactant Templated Porous Silica Thin Films through Supercritical Carbon Dioxide Processing**
Kaustav Ghosh
Hans-Joachim Lehmler
Stephen E Rankin
Barbara L Knutson
- 508d** **Directly Patterned Mesoporous Carbon Film Prepared Using Block Copolymer Templates in Supercritical CO₂**
Gaurav Bhatnagar
James J. Watkins

- 508e Hydrothermal Synthesis and Deposition of Iron Oxide Nanoparticles in Activated Carbon**
Amy S. Teja
Chunbao Xu
- 508f Covalent Molecular Assembly in Supercritical Carbon Dioxide: a Preparative Method for Non-Fluorinated Functional Ultrathin Films**
Sreenivasa Reddy Puniredd
M. P. Srinivasan
- 508g Oxygenated Hydrocarbon Ionic Surfactants Exhibit CO₂ Solubility**
Xin Fan
Juncheng Liu
Robert M. Enick
Christopher B. Roberts

Session 514 - Nanoparticle Synthesis and Stabilization I

Chair: Darrell Velegol

Vice Chair: Anuj Chauhan

- 514a Controlled Self-Assembly of Monodisperse Magnetic Nanoparticles**
Marco Lattuada
T. Alan Hatton
- 514b Novel Synthetic Method for Narrow Distributed Colloidal Silicalite**
Vasudevan V. Namboodiri
Travis C. Bowen
Leland M. Vane
- 514c Kinetics and Size Distributions in Deaggregation of Titania Nanocolloids**
Themis Matsoukas
James Hall
- 514d Preparation of Nickel Nanoparticles in the Presence of Sodium Dodecyl Sulfate - Polyvinylpyrrolidone Clusters**
Jun Xu
Yun Fang
Yongmei Xia
Chunrong Wang
Mosha He
- 514e Control of Gold Nanoparticle Aggregates by Manipulation of Interparticle Interaction**
Taehoon Kim
Myung-Suk Chun
Sang-Woo Joo
Kangtaek Lee
- 514f The Use of Heat Transfer Fluids in the Synthesis of High-Quality Cdse Quantum Dots, Core/Shell Quantum Dots, and Quantum Rods**
Michael S. Wong
Subashini Asokan
Karl M. Krueger
Vicki Colvin
Nikos V. Mantzaris

514g Nanocrystal Interparticle Interactions in Organic and Supercritical Solvents

*Aaron E. Saunders
Keith P. Johnston
Brian A. Korgel*

Session 527 - Transport at Interfaces II

Chair: Elias I. Franses

Vice Chair: Anuj Chauhan

527a Finite Element Computations of Surfactant-Mediated Spreading on Solid Surfaces

*Srinath Madasu
Ali Borhan*

527b Wetting Kinetics of Thin Films of Dilute Polymer Solutions

*Parthasakha Neogi
S. Saritha*

527c An Investigation of the Spreading Dynamics of Sessile Drops of Polymer Blends

*Carlton F. Brooks
Anne M. Grillet
John A. Emerson*

527d Electron Transport on Metal-Molecule-Semiconductor Interfaces

*Luis A. Agapito
Jorge M. Seminario*

527e Lithium-Ion Conducting Channels for Solid State Lithium Ion Batteries

*Yingchun Zhang
Lawrence G. Scanlon
Perla B. Balbuena*

527f Effect of Rbcs on Dispersion in Tissues and Inclusion of Dispersion in Pharmacokinetic Models

*Marissa Fallon
Anuj Chauhan*

527g Thermodynamics and Dynamics of Diblock Copolymers

*B. J. Reynolds
M. L. Ruegg
N.P. Balsara
Clayton J. Radke*

Session 546 - Materials Synthesis and Processing with Supercritical Fluids II

Chair: Raashina Humayun

Vice Chair: Rajesh Dave

546a Development of Supported Nanoparticulate Metal Complexes Using Compressed Carbon Dioxide as Antisolvent

*Chad A. Johnson
Sarika Sharma
Bala Subramaniam
A.S Borovik*

546b Reductive Deposition of Cerium Oxide Films in Carbon Dioxide

*Adam O'Neil
James J. Watkins*

- 546c** **Synthesis of Metal Oxide Nanoaerogels Via a Sol-Gel Route in Supercritical CO₂**
Ruohong Sui
Amin S. Rizkalla
Paul A. Charpentier
- 546d** **Copper Chelation for Microelectronic Interconnects in Supercritical Carbon Dioxide**
Randy Weinstein
Carol Bessel
Dorothy Skaf
Donna Omiatek
Laurel Grotzinger
- 546e** **Copper Etching Using Hexafluoroacetylacetone (Hfach) Dissolved in Supercritical CO₂: a Kinetic Investigation**
Michael L. Durando
Anthony J. Muscat
- 546f** **Comparative Study of Covalent Molecular Assembly of Oligoimide Ultrathin Films in Supercritical Carbon Dioxide and Liquid Solvent**
Sreenivasa Reddy Puniredd
M. P. Srinivasan

Session 549 - Nano-Scale Interfacial Fundamentals

Chair: Robert D. Tilton

Vice Chair: Raymond R. Dagastine

- 549a** **Directed Assembly of Single-Walled Carbon Nanotubes at Liquid-Liquid Interfaces; Carbon Nanotubes as Nanoscale Conveyors for Interfacial Biocatalysis**
Prashanth Asuri
Sandeep S. Karajanagi
Jonathan S. Dordick
Ravi S. Kane
- 549b** **Nanoscale Interactions between Colloidal Particles**
John P. Pantina
Eric M. Furst
- 549c** **Modelling the Micron- and Nano-Scale Trends in the Steady-State Concentration Profile of a Charged Solute Adjacent to a Membrane Surface**
S.S. Vasan
R.W. Field
C.D. Bain
Z.F. Cui
- 549d** **Continuous Polyelectrolyte Nanofilm Growth under an Applied Electric Potential**
A. Pascal Ngankam
Paul R. Van Tassel
- 549e** **Manipulation of the Electrode/Electrolyte Interface of Gold Via the Application of an External Electric Field**
Patricia Taboada-Serrano
Viriya Vithayaveroj
Chia-Hung Hou
Sotira Yiacoumi
Costas Tsouris

549f Trapping and Condensing DNA at the Air/Water Interface

*Jaime Ruiz-Garcia
R. D. Cadena-Nava
G. Espinoza-Perez
J. L. Cuellar-Camacho*

549g Modeling of Interfacial Polymerization to Nanocapsule Formation

*Mélaz Tayakout
Kawthar Bouchemal
F. Couenne
H. Fessi*

Session 550 - Nanoparticle Synthesis and Stabilization II

Chair: Darrell Velegol

Vice Chair: Anuj Chauhan

550a Preparation of Polyetherimide Nanoparticles by Electro spray Drying, and Their Use in the Preparation of Nano-Sized Carbon Molecular Sieve (Cms) Adsorbents and Membranes

*Faezeh Bagheri-Tar
Muhammad Sahimi
Theodore T. Tsotsis*

550b Novel Method for Micro- and Nano- Particle Preparation by Electrohydrodynamic Atomization

*Liang Kuang Lim
Chi-Hwa Wang
Kenneth A. Smith*

550c Synthesis of Anisotropic Particles by Seeded Emulsion Polymerization

*Eric B. Mock
Hank De Bruyn
Robert G. Gilbert
Subramanian Ramakrishnan
Charles F. Zukoski*

550d Size and Shape-Controlled Synthesis of Metal Nanostructures Templated by Amphiphilic Block Copolymers

*Toshio Sakai
Paschalis Alexandridis*

550e Synthesis and Characterization of Novel Star Polymers

*Subramanian Ramakrishnan
Robert Lambeth
Ryan Mueller
Jeffrey Moore
Charles Zukoski*

550f Development of Triblock Copolymers as Dispersants and Interfacial Delivery Vehicles for Reactive Nanoparticulate Iron

*Kevin Sirk
Navid Saleh
Traian Sarbu
Krzysztof Matyjaszewski
Gregory V. Lowry
Robert D. Tilton*

550g Colloidal Particles Coated and Stabilized by DNA-Wrapped Carbon Nanotubes

*Erik K. Hobbie
Barry J. Bauer*

Session 577 - Nano-scale Modeling of Interfacial Systems

Chair: Paul R. Van Tassel

Vice Chair: Elias I. Franses

577a Molecular Modeling of Transport across Surfactant-Covered Interfaces of Microemulsions

*Ashish Gupta
Anuj Chauhan
Dmitry I. Kopelevich*

577b Molecular Dynamics Study of Propanic Acids at the Water-Isobutanol Interfaces

*Hirofumi Daiguji
Kenji Nanataki*

577c Structure and Dynamics of Dendrimer Encapsulated Nanoparticles in Aqueous Solutions

*Francisco Tarazona-Vasquez
Perla B. Balbuena*

577d Inverse Density Functional Theory as a Tool for Measuring Colloid-Surface Interactions

*Mingqing Lu
Richard Beckham
Michael A. Bevan
David M. Ford*

577e Simplified Crossover Droplet Model for Adsorption of Critical and Supercritical Fluids in Slit Nano-Pores

*Sergei B. Kiselev
James F. Ely*

577f Colloidal Interactions in Mixtures of Symmetric and Asymmetric Electrolytes: a Monte Carlo Study

*Patricia Taboada-Serrano
Sotira Yiacoumi
Costas Tsouris*

577g Microscopic Approach for the Design of Surfactants for Pmdi-Based Formulations: Ab Initio Calculations and Chemical Force Microscopy

*Robson S. Peguin
Libo Wu
Sandro R. P. Da Rocha*

Session 585 - Processing of Pharmaceuticals and Nutraceuticals under High Pressure

Chair: David Suleiman

Vice Chair: Sudhir N Aki

585a Nanoparticle Fabrication of Biodegradable Polymers Using Supercritical Antisolvent: Effects of Mixing and Thermodynamic Properties

*Lai Yeng Lee
Kenneth A. Smith
Chi-Hwa Wang*

- 585b Visualization of the Effects of Processing Conditions on the Spray Characteristics in Sas Precipitation**
*Daniel L. Obrzut
Philip W. Bell
Christopher B. Roberts
Steve R. Duke*
- 585c Synthesis of Supercritical Crystallization Processes**
*Benny Harjo
Christianto Wibowo
Ka Ming Ng*
- 585d CO₂-Soluble Gras Solvents for Extracting Nutraceuticals by a Gas Anti-Solvent (Gas) Process**
*Ibrahim A. Ozkan
Xenia C. Tombokan
Mitsuhiro Kamimura
Peter K. Kilpatrick
Ruben G. Carbonell*
- 585e Separation of Flurbiprofen Enantiomers with Supercritical and Sub-Critical Expanded Fluids**
*Wade Mack
Sermin G. Sunol
Aydin Sunol*
- 585f Sulfoxide Solvents and Surfactants for Facile Separations**
*Joshua D. Grilly
Colin A. Thomas
Ross R. Weikel
Christopher L. Kitchens
Jason P. Hallett
Philip G. Jessop
Charles L. Liotta
Charles A. Eckert*

Session 587 - Self-Assembly in Solution I

Chair: Srinivasa R Raghavan

Vice Chair: Orlin D. Velev

- 587a Shear-Induced Banding and Phase Separation in Solutions of Wormlike Micelles**
*Norman J. Wagner
Liberatore Matthew
Nettesheim Florian
Kaler Eric*
- 587b Synchrotron X-Ray Characterization of Pna-Amphiphile Micelles**
*Shane T. Grosser
Cheryl Lau
James W. Schneider*
- 587c Calorimetric Determination of Surfactant/Polyelectrolyte Binding Isotherms**
*Yakov Lapitsky
Maider Parikh
Eric W. Kaler*

- 587d** **Polymer-Surfactant Complexes: Structure Affected by Solvent Properties**
Marina Tsianou
Paschalis Alexandridis
- 587e** **Two Step Mechanism for the Nucleation Fibers of Sickle Cell Anemia Hemoglobin**
Peter G. Vekilov
Oleg Galkin
Weichun Pan
- 587f** **Computer Simulation of Fibril Forming Peptides**
Victoria Wagoner
Carol K. Hall
- 587g** **Nanocomposites under Shear: Alignment of Inorganic Nanoparticle and Protein Arrays Templated in Block-Copolymer Mesophases**
Danilo C. Pozzo
Lynn M. Walker
- 587h** **Dynamics of Nanoparticles in an Entangled Wormlike Micellar Network**
Matthew W. Liberatore
Florian Nettesheim
Eric W. Kaler
Norman J. Wagner

Session 603 - Interfacial Phenomena in Materials Processing / Crystallization

Chair: Marina Tsianou

Vice Chair: Michael F. Doherty

- 603a** **Detailed Analyses of Transport Limitations during Afm Measurements of Solution Crystal Growth**
David Gasperino
Andrew Yeckel
Michael D. Ward
Jeffrey J. Derby
- 603b** **A Novel Ex-Situ Scale Observation Detector (Exsod) for Mineral Scale Characterization and Online Ro Process Monitoring**
Michal Uchymiak
Eric Lyster
Anditya Rahardianto
Julius Glater
Yoram Cohen
- 603c** **Controlling Calcium Carbonate Crystallization with Carboxylic Acid Containing Polymer Adsorbates**
Jihui Guo
Steven J. Severtson
- 603d** **Effects of Polymers on Crystal Growth and Morphology of Salbutamol Sulphate**
Shuyi Xie
Shaohua Feng
Reginald B. H. Tan
- 603e** **Crystal Comets: Dewetting during Emulsion Droplet Crystallization**
Patrick T. Spicer
Rich W. Hartel

603f Two-Dimensional Monte Carlo Simulations of a Polydisperse Colloidal Dispersion Composed of Ferromagnetic Particles

*Masayuki Aoshima
Akira Satoh*

603g Synthesis of Gold Nanocrystals Using Polyethyleneglycol-Sodium Dodecyl Sulfate as Soft Template

*Chunrong Wang
Yun Fang
Yongmei Xia
Jun Xu
Guoqiang Ren
Jiwen Fen*

Session 610 - Self-Assembly in Solution II

Chair: Srinivasa R Raghavan

Vice Chair: Orlin D. Velev

610a Self-Assembled Encapsulation Membranes from Bioactive Colloids

*Kevin D. Hermanson
Daniel Huemmerich
Thomas Scheibel
Andreas R. Bausch*

610b Phase Behavior and Polymerization of Bicontinuous Divinylbenzene/Sugar Microemulsion Glasses

*Feng Gao
Hiteshkumar R. Dave
Chia-Chi Ho
Carlos C. Co*

610c Formation of Vesicles from Undecylenic Acid and Their Subsequent Polymerization

*Jae-Ho Lee
Srinivasa R. Raghavan*

610d Growth Kinetics of Polyamine/Salt Coacervates

*Vinit S. Murthy
Michael S. Wong*

610e From Oblate Cylinders to Elastic Films: a Neutron Scattering and Dilatational Rheology Investigation of Asphaltene Self-Assembly in Solution and at the Oil/Water Interface

*Vincent J. Verruto
Keith L. Gawrys
Peter K. Kilpatrick*

610f Effect of Grafted Peg on Fluctuating Membranes of Spontaneous Vesicles

*Ryan M. Van Zanten
Joesph A. Zasadzinski*

610g Molecular Relaxation Dynamics of Self-Assembled Monolayers

*Qing Zhang
Lynden Archer*

Session 611 - Supercooled Liquids and Glasses

Chair: Thomas M. Truskett

Vice Chair: Sharon C. Glotzer

- 611a** **“Caging” Dynamics of a Strong Glass Former**
Shi Xu
Janna K. Maranas
- 611b** **Role of Local Structure and Icosahedrality in Spatially Heterogeneous Dynamics in Supercooled, Glass-Forming Liquids**
Magnus N. J. Bergröth
Sharon C. Glotzer
- 611c** **Influence of Local Packing on Dynamics in a Model Glassy Polymer**
Tushar Jain
Juan J. De Pablo
- 611d** **The Impact of Confinement on Entropy and Liquid-State Dynamics: Thermodynamic Expectations and Experimental Trends**
Jeetain Mittal
Thomas M. Truskett
- 611e** **Scaling of Energy Landscape Features in Stressed Systems and Relationship to Viscoelastic Processes**
Dan Lacks
Craig Maloney
- 611f** **Spatially Heterogeneous Dynamics in Molten Silica**
Liping Huang
Michael Vogel
Sharon C. Glotzer
John Kieffer
- 611g** **Cluster Kinetics of Pressure-Induced Glass Formation**
Lisa A. Brenskelle
Benjamin J. McCoy
- 611h** **The Heat of Condensation of Supercooled D₂O**
Shinobu Tanimura
Barbara E. Wyslouzil
Mark Zahniser
Joanne Shorter
David Nelson
Barry McManus

Session 23 - Fundamentals of Adsorption and Ion Exchange I

Chair: Peter A. Monson

Vice Chair: Jose P. Mota

- 23a** **Adsorption of Water in Zeolites as Studied by Molecular Simulations**
Alain H. Fuchs
Angela Di Lella
Philippe M. Ungerer
Anne Boutin

- 23b Ion – Exchange of Monovalent and Bivalent Cations with Naa Zeolite Membranes : a Molecular Dynamics Study**
Sohail Murad
Wei Jia
Mukund Krishnamurthy
- 23c Quasi-One-Dimensional Adsorption of Alkanes on Carbon Nanotubes Observed from Experiments and Simulations**
Peter Kondratyuk
Yang Wang
Karl Johnson
John T. Yates
- 23d Adsorption Behavior of Repulsive Molecules**
Timothy E. Wetzel
Gregory L. Aranovich
Marc D. Donohue
- 23e Adsorption and Self-Assembly of Surfactants in Nanopores**
Anton Eltekov
Oliver Dietsch
Gerhard H. Findenegg
Henry Bock
- 23f Hysteresis in Sorption by Mesopores**
Chaim Aharoni
- 23g Three-Dimensional Reconstruction of Mesoporous Materials Using Gas Adsorption and Structure Factor Data**
Lev Gelb
Rafael Salazar

Session 29 - Membrane Tutorial

Chair: John Pellegrino

Vice Chair: Kamalesh K. Sirkar

- 29a Design of Hollow Fiber Membrane Modules**
G. Glenn Lipscomb
- 29b Experimental and Theoretical Aspects of Catalytic Membrane Reactors**
Theodore T. Tsotsis
- 29c Overview of Membrane Bioreactors**
John Pellegrino
- 29d Adsorptive Membrane Based Separations**
Ranil Wickramasinghe
- 29e Tutorial on Membrane Gas Separation**
Benny D. Freeman
- 29f Polymeric Membranes for Fuel Cells: Overview and Recent Developments**
Peter N. Pintauro

Session 30 - Modeling Transport through Membranes I

Chair: Glenn Lipscomb

Vice Chair: Alan Gabelman

30a Combining Previous Theoretical Analyses into an in Silico Predictive Global Model for Microfiltration of Complex Suspensions and Macromolecular Solutions

Gautam Baruah

Adith Venkiteshwaran

Georges Belfort

30b Modeling Pilot-Scale Cross-Flow Filtration of Simulated Nuclear Waste

Michael Poirier

Samuel D. Fink

Ralph Haggard

Vince Van brunt

Travis Deal

30c Modeling Flow through Microfiltration Membranes Using Data from High-Resolution 3d Imaging

Karsten E. Thompson

J.T. Fredrich

Chase Duclos-Orsello

Jack Lewnard

30d Medium Swelling and Pleat Crowding Effects in Cartridge Filters

Atul N. Waghode

Navraj S. Hanspal

Abhijit Kulkarni

V. Nassehi

R. J Wakeman

30e A Predictive Numerical Model for Unsteady State Scale Formation in a Spiral-Wound Membrane Module with Channel Spacers

Eric Lyster

Anditya Rahardianto

Michal Uchymiak

Yoram Cohen

Session 65 - Future Directions of Membrane Science (invited papers) I

Chair: William Krantz

Vice Chair: Alfred Gaertner

65a Materials & Materials Processing Opportunities to Enable Future Membrane Development

William J. Koros

65b Nurturing Membranes from Nature: Possible Opportunities for the Future

Georges Belfort

65c Biotechnology in Everyday Life: Opportunities for Membrane Technology in Non-Pharmaceutical Biotechnology

Alfred Gaertner

Meng Heng

Glenn Rozeboom

65d Membrane Clarification

Charles E. Glatz

Session 79 - SMB technology

Chair: Marco Mazzotti

Vice Chair: Linda S. Cheng

79a Optimization Strategies for Simulated Moving Bed and Powerfeed Processes

Yoshiaki Kawajiri

Lorenz T. Biegler

79b Implementation of an on-Line Optimization Based Control Scheme on a Laboratory Simulated Moving Bed Plant

Gueltekin Erdem

Mohammad Amanullah

Cristian Grossmann

Manfred Morari

Marco Mazzotti

Massimo Morbidelli

79c A Five-Zone Simulated Moving Bed for Isolation of Six Sugars from Biomass Hydrolyzate

Yi Xie

Chim Y. Chin

Diana Santiago Campos Phelps

Chong Ho Lee

Ki Bong Lee

Sungyong Mun

Linda Wang

79d Theory and Practice of Single-Column Smb Analogs

Jose P. Mota

João M. M. Araújo

Rui C. R. Rodrigues

79e Simulated Moving Bed Systems for Center-Cut Separation from Quaternary Mixtures

Jin Seok HUR

Phillip C. Wankat

79f Optimal Economic Design and Operation of Single and Multi-Column Chromatographic Processes

Sharon Chan

Eva Sorensen

Nigel Titchener-Hooker

79g A Two-Bed Simulated Moving-Bed Adsorber for the Fractionation of Gas Mixtures

S.V. Sivakumar

K.K. Gupta

D. P Rao

79h Parallel Two-Zone and Four-Zone Hybrid Smb System for the Separation of *P*-Xylene

Weihua Jin

Phillip C. Wankat

Session 105 - Advances in Liquid Separation Membranes and Applications: Part I

Chair: Norman N. Li

Vice Chair: D. Bhattacharyya

105a Progresses in Membrane Reactors (Invited Keynote Speaker)

Enrico Drioli

Enrica Fontananova

105b Interfacially Polymerized Flat and Hollow Fiber Thin Film Composite Membranes Based on Microporous Polypropylene

Alexander P. Korikov

Praveen B. Kosaraju

Kamalesh K. Sirkar

105c Hybrid Polymeric/Ceramic Membranes for Water Purification

Olga Kammona

Elpiniki Dini

Costas Kiparissides

105d Anti-Fouling Membranes for Water Treatment

Richard Q. Song

Jane C. Li

Norman N. Li

105e Role of Foulant-Foulant Adhesion in Organic Fouling of Reverse Osmosis Membranes

Sangyoun Lee

Menachem Elimelech

105f Advances in Hemodialysis Applications

Norma J. Ofsthun

Ralph Bryant

Zhensheng Li

Dave Updyke

Session 120 - Fundamentals of Adsorption and Ion Exchange II

Chair: Peter A. Monson

Vice Chair: Jose P. Mota

120a Diffusion of C7 Hydrocarbons in Mesostructured Zeolitic UI-Zsm-5 Materials

Mladen Eic

Hoang Vinh Thang

Do Trong On

Qinglin Huang

Serge Kaliaguine

120b Dynamic Adsorption and Desorption of Carbon Dioxide in Potassium-Promoted Hydrotalcite

James A. Ritter

Steven P. Reynolds

Armin D. Ebner

120c Kinetics of Sorption of 1,3 DI-Isopropyl Benzene and 1,3,5 Tri-Isopropyl Benzene in Nay Crystals, Alumina Matrix and Fcc Catalyst Particles by Zero Length Column Method

Kevin F. Loughlin

Sulaiman S. Al-Khattaf

Sharif F. Zaman

- 120d** **Roles of Steric and Acid-Base Factors in CO₂ Adsorption in Alkali-Metal Cation Exchanged Y and X Zeolites**
Krista S. Walton
Morgan B. Abney
M. Douglas LeVan
- 120e** **Two-Site Equilibrium Model for Ion Exchange between Multivalent Cations and Zeolite-a in a Molten Salt**
Supathorn Phongikaroon
Michael F. Simpson
- 120f** **Effects of Reversible Association on Size Exclusion Chromatography of Proteins**
Chi Ming Yu
Sungyong Mun
Linda Wang
- 120g** **Diffusivities of N-Alkanes in Silicalite Using the Zlc Method**
Alfeno Gunadi
Stefano Brandani

Session 150 - Adsorption from Mixtures

Chair: Celio L. Cavalcante Jr

Vice Chair: Shamsuzzaman Farooq

- 150a** **Propylene Separation from C₃ Fractionator Feed Gas by Pressure Swing Adsorption**
Jong-Nam Kim
Chang Hyun Ko
Jong-Ho Park
Sang-Sup Han
Soon-Haeng Cho
Seong Jun Lee
- 150b** **Effects of Carboxylic Acids on Liquid-Phase Adsorption of Ethanol and Water by High-Silica Zsm-5**
Travis C. Bowen
Leland M. Vane
- 150c** **Standing Wave Design of Carousel Ion-Exchange Processes for the Removal of Zinc Ions from a Protein Mixture**
Sungyong Mun
Chim Y. Chin
Yi Xie
Linda Wang
- 150d** **Competitive Adsorption of Heavy Metals Onto Straw**
Sandra Nunez
Robert W. Peters
Lisa Ann Blankinship
Joseph J. Gauthier
- 150e** **Optimisation of Adsorption and Desorption Processes of Heavy Metals from Different Matrices Prior to Atomic Absorption Spectroscopy**
Seyed J. Shahtaheri
Monireh Khadem
Farideh Golbabaei
Abbas Rahimi-Froushani

150f Multicomponent Adsorption of C1-C4 Hydrocarbons on Activated Carbon

*Moisés Bastos-Neto
Marcelo A Ramalho
Daniel V. Canabrava
Zuzilene S. Evangelista
A. Eurico B. Torres
Célio L. Cavalcante Jr
Diana C. S. Azevedo*

Session 163 - Experimental Methods in Adsorption I

Chair: Stefano Brandani

Vice Chair: F. Handan Tezel

163a Use of Both Pressure-Swing and Concentration-Swing Frequency Response Methods to Determine Mass Transfer Mechanisms and Parameters for Pure and Mixed Adsorbates in Nanoporous Adsorbents

*Yu Wang
M. Douglas LeVan*

163b Effect of Nonlinear Equilibrium on Zero Length Column Experiments in Mesoporous or Macroporous Sorbents: Limiting Analytical Asymptotic Forms

Kevin F. Loughlin

163c Sorption Measurements of Alkanes on Zeolites under Equilibrium and Non-Equilibrium

*Reiner Staudt
Andreas Möller*

163d Determination of Dynamic Mass Transfer Properties in O2 Rpsa

*Matthew J. LaBuda
Roger D. Whitley
David R. Graham
Joshua E. Middaugh*

163e Characterization of Liquid Adsorption Columns by Computed Tomography (Ct)

*Dirk-Uwe Astrath
Duc Thoung Vu
Wolfgang Arlt
Erling Stenby*

163f Protein Adsorption Kinetics Measurements with Radioactive Tracers

*Giorgio Carta
Antonio Ubiera*

Session 166 - Future Directions of Membrane Science (invited papers) II

Chair: Alfred Gaertner

Vice Chair: William B. Krantz

166a Future Directions for Membrane Technology in the Pharmaceutical Industry

Kumar Abhinava

166b 'Future Directions of Membrane in Biopharmaceutical Processes; Ultrafiltration:Where Have We Been and Where Are We Going...'

S. Mookie Sternberg

166c Membrane Science and Intelligent Therapeutics

Nicholas A. Peppas

166d Tools for the Fast Development of Membrane Processes

Nigel Titchener-Hooker

Session 170 - Microdevices in Separations

Chair: Anup K. Singh

170a Focusing, Collection, and Metering of DNA Using Microfabricated Electrode Arrays

Faisal Shaikh
Victor M. Ugaz

170b Miniaturized High-Performance Liquid Chromatography (HPLC) System Using Capillary-Scale Electrokinetic Micropumps

Kamlesh D. Patel
Robert W. Crocker

170c Blood Cell Separation Issues in Miniature Blood Diagnostic Kits

Ronghui Zhou
Hsueh-Chia Chang

170d Rapid Bacteria Trapping Using Micro-Fluidic Vortex Flow

Zachary R. Gagnon
Hsueh-Chia Chang

170e Development of Environmentally Sensitive Affinity Hydrogels for Bioseparations in Microdevices

Ganapathysubramanian Iyer
Viranga Tillekeratne
Maria Coleman
Arunan Nadarajah

170f Micro-Structured Membrane Dispersion Mixer and Its Characteristics

Guangsheng Luo
Guiguang Chen
Jianhong Xu
Jiading Wang

170g Poisson's Effect in Electrical Field Flow Fractionation

Joseph J. Biernacki
P. Manikya Mellacheruvu
Satish M. Mahajan

Session 214 - Fuel Cell Membranes I

Chair: W.S. Winston Ho

Vice Chair: Santi Kulprathipanjan

214a Design and Synthesis of Optimized Soft Structures

Jingyu Shi
Frank M. Zalar
Henk Verweij

- 214b** **A Nanoporous Silicon Based Membrane Electrode Assembly for on-Chip Micro Fuel Cell Applications**
Kuan-Lun Chu
Vaidyanathan Subramanian
Mark A. Shannon
Richard I. Masel
- 214c** **Molecular Design of Pems: Rigid Rod Liquid Crystalline Polyelectrolytes-Synthesis and Properties**
Morton H. Litt
Sergio Granados-Focil
- 214d** **The Effect of Temperature and Pre-Treatment on Water and Methanol Sorption and Diffusion in a Short-Side-Chain Perfluorosulfonic Acid Ionomer Membrane for Pemfcs**
Maria Grazia De Angelis
Stuart Lodge
Marco Giacinti Baschetti
Ferruccio Doghieri
Giulio C Sarti
Aldo Sanguineti
Paolo Fossati
- 214e** **The Effect of Membrane Thickness on Short- and Long-Term Performance of a Direct Methanol Fuel Cell**
Jeong Lee
R. Wycisk
Jun Lin
Peter N. Pintauro
- 214f** **Nafion/Zeolite Nanocomposite Membrane for Direct Methanol Fuel Cell**
Zhongwei Chen
Brett A. Holmberg
Wenzhen Li
Xin Wang
Yushan Yan
- 214g** **New Conceptual Zeolitic Direct Methanol Micro Fuel Cell**
Siu Ming Kwan
King Lun Yeung

Session 223 - Molecular Simulation of Adsorption

Chair: Alexander V. Neimark

- 223a** **Adsorption Simulations and Biology: Grand Canonical Monte Carlo Calculations of Binding Locations, Occupancy, and Free Energies of Xenon in Comp and Mutant Phage T4 Lysozyme L99a**
Brian K. Peterson
Carlos A. Valenzuela
Juan Carlos Sacristan Martin
Nicholas P. Franks

- 223b** **Water Adsorption Isotherms in Molecularly Reconstructed Models of Activated and Un-Activated Carbons Obtained from Saccharose**
Alberto Striolo
Surendra K. Jain
Jorge P. Pikunic
Roland J.-M. Pellenq
Ariel Chialvo
Keith E. Gubbins
Peter T. Cummings
- 223c** **Coarse Graining of Molecular Models for Fluids in Porous Materials**
Bradd Libby
Peter A. Monson
- 223d** **Adsorption of Nitrogen and Methane in Ets-4**
Gemma Bosch
Flor R. Siperstein
Martin Lisal
- 223e** **Adsorption of Water in Polyoxoniobate Materials. a Molecular Simulation Investigation**
James P. Larentzos
François Bonhomme
May Nyman
Edward J. Maginn
- 223f** **Density Functional Theory Model of Adsorption on Amorphous and Microporous Solids**
Peter I. Ravikovitch
Alexander V. Neimark
- 223g** **Comparison of Adsorption of Spherical and Non-Spherical Nitrogen in Parallel Slit Pores Using Density Functional Theory: Density Profiles and Pore Size Distributions**
Bryan J. Schindler
Clare McCabe
Peter T. Cummings
M. Douglas LeVan

Session 230 - Novel Membranes and Membrane Processes for Recovery/recycle

Chair: Yoram Cohen

Vice Chair: William Krantz

- 230a** **Antifouling Thin Film Nanocomposite (Tfnc) Membranes for Desalination and Water Reclamation**
Byeong-Heon Jeong
Arun Subramani
Yushan Yan
Eric M.V. Hoek
- 230b** **Dendrimer-Ceramic Nanocomposite Membranes for Voc Recovery**
Sukjoon Yoo
Robert L. Sherman
Daniel F. Shantz
Eric E. Simanek
David M. Ford

- 230c High Recovery Desalination of Agricultural Drainage Water: Integration of Accelerated Chemical Precipitation with Ro Membrane Desalination**
Anditya Rahardianto
Saeed Rezvani
Yoram Cohen
- 230d Electrodialysis as an Alternative Seawater Desalination Method**
Marian Turek
Piotr Dydo
Tomasz Wiltowski
- 230e Cyanide Removal from Industrial Praziquantel Wastewater Using Integrated Coagulation – Gas-Filled Membrane Absorption**
Binbing Han
Zhisong Shen
Ranil Wickramasinghe
- 230f Separation of Fluorine Containing Greenhouse Gases with Porous Membranes**
Kazuhiro Shiojiri
Chihiro Kato
Akihiro Yamasaki
Fumio Kiyono
Yukio Yanagisawa
Mitsutaka Kawamura

Session 245 - Advances in Liquid Separation Membranes and Applications: Non-Aqueous Systems

Chair: Norman N. Li

Vice Chair: Jamie A. Hestekin

- 245a New Applications of Organic Solvent Nanofiltration and Pervaporation in Chemical and Refining Processes (Invited Keynote Speaker)**
Lloyd S. White
- 245b Novel Polymeric Membrane for Dehydration of Organic Solvents**
Vasudevan V. Namboodiri
Leland M. Vane
- 245c Preferential Permeability of Methanol into Water Using Polysilicone and Polytrimethylsilylpropyne Membranes**
Anna Maria Bofinger
Javit Drake
- 245d Membrane Pervaporation Process for Diacetone Alcohol – Water Separations**
C. Stewart Slater
Timothy Schurmann
Joshua MacMillian
Angela Zimarowski
- 245e The Pervaporation Dehydration of Isopropanol by Btda-Tdi/MDI (P84) Co-Polyimide Membranes**
Ruixue Liu
Xiangyi Qiao
Tai-Shung Chung

Session 261 - Experimental Methods in Adsorption II

Chair: F. Handan Tezel

Vice Chair: Stefano Brandani

- 261a** **Evaluation of Surface Area and Porosity from Physisorption Isotherms**
E. Loren Fuller
- 261b** **Removal of Arsenic and Chromium Ions from a Mixed Aqueous Solution Using a Continuous, Hybrid Field-Gradient Magnetic Separation Device**
Ashish Jha
Arijit Bose
Jerome P. Downey
- 261c** **Accurate Hydrogen Sorption Measurements Via Differential Pressure Analyses**
John M. Zielinski
Charles G. Coe
Alan C. Cooper
Guido P. Pez
- 261d** **Development of a New Volumetric Gravimetric Device of H₂ Sorption for the Analysis of Zeolites under Equilibrium Conditions**
Benno P. Weinberger
Farida D. Lamari
Saadet B. Kayiran
Serge Moreau
- 261e** **Experimental Uncertainties of Volumetric Methods for Measuring Equilibrium Adsorption**
Khaled A. M. Gasem
James Fitzgerald
Rob L. Robinson
Ahmed Sayeed
- 261f** **Investigation of the Surface Heterogeneity of Solids from Reversed Flow Gas Chromatography**
Dimitrios GAVRIL
- 261g** **Structural Characterisation of Adsorbed Films in Periodic Mesoporous Silica by in-Situ Small-Angle X-Ray Diffraction**
Susanne Jaehnert
Gerald Zickler
Oskar Paris
Gerhard H. Findenegg

Session 267 - Modeling Transport through Membranes II

Chair: Glenn Lipscomb

Vice Chair: Alan Gabelman

- 267a** **Barrier Membranes: How Good Are Geometric Estimates for Flux and Lag Time?**
Christopher Goodyer
Annette L. Bunge
- 267b** **Multicomponent Transport in Membranes: Theory and Experiment**
John R. Dorgan
Oluwasijibomi Okeowo

- 267c Double Sided Thin Film Membranes - Higher Flux and Selectivity**
Tracy Q. Gardner
John L. Falconer
Richard D. Noble
- 267d Flux Coupling in Pervaporation of Binary Alcohol-Water Mixtures through a Microporous Silica Membrane**
Ben Bettens
Jan Degrève
Bart Van der Bruggen
Carlo Vandecasteele
- 267e Optimization of Membrane Mixtures and Mass Transfer of Supported Liquid Membranes**
Christian Huber
Matthäus Siebenhofer
Rolf Marr

Session 288 - Poster Session on Adsorption and Ion Exchange

Chair: Mark Davis

Vice Chair: Linda S. Cheng

- 288a One-Column Analog to Smb for Center-Cut Separation from Quaternary Mixtures**
Jin Seok HUR
Phillip C. Wankat
- 288b Assessment of Smb Performance Using a Single-Column Setup**
João M. M. Araújo
Rui R. C. Rodrigues
José P. B. Mota
- 288c Efficient Computational Methods to Calculate the Periodic State of Smb Processes**
Rui C. R. Rodrigues
João M. M. Araújo
José P. B. Mota
- 288d Single-Column Simulated-Moving-Bed Process with Recycle Lag**
João M. M. Araújo
Rui C. R. Rodrigues
José P. B. Mota
- 288e Binding of Transition Metals to Silica-Bound Branched Poly(Ethyleneimine): a Raman Spectroscopic Study**
Katri Sirola
Markku Laatikainen
Erkki Paatero
- 288f Activated Carbons from Biomass for Methane and Hydrogen Storage**
Tengyan Zhang
W. T. Walawender
L. T. Fan
- 288g The Role of Dissociation-Reaction in Simulated Moving Bed Purification of Lactic Acid Using Ion Exchange Resin**
Ho-joon Lee
Chim Yong Chin
Linda Wang

- 288h** **Effects of Partial Withdrawal on the Performance of Four-Zone Simulated Moving Bed**
Youn-Sang Bae
Jong-Ho Moon
Chang-Ha Lee
- 288i** **Modeling and Simulation of Non-Isothermal Adsorption Separation Systems**
Navdeep Kaur
V.K. Srivastava
H.M. Chawla
- 288j** **Kinetic Separation of Co₂/Ch₄ Mixture Using Carbon Molecular Sieve by Two-Bed Psa: Nonisothermal Operation**
Min-Bae Kim
Sang-Jin Lee
Dae-Ki Choi
Chang-Ha Lee
- 288k** **A Mechanistic View of Pressure Swing Adsorption Processes**
S.V. Sivakumar
D. P Rao
- 288l** **Cadmium Sorption by Some Alkaline Soils of North-West India**
H. S. Hundal
Raj Kumar
Kuldip Singh
Dhanwinder Singh
- 288m** **The Reuse of Biosludge as an Adsorbent for Benzene and Dye Adsorption**
Hung-Lung Chiang
Chih-Yu Chen
Kuo-Hsiung Lin
- 288n** **On Determination Procedure of Intraparticle Diffusivity from Multi-Component Chromatogram for Non-Linear Systems**
Hidekazu Nakayama
Katsumi Yokoyama
Kohei Satoh
Huai T. Chang
Huan-Jung Fan
Eiji Furuya
- 288o** **Evaluation of Surface Area and Porosity Utilizing Physisorption Isotherms: Porous Materials**
E. Loren Fuller
- 288p** **Enrichment of Lead (II) Ions Using Phthalic Acid Functionalized Xad-16 Resin as a Sorbent**
Saima Q. Memon
M. I. Bhanger
- 288q** **A New Concept about Adsorption Effect on Kinetic Resolution of Racemates Catalyzed by Immobilized Enzymes in a Batch Reactor**
HW Yu
CB Ching

Session 290 - Poster Session: Membranes

Chair: Glenn Lipscomb

Vice Chair: Ranil Wickramasinghe

- 290a** **Membrane Extraction through Double-Pass Cross-Flow Flat-Plate Modules with External Recycle**
Ho-Ming Yeh
- 290b** **Crystallization on Ro Membranes and Surrogate Surfaces**
Wen-Yi Shih
Yoram Cohen
- 290c** **Amino Acid Resolution Using Supported Liquid Membranes**
Ranil Wickramasinghe
Binbing Han
Jason Clark
Abhoyjit Bhowm
- 290d** **Enveloped and Non-Enveloped Virus Clearance by Flocculation Prior to Microfiltration**
Binbing Han
Ranil Wickramasinghe
- 290e** **Ultrafiltration of Endo-Pectinase Solution with a Static Mixer Placed in a Ceramic Membrane**
Darko M. Krstic
Mirjana G. Antov
Draginja M. Pericin
Wilhelm Höflinger
Miodrag N. Tekic
- 290f** **Control of Chemical, Thermal, and Gas Transport Properties in Dense Phosphazene Polymer Membranes**
Christopher J. Orme
Frederick F. Stewart
Mark L. Stone
Mason K. Harrup
Thomas A. Luther
Eric S. Peterson
- 290g** **A Nucleation Theory Based Approach for Understanding Nanofiltration/Reverse Osmosis Membranes Scaling Limits**
Piotr Dydo
Marian Turek
Tomasz Wiltowski
Kanchan Mondal
- 290h** **Hydrogen Permeation through Microporous Silicon Carbide-Based Membranes Derived from Polycarbosilane Precursor**
Hiroyuki Suda
Hiroyuki Yamauchi
Yuko Uchimaru
Ichiro Fujiwara
Kenji Haraya

- 290i** **Design and Operation of Batch Extractive Distillation with Two Reboilers**
Chao Hua
Peng Bai
Li Xingang
- 290j** **Hydrogen Permeation Behavior of Thin Pd Film on Alpha Alumina Hollow Fiber Based on a Novel Catalyzing Process**
Jianhua Tong
Hiroyuki Suda
Kenji Haraya
- 290k** **Influence of Thermally Labile Polymer on Gas Separation Properties of Carbon Membranes Derived from Poly(2,6-Dimethyl-1,4-Phenylene Oxide)**
Hong-Joo Lee
Hiroyuki Suda
Kenji Haraya
- 290l** **Deep Desulfurization of Transportation Fuels Via Supported Ionic Liquid Membranes**
Richard A. Kindt
Pei Li
Maria R. Coleman
Sasidhar Varanasi
- 290m** **Membrane-Supported Metallic Nanoparticles for the Dechlorination of Organics in Water**
Stephen M. Ritchie
- 290n** **Integration of Heat Pumps in Pervaporation Systems for Improved Energy Efficiency**
Leland Vane
Franklin Alvarez
Stuart Shealy
Donald Schupp
- 290o** **Removal of Arsenic (V) from Water Using Cationic Amphiphilic Molecules and Ultrafiltration Membrane: Effects of Amphiphile, Initial Arsenic (V) Concentration, Membrane Type and Membrane Pore Size, and Existing Co-Ions**
Hatice Gecol
Erdogan Ergican
- 290p** **Theoretical Observations of Recirculation Regions in the Bore Fluid during Hollow Fiber Spinning**
Yang Su
Holly Balasubramanian
Glenn Lipscomb
Doug Lloyd
- 290q** **Chemical and Mechanical Stability of Membranes Modified by Ion Beam Irradiation**
Frederick Roepcke
Isabel Escobar
- 290r** **Hydraulic and Chemical Cleaning of Cellulose Acetate Ultrafiltration Membranes**
Isabel Escobar
- 290s** **Analysis of Fouled Water Treatment Membranes and Determination of Foulant Irreversibility**
Christopher J. Muntean
Isabel Escobar

- 290t** **Membrane Applications for Recovery & Renewable Energy**
Chester Luce
RD Rex Dieterle
- 290u** **Nanoparticle-Induced Desilylation of Substituted Acetylene Polymers to Prepare Gas Separation Membranes with Exceptional Chemical Resistance**
Scott T. Matteucci
Roy D. Raharjo
Benny D. Freeman
Toshikazu Sakaguchi
Toshio Masuda
- 290v** **An on-Line Study of Progressive Ro Membrane Mineral Scaling by Time-Lapse Photo Microscopy**
Michal Uchymiak
Anditya Rahardianto
Eric Lyster
Julius Glater
Yoram Cohen
- 290w** **A Theoretical and Experimental Method of Enhancing Mass Transfer in Flat Plate Membrane Distillation Using CFD**
catherina Katsandri
Maria M. Vahdati
- 290x** **Prevention of Precipitation Fouling in Ro by Reverse Flow Operation**
N. Pomerantz
Jack Gilron

Session 292 - Poster Session: Recent Developments in Crystallization and Evaporation

Chair: R. Dennis Vigil

Vice Chair: Joe Schroer

- 292a** **Numerical Simulation on the Effects of the Design Feature of a Cyclone and the Inlet Flow Velocity on the Separation of Co₂ Particles from a Co₂-Cof₂ Mixture**
Younggeun Park
Chang Yeon Yun
Jongheop Yi
Honggon Kim
- 292b** **Supersaturation Monitoring and Control with Atr-Ftir**
Terry P. Redman
Joerg Worlitschek
Wes Walker
Claude Didierjean
- 292c** **Effect of Additives on the Nucleation Kinetics of Hen Egg White Lysozyme and Glucose Isomerase**
Rajendrakumar A. Gosavi
Constance A Schall
Sasidhar Varanasi
- 292d** **A Study of Iron Sulfide Film Formation in H₂S Environments**
Wei Sun
Srdjan Nesic
Sankara Papavinasam

Session 293 - Poster Session: Separations (general)

Chair: Stephen M. Ritchie

- 293a** **Enhanced Gas Separation Performance in Polyethersulfone (Pes)-Modified Zeolite Mixed Matrix Membranes**
Yi Li
Tai-Shung Chung
Santi Kulprathipanja
- 293b** **Measurement of Infinite Dilution Activity Coefficients of Alkanes in Ionic Liquid Using Gas-Liquid Chromatography**
Go Inoue
Munehiro Yasutake
Yoshio Iwai
Katsumi Honda
Yasuhiko Arai
- 293c** **Ethanol Production: Applicability of Reactive Separation**
Kanjana Piriyasurawong
Pramoch Rangsunvigit
Santi Kulprathipanja
- 293d** **Separation of P-Xylene from the Ternary Xylene System by Distillative Freezing**
Lie-Ding Shiau
- 293e** **Macromolecular Separation Based on Unique Microscale Transport**
Partha Roy
- 293f** **A Generalized Particle Model for Pressure Drop through Structured and Random Packings**
Fabiola Islas-Lugo
Ricardo Macias-Salinas
- 293g** **Prediction of Shear Damage in Industrial Scale Process Using an Ultrascale-down Device**
Hu Zhang
B. Buranawatanachoke
Nigel Titchener-Hooker
Mike Hoare
- 293h** **Ethoxylated Nonionic Surfactants in Hydrophobic Solvents: Separation Using Membrane Immobilized Poly-Acrylic Acid**
Abhay Ladhe
D. Bhattacharyya
- Reuse of Washing Water Used in Dehydration and Desalted Process of Crude Oil**
CRUZ PEDRERO MANUEL
Jorge L. Aguilar Gonzalez
Adrian Reyes F.

Session 298 - Advances in Liquid Separation Membranes and Applications: Part II

Chair: Isabel Escobar

Vice Chair: D. Bhattacharyya

298a Facilitated Transport Membranes: New Directions for Environmental, Bio and Energy Applications (Invited Keynote Speaker)

Jin Huang

Jian Zou

W.S. Winston Ho

298b Evaluation of Nanoporous Lyotropic Liquid Crystal Polymer Membranes for Reverse Osmosis

Parag R. Nemade

Douglas L. Gin

298c Solvent-Membrane Interactions in Liquid CO₂ and Organic Solvent Permeation through Mesoporous & Gamma - Alumina, Titania, and Zirconia Membranes

Geoffrey D. Bothun

Shamsuddin Ilias

Katif Peay

Kingsley Nelson

Vincent Morehead

Willie Arnold

298d A Novel Evaluation and Characterization Technique for Solvent Resistant Nanofiltration (SRNF) and Reverse Osmosis (SRO) Membranes

Alexander Anim-Mensah

James Mark

David Mast

William B. Krantz

Abhinava Kumar

298e Desalination Using a Novel Ammonia-Carbon Dioxide Forward Osmosis Process: Evaluation of Process Performance

Jeffrey R. McCutcheon

Robert McGinnis

Menachem Elimelech

Session 308 - Characterization of Novel Adsorbents

Chair: Peter I. Ravikovitch

308a Non-Destructive, Quantitative Characterization of Microporous Thin Film Polycrystallinity for Elucidating Structure-Properties Relations

Mark A. Snyder

Dionisios G. Vlachos

Zhiping Lai

Michael Tsapatsis

Vladimiro Nikolakis

308b Different Methods for Mesoporous Silica Synthesis and Their Effects on Surface Properties

Asli Ertan

Surendra N. Tewari

Orhan Talu

- 308c** **Effect of Surface Chemistry on the Sorption, Wetting and Phase Behavior of Water and Simple Fluids in Novel Ordered Mesoporous Materials**
Matthias Thommes
- 308d** **Removal of Ammonium and Organic Compounds by Ion Exchange and Adsorption**
Laurence R. Weatherley
Tony Jorgensen
- 308e** **Synthesis and Characterization of Microfibrous Media Supported K₂CO₃ for CO₂ Capture**
Noppadon Sathitsuksanoh
Hongyun Yang
Yong Lu
Donald R. Cahela
Bruce J. Tatarchuk
- 308f** **Characterization of Cr(VI) Ion Exchange with Hydrotalcite**
Patricia A. Terry
- 308g** **Characterization of Metal-Organic Framework as Novel Adsorbent**
Zheng Ni
Richard I. Masel
Keith Cadwallader
Mark Shannon
John Jerrell
- 308h** **Removal of the Structure-Directing Agent from a Thermally Unstable Cobalt Substituted Aluminophosphate**
Arturo J. Hernandez-Maldonado
Daphne S. Belén-Cordero

Session 311 - Crystallization of Pharmaceutical and Biological Molecules: I

Chair: Venkateswarlu Bhamidi

Vice Chair: Christopher Burcham

- 311a** **Antisolvent Crystallization and Mixing in Porous Hollow Fiber Devices**
Dimitrios M. Zarkadas
Kamalesh K. Sirkar
- 311b** **Using Complex Crystallizer Configurations in a Batch System to Affect Crystal Size and Morphology**
Ronald W. Rousseau
José R. Méndez del Río
- 311c** **Effect of Molecular Speciation of Impurities on Amino Acid Crystallization**
Sendhil K. Poornachary
Pui Shan Chow
Reginald B. H. Tan
- 311d** **Estimation of Critical Supersaturation Using a Microdroplet Evaporation Technique**
Guangwen He
Venkateswarlu Bhamidi
Reginald B. H. Tan
Paul J. A. Kenis
Charles F. Zukoski

311e Adaptive Neuro-Fuzzy Modeling of Protein Crystal Nucleation Kinetics

*Rajendrakumar A. Gosavi
Constance A Schall
Sasidhar Varanasi
Devinder Kaur*

311f Crystal Growth by Spiral Motion

*Ryan C. Snyder
Jacob P. Sizemore
Michael F. Doherty*

Session 334 - Mixed Matrix Membranes

Chair: Santi Kulprathipanja

Vice Chair: Stephen M. Ritchie

334a Fabrication and Characterization of Zeolite/Polymer Mixed Matrix Nano-Composite Hollow Fiber Membranes

*Tai-Shung Chung
Lan Ying Jiang
Yi Li
Santi Kulprathipanja*

334b Mixed Matrix Speck Based Membranes for Direct Methanol Fuel Cell

*Vladimir M. Linkov
Shan Ji
Guntars Vaivars
Ben Bladergroen
Gerhard Gericke*

334c Macrovoids in Mixed Matrix Hollow Fiber Membranes

*Shabbir Husain
William J. Koros*

334d Permeability Enhancement in Nanoparticle Filled Polymeric Membranes

*Scott T. Matteucci
Haiqing Lin
Dr. Benny D. Freeman
Victor Kusuma
Miguel Jose-Yacaman
Sumod Kalakkunnath
Douglass S. Kalika
Anita J. Hill*

334e Nanoparticles Embedded Membrane Reactor for the Reductive Degradation of Chlorinated Organics: Tce and Pcb Studies

*Yit Hong Tee
D. Bhattacharyya*

334f Room Temperature Ionic Liquid/Polymer Composite Membranes for Chemical Separations

*Richard Noble
Carl Koval
Douglas L. Gin
Dean E. Camper
Jason Bara*

334g **Mixed Matrix Membranes for CO₂/CH₄ Separation: Plasticization Study on Cellulose Acetate**
Kitchana Sriwasut
Thirasak Rirksomboon
Santi Kulprathipanja

334h **Modeling and Molecular Simulation of Mixed-Matrix Membranes**
Muhammad Sahimi
Theodore T. Tsotsis
SEONG YUN LIM

Session 347 - Design and Synthesis of New Adsorbent Materials

Chair: Shuguang Deng

347a **Improvement of Adsorption Applications Using High Contacting Efficiency Microfibrous Entrapped Materials**
Eric A. Luna
Ranjeeth Kalluri
Donald Cahela
Bruce Tatarchuk

347b **A Nanostructured Chelating Adsorbent for the Capture of Gaseous Mercury: Synthesis and Characterization**
Lei Ji
Neville G. Pinto

347c **Effect of Dopant Addition on Phase Stability and Oxygen Sorption Properties of La-Sr-Co-Fe-O Perovskite Type Oxides**
Qinghua Yin
Y.S. Lin

347d **Removal of Carbon Monoxide and Hydrogen from Air**
Ravi Kumar
Shuguang Deng

347e **Use of Composite Activated Alumina Adsorbents for Separation of Hydrocarbons from Olefin Containing Streams**
F. Handan Tezel
Timothy C. Golden
Jon Mogan
Bruno Morin

347f **Moderate Temperature H₂S Removal over High Specific Surface Area SiO₂ Supported ZnO Sorbent: Preparation and Characterization**
Hongyun Yang
Noppadon Sathitsuksanoh
Yong Lu
Bruce J. Tatarchuk

347g **Adsorption Fundamentals in Metal-Organic Frameworks from Molecular Modeling**
Houston Frost
Tina Düren
Randall Q. Snurr

Adsorption of H₂, N₂, O₂, CH₄ and CO₂ on an Ordered Mesoporous Carbon Material

*Li Zhou
Xiuwu Liu
Jingwen Li
Yaping Zhou*

Session 353 - Fuel Cell Membranes II

Chair: W.S. Winston Ho

Vice Chair: Santi Kulprathipanja

353a Development of Encapsulated Submicron Pd and Pd/Ag Alloy Hollow Fiber Membranes for a Membrane Fuel Processor

*Balamurali Krishna R. Nair
Michael P. Harold*

353b Hydrogen Purification for Fuel Cells by Carbon Dioxide Removal Membrane Followed by Water Gas Shift Reaction

*Jian Zou
Jin Huang
W.S. Winston Ho*

353c Synthesis Gas Generation Using Ionic/Electronic Oxygen Permeable Membranes

*David A. Slade
Sean M. Murphy
Karen Nordheden
Susan M. Stagg-Williams*

353d Experimental Study and Thermodynamic Analysis of Steam Reforming of Methane with Membrane Reactor

*Nobuhiko Mori
Toshiyuki Nakamura
Osamu Sakai
Naoyuki Ogawa
Yuji Iwamoto
Tadashi Hattori*

353e Sorption and Transport in Polymer Electrolyte Membranes

*Ravindra Datta
Pyoungcho Choi
Nikhil H. Jalani*

353f Gas Transport in Poly(Arylene Ether Sulfone) Proton Exchange Membranes

*Will James
Eva Marand
Brian Einsla
Kent Wiles
James McGrath*

353g Electro-Osmotic Transport of Water through Nafion-112 Membrane

*Yushi HIRATA
Shingo SUIZU
Herie J. SOTOH
John W. VAN ZEE*

Session 362 - Membrane Processes in Bioseparations

Chair: Wallace W.- Leung

Vice Chair: Vinay V. Vyas

- 362a** **Membrane Cascades and Intensification of Downstream Processing**
E. N Lightfoot
- 362b** **Determining Protein Fouling Parameters from Microfiltration Test**
Wallace W.- Leung
- 362c** **Combined Models of Membrane Fouling: Development and Application to Constant Flow Microfiltration of Biological Fluids**
Glen R. Bolton
Daniel LaCasse
Sal Giglia
- 362d** **Crossflow Microfiltration of E.Coli Cell Lysate Containing Inclusion Bodies of Recombinant Human Growth Hormone (Met-Hgh)**
Adith Venkiteshwaran
Sandro Matosevic
Are Bogsnes
Arne Staby
Susan Sharfstein
Georges Belfort
- 362e** **Minimization of Cell Migration between Flowing Blood and Concurrent Miscible Layers in a Microfluidic Environment**
Christian P. Aucoin
Edgar E. Nanne
Edward F. Leonard
Nicholas G. Vitale
Alan C. West
- 362f** **Adsorptive Depth Filters for Virus Filtration**
Willem Kools
Daniel LaCasse
Todd Ireland
Glen R. Bolton

Session 381 - Turning Whey Into Valuable Products

Chair: Jamie A. Hestekin

Vice Chair: Czarena CROFCHECK

- 381a** **Processing of "Whey-Ste" into a Value-Added Product: an Overview**
Czarena Crofcheck
Jamie A. Hestekin
- 381b** **Membrane Use for Dairy Process, Reuse - Recovery - Ethanol**
Chester Luce
- 381c** **Separation of Lactic Acid from Cheese Whey Fermentation Broth Using Cross-Flow Ultrafiltration and Nanofiltration Membrane System**
Yebo Li
Abloghasem Shahbazi
Sekou Coulibaly

- 381d** **Separation Media Derived from Whey Protein Isolate**
Jiunn Teo
Robert R. Beitle
- 381e** **Production and Separation of Galacto-Oligosaccharides from Lactose by B-Galactosidase Immobilized on Nanofiltration Membrane in a Cross-Flow System**
Suwattana Pruksasri
Shang-Tian Yang
- 381f** **Concentration of Whey Solutions by Foam Fractionation**
Aubrey Shea
J.N. Swamy
Czarena Crofcheck

Session 385 - Adsorption and Sustainable Processing: I

Chair: Jeffrey R. Hufton

Vice Chair: Stefano Brandani

- 385a** **A Regenerable Adsorption System for the Removal of Carbonyl Sulfide and Hydrogen Sulfide from a Syngas Stream Using Novel Adsorbents**
Clinton B. Summers
Chris E. Ellis
Albert C. Tsang
- 385b** **Comparison of Adsorbents for Deep-Desulfurization of Diesel**
Jong-Nam Kim
Chang Hyun Ko
Jung Geun Park
Sang-Sup Han
Soon-Haeng Cho
Viany M. Bhandari
- 385c** **Applications of Adsorption Technology for the Optimization of Processes for Biodiesel Production**
Celio L. Cavalcante
Diana C. S. Azevedo
A. Eurico B. Torres
Monica C. G. Albuquerque
Lia F. Belo
Juliana R. Sousa
Louise L. Sousa
Izabelly L. Lucena
Expedito Parente Jr.
- 385d** **Comparison of Activated Carbons for Natural Gas Storage: Influence of Nonisothermal Effects and Heavy Alkanes**
Krista S. Walton
M. Douglas LeVan
- 385e** **Parametric Study of High Purity O₂ Three-Bed PvsA Process for Combustion Processes**
Min-Bae Kim
Sang-Jin Lee
Jin-Hwan Jung
Jeong-Geun Jee
Chang-Ha Lee

Session 386 - Advances in Liquid Separation Membranes and Applications: Part III

Chair: D. Bhattacharyya

Vice Chair: Norman N. Li

- 386a** **Fundamentals and Applications of Pervaporation through Zeolite Membranes (Invited Keynote Speaker)**
Richard Noble
John L. Falconer
Travis Bowen
- 386b** **Enhanced Surface Flow Membranes for Ethanol Separation**
Yanling Wu
Rakesh Govind
- 386c** **Mechanisms of Chemical Cleaning of Organic-Fouled Reversed Osmosis Membranes**
Wui Seng Ang
Sangyoup Lee
Menachem Elimelech
- 386d** **High Temperature Proton-Exchange Membranes for Fuel Cells**
He Bai
W.S. Winston Ho
- 386e** **Synthetic Sulfonated Polyimide Membranes for Dehydration of Isopropanol**
Shude Xiao
Xianshe Feng
Robert Y.M. Huang
Md. Nasim Hyder
Pu Chen
Peter L. Douglas
Rajinder Pal
Apichit Svang-Ariyaskul
- 386f** **Polymerization Induced Phase Separation and Its Effects on Water Uptake, Flux, and Other Properties of Crosslinked Poly(Ethylene Glycol)**
Conor A. Braman
Dr. Benny D. Freeman
Douglass S. Kalika
Teruhiko Kai
Sumod Kalakkunnath
- 386g** **Characterization of Sulfonated Polysulfone Membranes Modified by Ion Beam Irradiation**
Rama Chennamsetty
Isabel Escobar

Session 392 - Centrifugal Field-Enhanced Bioseparations

Chair: Wallace W.- Leung

Vice Chair: Seyi A. Oduyungbo

- 392a** **Simulation of Centrifugal Recovery of Protein in Biopharmaceutical Production Using Atspin Simulator**
Wallace W.- Leung

392b Continuous Centrifugation of Adenovirus Infected Cell Culture Lysates

*Jon Shanter
Michael Laska
John Konz
Hari Pujar*

392c Steps in Development of a Counter-Current Centrifugal Separator for Use in Downstream Processing

*David Senica
R.G.J.M. van der Lans
L.A.M. van der Wielen*

392d Experimental and Theoretical Study of Flow and Sedimentation of Tubular Centrifuge for Bioseparation

Wallace W.- Leung

Session 394 - Crystallization of Pharmaceutical and Biological Molecules: II

Chair: Venkateswarlu Bhamidi

Vice Chair: Christopher L. Burcham

394a Control of Polymorph Crystallization Via Quasi-Emulsions

*Xing Wang
Donald J. Kirwan*

394b Polymorph Screening Using Microfluidics

*Venkateswarlu Bhamidi
Guangwen He
Paul J. A. Kenis
Charles F. Zukoski*

394c Polymorphic Behaviour and Morphology of an Anti-Viral/HIV Drug: Stavudine

*Sohrab Rohani
Mahmoud Mirmehrabi*

394d Effect of Fermentation Co-Solutes on the Crystallization of Levodione

*Evelyn M. Buque-Taboada
Adrie J. J. Straathof
J. J Heijnen
Luuk AM Van der Wielen*

394e Chiral Resolution Via Diastereomeric Salt Crystallization

*Arthur W.H. Lam
Ka Ming Ng*

394f Using Fbrm Measurements, Fines Destruction and Varying Cooling Rates to Control Paracetamol Csd in a Batch Cooling Crystallizer

*Ronald W. Rousseau
Stephanie Barthe*

394g Direct Design of Batch Recipes and Concentration Control in Antisolvent Crystallization

*Mitsuko Fujiwara
Thomas J. Wubben
Xing Yi Woo
Richard D. Braatz*

Session 407 - Inorganic Membranes for Gas and Vapor Separations

Chair: Lora G. Toy

Vice Chair: Benny D. Freeman

- 407a Fabrication of a-Oriented Mfi Zeolite Membrane by Secondary Growth**
Jungkyu Choi
Shubhajit Ghosh
Zhiping Lai
Michael Tsapatsis
- 407b Synthesis and Gas Permeation Properties of Sodalite Membranes**
zhenkun Zheng
Vadim Guliants
Y.S. Lin
Mark A. Snyder
Dionisios G. Vlachos
- 407c Silica and Silica-Metal Membranes for Hydrogen Separation and Membrane Reactors**
Yasushi Yoshino
Balagopal N. Nair
Hisatomi Taguchi
Naotsugu Itoh
- 407d Palladium Coated Vanadium Alloy Membranes for Hydrogen Separation**
Stephen N. Paglieri
David R. Pesiri
Robert C. Dye
Thomas J. Venhaus
Dhanesh Chandra
Craig R. Tewell
Ronny C. Snow
- 407e Directionally Dependent Transport in a Mixed Ionic-Electronic Conducting Membrane for Separating Oxygen from Air**
Kirk Gerdes
Dan Luss
- 407f CFD Analysis of Flow in Tubular Zeolite Membrane Modules**
Masahiko Matsukata
Mitsuko Takada
Yasushi Sekine
Eiichi Kikuchi
Kiminori Sato
Hiroshi Takeda
Tomoko Watanabe
- 407g Gas Permeation and Separation in Zsm-5 Micromembrane Unit**
Siu Ming Kwan
Yat Lai, Adrian Leung
King Lun Yeung

Session 439 - Adsorption and Sustainable Processing: II

Chair: Stefano Brandani

Vice Chair: Jeffrey R. Hufton

- 439a Gravimetric Measurement of Coal Adsorption Isotherms**
Gianluca Di Federico
Stefano Brandani
Ricardo Bazan
Reiner Staudt
- 439b Experimental Pilot-Scale Study of Carbon Dioxide Recovery from Flue Gas Streams by Vacuum Swing Adsorption**
Jun Zhang
Paul A. Webley
Penny Xiao
- 439c Sorption Enhanced Reaction Process for Electricity Production and CO₂ Capture**
Hendricus Th.J. Reijers
Gerard D. Elzinga
Steven C.A. Kluiters
Jan-Wilco Dijkstra
Paul D. Cobden
Ruud W. van den Brink
- 439d CO₂ Sorbents Made by Flame Spray Pyrolysis and High Temperature Calcination**
Hong Lu
Frank O. Ernst
Sotiris E. Pratsinis
Panagiotis (Peter) Smirniotis
- 439e Kinetic Study and Modeling of the High Temperature CO₂ Capture by Na₂ZrO₃ Solid Sorbent**
Diana Barraza Jimenez
Daniel Lardizábal Gutierrez
Virginia Collins Martinez
Alejandro Lopez Ortiz
- 439f Applications of Sorbents Developed Using Aerosol Process**
Miodrag Oljaca
Paolina Atanassova
JP Shen
Mark Hampden-Smith
Toivo Kodas

Session 440 - Adsorption in a Hydrogen Economy

Chair: Orhan Talu

Vice Chair: Scott A. Gold

- 440b In-Situ Growth of Zeolites and Mesoporous Silica on Metal Substrates**
Pradeep Kodumuri
Dr. Orhan Talu
Dr. Surendra N Tewari
- 440c Adsorption of Hydrogen and Methane in Metal-Organic Frameworks**
Diana Y. Siberio-Pérez
Omar M. Yaghi
Adam J. Matzger

440d Mechanisms of Hydrogen Adsorption in Metal Organic Frameworks

*Giovanni Garberoglio
Anastasios Skoulidas
Karl Johnson*

440e Hydrogen Adsorption in Self-Assembled LI-Doped Corannulene

*Yingchun Zhang
Lawrence G. Scanlon
Perla B. Balbuena*

440f Reversible Hydrogen Storage in Complex Hydrides

*Jun Wang
Tanya Prozorov
Armin D. Ebner
James A. Ritter*

440g Reversible Chemisorption of Carbon Dioxide

*Alexander Verdooren
Jonathan P. McMullen
Jennifer L. Purcell
Hugo S. Caram
Shivaji Sircar*

Session 443 - Advances in Fluid-Particle Separations I

Chair: George G. Chase

Vice Chair: Seyi A. Oduyungbo

443a Development of a Magnetic Separator for Sequestration of Magnetic Micro Spheres Designed for Ex-Vivo Blood Detoxification

*Haitao Chen
Armin D. Ebner
James A. Ritter
Sandra Guy
Axel J. Rosengart
Michael D. Kaminski*

443b Magnetophoretic Size-Based Trapping and Separation of Nonmagnetic, Submicronparticles in a Microsystem

*Lino A. Gonzalez
Edward S. Park
Kenneth A. Smith
T. Alan Hatton*

443c Filtration of Submicron Particles by Agglomerates of Nanoparticles

*Jose A. Quevedo
Daniel Lepek
Qun Yu
Robert Pfeffer
Rajesh Dave
Stan Dukhin*

443d Nanofibers in Capturing Submicron Particles

Wallace W.- Leung

443e Separation of Molybdate Catalyst from Pulp Bleaching Effluents

*Bandaru V. Ramarao
Raymond Francis
Nilay Sameer
A Nayar
A Ramarao*

443f Nonequilibrium Compression Effects in the Dewatering of Fibrous Suspensions: Analysis Using Dual Porosity Dual Permeability Approach

*Bandaru V. Ramarao
Sergei Lavrykov
Chi Tien*

Session 461 - Functionalized Membranes: Synthesis and Applications

Chair: David M. Ford

Vice Chair: Stephen M. Ritchie

461a Barrier Films for Cesium or Carbon Tetrachloride

*Andy Warta
Tsutomu Shimotori
William A. Arnold
Edward L. Cussler*

461b Bimetallic Nanoparticles Synthesis in Membrane Matrix: Nanoparticle Structure and Reactive Properties

*Jian Xu
D. Bhattacharyya*

461c Gated Chemical Transport through Vertically Aligned Carbon Nanotube Membranes

*Bruce J. Hinds
Mainak Majumder
Nitin Chopra*

461d CO₂/C₂H₆ Separation Using Solubility Selective Membrane Materials

*Scott D. Kelman
Haiqing Lin
Benny D. Freeman*

461e Polymeric CO₂-Selective Membranes Containing Mobile and Fixed Carriers

*Jian Zou
W.S. Winston Ho*

461f Adsorption and Elution of Lectins by Affinity Membranes

*Mirco Sorci
Cristiana Boi
Rachele Facchini
Giulio C. Sarti*

461g Controlled-Chain Pegma-Enhanced Cellulose Acetate Ultrafiltration Membranes for Fouling Control

*T. Gullinkala
Isabel Escobar*

Session 470 - Particle Formation and Crystallization Processes from Liquids or Slurry

Chair: Priscilla J. Hill

Vice Chair: Patrick T. Spicer

470a Development of a Continuous Crystallization Technique to Produce Small Crystals of Pharmaceutical Compounds

Bing Shiou Yang

Chenkou Wei

San Kiang

470b Analysis and Optimization of Different Configurations for Preferential Crystallization

Grzegorz Ziomek

Martin Peter Elsner

Andreas Seidel-Morgenstern

470c Crystallization in Monodisperse Emulsions

Richard D. Dombrowski

James D. Litster

Norman J. Wagner

Yinghe He

470d Use of in-Situ Instrumentation to Characterise Anti-Solvent Addition Crystallization

Des O' Grady

Brian Glennon

470e Crystallization from Aqueous Solutions of Na₂CO₃ and Na₂SO₄ as Related to Heat Exchanger Fouling

Christopher L. Verrill

Ronald W. Rousseau

Angus P. Wilkinson

470f Silver Carboxylate Nanostructure Nucleation and Growth on AgBr Crystals

Alon V. McCormick

Jingshan Dong

David R. Whitcomb

H. Ted Davis

470g Evaluating the Efficiency of Ozawa Theory for the Non-Isothermal Crystallization of N-Paraffins in Solution

Michael Senra

H. Scott Fogler

Session 507 - Liquid Phase Adsorption

Chair: Gino V. Baron

Vice Chair: Armin D. Ebner

507a Competitive Adsorption of 1,5-, 1,6- and 2,6-Dimethylnaphthalene on Various Ion-Exchanged Faujasite Zeolites

Natthakorn Kraikul

Pramoch Rangsunvigit

Santi Kulprathipanja

507b Packing Induced Selectivity Effects in the Liquid Phase Adsorption of Alkane/Alkene Mixtures on Nay

*Inge Daems
Philibert Leflaive
Alain Methivier
Joeri F.M. Denayer
Gino V. Baron*

507c Breakthrough Curves for Solid-Acid Catalyzed Liquid-Phase Alkylation Reactions

*Subramanya Nayak
VidyaSagar Sarsani
Muthana Al-Dahhan
Bala Subramaniam
Milorad Dudukovic*

507d Effects of System Parameters and Material Properties on Productivity and Desorbent Consumption in Chiral Smb Separation

*Ki Bong Lee
Geoffrey B. Cox
Nien-Hwa Linda Wang*

507e Preparative Gradient Elution Chromatography for the Optimized Separation of Ternary Mixtures

*Yichu Shan
Andualem Damtew
Andreas Seidel-Morgenstern*

507f Batch Preparative Chromatography Applied to the Separation of Sugars from Cashew Apple Juice

*Djavanja A Luz
Caroline V Gonçalves
Anne K. O. Rodrigues
Fábio R C Silva
Célio L Cavalcante Jr
Diana C. S. Azevedo*

507g Adsorption Separation of Ethanol from Water for Bio-Ethanol Production

*Rudy Jones
F. Handan Tezel
Jules Thibault
Rania El-Hawary
Jeffrey S. Tolan*

507h An Investigation of the Adsorption Properties of Saudi Bentonite Clay for Dyes in Wastewater

*Saad Al-Jlil
Philip A. Rice*

Session 509 - Membranes for Gas and Vapor Separations

Chair: Benny D. Freeman

Vice Chair: Lora G. Toy

509a Room Temperature Ionic Liquid Membrane for Facilitated Transport of CO₂

*Ashutosh Jha
Paul Scovazzo*

- 509b** **Mixed Gas Selectivities and Permeabilities for Carbon Dioxide/Methane Separation Using Room Temperature Ionic Liquid Membranes**
Prem K. Kilaru
Michael McShea
Paul Scovazzo
- 509c** **Correlation of Structure and Function for CO₂ Permeation in Polyphosphazene Membranes**
Frederick F. Stewart
Christopher J. Orme
- 509d** **Hydrogen Sulfide Removal with Polymer Membranes for Fuel-Cell Applications**
Jin Huang
Jian Zou
W.S. Winston Ho
- 509e** **Crosslinking of High Free Volume Polymers for the Separation of Organic Vapors from Permanent Gases**
Scott D. Kelman
Benny D. Freeman
- 509f** **Can We Increase Flux by Patterning the Surface of a Gas Separation Membrane?**
Christopher E. Goodyer
Annette L. Bunge
Omar Ishteiwy
Paul Thoen
Fernando Roa
J. Douglas Way
- 509g** **Theoretical and Experimental Analyses of Fiber Property Variation in Hollow Fiber Membrane Module for Permeate Purification of Oxygen from Air**
Santosh A. Sonalkar
Glenn Lipscomb

Session 515 - PSA/TSA

Chair: Jose P. Mota

Vice Chair: Roger D. Whitley

- 515a** **A Numerical Method for the Accurate Simulation of Fast Cyclic Adsorption Processes**
Stefano Brandani
Hyungwoong Ahn
- 515b** **Psa Cycle Selection for Binary Gas Separations – Dual Reflux, Rectifying or Stripping Cycles?**
Paul A. Webley
David T. Kearns
- 515c** **Development of a High Recovery O₂ PvsA System**
Roger D. Whitley
Matthew J. LaBuda
Glenn P. Wagner
Craig E. Steigerwalt

- 515d** **Concentration and Recovery of Carbon Dioxide at High Temperature with Heavy Reflux Psa Cycles**
Steven P. Reynolds
Armin D. Ebner
James A. Ritter
- 515e** **Prepurification of Air Using an Advanced Thermal-Pressure Swing Adsorption (Tpsa) Cycle**
Andrew D. Wright
Mohammad A. Kalbassi
Timothy C. Golden
- 515f** **Gas Separation by a Novel Hybrid Membrane/Pressure Swing Adsorption Concept: Case Studies**
Isabel A. A. C. Esteves
J.P.B. Mota
- 515g** **Modeling and Simulation of a Combined Reactor/Pressure Swing Adsorption Unit for Isomerization of a Mixed Feed of Pentanes and Hexanes**
Kevin F. Loughlin
Tareq M. Al-Soudani
- 515h** **Propylene Purification by Applying π - Complexation Adsorbent**
Soon-Haeng Cho
Sang-Sup Han
Jong-Nam Kim
Hee-Tae Beum
Jong-Ho Park

Session 516 - Particle and Cell Separations in Bioprocessing

Chair: Ray M Collins

- 516a** **A Rational Approach to Design an Efficient Primary Recovery Process for a Recombinant Protein from Microbial Biomass**
Anant Patkar
Subrata Sen
Wu Chen
- 516b** **Separation of (Sub-)Micron Bioparticles by Selective Flotation**
P. Van Hee
RGJM Van der Lans
LAM Van der Wielen
- 516c** **Broth Conditions Determining Specific Cake Resistance during Microfiltration of *Bacillus Subtilis***
Kevin M. Graves
Meng Heng
Glenn Rozeboom
Charles E. Glatz
- 516d** **Optimum Technology for Separating Biomaterials from Extracts**
Raymond M. Collins

Session 529 - Advances and Case Studies in Crystallization and Post-crystallization Processing

Chair: R. Dennis Vigil

Vice Chair: Joe Schroer

- 529a Overview of Modeling Approaches to Better Understand and Control Crystallization Processes**
Kumar M. Dhanasekharan
- 529b Simulation of Mixing Effects in Antisolvent Crystallization Using a Coupled CFD-Micromixing-Pbe Approach**
Xing Yi Woo
Reginald B. H. Tan
Richard D. Braatz
- 529c CFD Simulations for Scale-up of Anti-Solvent Crystallization Process**
Xiaomin Liu
Dimitri Hatzivramidis
Hamid Arastoopour
Allan S. Myerson
- 529d The Application of Cluster Size Distribution Methods in Polymer Crystallization Kinetics**
Jiao Yang
Benjamin J. McCoy
Giridhar Madras
- 529e Optimizing Powder Behavior through Crystallization Engineering**
Maria C. Alvarez
James H. Simpson
Terence J. Moore
Jeffrey T. Bien
Michael E. Randazzo
- 529f Concentration-Control of Anti-Solvent Crystallization Using Atr-Ftir**
Zai Qun Yu
Pui Shan Chow
Reginald B. H. Tan
- 529g Control of Api Powder Properties Via Agitated Drying**
Srividya Ramakrishnan
Derek Berglund
Sean Cusack
Jon Hilden

Session 532 - Advances in Fluid-Particle Separations II

Chair: Badie I. Morsi

Vice Chair: Seyi A. Oduyungbo

- 532a Design of Hydrocyclone Separation Equipment Using CFD Coupled with Optimization Tools**
David Schowalter
Rafiqul Khan
Therese Polito
Tim Olson

- 532b** **Analysis of Droplet Coalescence in Emulsions Subjected to Acoustic Fields**
Gautam D. Pangu
Donald L. Feke
- 532c** **A Scale-up Study of Mstlflo Process for Oily Water Treatment**
Fan Shi
Shaio-hung Chiang
- 532d** **Experimental Characterisation of Wire Mesh Demisters**
Thomas Helsør
Hallvard Svendsen
- 532e** **Drag Correlation of Drop Motion on Fibers**
Saru Dawar
George G. Chase
- 532f** **Coalescence Filter Model Performance of Glass Fiber Media with and without Nanofibers**
Priyavardhana Srinivasan
George G Chase
- 532g** **Solid/Liquid Separation Processes in Gas-to-Liquid Systems**
Seyi A. Oduyungbo

Session 543 - Extractive Separations

Chair: Scott Husson

Vice Chair: Vincent Vanbrunt

- 543a** **Trays Versus Packing. Selection of the Optimal Extractor**
Frank Seibert
James Fair
Jose Bravo
- 543b** **Motion of Charged Drops in a Non-Newtonian Liquid-Liquid System**
Laurence R. Weatherley
Aravind Gangu
Tom Sleutels
- 543c** **Solubility and Diffusion of Gases in Ionic Liquids**
Dean E. Camper
Collin Becker
Carl Koval
Rich Noble
- 543d** **Predicting Gas Diffusivity in Room Temperature Ionic Liquids**
Lee Ferguson
Paul Scovazzo
- 543e** **Novel Solvent Resistant Hydrophilic Hollow Fiber Membranes for Membrane Solvent Back Extraction**
Praveen B. Kosaraju
Kamalesh K. Sirkar
- 543f** **Mixing Size Control and Mass Transfer Performance in a Micromixing Process**
Jianhong Xu
Guangsheng Luo
Guiguang Chen

543g Enantioseparation of D,L-Tryptophan with a New Chiral Selector through Solvent Extraction

*Bin Tan
Guangsheng Luo
Xuan Qi
Jiading Wang*

543h Separation of Metal Ions by a Column Packed with Microcapsules Containing Tricaprylmethylammonium Chloride and DI-2-Ethylhexyl Phosphoric Acid

*Weiwei Yang
Guangsheng Luo
Xingchu Gong*

Session 24 - Fundamentals of Fluidization I

Chair: T.C. Ho

Vice Chair: Bruce D Hook

24a A New Pulverized Biomass Utilization Technology

Shigekatsu Mori

24b Transient 3-Dimensional Behavior of Gas-Solid Fluidization Measured Using Electrical Capacitance Volume Tomography (Ecvt)

*Bing Du
Warsito Warsito
L.S. Fan*

24c CFD Simulations of Gas Fluidized Beds Using a Revised Formulation of the Multi-Dimensional "Particle Bed Model"

*Luca Mazzei
Paola Lettieri
Tim Elson
Derek Colman*

24d Homogeneous Gas Fluidization: Kinematic and Dynamic Wave Velocities, Particle Mobility and Apparent Suspension Viscosity

*Katia Gallucci
Lorenzo G. Gibilaro*

24e The Hydrodynamics of a Rotating Fluidized Bed

*Maureen A. Howley
Robert Pfeffer*

24f The Effect of Gas-Solids Dispersion on a Two Fluid Model of a Transport Gasifier

*Chris Guenther
Ron Breault*

24g Residence Times in Fluidized Beds with Secondary Gas Injection

*Dana O. Christensen
Marc-Olivier Coppens
John Nijenhuis*

Session 62 - Fundamentals of Fluidization II

Chair: Isaac K. Gamwo

Vice Chair: Ben Glasser

- 62a** **Kinetic Theory Based CFD Simulation of Turbulent Fluidization of Fcc Particles in a Riser**
Veeraya Jiradilok
Dimitri Gidaspow
Somsak Damronglerd
William J. Koves
Reza Mostofi
Suchaya Nitivattananon
- 62b** **Three-Dimensional Simulation of a Single Bubble in a Rectangular Gas-Solid Fluidized Bed with a Central Jet**
Hamid Arastoopour
Shyam S Dokka
- 62c** **Fluidization of Cohesive Particles**
Yuhua Chen
Jun Yang
Rajesh Dave
Robert Pfeffer
- 62d** **Computational Validation of the Glicksman Scaling Laws Using Gas/Solids Fluidized Bed Simulations**
Sofiane Benyahia
Sreekanth Pannala
Charles E. A. Finney
Madhava Syamlal
Stuart C. Daw
Thomas O'Brien
- 62e** **Numerical Simulations of Hydrodynamic Behaviors in Conical Spouted Beds**
Z.G. Wang
H.T. Bi
C.J. Lim
- 62f** **Detailed Measurements of Flow Dynamics inside a Dense Gas-Solids Fluidized Bed**
Haiyan Zhu
Jesse Zhu
- 62g** **Towards the CFD Modelling of Bimodal Gas Fluidized Beds**
Olumuyiwa Owoyemi
Paola Lettieri
Roger Place

Session 66 - Gas Phase Synthesis of Particles I

Chair: Amit Limaye

Vice Chair: Srinivas Vemury

- 66a** **Thermal Decomposition Mechanism of Nickel Oxalate in an Aerosol Flow Reactor**
Casey Carney
Christopher Gump
Alan W. Weimer

- 66b** **Co-Synthesis of H₂ and Zn Nanoparticles by in-Situ Zn Aerosol Formation and Hydrolysis**
Frank O. Ernst
Antonio Tricoli
Sotiris E. Pratsinis
Aldo Steinfeld
- 66c** **Synthesis of Tellurium Dioxide Nanoparticles by Spray Pyrolysis**
Hongwang Zhang
Mark T. Swihart
- 66d** **Ultrafine Particles for Catalytic Applications Made by Spray-Pyrolysis**
George Fotou
Miodrag Oljaca
Toivo Kodas
Jiang-Ping Sen
Qi Fu
Jian Zheng
- 66e** **Synthesis of Iron Oxide Nanoparticles in Counterflow Diffusion Flame Reactor**
Hector Ruiz
Chris S. Randall
Paul C. Högberg
Yangchuan Xing
- 66f** **Biodegradable, Nanoparticulate Polymer Fillers**
Stefan Loher
Matthias Huber
Wendelin J. Stark
- 66g** **Generation of Tailored Microparticles by Photopolymerization of Monodisperse Droplets**
Asit K. Ray
Zhiqiang Gao
- 66h** **Synthesis of Binary Metal Nanoparticles of Ru-Ni with Core and Shell Structure**
Kalyana C. Pingali
Shuguang Deng
David Rockstraw

Session 84 - Solids Handling and Processing

Chair: Bruce D Hook

Vice Chair: George E. Klinzing

- 84a** **Modeling of Heat Transfer in Granular Flow in Rotating Vessels**
Bodhisattwa Chaudhuri
Fernando J. Muzzio
M. Silvina Tomassone
- 84b** **Parameter Characterization for Drying of Porous Spherical Particles**
James L. Manganaro
- 84c** **Scaling of the Adhesion between Particles and Surfaces from Micron-Scale to the Nanometer Scale**
Gautam Kumar
Shanna Smith
Stephen P. Beaudoin

- 84d** **A Method for Predicting Hopper Flow Characteristics of Unconfined Cohesive Powders**
Abdul M. Faqih
Amit Mehrotra
Bodhisattwa Chaudhuri
M. Silvana Tomassone
Fernando J. Muzzio
- 84e** **Particle Attrition during Dense and Dilute Phase Pneumatic Conveying**
Robert A. Hamilton
Doraiswami Ramkrishna
Jennifer S. Curtis
- 84f** **Electrostatic Phenomenon in Gas-Liquid-Solid Fluidized Beds**
Ah-Hyung Park
L.S. Fan
- 84g** **Experimental Investigation of Granular Electrostatics and Ignition Hazard in a Pneumatic Conveying System**
Jun Yao
Chi-Hwa Wang
Yan Zhang

Session 115 - Characterization of Engineered Particles and Nano-Structured Particles

Chair: Gregory Beaucage

Vice Chair: Mark Bumiller

- 115a** **Aerosol Synthesis of Low Density High Surface Area Aerosol Gels**
C. M. Sorensen
R. Dhaubhadel
A. Chakrabarti
- 115b** **Experimental and Computer Simulation Studies of the Mechanical Behavior of Nanoparticle Chain Aggregates**
Adamos Dalis
Weizhi Rong
Sheldon K. Friedlander
- 115c** **Phase Composition of Fumed Alumina Nanoparticles**
George Fotou
Lawrence Murphy
Robert Picthall
- 115d** **Characterization of Nanoparticle Composition and Reactivity by Single Particle Mass Spectrometry**
K. Park
Zhou Lei
Michael Zachariah
- 115e** **Real Time Measurement of Sintering Rates by Tandem Mobility Dma and an Electropray System**
Kuk Cho
Pratim Biswas

115f Dynamics of Particle Formation and Growth in Spray Flame Pyrolysis Using in Situ X-Ray Scattering

*Gregory Beaucage
Rainer Jossen
Sotiris E. Pratsinis
Theyencheri Narayanan*

115g Size Distributions of Non-Spherical Particles from Chord Length Measurements: How to Account for Orientation Bias Due to Flow

*Nandkishor K. Nere
Doraiswami Ramkrishna
Bruce Parker*

Session 117 - Fred Thomson Memorial Session: Industrial Perspective of Solids Processing

Chair: Shrikant Dhodapkar

Vice Chair: Tim Bell

117a Fred Thomson and the Role of the Technology Specialist in Industry

Timothy A. Bell

117b Thoughts on Engineering, Design and Start-up of Solids Processing Plants

Karl Jacob

117c Scale-up of Size Enlargement Processes: a Pharmaceutical Perspective

James N. Michaels

117d Process Scale up or Why I Never Have the Proper Data

Willie Hendrickson

117e Road Map for Successful Start-up of Bulk Handling Facilities

John Pfeiffer

117f Closing Remarks

Shrikant Dhodapkar

Session 121 - Fundamentals of Fluidization III

Chair: Maureen A. Howley

Vice Chair: Seyi A. Oduyungbo

121a Pressure Pulsation in Vibrofluidization of Fine Powders

*Sung Joon Moon
Yannis G. Kevrekidis
Sankaran Sundaresan*

121b Instabilities in Liquid Fluidization Systems

*Yee Sun Wong
Eldin Wee Chuan Lim
Chi-Hwa Wang*

121c The Kinematic Theory of Fluidized Bed Expansion and Contraction

Stefano Brandani

121d A Local Transient Approach to Monitoring Fluidization Quality

*Clay R. Sutton
John C. Chen*

- 121e** **Novel Technique to Optimum Catalyst Size Selection for Slurry Bubble Column Reactors**
Isaac K. Gamwo
Dimitri Gidaspow
Jonghwun Jung
- 121f** **Particle Size Monitoring in a Fluidized Bed Using Pressure Fluctuations**
Clive E. Davies
Rory C. Flemmer
- 121g** **Some Applications of Acoustic Emission in Fluidized Bed**
Weijie Shu
Jingdai Wang
Yongrong Yang
Congjing Ren
Yijia Cao
- 121h** **Integration of Ect Measurements with Hydrodynamic Modelling of Conventional Gas-Solid Bubbling Bed**
Y. Makkawi
C. Reid
R. Ocone

Session 159 - Circulating Fluidized Beds

Chair: S. B. Reddy Karri

Vice Chair: Clay R. Sutton

- 159a** **Mp-Pic Simulations Dense-Bed Reactors: Chlorinators and Fluid Cokers**
Ken A. Williams
Shibu Banerjee
- 159b** **Solids Fractions and Flow Characteristics in a Cfb as Measured with a Fiber Optic Probe**
Steven M. Seachman
Paul C. Yue
Emily Taylor
Lawrence J. Shadle
- 159c** **Particle Velocity Measurements in a Circulating Fluidized Bed**
Chris Guenther
Ron Breault
Anthony Zinn
- 159d** **Radial and Axial Profiles of Solids Loading in a Gas-Solid Circulating Fluidized Bed**
Timothy O'Hern
Steven M. Trujillo
John R. Torczynski
Paul R. Tortora
Steven L. Ceccio
- 159e** **Wavelet Analysis of a Circulating Fluidized Bed Optical Probe Data**
Chris Guenther
Ron Breault
- 159f** **A Model for Axial Voidage Profile in Risers**
Subbarao Duvvuri
Sanjay Gambhir

- 159g** **Experimental and Computational Study of T- and L-Outlet Effects in a Dilute Circulating Fluidized Bed Pilot Riser**
Gorik Van engelandt
Juray De Wilde
Geraldine J. Heynderickx
Guy B. Marin
- 159h** **Application of Drift-Flux Model to Phase Holdup in Liquid-Solids Circulating Fluidized Bed**
Palani Natarajan
R. Velraj
R.V. Seeniraj

Session 209 - Computational and Numerical Approaches to Particle Flow

Chair: Jennifer S. Curtis

Vice Chair: Pedro E. Arce

- 209a** **Coarse-Graining of Two-Fluid Models for Fluidized Gas-Particle Suspensions**
Arthur T. Andrews
Sankaran Sundaresan
- 209b** **Preconditioning for the Simultaneous Solution of Gas-Solid Flows**
Juray De Wilde
Edward Baudrez
Geraldine J. Heynderickx
Guy B. Marin
- 209c** **Consistency of Fully Developed and Periodic Simulations in Gas/Solids Flow in a Riser**
Sofiane Benyahia
Madhava Syamlal
Thomas O'Brien
- 209d** **Simulating the Hydrodynamics of Spouted Beds Using a Continuum Formulation**
Dhanunjay (Jay) S. Boyalakuntla
Sreekanth Pannala
Carles E. A. Finney
Stuart C. Daw
- 209e** **Modeling of Slow-Frictional Flow in CFD Eulerian Framework**
Peter Spicka
- 209f** **Granular Attrition as a Diffusion Phenomenon**
Eldin Wee Chuan Lim
Chi-Hwa Wang
- 209g** **Rotating Fluidized Bed an Efficient Polymerization Reactor**
Azita Ahmadzadeh
Hamid Arastoopour
Fouad Teymoour
- 209h** **Numerical Simulation of Heat Transfer in a Rotary Kiln**
Deliang Shi
Joseph J. McCarthy

Session 284 - Transport in Fluidized Beds

Chair: Ray Cocco

Vice Chair: Sofiane Benyahia

- 284a Particle Injection and Mixing Experiments in an One Quarter Scale Model Bubbling Fluidized Bed**
*Leon Glicksman
Ezra Carr
Peter Noymer*
- 284b Comparison of the Performance of a Conventionally-Heated and a Microwave-Heated Fluidized Bed Mercury Desorber Employing a Mass Transfer-Based Kinetic Model**
*T. C. Ho
Suraj Shetty
Tae-Hoon Kim
Jerry Lin
Hsing-wei Chu
Jack R. Hopper*
- 284c A CFD Study of Coal Gasification Using Eulerian-Granular Multiphase Model**
*Shaoping Shi
Stephen E. Zitney
Chrisopher Guenther
Madhava Syamlal
William A. Rogers
Stefano Orsino*
- 284d A Hybrid Lagrangian-Eulerian Approach in Simulating Gas-Solid Flows Consisting of Multiple Solid Phases**
*Dhanunjay (Jay) S. Boyalakuntla
Sreekanth Pannala
Stuart C. Daw
Sofiane Benyahia
Thomas O'Brien
Madhava Syamlal*
- 284e Modeling and Design of a Spray Dryer for the Manufacture of Hollow Micro-Particles**
*Vikram S. Shabde
Karlene A. Hoo*
- 284f Hydrodynamic Correlations with Experimental Results from Cold Mockup Spouted Beds for Advanced Fuel Particle Coating**
*Jiandong Zhou
Duane D. Bruns
Charles E. A. Finney
C. Stuart Daw
Sreekanth Pannala*
- 284g Case Study: Optimization of an Industrial Fluidized Bed Drying Process for Large Geldart Type D Nylon Particles**
*Wai Kiong Ng
Reginald B.H. Tan*
- 284h A Model for Gas to Particle Mass Transfer in Risers**
Subbarao Duvvuri

284i On the Effect of Particle Size Distribution in Fluidized Bed Simulations

Kuo-chen Tsai

Session 287 - Particle Technology Forum Poster Session

Chair: Joseph McCarthy

Vice Chair: Shrikant Dhodapkar

287a Studies to Investigate Variables Affecting Coating Uniformity in a Pan Coating Device

Preetanshu Pandey

Richard Turton

287b Error Analysis of Focused Beam Reflectance Measurements

Michael E. Lasinski

Nandkishor K. Nere

Robert A. Hamilton

Benjamin D. James

Jennifer S. Curtis

287c Dynamic Model of the Riser in Pilot-Scaled Circulating Fluidized Bed

Yue Huang

Richard Turton

Juchirl Park

Parviz Famouri

Edward J. Boyle

287d Granular Attrition Effect on the Electrostatic Behavior in a Pneumatic Conveying System

Jun Yao

Chi-Hwa Wang

287e A One-Dimensional Model of Gas-Solids Flows in the Acceleration Zone of a Cfb Riser

Chao Zhu

Jun You

287f Optical Effects of Nano-Thick Coatings on Particles of the Core-Shell Type

David M. King

Jarod McCormick

Luis Hakim

Steven George

Alan Weimer

287g Particle Aldtm Based Ultrafast Electrical Surge Suppression Devices

Michael A. Weimer

David M. King

Luis Hakim

Guodong Zhan

Alan W. Weimer

287h Fractal Gelation or Self-Preservation

Frank O. Ernst

Sotiris E. Pratsinis

287i Approaches to Non-Brownian Particle Migration in a Stirred Tank Flow

Adetola A. Abatan

Joseph J. McCarthy

- 287j** **Polymer Coating of Submicron Particles from Sas Process and Characterization Using Tem-Eels**
Yueyang Shen
Ryan Barrow
Dongguang Wei
Rajesh Dave
Robert Pfeffer
- 287k** **Particle Dynamics in Flame Synthesis of Materials**
Martin C. Heine
Sotiris E. Pratsinis
- 287l** **Near Infrared Optical Transduction on Single-Walled Carbon Nanotubes**
Daniel A. Heller
Esther S. Jeng
Tsun-Kwan Yeung
Brittany M. Martinez
Anthonie E. Moll
Michael S. Strano
- 287m** **Voidage Instabilities in Liquid Fluidized Beds**
Eldin Wee Chuan Lim
Yee Sun Wong
Chi-Hwa Wang
- 287n** **Effects of Preparation Condition on Morphology of Fine Nickel Particle**
Katsuyasu Sugawara
Hiroshi Sato
Risehiro Nonaka
Takuo Sugawara
- 287o** **Design and Development of a Capacitance Transducer for Airborne Particulates**
Haroun Mahgerefteh
- 287p** **Towards the Optimal Reconstruction of a Distribution from Its Moments**
Volker John
Ivan Angelov
Ahmet Alper Öncül
Kai Sundmacher
Dominique Thévenin

Session 300 - Agglomeration, Granulation and Particle Formation Processes

Chair: Paul Mort

Vice Chair: Rebecca L. Carrier

- 300a** **Multidimensional Modeling of Granulation**
Andreas Braumann
Mike Goodson
Markus Kraft
Paul Mort
- 300b** **Micromechanical Properties of Model Intragranular Bridges of Pharmaceutical Excipients**
Farber Leon
James N. Michaels
Gabriel I. Tardos

- 300c** **Determination of the Coalescence Probability of Wet Granules by Mesoscale Modeling**
Frantisek Stepanek
Pavol Rajniak
Christopher Mancinelli
Rey Chern
- 300d** **A Micro-Mechanistic Investigation of the Effects of Binder Surface Tension in Pharmaceutical Granulation**
Cristina Jimenez
Stefaan J Simons
Rob Ward
Shaun Fitzpatrick
- 300e** **Adhesion Force and Wetting Behaviour of Las Acid Bridges: A Comparison of Different Neutralisation States in Relation to Detergent Granulation**
Sarah Germaná
Stefaan J.R. Simons
Judith Bonsall
- 300f** **Wet Granule Breakage in High Shear Mixer Granulation**
James D. Litster
Rachel Smith
Neil Page
- 300g** **Discrete Element Method Application for Verification of Kinetic Theory of Granular Flow in a High Shear Mixer**
Justin A. Gantt
Edward P. Gatzke
- 300h** **Use of Lasentec Fbrm in-Process Particle Sizing Pat Technique to Study Top- and Bottom-Spray Fluid Bed Granulation Processes**
Mario Hubert
Benjamin Smith
Eric Dycus
Andrew Birkmire
Kim T. Walter

Session 315 - Dynamics and Modeling of Particulate Systems I

Chair: Joerg Theuerkauf

Vice Chair: Ben Glasser

- 315a** **Plane Shear Flow of Cohesive Granular Materials**
Lee R. Aarons
Sankaran Sundaresan
- 315b** **Gelation or Self-Preservation during Turbulence-Induced Coagulation**
Frank O. Ernst
Sotiris E. Pratsinis
- 315c** **Molecular Dynamics Simulation of Titania Nanoparticles**
Vishal N. Koparde
Peter T. Cummings

- 315d** **Analysis of Local and Global Structure during Densification of Non-Spherical Particulate Materials**
Wenli Zhang
Karsten E. Thompson
Allen H. Reed
- 315e** **An Investigation of the Effect of Process Conditions on the Fluidization Behaviour of Gas Fluidized Beds Linked with Rheological Studies**
Giovanna Bruni
Paola Lettieri
Tim Elson
John Yates
David Newton
- 315f** **The Effect of Particle Shape on Granular Stress**
Benjamin D. James
Jennifer S. Curtis
- 315g** **Numerical Approach for Solving Dynamics of Dense Granular Flows**
Rahul Agarwal
Ramanan Pitchumani
Balakrishnan Pitchumani
- 315h** **Choosing an Objective Function for Seeded Batch Crystallization**
Jeffrey D. Ward
Michael F. Doherty
Duncan A. Mellichamp

Session 323 - Functional Nano-particles and Applications I

Chair: George Fotou

Vice Chair: Lutz Madler

- 323a** **Functionalized Monodisperse Magnetic Nanoparticles**
Marco Lattuada
T. Alan Hatton
- 323b** **Synthesis and Functionalization of Magnetite (Fe₃O₄) Nanoparticles for Cancer Treatment**
Adriana P. Herrera
Hector L. Rodriguez
Madeline Torres-Lugo
Carlos Rinaldi
- 323c** **Droplet and Particle Dynamics during Flame Spray Synthesis of Nanoparticles**
Martin C. Heine
Sotiris E. Pratsinis
- 323d** **Synthesis and Characterization of Biocompatible Metal Nanoparticles**
Christopher Carach
Matthew Gallovic
R. Mohan Sankaran

323e Nanostructured Polymeric Materials for Biomedical Applications

*Katerina Kotti
Olympia Kotrotsiou
Elpiniki Dini
Olga Kammona
Costas Kiparissides*

323f Mechanical and Gas Barrier Properties of Styrene-Butadiene Rubber (Sbr) Nanocomposites Containing Organoclays and Carbon Black

*Paulo C. Meneghetti
Sohel Shaikh
Syed Qutubuddin
Sergei Nazarenko*

323g Fabrication and Electrical Characterization of Ultrafast Transient Surge Suppression Devices Based on Ald Surface Modified Varistor Materials

*Michael A. Weimer
David M. King
Luis F. Hakim
Guodong Zhan
Alan W. Weimer*

Session 354 - Functional Nano-particles and Applications II

Chair: Lutz Madler

Vice Chair: George Fotou

354a Synthesis of Non-Oxidic Nano Scale Materials Using Flame Technology

*Robert N. Grass
Wendelin J. Stark*

354b Surface Modification of Ceramic Nanoparticles Via Atomic Layer Deposition

*Luis F. Hakim
Alan W. Weimer
Guodong Zhan
Steven M. George*

354c Visibly Transparent and Radiopaque Inorganic Organic Composites from Flame-Made Mixed-Oxide Fillers

*Lutz Madler
Heiko Schulz
Sotiris E. Pratsinis
Frank Krumeich
Peter Burtscher
Norbert Moszner*

354d Benign Nano-Thin Film Composite Particles for Protection from Uva/Uvb - Rays

*David M. King
Jarod McCormick
Luis Hakim
Steven George
Alan Weimer*

Session 364 - Mixing and Segregation

Chair: James F. Gilchrist

Vice Chair: Joseph McCarthy

- 364a** **Cluster Model of Particle Segregation in Vibrated Granular Media**
Ben McCoy
Giridhar Madras
- 364b** **Segregation during Hopper Discharge: a DEM and Experimental Study**
William R. Ketterhagen
Jennifer S. Curtis
Carl R. Wassgren
Angela Kong
Padma J. Narayan
- 364c** **Segregation under Chaotic Flow in 2d Granular Systems**
Stephen E. Cisar
Paul B. Umbanhowar
Julio M. Ottino
- 364d** **Modeling Granular Mixing Processes Utilizing a Hybrid DEM-Compartment Modeling Approach**
Patricia M. Portillo
Fernando J. Muzzio
Marianthi G. Ierapetritou
- 364e** **Mixing and Segregation of Slurries for Catalyst Production**
Keirman R. LaMarche
Jigar Shah
Ben Glasser
Troy Shinbrot
- 364f** **Segregation Potential in Pharmaceutical Powder Blends: from the Bench to Production**
Elizabeth Shen
Robert W. Schumacher
Atish Dalal
Hemant Alur
Samuel A. Maya
Brendan Walsh
Tony James
Ian Bridle

Session 369 - Population Balance Modeling for Control of PF Processes: Nucleation, Aggregation and Breakage Kernels

Chair: Edward P. Gatzke

Vice Chair: Richard B McClurg

- 369a** **Comparison of Models for Coarse Particle Shape Evolution during Attrition in a Stirred Vessel**
Priscilla J. Hill
Devkant S. Gandhi

- 369b** **Population Balance Equation Modeling of Drop Size Distributions in Turbulently Prepared Emulsions**
Neha B. Raikar
Surita R. Bhatia
Michael F. Malone
Michael A. Henson
- 369c** **Mathematical Modeling of Wet Granulation:**
Pavol Rajniak
Rey Chern
Christopher Mancinelli
Frantisek Stepanek
- 369d** **Constraints on the Kernel of the Multiple Fragmentation (Breakage) Equation**
Robert M. Ziff
- 369e** **Transient and Asymptotic Behavior of the Binary Breakage Problem**
Nikos V. Mantzaris
- 369f** **Bivariate Applications and Extensions of the Quadrature Method of Moments**
Robert L. McGraw
Manuel Arias-Zugasti
Daniel E. Rosner
- 369g** **Population Balance Modeling of Comminution Processes: Implications of a Nonlinear Theory for Practice**
Ecevit Bilgili
Pavol Rajniak

Session 382 - PTF Baron Award Lecture

Chair: Alan W. Weimer

- 382a** **Challenges in Quantitative Analysis of Particulate Flows**
Sankaran Sundaresan

Session 399 - Dynamics and Modeling of Particulate Systems II

Chair: Benjamin J. Glasser

Vice Chair: Joerg Theuerkauf

- 399a** **Modelling of Solid Stress in Gas-Solid Flow Systems**
Y. Makkawi
R. Ocone
- 399b** **A Computational Study of the Various Flow Regimes in Pneumatic Conveying of Granular Materials**
Eldin Wee Chuan Lim
Chi-Hwa Wang
- 399c** **Simulation of Pneumatic Dense Phase Conveying Using the Discrete Element Method**
Joerg Theuerkauf
David Pontiondy
Shrikant Dhodapkar

- 399d** **The Unsteady Drag Force on a Cylinder Immersed in a Dilute Granular Flow**
Carl R. Wassgren
Rahul Bharadwaj
Roberto Zenit
- 399e** **Granular Flow of Wet Solids in a Four Bladed Mixer**
Azzeddine Lekhal
Johannes Khinast
Benjamin J. Glasser
- 399f** **Flow-Induced Dilation of Fine Powders in a Rotating Drum**
Abdul M. Faqih
Bodhisattwa Chaudhuri
Fernando J. Muzzio
M. Silvina Tomassone
- 399g** **Model of Wet Particle Collisions and Its Application to Dilute Wet Particulate Systems**
Advait A. Kantak
Robert H. Davis
Christine M. Hrenya

Session 403 - Functional Nano-Particles and Applications III

Chair: Karsten Wegner

Vice Chair: Yakov Kutsovsky

- 403a** **Modifying Bandgap of TiO₂-Based Nanoparticles by Cation Doping**
Wey Yang Teoh
Lutz Maedler
Rose Amal
Sotiris Pratsinis
- 403b** **Coating Nanoparticles by Atomic Layer Deposition in a Rotary Fluidized Bed: Al₂O₃ Ald on ZrO₂**
Jarod A. McCormick
Alan W. Weimer
Steven. M. George
- 403c** **Microfluidic Synthesis and Surface-Engineering of Colloidal Nanoparticles**
Saif A. Khan
Klavs F. Jensen
- 403d** **Flame Synthesis of Doped ZnO Nanorods**
Murray J. Height
Lutz Mädler
Frank Krumeich
Sotiris E. Pratsinis
- 403e** **Tuning the Reactivity of Nanoparticles and Nanoparticle Mixtures**
Anand Prakash
Alon V. McCormick
Michael Zachariah
- 403f** **Organic Monolayer Deposition on Aerosolized Silicon Nanoparticles**
Ying-Chih Liao
Amanda Nienow
Jeffrey T. Roberts

Electrochemically Active Nanoparticles Made by Flame Spray Pyrolysis

*Frank O. Ernst
Joachim Ufheil
Sotiris E. Pratsinis
Petr Novak*

Session 411 - Modeling and Scale-Up of Nano-Particle Processing

Chair: Roger Place

Vice Chair: Silvina Tomassone

411a A Comparison of Deterministic Population Balance Equations and Stochastic Monte-Carlo Approaches for Modelling the Particle Precipitation in Microemulsions

*Andreas Voigt
Bjoern Niemann
Jan Recksiedler
K. Sundmacher*

411b Competition between Mixing and Gelation in Continuous Processing of Nanoparticle Dispersions

*Miroslav Soos
Andrea Vaccaro
Massimo Morbidelli
Jan Sefcik*

411c Gas Entrainment Measurement in Spray Flames for Particle Synthesis

*Martin C. Heine
Lutz Mädler
Rainer Jossen
Sotiris E. Pratsinis*

411d Controlling the Processing Behavior of Silica Agglomerates Using a Thermo-Responsive Binder

*Luciana Bava
Donald L. Feke
Ica Manas
Stuart Rowan*

411e Dynamic Optimization of Hybrid Discrete/Continuous Particulate Processes

Roberto Irizarry

411f Fluidization of Nanoparticles in a Rotating Fluidized Bed

*Jose A. Quevedo
Hideya Nakamura
Yueyang Shen
Rajesh N. Dave
Robert Pfeffer
Satoru Watano*

411g Quenching of Growth of Asa Crystal Surfaces by Adsorption of Various Surfactant Molecules Using Molecular Dynamics Simulations

*M. Silvina Tomassone
Tao Li*

Session 473 - Processing and Safety of Energetic Materials

Chair: Dilhan M. Kalyon

Vice Chair: Lilia Mastov

473a Development of Flow Instabilities during the Extrusion of Energetic Materials: Mathematical Analysis and Experimental Results

Dilhan M. Kalyon

Hansong Tang

Elvan Birinci

473b Rheological Characterization of Nasa Propellants and Modeling/Simulation of the Mixing Process for Scale-up to Production

Lilia Mastov

Joseph Palk

Fee M. Lee

473c Analysis of the Fundamentals of Co-Extrusion Process for Co-Extrusion of Fast/Slow Burn Composite Grains

Halil Gevgilili

Dilhan M. Kalyon

473d Development of a Co-Extrusion Process for Propellant Manufacture

Christopher Gonzales

Richard Muscato

Suzanne Prickett

Collier Cline

Dilhan M. Kalyon

Moinuddin Malik

James E. Kowalczyk

473e Rheological Characterization of Nc Gels and Development of Processing Simulants

Dilhan M. Kalyon

Elvan Birinci

David Fair

473f Twin Screw Extrusion Processing of Double Base Propellant

Suzanne Prickett

Wayne G. Thomas

Christopher M. Radack

Dilhan M. Kalyon

Moinuddin Malik

James E. Kowalczyk

Session 474 - Purification, Separation, and Manipulation of Nano-Particles

Chair: Yangchuan Xing

Vice Chair: Benjamin C. Fuchs

474a Nanoseparations – State of the Art and Future Needs

Karsten Keller

Benjamin C. Fuchs

474b Separation of Functionalized Single-Walled Carbon Nanotubes Via Gel Electrophoresis

Monica Usrey

Ethan S Lippmann

Michael S. Strano

- 474c Nano Colloid Coating of Micro-Porous Electrode Membrane by Precision Electro spray Deposition**
Ping Wang
Hsueh - Chia Chang
- 474d Size Selective Fractionation of Nanoparticles Using the Tunable Solvent Properties of CO₂ Gas Expanded Liquids**
Madhu Anand
Philip W. Bell
Juncheng Liu
Christopher B. Roberts
- 474e Nucleation and Growth Kinetics for the Nanoparticle Precipitation of Barium Sulfate in Microemulsions**
Bjoern Niemann
Jan Recksiedler
Dendy Adityawarman
Kai Sundmacher

Session 511 - Nano-Energetic Materials

Chair: Jan A. Puszynski

Vice Chair: Hendrik J. Viljoen

- 511a The Development of Energetic Nanocomposites for the Warfighter**
Paul Redner
Steven Nicolich
Shubhra Gangopadhyay
Rajesh Shende
- 511b Optimization of the Selection of the Extruder Type, Geometry and Operating Conditions for the Processing of Nano-Energetic Materials Based Fem Analysis of the Process**
Moinuddin Malik
Dilhan Kalyon
James E. Kowalczyk
- 511c The Effect of Heating Rate on the Reaction Kinetics of Nanoscale Aluminothermic Reaction**
Michelle Pantoya
John J. Granier
Ashish Rai
K. Park
Michael Zachariah
- 511d Investigation of Reaction Mechanisms and Combustion Characteristics of Nanothermites**
Christopher J. Bulian
Jacek J
Jan A
- 511e A Reaction Model for Plasma Coating of Nanoparticles in Hydrocarbon Plasma**
Alexander L. Yarin
Beniamino Rovagnati
Farzad Mashayek
Themis Matsoukas

Session 524 - Supercritical Fluids for Food and Pharmaceuticals

Chair: Rajesh Dave

- 524a** **Totally Predictive Models for Supercritical Fluid Extraction of Natural Products**
Wei-Yin Chen
Jiangping Liu
- 524b** **Rapid Expansion of Supercritical Solution with Solid Cosolvent (RESS-Sc) Process for Particle Formation: Pharmaceutical Nanoparticles**
Ranjit Thakur
Ram B. Gupta
- 524c** **Fabrication of Controlled Release Devices for Anticancer Agents Using Supercritical Antisolvent Method**
Lai Yeng Lee
Kenneth A. Smith
Chi-Hwa Wang
- 524d** **Denaturation of Egg Yolk Proteins during Processing with near-Critical Dimethylether**
Steve J. Tallon
Owen Catchpole
Kristina Fenton
- 524e** **Influence of Supersaturation and Growth on Particle Size and Morphology in High Pressure CO₂ Antisolvent Process**
Alan A. Chang
Domenico Larobina
Ruben G. Carbonell

Session 542 - Energetic Materials: Environmental and Life Cycle Issues

Chair: Charles R. Painter

Vice Chair: Doris A. Anders

- 542a** **Development of Physico-Chemical and Biological Process for the Treatment of Pink Water and Perchlorate at Picatinny Arsenal**
Mohammed Sidhoum
Pischa Wanaranta
Seung Nah
Tsan-Liang Su
Christos Christodoulatos
Kristin L. Jasinkiewicz
Kimberly E. Hogrelius
Pamela L. Sheehan
Scott Faluotico
- 542b** **Green Armaments Technology - Energetics Forensics Initiative**
Colette Lamontagne
Janet Mahannah
Leonard Mecca
Kristin L. Jasinkiewicz
Kimberly E. Hogrelius

- 542c Environmentally-Friendly Replacement for Mercurous Nitrate Test of Copper Alloys**
Mahmoud Wazne
Sant-Sri Billapati
Christos Christodoulatos
Kristin L. Jasinkiewicz
Kimberly E. Hogrelius
Michael Hespos
- 542d Materials of Evolving Regulatory Interest Team: Dod'S Approach to Moving beyond Compliance**
Randall J. Cramer
- 542e Phytoremediation of Energetic Materials (Dnts and Rdx) Using Arabidopsis Thaliana**
Jong M. Yoon
Sarah Rollo
David J. Oliver
Jacqueline V. Shanks

The session papers for sessions 01, 03, 31, 47, 182, 312, 424 and student poster sessions 90, 91, 92, 93, 94, 95, 96, 97 were not available at time of production

Session 4 - Meet the Faculty Candidate Poster Session

Chair: Sundararajan V. Madihally

Vice Chair: Dana E. Knox

- 4a First-Principles Screening of Alloys for Heterogeneous Catalysis**
Jeff Greeley
- 4aa Synthesis and Controlled Clustering of Magnetic Nanoparticle Suspensions**
Harpreet Singh
Paul E. Laibinis
T.A. Hatton
- 4ac Sustainable Technologies for Biomaterials from Renewable Resources**
Christopher L. Kitchens
- 4ad Molecular Dynamics Investigation into the Influence of Anionic and Zwitterionic Membrane Interfaces on Structure of Antimicrobial Peptides, and Implications on Antimicrobial Properties**
Himanshu Khandelwa
- 4ae Thermodynamic and Kinetic Modeling of Protein Phase Transition Related to Diseases and Drug Development through Control of Protein-Protein Interactions**
Sungmun Lee
- 4af Reaction Engineering, Process Design, and Catalyst and Material Development Research on the Utilization of Biorenewable Resources for Bioenergy and Bioproducts**
Justinus A. Satrio
- 4ag Crystal Nucleation in Levitated Polyethylene Oxide**
Adam P. Olsen
Richard C. Flagan
Julia A. Kornfield
- 4ah Flow-Induced Microstructure of Nanoparticles in Multiphase Systems: Processing, Characterization, and Applications**
Caroline H. Nam

- 4ai Nanoparticles for Pharmaceutical and Electronic Applications**
Ranjit Thakur
- 4aj High-Throughput Time-Series Metabolomic Analysis of a Systematically Perturbed Plant System**
Harin H. Kanani
Maria I. Klapa
- 4ak Advanced Sulfonated Polyarylenethioethersulfone Polymer and Copolymer Membranes for Fuel Cell Application**
Mitra Yoonessi
- 4al Strategies for Overcoming Drug Resistance**
Grace F. Liou
- 4am Dry Powder Aerosols for Therapeutic Drug Delivery**
Jennifer Fiegel
- 4an From Process Systems Engineering to Systems Biology and Synthetic Biology**
Xiaoxia (Nina) Lin
- 4ao Development and Application of Novel Pattern Discovery Techniques for Problems in Biochemical Engineering**
Kyle L. Jensen
Gregory Stephanopoulos
- 4ap Customized Bioengineering in Inhomogeneous Environments**
Thomas A. Knotts
- 4aq Directed Evolution of Proteins for Biomedical Application**
Zhilei Chen
Huimin Zhao
- 4ar Interfacial Effects and Properties of Ultrathin Polymer Films: from Nanofabrication to Large-Area Displays**
Bryan D. Vogt
- 4as High-Throughput Time-Series Transcriptional Profiling Analysis of a Biological System Subjected to Multiple Perturbations: a Case Study in Systems Biology**
Bhaskar Dutta
Maria I. Klapa
- 4at Simulations of Materials Systems with Multiple Coordination States Using a Reactive Force Field**
Liping Huang
John Kieffer
- 4av Directed Self-Assembly of Block Copolymers on Nanopatterned Surfaces**
Mark P. Stoykovich
- 4aw Nanocarriers for Controlled Delivery of Therapeutic Agents**
M. Laird Forrest
Daniel W. Pack
Glen S. Kwon

- 4ax** **Double Sided Thin Film Membranes**
Tracy Q. Gardner
John L. Falconer
Richard D. Noble
- 4ay** **Solution-Phase Growth of Nanostructures**
Timothy O. Drews
- 4az** **Enantioselectivity on Naturally Chiral Copper Surfaces**
David M. Rampulla
- 4ba** **Systematic Approaches to the Protein Engineering of Highly Specific Receptor-Ligand Pairs**
Karuppiah Chockalingam
Huimin Zhao
- 4bb** **Nanoporous and Nanostructured Materials for Biomimetic Sensor and Hydrogen Storage Applications**
Vijay I. Raman
- 4bc** **Multi-Scale Modeling of the Actin Filament: from Allostery to the Elasticity of Cytoskeleton**
Jhih-Wei Chu
- 4bd** **Exploring Physiological Landscapes for Cell and Metabolic Engineering**
Hal S. Alper
Gregory Stephanopoulos
- 4be** **Regulon Prediction and Coregulation Patterns in *Clostridium Acetobutylicum***
Carlos J. Paredes
Keith V. Alsaker
Eleftherios T. Papoutsakis
- 4bf** **Automatic Design of Biofluidic Microcircuits**
Anton J. Pfeiffer
- 4bg** **Assembly and Investigation of Biomimetic Colloids**
Kevin D. Hermanson
- 4bh** **Morphology and Structure in Polymer Nanocomposites and Compound Droplets**
Kurt A. Smith
- 4bi** **Highly Responsive Gels Via Self-Assembly of Block Copolymers in Liquid Crystal Solvent**
Neal Scruggs
Rafael Verduzco
Julia Kornfield
- 4bj** **Engineering Colloids – from Interparticle Interactions to Advanced Materials Assembly**
Ali Mohraz
- 4bk** **Monte Carlo Simulations to Study Polymorphism and Relative PolymorphStability in Solids**
Divesh Bhatt
- 4bl** **Optimization as a Tool for Predictive Modeling of Biological Systems and Mining of Large-Scale Data Sets**
Mano R. Maurya
Shankar Subramaniam

- 4bm** **Computer Simulation Studies of Pattern Recognition in Biomimetic Polymers**
Arthi Jayaraman
Carol K. Hall
Jan Genzer
- 4bn** **Hydrogen-Induced Crystallization of Diamond-Cubic Semiconducting Materials**
Radhika C. Mani
- 4bo** **Polyolefin-Organoclay Nanocomposites: Morphology, Properties and Applications**
Rhutesh K. Shah
Donald R. Paul
- 4bp** **Smart Nanotechnology in Biomaterials, Sensors, Actuators and Textiles**
Hong Chen
- 4bq** **Engineering Combustion for Gas Release: Emergency Oxygen Generators for Aircraft and Hydrogen Generation for Fuel Cells**
Victor Diakov
- 4br** **Combinatorial Initiated Chemical Vapor Deposition for Polymer Thin Film Discovery**
Tyler P. Martin
Kelvin Chan
Karen K. Gleason
- 4bs** **Effects of Yeast Elicitor on Secondary Metabolism and in-Vitro-Translated Protein Pattern of Eschscholtzia Californica Cell Culture**
Jeong Jin Park
- 4bt** **Micro Fuel Cells for Portable Applications**
Ranga S. Jayashree
Paul J. A. Kenis
- 4bu** **Synthesis and Applications of Nanostructured Materials**
Bing Tan
- 4bv** **Modeling, Analysis, and Design in Biological Systems Using Engineering Approaches**
Nicholas Hernjak
- 4bw** **Regulatory Networks in Escherichia Coli: Chemogenomic-Based Identification of the Nitrogen Oxide Response and Stochastic Modeling of Pap Operon Regulation**
Laura R. Jarboe
- 4bx** **Low Temperature Polymer Nanofabrication Using Carbon Dioxide and Its Applications to Tissue Engineering**
Yong Yang
- 4by** **Monte Carlo Simulation Study of Binary Hard Sphere Crystallization**
Sudeep Punnathanam
- 4bz** **Self-Assembly of Functional Structures and Devices for Electronic and Biomedical Applications**
Zhiyong Gu
David H. Gracias
- 4c** **Modified Absorption Isotherm Model for Aqueous Electrolytes**
William O'Neal Rains

- 4ca Multiscale Elucidation of Structure-Properties Relations for Molecular Transport in Polycrystalline Thin Films**
Mark A. Snyder
Dionisios G. Vlachos
- 4cb Self-Assembly of Anisotropic Tethered Nano Building Blocks**
Mark A. Horsch
- 4cc Development of Composite Membrane Electrode Assemblies (Cmeas) for Higher Temperature Proton Exchange Membrane Fuel Cells**
Nikhil Jalani
Ravindra Datta
- 4cd Crystal Morphology Considerations in Processing of Pharmaceutical Drugs: a Computer Aided Molecular Design (Camd) Approach**
Arunprakash T. Karunanithi
Luke E. K. Achenie
Rafiqul Gani
- 4ce Studies in Reaction Kinetics, Density Functional Theory, and Catalysis**
Thomas A. Manz
Kendall T. Thomson
James M. Caruthers
W. Nicholas Delgass
Mahdi Abu-Omar
- 4cf Novel Polymeric Networks for on-Chip Electrophoretic DNA Purification from Cell Lysate and High-Performance DNA Separations**
Thomas N. Chiesl
Annelise E. Barron
- 4cg Analysis and Optimization of Cellular Networks: a Systems Approach**
Rudiyanto Gunawan
- 4ch Surface Engineering of Micro and Nanoparticles**
Kenneth K. S. Lau
- 4ci Mass Transport through Polymer: from Theoretic to Experimental**
Quan Liu
- 4cj Composite Nanostructures: Protein and Nanoparticle Arrays Templated in Block-Copolymer Mesophases**
Danilo C. Pozzo
Lynn M. Walker
- 4ck Beyond Hydrogen and Methanol - Development of Direct Ethanol PEM Fuel-Cell Systems**
Kenneth W. Lux
Elton J. Cairns
- 4cl Microfluidic Systems for Colloidal Materials Processing**
Saif A. Khan
Klavs F. Jensen
- 4cm Epidermal Growth Factor-Mediated Proliferation Requires Tcf/Lef Signaling**
Nicholas A. Graham
Anand R. Asthagiri

- 4cn Protein Engineering by Single or Multiple Site-Specific Incorporation of Nonnatural Amino Acids *in Vivo***
Inchan Kwon
David A. Tirrell
- 4co New Fabrication Methods of Micro/Nanodevices: Use of Wet Stamping Techniques**
Christopher J. Campbell
- 4cp Molecularly Designed Mucoadhesive pH Responsive Tethered Biomaterials and Their Use in Spatially Controlled Therapeutic Delivery**
Joshua B. Thomas
James W. McGinity
Nicholas A. Peppas
- 4cq Lipid Assemblies in Bioengineering: Model Systems to Examine Bioaccumulation, Solvent Toxicity, and Membrane Compartmentalization**
Geoffrey D. Bothun
- 4cr Comprehensive Analysis of Metabolic Pathways through the Use of Multiple Isotopic Tracers**
Maciek R. Antoniewicz
Joanne K. Kelleher
Gregory Stephanopoulos
- 4cs Effect of Site-Isolation on the Preparation and Performance of Silica-Immobilized Cgc-Inspired Olefin Polymerization Catalysts**
Michael W. McKittrick
- 4ct Collision between a DNA Replication Fork and an RNA Polymerase Ternary Complex**
Charles M. Schroeder
X. Sunney Xie
- 4cu Microfluidics for Biomolecular Studies**
Michael W. Toepke
Paul J. A. Kenis
- 4cv Functionalization and Transport of Nanoparticles**
Ying-Chih Liao
- 4cw Study and Utilization of Microscale Phenomena for Operation of Microscale Devices and High-Temperature Microreactors**
Michael Mitchell
Paul Kenis
- 4cx Biodegradable Scaffolds in Tissue Engineering**
Eric Maase
- 4cy Nanostructured Composites for Energy Generation from Renewable Hydrocarbons**
Vaidyanathan Ravi Subramanian
Edmund G. Seebauer
Richard I. Masel
- 4cz Biomolecular Engineering from Stem Cells to Neurons**
In Hong Yang
- 4d Global Optimization of Dynamic Systems**
Yue Chen

- 4da** **Computational Studies of Activated Processes in Complex Systems**
Baron Peters
- 4db** **Design, Synthesis, and Characterization of Functional Polymers, Surfaces, and Interfaces**
Brandon M. Vogel
- 4dc** **Chemical Separations Based on Spatially Controlled Phase Transformations in Thermotropic Liquid Crystalline Materials**
Stephen M. Martin
T. Alan Hatton
- 4dd** **Systems Engineering Approaches to the Study of Nano-Scale Devices and Biological Systems**
Jin Wang
- 4de** **Electrically Induced Pillar Arrays Formed Using Photocurable Materials**
Michael D. Dickey
C. Grant Willson
- 4df** **Density Functional Theory Studies of Acid Catalysis & Electrocatalysis**
Michael J. Janik
- 4dg** **Advanced Integrative Approaches for Designing and Constructing Control Circuits in Synthetic Biology**
Jason K. Suen
- 4dh** **Controlled Radical Polymerization on a Chip**
Tao Wu
Kathryn L. Beers
- 4f** **Novel Single-Dose Controlled-Release Vaccine Carrier with Tailored Micro/Nanostructure**
Matt J. Kipper
- 4g** **Molecular Simulation of Nanostructured Materials and Their Use in Storage/Separation of Hydrogen, Hydrocarbons, Aromatics, and Biomolecules**
C.G. Sonwane
- 4h** **Leveraging Large-Scale Transcriptional Analysis in Cell Culture Engineering**
Peter G. Fuhrken
William M. Miller
Eleftherios T. Papoutsakis
- 4i** **Protection Schemes for Extreme Ultraviolet Lithography (Euvl) Masks in Low Pressure Environments**
Jung Hyeun Kim
David Y. H. Pui
Heinz Fissan
- 4j** **Development of Corrosion Resistant Implant Materials Using Biocompatible Thin Films**
Holly J. Martin
Kirk H. Schulz
- 4k** **Optimization of Insitu Chemical Oxidation**
John M. Harden

- 4l** **From Synthetic to Natural Colloidal Biomaterials**
Harry Bermudez
- 4m** **Slithering Polymers and Migrating Cells: Application of Computational Methods to Problems in Polymer Physics and Cell Organization**
Sachin Shanbhag
- 4n** **Ac Electric Field Induced Forces on Colloidal Particles near a Planar Electrode**
Jeffrey A. Fagan
- 4o** **Next Generation Dynamic Optimization**
Shivakumar Kameswaran
- 4p** **Advanced Strategies for the Solution of Structured Dynamic Optimization Problems Using Interior Point Methods**
Carl D. Laird
- 4q** **Studying Single Proteins at Interfaces Towards the Development of Integrated Systems**
Vamsi K. Yadavalli
- 4r** **An Integrated Approach to Catalytic Systems**
Aditya Bhan
- 4s** **Circle: a Novel Solvation Energy Potential for Simulation and Design of Biomolecules**
Tushar Jain
David Cerutti
J. Andrew McCammon
- 4t** **Protein Aggregation in the Pathogenesis of Amyloid Diseases**
Eva Y. Chi
Ka Yee C. Lee
Theodore W. Randolph
- 4u** **Controlling the Motion of Cells along Compliant Polymeric Substrates**
Rolf Verberg
- 4v** **Multi-Scale and Multi-Functional Microfabrication of Nanostructured Materials**
Hae-Kwon Jeong
Mark A. Shannon
Richard I. Masel
- 4w** **Density Functional Theory Studies of Acid Catalysis and Electrocatalysis**
Michael J. Janik
- 4x** **Microfluidic Devices for Protein and Pharmaceutical Crystallization Applications**
Venkateswarlu Bhamidi
Paul J. A. Kenis
Charles F. Zukoski
- 4y** **Functional Elastomeric Scaffold Development for Tissue Engineering**
John J. Stankus
- 4z** **Molecular Modeling of Peptides Crossing the Cell Membranes**
Shaji Chempath

Electrokinetic Mass Transport Control in Gels Via Immobilized Nanoparticle Pumps

Marvi Matos

Bioengineering of Polypeptides and Nanoscale Assemblies for Cancer Cell Destruction

Kaushal Rege

Session 32 - National Student Paper Competition

Chair: Douglas K. Ludlow

Vice Chair: William G. Pitt

32a Removal of Ammonia from Semiconductor Wastewater

Amanda A. Cordes

Julie Meloy

Eric Andersen

Mathew Cleveland

Christopher Barnhart

Ryan Armstrong

32b Examining Rhodium Catalyst Complexes for Use with Conducting Polymers Designed for Fuel Cells in Preparing Biosensors

Melisa Carpio

John B. Kerr

32c Transcription of Type II Collagen in Engineered Cartilage

Emily L. Levi

32d Mobility and in-Situ Aggregation of Charged Microparticles at Oil-Water Interfaces

Jeremy P. Verneti

Sowmitri Tarimala

Srinivas R. Ranabothu

Lenore L. Dai

32e Feasibility of Electrolyzing Ammonia Effluents for the Production of Hydrogen

Elizabeth J. Cellar

Egilda P. Bonnin

Gerardine G. Botte

32f Design and Fabrication of Micromachined Sensor Platforms

Gary Craig

M. Clayton Wheeler

32g Novel Measurement and Modeling of in Vivo Oral Drug Absorption Rate in Rats

Theresa A. LaFollette

Marylee Z. Southard

32h Design of a Fuzzy Logic Control System for Interacting Tanks

Christian Vives

32i Reaction -Diffusion Modeling of Metabolic Processes

Amanda Jordan

Session 37 - Poster Session: Educational Software Demonstrations I

Chair: Kevin D. Dahm

Vice Chair: Douglas Cooper

- 37a Remote Experimentation in Unit Ops and Controls**
Jim Henry
- 37b Using Visualization in the Process Control Curriculum**
Douglas Cooper
Jeffrey Arbogast
Rachelle Jyringi
- 37c Development of Mrdsim, Multiphase Reactor Design Simulator**
Canan Tunca
P.A. Ramachandran
M.P. Dudukovic
- 37d Software for Chemical Reactor Engineering**
H. Scott Fogler
- 37e A Software Program for Chemical Reactor Engineering**
M. Nihat Gürmen
Michael Senra
H. Scott Fogler
- 37f Real Laboratories at a Distance**
Jim Henry
- 37g Molecular Simulation Using a Graphical User Interface**
Andrew J. Schultz
David A. Kofke
- 37h A Software Program for Preparative Ion-Exchange Chromatography**
Aaron Mehay
Tingyue Gu
- 37i Superpro Designer: an Interactive Software Tool for Designing and Evaluating Integrated Chemical, Biochemical, and Environmental Processes**
Nirupam Pal
Charles Siletti
Demetri P. Petrides
- 37j Prosec: a Process Security Analysis Tool for Chemical Engineering Education**
Cristina Piluso
Korkut Uygun
Yinlun Huang
Helen H. Lou
- 37k Computational Tools to Understand Liquid-Vapor Equilibrium for Undergraduate Students**
R. Chavela-Guerra
A. Alarcón-García
L.G. Ríos-Casas
J.X. Gutiérrez-Vélez
A. Palacios-Rosas

37l Teaching Molecular Thermodynamics with Cosmotherm

Andreas Klamt

37m Polymath 6.0 - a Significant New Release

Michael B. Cutlip

Mordechai Shacham

37n New Audio-Visual Presentation Software for Internet and Pc

D. T. Wu

Session 41 - Statistics in the ChE Curriculum

Chair: S. Scott Moor

41a Computer Facilitated Teaching of Classical Mathematical Methods – Perturbation Techniques

Venkat Subramanian

41b Integrating Engineering Statistical Analysis into the Curriculum: a Hands-on Approach Using Catsup Rheology Measurements

Z. Otero Gephardt

41c A Graduate Elective in Statistical Methods for Mathematical Model Building

Gary E. Blau

Selen Aydogan

George Applequist

41d Extensive Utilization of the Linear Least Squares Method for the Unit Operations Laboratory Class

YoonKook Park

Nader Vahdat

Kyung C. Kwon

Session 61 - Free Forum on Engineering Education I

Chair: Douglas K. Ludlow

Vice Chair: Timothy M. Raymond

61a Teaching Generic Skills through Engineering Competition Design

Judy A. Raper

61b Learning Technical Writing Skills through Peer Review: Use of Calibrated Peer Review™ in Unit Operation Lab

Seong H. Kim

John Wise

Mechteld Hillsley

61c Teaching Chemical Engineering within a General Engineering Program at a Liberal Arts College

Michael J. Misovich

61d The Transport Cup

Jason M. Keith

- 61e Chem-E-Car Experiments in Unit Operations Laboratory**
Sundararajan V. Madihally
Jeremy W. Tillman
Randy S. Lewis
- 61f A Chemical Engineering Competition for Middle and High School Students**
Laura P. Ford
Christi L. Patton
- 61g A Homemade Sliderule as a Manipulative Study Aid for Chemical Reactor Design**
Andrew I. Biaglow
- 61h Operability in Undergraduate Chemical Engineering Education**
Tom E. Marlin
- 61i Chemical and Paper Engineering and Technology Workshops for K-12 and Community College Educators**
Steve R. Duke
R. Dale Smith

Session 98 - Poster Session: General Papers (Students)

Vice Chair: Christopher Williams

- 98a Modelling of Bubble Growth in Tissues during the Decompression Sickness**
Fatemeh Hayer
- 98b An Experimental Study of Elliptical Liquid Bridges**
Nicolas Alvarez
Abdullah K. Uguz
Ranga Narayanan
- 98c Structure and Surface Energy of Ligands-Protected Nanoparticles in Polymeric Solutions by Density Functional Theory**
Analee Miranda
Zhidong Li
Jianzhong Wu
- 98d Explicit Phase Equilibrium Calculations from Cubic Equations of State**
Michael J. Misovich
Kurtis F. Blohm
Andrew J. DeDoes
Matthew D. Goetz
Emily J. Walsh
Kimberly Wadelton
- 98e Graduate Thesis and Peer-Reviewed Articles: Any Efficient Connection?**
Ryan P. O'Hara
Mario A. Oyanader
Pedro E. Arce

Session 118 - Free Forum on Engineering Education II

Chair: Timothy M. Raymond

Vice Chair: Douglas K. Ludlow

- 118a Pillars of Chemical Engineering: an Integrated Curriculum**
*Joseph J. McCarthy
Adetola A. Abatan
Robert S. Parker
Mary Besterfield-Sacre*
- 118b Troubleshooting in the Engineering Curriculum: an Integrated Approach in a Process Fluids Transport Course**
Z. Otero Gephardt
- 118c Effective Integration of Coursework: Equilibrium Thermodynamics as a Bridge from Material and Energy Balances and Mass Transfer to Design**
Paul Blowers
- 118d Plant Design Project: Biodiesel Production Using Acid-Catalyzed Transesterification of Yellow Grease**
*Rafael Hernandez
Mathew J. Thomas
Anirudha Marwaha
Trent Jeffreys*
- 118e Looking to the Unit Operations Laboratory as a Source of Chemical Engineering Design Projects**
Samuel A. Morton III
- 118f The Catalytic Pellet: a Rich Learning Environment for Scaling**
*Pedro E. Arce
Stephen Whitaker
Mario A. Oyanader*
- 118g Challenges in Teaching Chemical Engineering Capstone Design**
*Irvin W. Osborne-Lee
Michael Gyamerah*
- 118h A Simple See-through Extruder to Teach Principles of Polymer Melt Extrusion**
*Raj K. Krishnaswamy
David Higbee
Hemina KrishnaBachia*
- 118i Chemical Engineering High School Student Recruitment Program**
Harold N. Knickle

Session 145 - Poster Session: Engineering Education

Chair: David J. Dixon

- 145a Modeling, Analysis and Tuning Tools for Teaching Process Dynamics and Control**
*Douglas Cooper
Jeffrey Arbogast
Rachelle Jyringi*
- 145b Solving Mass Transfer Problems on the Computer Using Mathcad**
Ernest N. Bart

- 145c** **Quantifying and Characterizing Active Learning in the Research Communications Studio Model**
Michael A. Matthews
Chris Long
Lori Donath
Roxanne Spray
Nancy Thompson
Elisabeth Alford
- 145d** **An Application of Aspen Software in Undergraduate Thermodynamics**
Rhonda J. Lee-Desautels
- 145e** **A Chemical and Biopharmaceutical Engineering Track**
Tate Tsang
Kim Anderson
D. Bhattacharyya
Michael Jay
- 145f** **Improving Performance of Student Teams through Exploring Learning Preferences**
Kevin D. Dahm
James Newell
Brian Lefebvre
Roberta Harvey
- 145g** **Web-Based, Interactive Simulation for Teaching Engineering Economics**
Kevin D. Dahm
David L. Silverstein
- 145h** **Understanding Binary Mixture Properties through 3d Phase Diagrams**
Alejandra Alarcon-Garcia
R. Chavela-Guerra
L.G. Ríos-Casas
- 145i** **Teaching Thermodynamics through Software Development**
R. Chavela-Guerra
A. Alarcón-García
L.G. Ríos-Casas
- 145j** **Problem Based Learning (Pbl) for Fuel Cell Powered Chem-E-Car Class**
Jong-Koo Lim
Il Moon
- 145k** **Forwarding Green Chemical Engineering Education and Research through a Student Run Organization: the Society of Environmental Engineers and Scientists**
Samuel A. Morton III
Paul S. Dimick
Andy Baker
Arthur D. Kney
Steven E. Mylon
- 145l** **Complex Fluids in Motion: Elastic Instabilities in Microfluidic Devices, Advection-Diffusion-Reaction Systems, and Granular Flows**
Paulo E. Arratia
- 145m** **Introducing Microreaction Engineering in the Education**
Marcel A. Liauw

Session 162 - Eating Your Way Through the ChE Curriculum: Using Food to Teach Engineering

Chair: Mariano J. Savelski

Vice Chair: David L. Silverstein

- 162a** **Chemical Engineering as an “Eggs Act” Science**
Kenneth R. Cox
- 162b** **Better Eating through Surface Chemistry**
Margot Vigeant
- 162c** **The Proper Place for Beer in the Undergraduate Curriculum**
Margot Vigeant
- 162d** **Twin-Screw Food Extruder: a Multivariable Case Study for a Process Control Course**
B. Wayne Bequette
Joel Schlosburg
- 162e** **Welcome to Che: Chocolate Engineering**
Christi L. Patton
Laura P. Ford
Daniel W. Crunkleton
- 162f** **Teaching Process Engineering Fundamentals Using an Ice Cream Maker**
Gönül Kaletunç
Kevin Duemmel
Chris Gecik

Session 184 - Recruiting, Mentoring, and Motivating Graduate Students

Chair: Donald P. Visco

Vice Chair: Julie L. Jessop

- 184a** **How to Grow Your Graduate Students (Mentoring Tips)**
Julie L. Jessop
- 184b** **Graduate Student inside an Undergraduate Class Room - an Integrated Experience**
Barath Baburao
Saravanan Swaminathan
Donald P. Visco
- 184c** **Using Technical Articles to Teach Entering Graduate Students the Role of Journal Articles in Research**
Priscilla J. Hill
- 184d** **Using the Classroom to Improve Mentoring and Motivation: a Class on “How to Be a Graduate Student”**
Joseph H. Holles
- 184e** **Graduate Student Recruiting and Mentoring through an Reu Program**
Howard A. Stone
Kathryn Hollar
Cynthia Friend
Robert Graham

Session 218 - Incorporating and Assessing ABET Criteria

Chair: David C Miller

- 218a** **A Hands-on, Multidisciplinary, Fun Engineering Team Design Project and Competition for Freshman**
Randy Weinstein
Kenneth Muske
- 218b** **Chemical Ethics in 52 Minutes or Less**
Margot Vigeant
Timothy M. Raymond
- 218c** **Integrating Ethics, Socio/Cultural Awareness, Diversity, and Contemporary Global Issues into the Introductory Chemical Engineering Curriculum**
David DiBiasio
Stephanie Blaisdell
Calvin Hill
Natalie Mello
- 218d** **Personal Class Binders (Pcb): an Incubator of Life-Long Learning**
Pedro E. Arce
Robyn Rawlings
Scott Allen
- 218e** **A Four Semester Evaluation of Various Techniques for Educating Chemical Engineers**
Tamara M. Floyd
Nader Vahdat
- 218f** **Student-Directed Learning Modules**
Charles J. Coronella
- 218g** **Towards Achieving Abet Accreditation in Department of Chemical Engineering at a Non-Us Institution**
Majeed Jassim
Babatunde A. Oyenekan

Session 225 - NSF Workshop I

Chair: Robert Wellek

Vice Chair: Wallace B. Whiting

- 225a** **Introduction**
Robert Wellek
William B. Krantz
- 225b** **Nsf Overview**
Richard Buckius
Bruce Hamilton
- 225c** **Nsf Nse Nanotechnology Science & Engineering Activities**
Geoffrey A. Prentice
- 225d** **Cyber Infrastructure and Complexity in Engineered & Natural Systems**
Maria K. Burka
- 225e** **Shared Cyber Infrastructure**
Sang Tae Kim

- 225f** **Nsf Career and Igert Activities**
Geoffrey A. Prentice
- 225g** **Overview of Nsf Engineering Environmental Activities**
Bruce Hamilton
- 225h** **Small Business Innovation Research Partnership Opportunities**
Rosemarie D. Wesson
- 225i** **Nsf International Activities**
Glenn L. Schrader
- 225j** **Major Research Instrumentation & Research Equipment Grants**
Robert Wellek
- 225k** **Panel Discussion and Q & a Session**
Wallace B. Whiting
William B. Krantz

Session 237 - Teaching Alternate Separation Technologies

Chair: Laurent Simon

- 237a** **Continuous Opportunities for Teaching Membrane Technology into the Curriculum**
C. Stewart Slater
Stephanie Farrell
Robert Hesketh
Brian Lefebvre
Mariano Savelski
- 237b** **Shortcut Methods for Multicomponent Gas Separation by Permeation in Membranes**
Richard A. Davis
- 237c** **Using a Commercial Simulator to Teach Adsorption and Chromatography**
Phillip C. Wankat
- 237d** **Theory and Practice in Bioseparation Engineering**
Giorgio Carta
Donald J. Kirwan
- 237e** **Aqueous Two-Phase Extraction – a Case Study in Process Analysis and Control**
Laurent Simon
- 237f** **Project Based Environmental Separations**
Patricia A. Terry
Richard Noble

Session 270 - NSF Workshop II

Chair: Robert Wellek

Vice Chair: William Krantz

- 270a** **Introduction**
Wallace B. Whiting
- 270b** **Overview of Chemical & Transport Systems Division**
Geoffrey A. Prentice

- 270c** **Chemical Reaction Processes**
Maria K. Burka
Glenn L. Schrader
- 270d** **Interfacial, Transport, and Separations Processes**
Robert Wellek
Geoffrey A. Prentice
- 270e** **Fluid and Particulate Systems**
T. J. Mountziaris
- 270f** **Thermal Systems (Heat Transfer & Combustion)**
Linda G. Blevins
Alfonso Ortega
- 270g** **Overview of Bio-Engineering & Environmental Systems**
Bruce Hamilton
- 270h** **Biochemical and Biomedical Engineering Programs**
Frederick G. Heineken
- 270i** **Environmental Engineering & Technology**
Patrick L. Brezonik
- 270j** **Panel Discussion and Q & a Session**
Robert Wellek

Session 286 - What a ChE Educator Needs to Know about Bio

Chair: Patrick Gilcrease

Vice Chair: Paul D. Dunbar

- 286a** **A New Chemical and Biopharmaceutical Engineering Track at the University of Kentucky**
Tate Tsang
Kimberly W. Anderson
D. Bhattacharyya
Michael Jay
- 286b** **The Research Proposal in Biochemical and Biological Engineering Courses**
Roger G. Harrison
Matthias U. Nollert
David W. Schmidtke
Vassilios I. Sikavitsas
- 286c** **Resources for Teaching a Combined Biotechnology/Biomedical Engineering Course**
Richard L. Long
- 286d** **Introduction to Biotechnology and Bioprocess Engineering - a Course for the Chemical Engineering Curriculum**
Michael Gyamerah
Irvin W. Osborne-Lee
- 286e** **Undergraduate Programs in Chemical and Biological Engineering in China**
Xue-Ming Zhao

286f **The Academic Institution's Response to the Biotechnology Industry's Demand for a Well Trained Workforce**
Kamal A. Rashid

286g **A Multi-Year and Multidisciplinary Integration of Bioprocess Engineering into Chemical Engineering at Michigan Technological University**
David R. Shonnard
Tomas B. Co
Faith A. Morrison
Susan T. Bagley
James E. Hertel

Session 367 - New Ideas for Electives and Old Courses: I

Chair: Kevin D. Dahm

Vice Chair: Joseph J. Biernacki

367a **Graduate and Undergraduate Teaching of Colloid Science and Nanoscale Engineering - Combining Fundamentals with Emerging Technologies**
Orlin D. Velev

367b **Integrating Biophysics into Chemical Engineering**
Gunjan Agarwal

367c **Single or Married: Electrokinetics or Electrokinetic-Hydrodynamics? a Dual Senior Elective/Grad Level Course**
Pedro E. Arce
Mario A. Oyanader
Ryan P. O'Hara

367d **Development of a Molecular and Systems Biotechnology Course**
Lianhong Sun
Michael A. Henson

367e **Designing a Semester Long Course in Microfluidics for Advanced Undergraduate Science and Engineering Students**
Anubhav Tripathi

367f **Pharmaceutical Engineering Courses as Electives for Chemical Engineering Students**
Piero M. Armenante
Joseph J. Manfredi
Maureen A. Howley
Steven A. Ostrove
Stephen Orosz
Orlando Perez

367g **Integration of Molecular Modeling Concepts in Thermodynamics and Kinetics Courses**
Will Medlin

367h **An Elective Course in Drug Delivery for Chemical Engineers**
Stephanie Farrell

Session 416 - New Ideas for Electives and Old Courses: II

Chair: Joseph J. Biernacki

Vice Chair: Kevin D. Dahm

- 416a** **Hands on Experiments in an Introduction to Chemical Engineering Course**
Adrienne R. Minerick
Kirk H. Schulz

- 416b** **Better Integration of Process Design/Control Principles in Engineering Labs**
Kerry M. Dooley
Harold J. Toups
Daniel B. Mowrey

- 416c** **An Effective/Efficient Way to Teach Senior Lab - Distillation Column**
Kartik Potukuchi
Venkat Subramanian

- 416d** **Product Design and Process Design -- Together at Last!**
Kenneth R. Cox
Kevin G. Joback

- 416e** **Contemporary Issues in Homeland Security in a Chemical Process Safety Course**
David L. Silverstein

- 416f** **Incorporating Chemcad with Process Design: a Laboratory Method**
Holly J. Martin
Mark Bricka

- 416g** **Homeland Security and Safety Engineering – Concept, Curriculum and Challenges**
Shekar Viswanathan
Howard Evans

Session 285 - Tutorials: Optimal Corporate Structures and Styles of Innovation

Chair: Daniel Hershey

Vice Chair: Frank Van Lier

- 285a** **Designing an Optimal Corporate Structure**
Daniel Hershey

- 285b** **Using Styles of Innovation for Strategy and Growth**
Jack Hipple

Session 318 - Entrepreneurial Science for Educators, Engineers, and Scientists

Chair: Rosemarie D. Wesson

Vice Chair: Adam Lo Shrier

- 318a** **The Impact of Science Entrepreneurship in a University on Economic Development in the Region**
Robert D. Hisrich

- 318b** **Ohio's Third Frontier Initiative: Ideation to Commercialization**
John M. Griffin

- 318c** **Human Capital and Technology Transfer: the Key Third Link**
Michael D. Ensley

318d How to Successfully Launch and Nurture a University Spin-off

Alan W. Weimer

318e From Prototype to Product with the Help of Sbir Funding

Karen K. Gleason

Hilton G. Pryce Lewis

318f Nanoscale Materials, Inc.; Founded 1995; Nanoactive® Products for Environmental Protection and Remediation

Kenneth J. Klabunde

Session 370 - Project Management

Chair: Frank Van Lier

Vice Chair: Eldon R. Larsen

370a A Project Management Guide to Improving Productivity

David P. Hill

Eldon R. Larsen

370b A Project Management Centered Approach for Moc in the Process Industry

Angela Wong

370c Radically Accelerate and Improve New Product Development

Lloyd Switzer

370d A Holistic Approach for Portfolio Selection and Resource-Constrained Scheduling of Multi-Task Projects

P.K. Viswanathan

I.A. Karimi

Arul Sundaramoorthy

370e Project Flow: Lowering Wip to Increase Productivity and Throughput

Eugene Kania

Session 410 - Lean Product Development and Lean Manufacturing

Chair: Charles J Brez

Vice Chair: David Barbieri

410a Lean Innovation – the Application of Lean Thinking to New Product Development

Mark Adkins

410b Lean beyond Manufacturing - Competitive Advantage for the Process Industries

Norm Stewart

410c Business Continuity and Lean Operations – Synergies and Conflicts

John R. Battler

410d The People Side of Process Improvement

Ed Eppley

Sherry Graber Roth

410e Management of Supplies and Movements of Tank Containers in Chemical Logistics

I.A. Karimi

Moosa Sharafali

Arul Sundaramoorthy

Session 83 - Solid-Liquid, Liquid-Liquid and Gas-Liquid Mixing

Chair: Piero M. Armenante

Vice Chair: Richard V. Calabrese

- 83a** **A Continuous-Jet Hydrate Reactor for the Formation of Co₂ Hydrate Particles: Hydrate Formation and Dissolution in a High-Pressure Water Tunnel Facility**
Costas Tsouris
David E. Riestenberg
Robert P. Warzinski
Ronald J. Lynn
Jorge F. Gabitto
- 83b** **Formation and Size Distribution of CO₂ Drops in Static Mixer for Ocean Disposal**
Hideo Tajima
Akihiro Yamasaki
Fumio Kiyono
- 83c** **Influence of Process and Formulation Variables on the Rheological Properties of Highly Concentrated Water-in-Oil Emulsions**
Oscar A. Alvarez
Veronique Sadtler
Lionel Choplin
Philippe Marchal
Marie José Stébé
- 83d** **Break-up and Coalescence Kinetics in a High Dispersed Phase Fraction Liquid-Liquid System**
David A. R. Brown
- 83e** **Liquid-Liquid and Gas-Liquid Laminar Dispersion in a Smx Static Mixer**
Louis Fradette
Philippe Tanguy
Lionel Choplin
- 83f** **Application of a Stereoscopic Vision System for the Accurate Measure of Air Bubbles Density Trapped in Oil Drops in a Model Fermentation System**
María Soledad Cordova
Gabriel Corkidi-Blanco
Enrique Galindo
- 83g** **Axial Dispersion of Gas Phase in Slurry Bubble Column Reactor**
Lu Han
Muthanna H. Al-Dahhan

Session 131 - Novel Computational and Experimental Methods in Mixing: I

Chair: Elizabeth M. Marshall

Vice Chair: Alvin Nienow

131a Novel Computational and Experimental Methods in Mixing

Robert S. Brodkey

Abdullahi Yusuf

Alex Brown

Miguel Garcia

Yang Zhao

James Knight

Thomas Yang

Matt Nilsen

131b Using a Dispersed Phase Model to Track Particle Paths and Deformation Rates in Complex Mixing Geometries

Richard V. Calabrese

Karl R. Kevala

Kenneth T. Kiger

131c Conservation and Cartesian Methods

Jeremy N. Thornock

Philip J. Smith

131d Simulation of Turbulent Mixing and Chemical Reaction in a Partially Stirred Reactor Using the Direct Quadrature Method of Moments

Rochan R. Upadhyay

Ofodike A. Ezekoye

131e Mixing Times and Mixing Time Correlations Revisited by Means of LES

Hugo Hartmann

Jos J. Derksen

Harry E.A. Van den Akker

131f Tendrils and Sheets: Topology of Injections in Steady Chaotic 3d Flow

Justin P. Lacombe

FJ Muzzio

131g Design of a Static Mixer Using CFD and Experiments

Jose Roberto Nunhez

Efraim Cekinski

Celso F. Joaquim

Luis A. G. Fernandes

Marcelo M. Seckler

Session 178 - Novel Computational and Experimental Methods in Mixing: II

Chair: Elizabeth M. Marshall

Vice Chair: Alvin Nienow

178a Interfacial Area Concentration Transport Computed from a Length Scale Limited Interfacial Area Transport Balance Equation

Richard L. Long

Asem Al Jarrah

Mohammad Aliedeh

- 178b** **Aggregative Mixing**
Themis Matsoukas
Kangtaek Lee
- 178c** **Using CFD to Capture Macro-Instability Modes in a Stirred Tank**
Brian Bell
Elizabeth M. Marshall
Christine Wolfe
Sung-Eun Kim
- 178d** **Experimental and CFD Study of Mixing Quality of the Maxblend Impeller**
Arash Iranshahi
Louis Fradette
Mourad Heniche
Philippe A. Tanguy
Ryuichi Yatomi
Shoji Morinaga
Katsuhide Takenaka
- 178e** **Computational Evaluation of Impeller Performance Based on Information Entropy Theory**
Shinichi Ookawara
Ryoko Konishi
David Street
Kohei Ogawa
- 178f** **Experimental Power Number Data for Pitched Blade Impellers**
Edimilson Souza
Jose Roberto Nunhez
Jefferson Luiz GranJheiro Da Silva
Efraim Cekinski

Session 222 - Mixing in Microdevices and Microreactors I

Chair: Lawrence L. Tavlarides

Vice Chair: Abraham D. Stroock

- 222a** **Extracting and Mixing by Using Integrated Actuators in a Microfluidic System**
Patrick Tabeling
- 222b** **Towards the Design of High Efficiency, Passive Microfluidic Mixers**
Joel P. Golden
Peter B. Howell
David R. Mott
Carolyn R. Kaplan
Elaine S. Oran
Frances S. Ligler
- 222c** **Microsystems: Measuring Mixing Efficiency Using Statistical Entropy**
Marco Camesasca
Ica Manas-Zloczower
Miron Kaufman
- 222d** **To MIX or Not to MIX - Routes to Structured Materials**
Axel Guenther
Klavns F. Jensen

Panel Discussion on Mixing in Microdevices and Microreactors

Abraham D. Stroock

Lawrence L. Tavlarides

Session 266 - Mixing in Microdevices and Microreactors II

Chair: Abraham D. Stroock

Vice Chair: Lawrence L. Tavlarides

266a Micromixing Using Planar Curved Channels

Arjun P. Sudarsan

Victor M. Ugaz

266b Numerical Simulation of Mixing in Micro-Channels Packed with Spherical Beads

Hersh V. Kshetry

Tina Tsong

Xiaolong Yin

Donald L. Koch

Abraham D. Stroock

266c Mixing and Flow of Partially Miscible Components in Submicron Channels - III

Ashish Nigam

E. Bruce Nauman

266d Mass Transport to Boundaries and Mixing in Microfluidic Systems

Joseph D. Kirtland

Abraham D. Stroock

266e Microfluidic Mixing Based on Transverse Electro-Osmotic Flows

Nicholas S. Lynn

Charles S. Henry

David S. Dandy

Session 335 - Mixing Issues in Industrial Processes I

Chair: Shaffiq Jaffer

Vice Chair: Harish Santhanam

335a 2005 Namf Award Lecture: Mixer Design for the Masses

David S. Dickey

335b A Process for the Manufacture of Chemically Produced Toner (Cpt)

Alvin Nienow

Ping Ding

Andrzej W Pacek

335c Production of Yogurt from Goat Milk in Agitated Conditions

Genoveva Galarza

Ana Isabel Uribe

Mario M. Alvarez

335d Mixing and Reaction in the Formation of Block Copolymer Self-Assembly of Nanoparticles

Robert K. Prudhomme

Jessica L. Anacker

Christopher W. Macosko

Thomas R. Hoye

Walid S. Saad

- 335e** **A New Methodology for Scale-up of Bubble Column Reactors**
Ashfaq S. Shaikh
Muthanna Al-Dahhan
- 335f** **Computational and Experimental Determination of the Velocity Distribution in a Stirred Reactor with a Retreat Blade Impeller Using Ldv Experimentation and CFD Modeling**
Giuseppe Di Benedetto
Piero M. Armenante
- 335g** **Vortex Depths in Partially-Baffled Vessels with Pitched Blade Impellers - an Experimental and Correlational Study**
W. Roy Penney
G. S Spanel
- 335h** **Baffling Approaches for Modern Axial-Flow Impellers**
Kevin J. Myers
Eric E. Janz
Julian Fasano

Session 363 - Mixing Issues in Industrial Processes II

Chair: David S. Dickey

Vice Chair: Midey Chang-Mateu

- 363a** **Scale up of a Co-Current Solid Liquid Leaching Process**
James Oldshue
- 363b** **Drawdown of Floating Solids in Stirred Tanks**
Suzanne Kresta
Oscar Khazam
- 363c** **Pilot-Scale Studies of Requirements for Suspending Settled Solids in Srs Process Tanks**
Michael Poirier
David T. Herman
Erich Hansen
Samuel D. Fink
- 363d** **Different Solids Suspension Techniques in Flue Gas Desulfurization**
Eric E. Janz
Julian Fasano
Kevin J. Myers
- 363e** **Predicting the Effect of Mixing on Oxygen Transfer and Nutrient Removal in Activated Sludge Basins**
Gregory Cartland Glover
Stephanie Vermande
Karim Essemiani
Jens Meinhold
- 363f** **Effect of Jet Pulsing on the Mixing of Non Newtonian Fluid in Storage Tank**
Dean Ducreay
Mario Valdivieso
C.X. Lin
Chaouki Ghenai

Panel Discussion on Industrial Mixing

Midey Chang-Mateu
David S. Dickey

Session 409 - Laminar Mixing and Mixing Fundamentals

Chair: Julian Fasano

Vice Chair: Susan A Somers

409a Mixing Analysis of a Coaxial Mixer

Christian A. Rivera
Stephane Foucault
Mourad Heniche
Teodoro Espinosa-Solares
Philippe A. Tanguy

409b Power and Flow in Stirring Viscoelastic Fluids

Gary K. Patterson

409c Dynamic Behavior of Stretching and Folding of Fluid Interface Induced by Reciprocating a Disk in a Cylindrical Vessel

Yushi Hirata
Kazunobu Matsumura
Yoshiro Inoue
Ryan C. Petty
Francis Gadala-Maria

409d Particle Behavior in Closed Streamline Flows: Dilute and Concentrated Suspensions

John Paul Bir Singh
Jeffrey F. Morris

409e Mixing Characteristics of High Viscous Fluid by a Multi-Holed Static Mixer

Masafumi Minami
Hiroshi Suzuki
Yoshiyuki Komoda
Hiromoto Usui
Katsutoshi Shoji
Kenji Kubo

409f The Interstate Highway System of Fluid Flow: a Flow Skeleton Method to Study Mixing in Realistic 3d Autonomous Flows

Justin P. Lacombe
FJ Muzzio

Session 466 - Mixing and Chemical Reaction

Chair: Rodney O. Fox

Vice Chair: Otute Akiti

466a Optimum Photolysis in Taylor-Couette Flow

Zhengcai Ye
Larry Forney

466b Novel Bioreactor Design for the Culture of Suspended Mammalian Cells

María Irene Sánchez
Josefina Castillo-Reyna
Jorge Eugenio Moreno
Mario M. Alvarez

- 466c** **Continuous-Phase Mixing in Reactive Bubble Swarms with Fully Resolved Dynamic Interfaces**
Athanas A. Koynov
Johannes Khinast
- 466d** **Understanding Selectivity of an Exothermic Lithiation Reaction in a Semi-Batch Reactor Using CFD and Kinetic Modeling Tools**
David J. Am Ende
Eric L. Dias
Jason Mustakis
- 466e** **Laboratory/Pilot Plant Experimentation for Developing a Liquid-Liquid Mixing Process Involving Complex Chemical Reactions**
Ramesh R. Hemrajani
- 466f** **Performance of Surface Feed with Pbtu and Varying Reaction Kinetics**
Dwight Hirschfield
Sujit Bhattacharya
Suzanne Kresta
- 466g** **Modelling and Design of Non-Ideally Mixed Batch and Semi-Batch Reactor Systems**
Xiaoping Zheng
Constantinos Theodoropoulos
- 466h** **Jet Mixers in Preventing Runaway Reactions – a CFD Based Review**
Duraivelan Dakshinamoorthy
Srivijay .D Kalidas Sridharan
Joseph .F Louvar

Session 44 - Transport Phenomena and Renewable Energy Systems

Chair: Virendra K. Mathur

Vice Chair: Yangchuan Xing

- 44a** **A Program for the Directed Evolution of Oxygen-Tolerant Hydrogenase Enzymes for Use in Photobiological Hydrogen Generation**
Marcus E. Boyer
James A. Stapleton
Chia-wei Wang
James R. Swartz
- 44b** **Modeling and Optimization of Fluid-Wall Aerosol Reactors for Solar Thermochemical Hydrogen Production**
Christopher Perkins
Paul Lichty
Carl Bingham
Alan W. Weimer
- 44c** **An in Vitro Expression Method for the Production and Study of Iron-Sulfur Proteins**
Marcus E. Boyer
James A. Stapleton
Chia-wei Wang
James R. Swartz
- 44d** **Active Storage of Liquid Hydrogen**
Alberto Posada
Vasilios I. Manousiouthakis

- 44e** **Comparative Thermogravimetry/Mass Spectrometry Study of Woody Residuals and an Herbaceous Biomass Crop**
Claudia J. Gómez
Enric Velo
Luis Puigjaner
- 44f** **An Integrated Mathematical Model of Fluid Dynamics, Heat Transfer and Reaction Kinetics for Fluidized Bed Gasification of Biomass**
Lijun Wang
Curtis L. Weller
Milford A. Hanna
- 44g** **An Economic and Thermodynamic Evaluation of the Conversion of Natural Gas to Liquid Fuels Using an Ion-Transport Membrane**
Stuart W. Churchill
Douglas Muth
Eve Rodriguez
Christopher Sales
William B. Retallick
- 44h** **Ionic Liquids Containing Ester Group as Potential Electrolytes**
Hoon Sik Kim
Je Seung Lee
Nguyen Dinh Quan
Hyunjoo Lee
Sang Deuk Lee
Honggon Kim

Session 259 - Dynamics of Complex Fluid Systems

Chair: Sanjoy Banerjee

Vice Chair: Valeriy Ginzburg

- 259a** **Lyotropic Chromonic Liquid Crystals: Self-Assembly and Emerging Optical and Biological Applications**
Oleg D. Lavrentovich
Sergii Shiyanovskii
Hui Liu
Ye Yin
Yurii Nastishin
Ivan Smalyukh
Vassili Nazarenko
Mikhail A. Anisimov
Andrei F. Kostko
Tod Schneider
Cristopher Woolverton
- 259b** **Harnessing Light to Create Defect-Free, Hierarchically Structured Polymeric Materials**
Anna C. Balazs
Olga Kuksenok
Rui Travasso
- 259c** **Predicting Fluid Flow and Pressure Drop in Randomly Packed Beds of Cylindrical Particles by Coupling DEM and CFD**
Hua Bai
Joerg Theuerkauf
Paul Witt

- 259d Rheological Characteristics of Anti-Icing Fluids**
Dale C. Schmidt
Melissa Mielcarek
David C. Busby
Gene D. Rose
- 259e Surfactant Effects on Highly Nonequilibrium Surfaces: Surfactants and Drop Detachment**
Fang Jin
Nivedita Gupta
Kathleen J. Stebe
- 259f Structure Development in Phase-Separating Complex Fluid Systems**
David M. Hall
Turab Lookman
Sanjoy Banerjee
- 259g Theoretical and Experimental Studies of New Polymer-Metal High-Dielectric Constant Nanocomposites**
Valeriy Ginzburg
Michael J. Elwell
Kyle Myers
Robert Cieslinski
Mark T. Bernius
- 259h Drying, Film Formation and Particle Coalescence in Polymer Films and Coatings: a Theoretical and Experimental Study**
Madan Somasi
Valeriy Ginzburg
Gary Strandburg
Mark VanSumeren
- 259i On Fluctuations in Polymer Solutions: Field Theoretic Simulations**
Kirill Katsov
Glenn Fredrickson
- 259j Computational Fluid Dynamics Modeling of Inter- Circulating Fluidized Bed**
Leo Qiang Wang
Peisheng MA

Session 40 - Self-Assembled Biomaterials: Part I

Chair: Andre Palmer

Vice Chair: Padma J. Narayan

- 40a The Design of Potent Liposome-Based Inhibitors of Anthrax Toxin**
Prakash Rai
Vincent Poon
Chakradhar Padala
Arundhati Saraph
Kevin Tao
Jeremy Mogridge
Ravi Kane

- 40b** **Formation of Supported Functional Bilayers by Vesicle Fusion: Experimental Data and Modeling**
Dimitrios Stroumpoulis
Alejandro Parra
Matthew V. Tirrell
- 40c** **Using Crystallinity to Control Structure and Rheology of Pla-Peo-Pla Hydrogels**
Sarvesh K. Agrawal
Naomi Sanabria-Delong
Gregory N. Tew
Surita R. Bhatia
- 40d** **Soft Supported Biomimetic Membranes: Assembly and Performance**
Monica J. Escobar
Jeffy Jimenez
Garrett Matthews
Norma Alcantar
- 40e** **Fabrication and Characterization of Solid-Supported Membranes on Silica Beads Using Bacteriorhodopsin Conjugates as Integrated Anchors**
M. L. Gilchrist
Manoj K. Sharma
- 40f** **Toward Controlled Conformational Change of Self-Assembled Vault Nanocapsules in Solution**
Marcella Yu
Lisa E. Goldsmith
Harold G. Monbouquette
Leonard H. Rome
- 40g** **Nanometer-Scale Structure and Erosion Profiles of Erodible Multilayered Polyelectrolyte Films**
Nathaniel J. Fredin
Jingtao Zhang
David M. Lynn
- 50a** **Microaligned Collagen Matrices by Hydrodynamic Focusing: Controlling the Alignment and pH-Induced Self-Assembly of Collagen**
Jennie B. Leach
Sarah Koester
Thomas Pfohl
Joyce Y. Wong

Session 50 - Advances in Biomaterial Science and Engineering

Chair: Sundararajan V. Madihally

Vice Chair: Abraham D. Stroock

- 50b** **Synthesis and Characterization of Poly(L-Lactide) Networks as in-Situ Crosslinkable Scaffolds for Guided Tissue Regeneration**
Esmail Jabbari
- 50c** **Solid-Phase Synthesis of Functionalized Peptides as Enzymatically Degradable Crosslinkers for Fabrication of Tissue Engineering Scaffolds**
Xuezhong He
Esmail Jabbari

50d Degradable Segmented Polyurethanes for Bone Tissue Engineering

*KA Dulaney
SA Guelcher
Jeffrey O. Hollinger
Aaron S. Goldstein*

50e Functionalizable Biomaterials Based on Dihydroxyacetone

*Peter N. Zawaneh
David Putnam*

50f Staphylococcus Epidermidis Adhesion on Modified Silicone Rubber

*Haiying Tang
Ting Cao
Anfeng Wang
Xuemei Liang
Steven O. Salley
James P. McAllister II
Simon K. Y. Ng*

Gemetric Control of Directional Cell Migration

*Girish Kumar
Chia-Chi Ho
Carlos Co*

Session 59 - Eco-Friendly Composites

Chair: Gautham Parthasarathy

Vice Chair: David R. Shonnard

59a Development of Recyclable Paraffin-Based Composite Coating for Moisture Barrier Applications

*Jinfeng Wang
Steven J. Severtson*

59b Morphology of Fatty Acid-Based Vinyl Esters

*John J. La Scala
Amutha Jeyarajasingam
James M. Sands
Giuseppe R. Palmese*

59c Low Density Microcellular Foam Wholly Thermoplastic Composite

*Desmond J. VanHouten
Donald G. Baird*

59d Towards Inexpensive Nanostructured Composites: Layer-by-Layer Assembly of Cellulose Nanocrystals and Poly(Diallyldimethylammonium Chloride)

*Paul Podsiadlo
Seok-Youl Choi
Bongsup Shim
Jungwoo Lee
Meghan Cuddihy
Nicholas A. Kotov*

Session 81 - Self-Assembled Biomaterials: Part II

Chair: Andre Palmer

- 81a** **Novel Nanomaterials: Lbl Self-Assembly at “Soft” Interfaces**
Tatyana F. Svitova
Clayton J. Radke
- 81b** **Stimuli-Responsive Lysine-Glycine Block Copolypeptide Supramolecular Structures**
Daniel F. Shantz
Jeng-Shiung Jan
- 81c** **Self-Assembly of Amphiphilic Linear Dendritic Block Copolymers for Drug Delivery**
Phuong M. Nguyen
Paula T. Hammond
- 81d** **Polymeric Worm Micelles as Nano-Carriers for Drug Delivery**
Young Kim
Paul Dalhaimer
David A. Christian
Dennis E. Discher
- 81e** **Patterns of Aptamers on Polyelectrolyte Multilayers**
Srivatsan Kidambi
Ilsoon Lee
Christina Chan
- 81f** **Artificial Protein Polymers for Development of Nanostructured Biomaterials**
Wesley D. Marner II
Jay D. Keasling
Susan J. Muller
- 81g** **Templated Deposition of RNA-Functionalized Colloids**
Marianne S. Terrot
Paula T. Hammond
- 100a** **Understanding Endothelialization: Rate Limitations in Chemotaxis,**
William H. Velander
Cicely Washington

Session 100 - Advances in Biomaterial Design and Properties

Chair: Anu Subramanian

Vice Chair: Dharmashankar Subramanian

- 100b** **Improved Marrow Stromal Cells Response on Nanostructured Surfaces for Bone**
Ketul C. Popat
Tejal A. Desai
- 100c** **Synthesis and Characterization of L-Tyrosine Containing Polyurethanes: New Biomaterials for Medical Applications**
Debanjan Sarkar
Anirban Sen Gupta
Stephanie T. Lopina

- 100d** **Elastomeric Tissue Mimetics Fabricated by a Microintegration Approach**
John J. Stankus
Jianjun Guan
Kazuro Fujimoto
William R. Wagner
- 100e** **Design of a Biomimetic, 3d Scaffold Suitable for Different Tissue Engineering Applications**
Jose F. Alvarez-Barreto
Jessica Yankovich
Mark C. Shreve
Paul L. DeAngelis
Vassilios I. Sikavitsas
- 100f** **Effect of Lactide to Ethylene Glycol Ratio on Material Properties of Novel Biodegradable Poly(Lactide-Ethylene Oxide-Fumarate) Terpolymer Hydrogels**
Esmaiel Jabbari
Subasri Muthukumarasamy Ayyadurai
- 100g** **Critical Aspects of Oligonucleotide Assembly by Pcr**
Hendrik J. Viljoen
- 100h** **Insect Cuticle as a Motif for Biomimetic Materials**
Christian Eichler
Yasuyuki Arakane
Michael R. Kanost
Karl J. Kramer
Stevin H. Gehrke
- 130a** **Molecular Size-Selective Vessel: Spherical Nano-Net**
Young-Woong Suh
Mayfair C. Kung
Y. M. Wang
Harold H. Kung

Session 130 - Novel Catalytic Materials

Chair: Vadim V. Guliyants

Vice Chair: Michael S. Wong

- 130b** **Nano-Crystalline Metastable and Stable Carbides of Molybdenum for Hydrogenation/Dehydrogenation Reactions**
Christopher H. Clark
Edwin L. Kugler
Jonathan C. Hanson
Zhen Song
Tanhong Cai
Jan Hrbek
James H. Wright
Dady B. Dadyburjor
- 130c** **Factors That Affect the Mesoporosity Development in Zsm-12 by Desilication**
Xiaotong Wei
Panagiotis (Peter) Smirniotis

130d M1 to M2 Phase Transformation in Mo-V-Te-O Catalysts for Selective (Amm)Oxidation of Propane

*Vadim Guliants
Olga Guerrero
Rishabh Bhandari
Vijay Vasudevan
Neelakandan Chandrasekaran
Balasubramanian Swaminathan*

130e Durability Investigation of Carbon Nanotube as Catalyst Support for Proton Exchange Membrane Fuel Cell Electrode

*Xin Wang
Wenzhen Li
Zhongwei Chen
Mahesh M. Waje
Yushan Yan*

Session 142 - MESD Poster Session

Chair: Chih-hung (Alex) Chang

Vice Chair: Yossef A. Elabd

142a Comparisons of Methods to Bond Metal and Chitosan: a Biopolymer for Use as an Implant Coating

*Holly J. Martin
Kirk H. Schulz
Joel D. Bumgardner*

142aa Hydrothermal Synthesis and Corrosion Resistance of Vanadium Zsm-5 Films

*Yachun Mao
Derek Beving
Ronnie Munoz
Yushan Yan*

142ab Superhydrophobic Conducting Polymer Films: Synthesis and Reversible Wettability

*Lianbin Xu
Wilfred Chen
Ashok Mulchandani
Yushan Yan*

142ac Molecular Studies of Proteins Encapsulated in Hydrogels

*Torres-Lugo Madeline
David Jiménez
Angelines Castro
Juan López-Garriga
Gustavo López
Jorge Ríos-Steiner*

142ad Zeolite a Coatings for Use in Condensing Heat Exchangers Onboard Manned Spacecraft

*Cory R. O'Neill
Derek Beving
Andrew M. P. McDonnell
Wilfred Chen
Yushan Yan*

- 142ae Electroless Deposition of Transparent Conducting Zn₂Sno₄ for Solar Cell Applications**
Rong Zhang
Lei Kerr
Shashi Lalvani
Gautham B. Jegadeesan
- 142af Impact of Carbon Nanofibers on Cure Kinetics and Viscosity of Vinyl Ester Resin System**
Bhavya M. Mehta
Dr. John P. Dismukes
Dr. Maria R. Coleman
- 142ag Computer Aided Design for Engineering Elastomers**
Ayush Goyal
Priyan Patkar
Shivani Syal
Jun Caoj
Venkat Venkatasubramanian
James M Caruthers
- 142ah An Investigation of Nickel-Based Amorphous Alloys and Their Corrosion Products**
Noppadon Sathitsuksanoh
Kanchan Mondal
Shashi Lalvani
- 142ai Dynamic Modeling of Solid-State Polymerization of Bisphenol a in a Moving Packed Bed Reactor**
Yuesheng Ye
Kyu Y. Choi
- 142aj Morphology, Composition and Thermal Stability of Flame-Made Zirconia-Based Mixed Oxides**
Rainer Jossen
Martin C. Heine
Sotiris E. Pratsinis
Kamal M. Akhtar
- 142ak The Effect of Filler and Diamine Size on the Fracture Toughness of Alumina Reinforced Epoxy Composites**
Laura M. McGrath
Richard Parnas
Joseph L. Lenhart
Saskia H. King
- 142al Chemical Vapor Deposition Copolymerization of Functionalized Paracyclophanes: an Approach Towards Multivalent Surface Coatings**
Yaseen Elkasabi
Hsien-Yeh Chen
Joerg Lahann
- 142am Effects of Template-Monomer Complex Formation on the Synthesis of Molecularly Imprinted Polymers in Aqueous Medium**
Lorena R. Padró-Cortés
Ortega-Fuentes Carlos
E. Juan-García Eduardo
Torres-Lugo Madeline

- 142an** **Synthesis and Characterization of pH-Sensitive Poly(Ethylene Glycol) -Rich Full Interpenetrated Polymer Networks for Controlled Drug Delivery**
Nilmarie Santos-Roman
Adriana A. Reyes-Barcelo
Jimmy Marrero
Madeline Torres-Lugo
- 142ao** **The Kinetics and Mechanism of Rapid Nickel Oxalate Thermal Decomposition**
Casey Carney
Christopher Gump
Alan W. Weimer
- 142ap** **Microinjection Molding of Microstructures - Experimental and Numerical Simulation**
Abdessalem Derdouri
Florin Ilinca
Jean-Francois Héту
- 142aq** **Combinatorial Studies of Phase Behavior in Polyanhydride Blends**
Jon B. Thorstenson
Balaji Narasimhan
- 142ar** **Polymeric Nano-Porous Materials Prepared Via Interfacial Polymerization in Soft Ionic Liquids**
Chien-Yueh Huang
Lining Zhu
Mu-Ping Nieh
Jing Zhang
Jing Wu
- 142as** **Towards Molecular Simulation of Polythiophene Oligomers**
Michael L. Hobbs
Michael L. Greenfield
- 142at** **Polyimide-Polysiloxane Segmented Copolymers for Fuel Cell Applications**
Lijun Zou
Mitchell Anthamatten
- 142au** **Real-Time and in-Process Monitoring and Control of Polymerization Processes**
Eric J. Hukkanen
- 142av** **Functional Polymer-Polymer Nanocomposites**
Mohamed Aflal M.R.
Giuseppe R. Palmese
- 142aw** **Experimental Study of Slip Flow in the Semi-Hyperbolically Converging Dies**
Prajakta A. Kamerkar
Brian J. Edwards
- 142ax** **A Generalized Approach to Construction of Complex Tissues**
Yong Yang
Yubing Xie
Ly James Lee
Douglas Kniss

- 142ay Numerical Modelling of Injection Moulding : Comparisons Using the Phan-Than-Teinner & Criminale-Erickson-Fibley Models**
*Navraj S. Hanspal
Abhijit Kulkarni
Atul N. Waghode
V. Nassehi*
- 142az Molecularly Smooth Cellulose Surfaces for Adhesion Studies**
*Hans Riegler
Ronny Sczech*
- 142b Using Computational Fluid Dynamics to Study and Improve Multihole Schwarz Melt-Blowing Dies**
*Holly M. Krutka
Dimitrios V. Papavassiliou
Robert L. Shambaugh*
- 142ba Morphology and Water Barrier Properties of Silane Films: the Effect of Process Parameters**
*Guirong Pan
Dale W. Schaefer*
- 142bb Material and Process Approaches to the Fabrication of Hierarchically Structured Tissue Engineering Scaffolds**
*Clifford L. Henderson
Benita Comeau
Benjamin Katz*
- 142bc Adsorption and Dissociation Kinetics of Dichlorosilane on Silicon Surface**
*Deepthi Gopireddy
Christos G. Takoudis*
- 142bd Inverted Colloidal Crystals (Icc) Scaffolds as Three Dimensional Microenvironments to Study Cell Interactions in Co-Cultures**
*Jungwoo Lee
Sachin Shanbhag
Nicholas A. Kotov*
- 142be Characterization and Fabrication of Capillary Flow Networks in Collagen-Based Scaffolds for the Development of Tissue-Engineered Products with Built-in Microvasculature**
*Vijayakumar Janakiraman
Brian Kienitz
Harihara Baskaran*
- 142bf Hydrothermal Degradation of Bis-Silane Films**
*Dale W. Schaefer
Yimin Wang
Guirong Pan
Michael S. Kent
Hyun Kim
Jaraslaw Majewski*
- 142bg Photoacid Diffusion in Photoresist Polymer Thin Films: Approaches for Measurement and Control of Thin Film Acid Diffusion**
*Cheng-Tsung Lee
Clifford L. Henderson*

- 142bh Nano- and Layered-Morphologies in Atactic/Syndiotactic Polystyrene Blends**
Xia Liao
Arghavan Victoria Nawaby
Y. Paul Handa
- 142bi Quantification of Bioparticulate Adhesion on Polymeric Surfaces Using Atomic Force Microscopy**
B. Reginald Thio
Carson Meredith
- 142bj Blending Chitosan with Polycaprolactone: Effect on Physicochemical Characteristics and Anti-Bacterial Activity**
Aparna Sarasam
Rajendra K. Krishnaswamy
Sundararajan V. Madihally
- 142c Adhesion and Viability of Liver Cells on Potential Bioreactor Materials**
Jeremiah Whittenton
Rashmi Sundararajan
Omair Khan
Dan Bauer
Adam Capitano
- 142d Mechanistic Modeling of Nitroxide-Mediated Controlled Radical Polymerization of Gradient Copolymers**
Andrew S. Cho
Linda Broadbelt
- 142e The Influence of N-Vinyl Pyrrolidinone on the Photopolymerization Kinetics and Mechanical Properties in Copolymerization with Acrylates with Increasing Functionality**
Timothy J. White
William B. Liechty
C. Allan Guymon
- 142f Polyolefin-Organoclay Nanocomposites: Properties, Morphology, and Applications**
Rhutesh K. Shah
Donald R. Paul
- 142g Crystallization, Melting, and Dynamic Relaxation Characteristics of Ptt and Ptt Blends**
Sumod Kalakkunnath
Terry W. Humphries
Douglass S. Kalika
- 142h Synthesizing Model Block Copolymers Via Atrp: the Utility of Kinetic Modeling in Guiding Experiments**
Rahul Sharma
You-Yeon Won
- 142i Dynamic Relaxation Characteristics of Crosslinked Poly(Ethylene Glycol) Networks and Composites**
Sumod Kalakkunnath
Haiqing Lin
Scott T. Matteucci
Benny D. Freeman
Douglass S. Kalika

- 142j** **Assembly of Carbon Tube-in-Tube Nanostructures**
xi Liu
- 142k** **Reaction Kinetics and Mechanism of Nickel Fiber Synthesis**
Kuo-Cheng Huang
Kan-Sen Chou
Kai-Ying Huang
- 142l** **Simulation of Contraction Flow of a Polystyrene – Carbon Dioxide Solution through an Axisymmetric Extrusion Foaming Die**
Shunahshep Shukla
Kurt W. Koelling
- 142m** **Pickering Emulsions - a Paradigm Shift**
Sowmitri Tarimala
Chih-yuan Wu
Lenore L. Dai
- 142n** **Fabrication of Magnetic Nickel-Tungsten-Phosphorus Particles by Electroless Deposition**
Chun-Han Chen
Ming-Kai Chang
Bing-Hung Chen
D. J. Lee
- 142o** **Influence of Heating Rate on Fine Structures of Japanese Cedar Chars**
Takanori Baba
Masatoshi Komiya
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- 142p** **Control of Crystal Structure and Its Defect of E-Hniw Prepared by Evaporation Crystallization**
Myung Ho Lee
Youngeun Kim
Woo-Sik Kim
- 142q** **A Novel Application of Solubility Parameter in Extraction of Bioactive Substances from Natural Products**
Youngeun Kim
Ji-Hwan Hwang
Myung-Ho Lee
Woo-Sik Kim
- 142r** **A Morphological Investigation of Soot Coming from the Detonation of Munitions**
Dana Pantea
Sylvie Brochu
Sonia Thiboutot
Guy Ampleman
Günter Scholz
- 142s** **Transport of Water in Nafion® Using Time-Resolved Ftir-Atr Spectroscopy**
Daniel T. Hallinan
Yossef A. Elabd
- 142t** **Conformal Coating of Ceramic Nanoparticles Via Atomic Layer Deposition**
Luis F. Hakim
Guodong Zhan
Steven M. George
Alan W. Weimer

- 142u** **Synthesis & Characterization of Polyimide/ Poss Nanocomposites**
Pallavi P. Kulkarni
Maria Coleman
- 142v** **Continuous Flow Microreactor for Chemical Bath Deposition**
Y.-J. Chang
P.H. Mudgar
D.-H. Lee
C.-H. Chang
S.-Y. Han
S.-O. Ryu
T.-J. Lee
- 142w** **Elastic Modulus and Hardness Studies of Single Crystal Zeolites Mfi, Fer, and Cha**
Christopher M. Lew
Zijian Li
Mark Johnson
Wayne Sun
Junlan Wang
Yushan Yan
- 142x** **Mechanical and Rheological Properties of Polyalkenoate Cements Designed as Portland Cement Substitutes**
Brian Grady
Diego Acosta
Gary Funkhouser
- 142y** **Zeolite Y Coatings on Al-2024-T3 Substrate by a Novel Three-Step Synthesis Method**
Ronnie A. Munoz
Derek Beving
Yachun Mao
Yushan Yan
- 142z** **Uv-Induced Tunability of Refractive Index for Dielectric Films Via Photoacid-Catalyzed Decomposition of Templated Sacrificial Polymers**
Sue Ann Bidstrup Allen
Jassem Abdallah
Paul Kohl
- Evaluation of the Extraction and Swelling of Colombian Coals**
Fredy J. Colpas Castillo
- Oxidation of Low Rank Colombian Coals with Hno₃-Air**
Fredy J. Fredy J. Colpas
- Study of the PirLisis of Organic Residues and Waste Water, for the Light Obtaining of Petroleum**
fredy J. Colpas
Mario Riccio Molinares
Giselle Fernandez

Session 157 - Biomaterials for Gene Therapy and Drug Delivery

Chair: Lonnie D Shea

Vice Chair: Howard W. Matthew

- 157a** **Functionalizable Polymer Precursors for Non-Viral Gene Delivery Vectors**
Sharon Y. Wong
David Putnam
- 157b** **Synthesis and in Vitro Characterization of a Triblock Copolymer Carrier for Sirna**
Tatiana Segura
Jeffrey A. Hubbell
- 157c** **An Anionic Polymer Enhances Cationic Lipid-Mediated Delivery of Antisense Oligonucleotides**
Li Kim Lee
Charity L. Williams
Charles M. Roth
- 157d** **Multilayered Polyelectrolyte Films for the Localized Delivery of DNA to Cells**
Christopher M. Jewell
Jingtao Zhang
Nathaniel J. Fredin
David M. Lynn
- 157e** **Patterned Substrate-Mediated Gene Delivery Using Microfluidics**
Tiffany Houchin
Lonnie D. Shea
- 157f** **Development and in Vitro Evaluation of a Peg-Insulin Conjugate Protein for the Treatment of Diabetes Mellitus**
Anthony D. Tiesca
Anthony M. Lowman
- 157g** **Engineering Shape of Polymeric Microparticles for Drug Delivery**
Julie Champion
Samir Mitragotri
- 157h** **Engineering Nanoscale Hydrogel Particles Entrapping Bovine Hemoglobin as Temperature and pH Sensitive Oxygen Carriers**
Andre Palmer
Jaqunda Patton

Session 174 - Nanoparticle Assemblies and Superlattices

Chair: Michael Z. Hu

Vice Chair: Ilona Kretzschmar

- 174a** **A Monte Carlo and Continuum Study of the Mechanical Properties of Porous Titania Nanoparticle Aggregate Films**
Oluwatosin A. Ogunsola
Sheryl Ehrman

- 174b** **Controlled Deposition and Modification of Antireflective Coatings from Silica Nanoparticles**
Brian G. Prevo
Yeon Hwang
James B. McClain
Ruben G. Carbonell
Orlin D. Velev
- 174c** **Determination of Zeolite Nanoparticle Morphology Evolution Mechanism from Simulations and SxS/Tem Measurements**
Timothy O. Drews
Markos A. Katsoulakis
Michael Tsapatsis
- 174d** **Assembly of Structurally Ordered Nanoparticle Thin Films Utilizing a CO₂-Expanded Liquid Deposition Strategy**
Juncheng Liu
Madhu Anand
Philip W. Bell
M. Chandler McLeod
Christopher B. Roberts
- 174e** **Molecular Dynamics Simulation of the Coalescence Kinetics of Bare and Coated Nanoparticles**
Takumi Hawa
Michael Zachariah
- 174f** **Nanotiling: Coatings from Suspensions of Hexagonal Zeolite Particles**
J. Alex Lee
Linli Meng
David Norris
L.E. Scriven
Michael Tsapatsis
- 174g** **Rational Fabrication of Nano-Electronic Devices Via Bottom-up Self-Assembly**
Stephanie L. Teich-McGoldrick
Joydeep Mukherjee
Sharon C. Glotzer

Session 187 - Structure and Properties of Polymers I: Mechanics and Rheology

Chair: Jing Wu

Vice Chair: Sachin Velankar

- 187a** **Local Dynamics of Syndiotactic Pmma Using Molecular Dynamics Simulation**
Chunxia Chen
Janna K. Maranas
Victoria Garcia Sakai
Inmaculada Peral
John R. D. Copley
- 187b** **Rheological and Structural Studies of Linear Polyethylene Melts under Planar Elongational Flow Using Nonequilibrium Molecular Dynamics Simulations**
Chunggi Baig
Brian J. Edwards
David J. Keffer
Hank D. Cochran

- 187c Visualizing Worm Micelle Dynamics and Phase Transitions of a Charged Diblock Copolymer in Water**
Yan Geng
Fariyal Ahmed
Nishant Bhasin
Dennis E. Discher
- 187d Effect of Free Volume Distribution on Transport and Dissolution Properties of Polymers**
Derrick Callander
Trevor Hoskins
Clifford Henderson
Peter Ludovice
Y.C. Jean
- 187e Rapid Crack Propagation Failures in Pressurized Hdpe Pipes: Structure-Property Investigations**
Raj K. Krishnaswamy
Mark J. Lamborn
Ashish M Sukhadia
Patrick Leever
- 187f Terahertz Dynamics of Polymer Crystallization**
Jing Wu
- 187g Crystalline Structure Formations under Steady-State Isothermal Planar Elongational Stretching of N-Alkanes: a Molecular Dynamics Study**
Tudor C. Ionescu
Chunggi Baig
Brian J. Edwards
David J. Keffer
Anton Habenschuss
- 187h Characterization of Mechanical Property Variations in Pressure Sensitive Adhesive Films Using Quasi-Static and Dynamic Nanoindentation**
Ryan P. Verhulst
Steven J. Severtson
Seth A. Downs
- 187i High-Throughput Screening of Mechanical Properties in Polymers**
Pedro J. Zapata
Joe-Lahai Sormana
Carson Meredith
- 202a Ehd Monomer Effect on Myoblastic Cell Attachment and Proliferation**
Erin E. Falco
Scott J. Roth
John P. Fisher

Session 202 - Bioinspired / Biomimetic Materials

Chair: John P. Fisher

Vice Chair: Christine E Schmidt

- 202b** **Spontaneous Formation of Gelatin-Polycaprolactone Matrices for Tissue Engineering**
Sean Duguay
Dan Cutbirth
Aparna Sarasam
Sundararajan V. Madihally
- 202c** **Synthesis and Characterization of Amphiphilic Block Copolymers, Self-Assembly Behavior and Drug Delivery Applications**
Michael D. Determan
Ankit Agarwal
Surya K. Mallapragada
- 202d** **Preparing Porous Polymeric Particles by Localized Solvent Implosion for Pulmonary Drug Delivery Applications**
Treniece L. Terry
Victor G. Rodgers
Aliasger K. Salem
- 206a** **Preparation of Hydrophobic Multilayers on Solid Surfaces**
Anfeng Wang
Jeff Chinn
Xuemei Liang
Ting Cao
Haiying Tang
Steven O. Salley
Gregory W. Auner
K. Y. Simon Ng

Session 206 - Chemical Vapor Deposition I

Chair: Daniel D Burkey

Vice Chair: David S. Dandy

- 206b** ***in Situ* Real-Time Diagnostics for Studying the Structural Evolution of Nanocrystalline Silicon Thin Films during Plasma Deposition**
Radhika C. Mani
Eray S. Aydil
- 206c** **Roll-to-Roll Initiated Chemical Vapor Deposition (IcVD) of Functional, Flexible Nanomaterials**
Malancha Gupta
Karen K. Gleason
- 206d** **On-Line APCVD of SnO₂ Coatings on Glass**
Mingheng Li
James W. McCamy
- 206e** **Metal Organic Chemical Vapor Deposition of Titanium Oxynitride Films Using Tetrakis(Diethylamino)Titanium**
Xuemei Song
Christos G. Takoudis

206f Chemical Vapor Deposition of Palladium Seed Layers

*Gregory L. Griffin
Lidong Wang*

206g Deposition of W_nC_n Using Allylimido Complexes $CL_4(Rcn)W(Nc_3H_5)$: Effect of NH_3 on Film Properties

*Hiral M. Ajmera
Tim Anderson
Laurel L. Reitfort
Lisa McElwee-White*

Session 207 - Composites - Structure and Properties

Chair: John J. La Scala

Vice Chair: Amod A. Ogale

207a Effect of Particle Size on the Mechanical Properties of Pc/Pbt Blend Composites

*Wade S. DePolo
Don Baird
Gregorio Velez*

207b Al_2O_3 -Reinforced Epoxy Composites with Enhanced Fracture Toughness: a Sem, Rheology and Mechanical Study

*Laura M. McGrath
Joseph L. Lenhart
Richard Parnas*

207c Nanoparticles and Long Fibers Reinforced Thermosetting Composites

*Gang Zhou
Xia Cao
L. James Lee*

207d Synthesis of Surface-Functionalized Nanotube-Polymer Network Composites

*Mary E. Sullivan
Giuseppe R. Palmese*

207e Viscoelastic Investigations of End-Tethered Silica-Poly(Butyl Acrylate) Nanocomposites

*Vivek Goel
Joanna Pietrasik
Krzysztof Matyjaszewski
Ramanan Krishnamoorti*

207f Shear Thickening Fluids Reinforced by Discontinuous Short Fibers: Ballistic and Rheological Properties

*Caroline H. Nam
Matthew J. Decker
Christopher Halbach
Eric D. Wetzel
Norman J. Wagner*

207g A Coarse-Grained Simulation of Rheology of Polymer Nanocomposites

*Venkat Ganesan
Victor Pryamitsyn*

Session 220 - Liquid-Phase Synthesis of Nanoparticles

Chair: Michael T. Harris

Vice Chair: Michael Z. Hu

- 220a** **General Shape Control of Colloidal Cds, Cdse and Cdte Semiconductor Nanorods and Nanorod Heterostructures**
Aaron E. Saunders
Felice Shieh
Brian A. Korgel
- 220b** **Small-Angle X-Ray Scattering and NMR Investigations of Zeolite Nucleation and Growth**
Daniel F. Shantz
Henry Cheng
- 220c** **Synthesis of Size, Shape and Composition Controlled Nanocrystals of Metals, Metal Alloys and Metal Oxides**
Xiaowei Teng
Yong Wang
Sean Maksimuk
Hong Yang
- 220d** **A Novel Thermal Electrochemical Synthesis Method for Production of Stable Colloids of "Naked" Metal (Ag) Nanocrystals**
Michael Z. Hu
Clay E. Easterly
- 220e** **Mechanical Strength Measurements of Single Crystal Zeolites Cha, Mfi, and Fer by Nanoindentation**
Christopher M. Lew
Zijian Li
Mark Johnson
Wayne Sun
Junlan Wang
Yushan Yan
- 220f** **Size and Shape-Controlled Synthesis of Bifunctional Gold/Fe₃O₄ Nanoparticles**
Weili Shi
Hao Zeng
Yudhisthira Sahoo
Mark Swihart
Paras N. Prasad
- 220g** **Surface Modification of Magnetic Nanoparticles: Characterization and Colloidal Stability in Polar Solvents**
Sang-Yup Lee
Michael T. Harris

Session 232 - Polymer Thermodynamics I

Chair: Gerassimos Orkoulas

Vice Chair: Michael C- Huang

- 232a** **Finding Simplicity in Complexity: Scaling, Tricriticality, and Crossover in Polymer Solutions**
Mikhail A. Anisimov
Jan V. Sengers

- 232b** **Evaluation of Energetic and Entropic Contributions to the Free Energy of Oriented Polymer Melts**
Tudor C. Ionescu
Brian J. Edwards
David J. Keffer
Vlasis Mavrantzas
- 232c** **Extending Thermodynamic Plasticizer Models to Ionic Liquids**
Mustafizur Rahman
Christopher S. Brazel
- 232d** **Study of Single-Site Linear Low-Density Polyethylene Liquids Using Inverse Gas Chromatography and Molecular Dynamics Simulation**
Mingzong Zhang
Zhehui Liu
Liyan Zhao
Phillip Choi
- 232e** **Efficient Modelling of Phase Equilibria of Polydisperse Polymer Systems Using the Saft Equation of State**
Nikolaos M.P. Kakalis
Constantinos C. Pantelides
- 232f** **High-Pressure Phase Behaviour of the System Linear Low Density Polyethylene + N-Hexane + Ethylene: Experimental Results and Modelling**
Ryan Krenz
Theo W. De Loos
Robert A. Heidemann
- 232g** **Interfacial Properties for Polymer and Copolymer Systems by Density Functional Theory**
Dong Fu
Lili Liang

Session 233 - Polymers for Biofunctional Surfaces

Chair: Carson Meredith

Vice Chair: Rastislav Levicky

- 233a** **Transnitrosation and Release Kinetics of Nitric Oxide (NO) with Cysteine-Modified Biomaterials**
Jun Gu
Randy S. Lewis
- 233b** **Living Radical Photografting - a Versatile Technique for Engineering Biofunctional Surfaces**
Andrew T. Metters
Bradley P. Harris
Edward W. Fritz
- 233c** **Surface Modification of Poly(L-Lactide) Films to Study the Effect of Surface Chemical Functionality on Fibroblast Adhesion**
Amol V. Janorkar
Rahul M. Rasal
Andrew T. Metters
Karen J. L. Burg
Douglas E. Hirt

- 233d** **Combinatorial Libraries for Investigation of Cell Interactions with Polymer Surfaces**
Jing Su
Pedro J. Zapata
Andres J. García
Carson Meredith
- 233e** **Nanoscale Protein Patterning Using Self-Assembled Diblock Copolymers**
Nitin Kumar
Jong-in Hahm
- 233f** **Bioactive Surfaces Based on Aldehyde-Containing Reactive Polymer Coatings**
Himabindu Nandivada
Hsien-Yeh Chen
Joerg Lahann
- 233g** **pH and Salt Responsive Peg Sams on Polyelectrolyte Multilayer**
Srivatsan Kidambi
Christina Chan
Ilsoon Lee
- 233h** **Evaluation of Polymer and Self-Assembled Monolayer Coated Silicone Surfaces to Reduce Neural Cell Growth**
Kruti R. Patel
Haiying Tang
William E. Grever
K. Y. Simon Ng
Jianming Xiang
Richard F. Keep
Ting Cao
James P. McAllister II
- 233i** **Evaluation of the Effect of the Chemistry of Biodegradable Polycarbonate Polymers Containing Iodine and Peg on Cellular Responses of Vascular Cell Lines**
Patrick A. Johnson
Yong Ho Bae
Robert Dubin
Joachim Kohn
Prabhas Moghe

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Chair: Rachel A. Segalman

Vice Chair: Zhong-Ren Chen

- 236a** **Structural Origin of Thermomechanical Behavior in Semicrystalline Ionomers**
Katsuyuki Wakabayashi
Richard A. Register
- 236b** **The Role of Positive Counterion in Ethylene-Methacrylic Acid Copolymer Blends with Nylon**
Brian Grady
- 236c** **Improved Polarizable Potential Model and Simulation Study of Aqueous Systems of Polyethylene Oxide and Inorganic Salts**
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- 236d** **Synthesis and Novel Application of Gradient Copolymers: Compatibilization of Immiscible Polymer Blends**
Jungki Kim
Hongying Zhou
SonBinh Nguyen
John Torkelson
- 236e** **Composition Dependence of the Dynamics of Poly(Methyl Methacrylate) in Binary Blends with Poly(Ethylene Oxide)**
Jiahong Liu
Victoria Garcia Sakai
Janna K. Maranas
- 236f** **Self-Consistent Brownian Dynamics Simulations of Ternary Polymer Blends**
Bharadwaj Narayanan
Victor Pryamitsyn
Venkat Ganesan
- 236g** **Modeling of Phase Behavior of Polymer Blends Containing Linear Telechelic Supramolecular Polymers**
Mitchell Anthamatten
Michelle H. Wrue
- 236h** **Nanoscale Polymer Blends Via Mechanical Milling**
Ryan Schexnaydre
Brian S. Mitchell
- 236i** **Photopolymerizable Thiol/Vinyl Ether Hybrid Materials**
Jacquelyn A. Carioscia
Christopher N. Bowman

Session 255 - Composites - II

Chair: Giuseppe R. Palmese

Vice Chair: Deepak Srinivasagupta

- 255a** **The Glass Transition and Physical Aging Behavior of Polymer Nanocomposites Studied Via Fluorescence**
Perla Rittigstein
Rodney D. Priestley
John M. Torkelson
- 255b** **Healing Surface Defects with Polymer Nanocomposites Containing Spheres and Rods**
Kurt A. Smith
Sandeep Tyagi
Anna Balazs
- 255c** **Melt Processing and Rheological Behavior of Modified Clay/Polyolefin Nanocomposites**
Emre A. Demirkol
Dilhan M. Kalyon
- 255d** **Suspension Polymerization of Inverse Emulsion of Water Expandable Polystyrene/Clay Nanocomposites**
Jiong Shen
Xia Cao
L. James Lee

255e **Properties and Morphology of Organoclay/Poly(Styrene-Co-Acrylonitrile) Nanocomposites: Effect of Copolymer Composition**
Holly A. Stretz
Donald R. Paul

255f **Mechanical Properties of Nanocomposite Systems**
George J. Papakonstantopoulos
Emmanouil Doxastakis
Kenji Yoshimoto
Juan J. de Pablo

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Chair: Hugh W. Hillhouse

Vice Chair: Stephen E. Rankin

272a **Functionalized Mesostructured Silica for Proton-Exchange Membranes**
George L. Athens
Bradley F. Chmelka

272b **Microfabrication of Mesoporous Silica Films for Mem Applications**
Hae-Kwon Jeong
Ramesh Chandrasekharan
Mark A. Shannon
Richard I. Masel

272c **Synthesis of Ordered Mesoporous Tin Oxide Thin Films Displaying Extremely High Thermal Stability: a Tem and Saxs Study of Structural Changes during the Thermal Treatment**
Vikrant N. Urade
Lauren A. Hunding
Hugh W. Hillhouse

272d **Investigation of the Curing Kinetics in Dip Coated Surfactant / Sol-Gel Silica Films**
Venkat R. Koganti
Stephen E. Rankin

272e **Synthesis of Tantalum Pentoxide Films for High Temperature Applications**
Vaidyanathan Ravi Subramanian
Nicholas Ndiege
Mark A. Shannon
Edmund G. Seebauer
Richard I. Masel

272f **On the Interpretation of Artifacts in 2d Gisaxs Patterns of Nanostructured Films**
Michael P. Tate
Hugh W. Hillhouse

272g **Fabrication of Zeolite Films Using Layer-by-Layer Depositions**
Zhiping Lai
Michael Tsapatsis
Derek Beving
Yushan Yan

272h Hydrothermal Synthesis of Inorganic and Organic Nanocomposite Zsm-5 Films from Recycled Solution
*Yachun Mao
Derek Beving
Ronnie Munoz
Yushan Yan*

272i Hydrophilic and Antimicrobial Zeolite Coatings
*Cory R. O'Neill
Derek Beving
Andrew M. P. McDonnell
Wilfred Chen
Yushan Yan*

Session 276 - Polymer Thermodynamics II

Chair: Rajesh Khare

Vice Chair: Vivek M Prabhu

276a Organic Vapor Sorption by Copolymers of Poly(Styrene-Butadiene) Using a Quartz Crystal Microbalance
*Randolph D. Williams
Anant K. Upadhyayulu
Venkat R. Bhethanabotla*

276b Measurement of the Solubility of Poly(Methyl Methacrylate)-Methyl Methacrylate System in Supercritical CO₂ and Their Modeling Using Saft
*Ratka Damnjanovic
Naveed Aslam
Aydin Sunol*

276c Modelling the Solubility of Chitosan in Supercritical Carbon Dioxide through Saft
*Naveed Aslam
Raquel Carvallo
Aydin Sunol*

276d Extrapolating Molecular Models of Thermodynamic Properties to Polymeric Species
*Fadime S. Baskaya
Neil H. Gray
Richard Elliott*

276e Predicting Solubilities in Polymer Systems Using Cosmo-Rs
*Nasir M. Tukur
S. M. Waziri
Esam Z. Hamad*

276f The Role of Curvature Dependent Free Energy in the Behavior of Polymer Vesicles and Composite Droplets
*Kurt A. Smith
Anna C. Balazs
David M. Jasnow
Mihail Mihailescu*

276g Computation of the Nonhomogeneous Equilibrium Phase Behavior of a Rigid Rod System
*Micah J. Green
Robert A. Brown
Robert C. Armstrong*

Session 278 - Polymers for Fuel Cell Applications

Chair: Yossef A. Elabd

Vice Chair: Ravindra Datta

278a Near Net-Shape Fabrication of Nafion® Membranes for Fuel Cell Applications

*Amanda Moster
Brian S. Mitchell*

278b Nafion®/Poly(Vinyl Alcohol) Blends: Effects of Crosslinking Conditions on Transport Properties

*Nicholas W. DeLuca
Yossef A. Elabd*

278c Investigation of PEM Fuel Cell Behavior: Swelling and Viscoelastic Properties of Nafion

*Barclay Satterfield
Jay B. Benziger*

278d Durability of Perfluorosulfonic Acid Membranes for PEM Fuel Cells

*Craig S. Gittleman
Yeh-Hung Lai
Christopher Lewis
Daniel Miller*

278e Synthesis and Characterization of Thermosetting Copolymers as PEM's

*Mohamed Aflal M.R.
Yossef A. Elabd
Giuseppe R. Palmese*

Session 283 - Structure and Properties of Polymers III: Networks and Gels

Chair: Zhong-Ren Chen

Vice Chair: Ronald C. Hedden

283a Phenol Formaldehyde Gels: Studies on the Gel Formation at a High Temperature and at Different pH

*Ranjan Banerjee
Kartic C. Khilar
Bisweshwar Ghosh
Kiran Patil*

283b Dynamics of Poly(Ethylene Glycol) Networks and Their Relation to Gas Transport Properties

*Sumod Kalakkunnath
Haiqing Lin
Benny D. Freeman
Douglass S. Kalika*

283c Lithium Ion Transport in Rubber-like Poly(Ethyleneimine) Electrolytes

*Kevin Yocca
Ronald Hedden*

283d In-Situ Monitoring of Photopolymerization Using Microrheology

*Ryan P. Slopek
Victor Breedveld*

- 283e** **Highly Responsive Self-Assembled Gels from Block Copolymers in Liquid Crystal Solvent**
Neal Scruggs
Rafael Verduzco
Julia Kornfield
- 283f** **Pulverization of Rubber with or without Carbon-Black under High Normal and Shear Forces**
Jatin Kumar
Hamid Arastoopour
Barry Bernstein
- 283g** **A Gaussian Slip-Link Model for Cross-Linked Polymers**
Mahnaz Eskandari
Jay D. Schieber
Hamid Arastoopour
- 283h** **Co-Crystallization of Ethylene-Propylene-Diene Elastomer with Polyethylene Plastomers**
Zhong-Ren Chen
- 283i** **The Solid State Shear Extrusion Process Optimization for Cross-Linked Polymers**
Mahnaz Eskandari
Hamid Arastoopour
- 283j** **Molecular Dynamics Simulation of Discontinuous Volume Phase Transitions in Permanently Crosslinked Polyelectrolyte Networks**
De-Wei Yin
Juan J. de Pablo

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Chair: Dennis W. Hess

Vice Chair: Alon V. McCormick

- 332a** **Electro-Active and Redox-Active Block Copolymer Nanostructures**
Nitash P. Balsara
- 332b** **Polymerization in Surfactant Solutions**
Eric W. Kaler
- 332c** **Biomolecular Interfaces Using Liquid Crystalline Materials**
Nicholas L. Abbott
- 332d** **Hierarchically Engineered Inorganic Materials**
Bradley F. Chmelka
- 332e** **Nanostructured Photovoltaic Materials**
Eray S. Aydil

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Chair: Yossef A. Elabd

Vice Chair: Peter Ludovice

- 350a** **Barrier Films with High Concentrations of Aligned Impermeable Flakes**
Edward L. Cussler
Quan Liu

- 350b Gas Barrier Properties of Polymeric Films with Hybrid Organic/Inorganic Coatings for Food Packaging Applications**
Matteo Minelli
Maria Grazia De Angelis
Marco Giacinti Baschetti
Ferruccio Doghieri
Giulio C Sarti
- 350c Configurational Diffusion of Small Molecules through Nano-Confined Polymers**
Amit Kumar
Raul F. Lobo
Norman J. Wagner
- 350d Dual Mode Transport with Finite Hole-Filling Kinetics in Glassy Polymers**
Juchen Guo
Timothy Barbari
- 350e Diffusion in Polymeric Systems: Arrhenius and Free-Volume Equivalence**
Narayan Ramesh
J. L. Duda
- 350f Deliquescence, Diffusion, and Crystal Nucleation in Levitated Polyethylene Oxide**
Adam P. Olsen
Richard C. Flagan
Julia A. Kornfield
- 350g Experimental and Theroretical Investigation of Multicomponent Solvent Removal from Semicrystalline Polymers**
Sim-Siong Wong
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Surya K. Mallapragada
- 350h An Improved Polarographic Apparatus to Determine Oxygen Permeability (DK), Diffusivity (D), and Solubility (K) of Highly Oxygen-Permeable Contact Lenses**
Mahendra Chhabra
Clayton J. Radke

Session 365 - Nanoscale Structure in Polymers I

Chair: C. Allan Guymon

Vice Chair: Matt J. Kipper

- 365a Polyester-Polyelectrolyte Nanocomposite Membranes as Breathable and Responsive Barriers**
Hong Chen
Giuseppe R. Palmese
Yossef A. Elabd
- 365b Molecular Dynamics of Pamam Dendrimers**
Jovan Mijovic
Sanja Ristic
- 365c Self Detoxifying Nanofiber Webs**
Mohammad Munim Hussain
Necip Guven
S.S. Ramkumar

- 365d** **Investigation of Factors Influencing Phase Retention in Lyotropic Liquid Crystal Template Polymerization**
Michael A. DePierro
Kyle G. Carpenter
C. Allan Guymon
- 365e** **Characterizations of Nano-Structures of Polyurea Synthesized in Soft Ionic Liquids**
Chien-Yueh Huang
Lining Zhu
Jing Zhang
Mu-Ping Nieh
Jing Wu
- 365f** **High Aspect Ratio Pillar Arrays Formed Via Electrohydrodynamic Instabilities**
Michael D. Dickey
Allen Raines
Elizabeth Collister
C. Grant Willson
- 365g** **Biocidal Coatings for the Military**
John J. La Scala
Johua A. Orlicki
Lars T. Piehler
Cherise Winston
Pauline Smith
Wendy Kosik
Adam M. Rawlett

Session 380 - Thin Film Processing

Chair: Brett A. Cruden

Vice Chair: Edward A. Evans

- 380a** **Multiscale Model for Plasma Enhanced Deposition on Nanostructures**
Edward A. Evans
Kevin Kreider
Guanghai Zhang
Jerry Young
Curt Clemons
Alper Buldum
- 380b** **Molecular Vapor Deposition for Enhanced Monolayer Stability and Durability**
B. Kobrin
W. Robert Ashurst
V. Fuentes
R. Nowak
R. Yi
Jeff Chinn
- 380c** **Interface Formation and Energy Level Alignment of Pentacene on GaN**
John J. Uhlrich
Thomas F. Kuech
- 380d** **Film Deposition on Electrostatically Suspended Nanowires by Pecvd in Dusty Plasma Reactor**
Themis Matsoukas
Jin Cao

- 380e Ion-Enhanced Plasma Etching of Metal Oxides in Chlorine Based Plasmas**
Ryan M. Martin
Hans-Olof Blom
Jane P. Chang
- 380f Electron-Beam Hardening of Functionalized Polynorbornene Thin Films**
Sue Ann Bidstrup Allen
Seongho Park
Paul A. Kohl
- 380g Remote Oxygen Plasma Growth of Mgo Films on Sic for Functional Oxide Integration**
Trevor L. Goodrich
Zhuhua Cai
Katherine S. Ziemer
- 380h Investigation of Local Coordination and Electronic Structure of Dielectric Thin Films from Theoretical Energy-Loss Spectra**
Javier Rosado
Manish Singh
Christos G. Takoudis

Session 396 - Diffusion in Polymers II

Chair: Russell E. Gorga

Vice Chair: Yossef A. Elabd

- 396a Multi-Component Diffusion in Polymer-Solvent Systems**
J. L. Duda
Ronald Danner
Reza Pourdarvish
- 396b Modeling and Simulation of Nonsolvent Vapor-Induced Phase Separation**
Yuen-Lai Yip
Anthony J. McHugh
- 396c Coupled Diffusion in Biochemical Protective Suits**
John R. Dorgan
Oluwasajibomi Okeowo
- 396d Probing Thermodynamic Effects in Polymer-Solvent Systems by Low and High-Pressure Inverse Gas Chromatography**
John M. Zielinski
Adam T. Jones
J. L. Duda
Ronald Danner
- 396e Hybrid Technique for the Monitoring of Diffusion of Water and Chromate within a Primer Layer**
Bill L. Riehl
Jay Johnson
R.J. Wilkens
Douglas C. Hansen
- 396f Modeling of Diffusion and Chemical Reactions in Ion-Exchange Resins during Swelling and Shrinking**
Tuomo Sainio
Erkki Paatero

396g Pervaporation of Water through Poly(Ethylene Glycol) Hydrogels: the Pumping Mechanism of a Synthetic Leaf

*Tobias D. Wheeler
Abraham D. Stroock
Claude Cohen
Lawrence J. Bonassar*

Session 415 - Nanoscale Structure in Polymers II: Polymer Nanocomposites

Chair: John J. La Scala

Vice Chair: Matt J. Kipper

415a Measuring and Modeling of Flow-Induced Nanostructure of Nanoclay/Polymer and Nanofiber/Polymer Melt Composites

*Yingru Wang
Jianhua Xu
Christopher Kagarise
Stephen E. Bechtel
Kurt W. Koelling*

415b Measurements of Particle Orientation in Simple Shear and Channel Flows of Polypropylene/Clay Nanocomposites

*Laura Dykes
Wesley Burghardt
Kosmas Kasimatis
John Torkelson*

415c Flow-Induced Crystallization of Polypropylene-Clay Nanocomposites: Clay Disorientation Kinetics and Morphology

*Mark A. Treece
James P. Oberhauser*

415d Entanglement Effects in the Plastic Deformation of Filled Polymer Glasses: a Simulation Study

*David Richardson
Cameron F. Abrams*

415e Styrene/Isoprene-Carbon Nanotube Composites Via Emulsion and Miniemulsion Polymerization

*Brian P. Grady
Mai Ha*

415f Synthesis of Water-Based Polystyrene-Nanoclay Hybrid Via Mini-Emulsion Polymerization

*Zhaohui Tong
Qunhui Sun
Yulin Deng*

415g Surfactant Degradation in Melt Processed Polyethylene-Organoclay Nanocomposites

*Rhutesh K. Shah
Donald R. Paul*

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Chair: Clifford L. Henderson

Vice Chair: Gerassimos Orkoulas

471a Comparison of the Distributions of Glass Transition Temperatures in Thin and Ultrathin Films of Polystyrene and Polymethylmethacrylate

Rodney D. Priestley

Manish K. Mundra

Perla Rittigstein

Linda J. Broadbelt

John Torkelson

471b CO₂-Induced Surface Tg Reduction of Polymer and Theoretical Modeling

Dehua Liu

Yong Yang

James Lee

David Tomasko

471c Structural Relaxation of Nanoconfined Glassy Polymer Systems Studied by Fluorescence Measurements

Rodney D. Priestley

Linda J. Broadbelt

John M. Torkelson

471d The Diffusion Behavior of Polymer Ultrathin Films: Fundamental Insights and Molecular Weight Effects

Clifford L. Henderson

Peter Ludovice

Lovejeet Singh

Ivan Ordaz

471e Thermodynamic Effects on Diffusion in Thin Polymer Blend Films

Ananth Indrakanti

Narayan Ramesh

Sanat Kumar

J. L. Duda

471f Moisture at Buried Polymer Interfaces: a Destabilizing Force

Bryan D. Vogt

Emmett P. O'Brien

Christopher C. White

Wen-li Wu

471g pH-Responsive Polymer Films and Membrane Skins

Dongshun Bai

Brian M. Habersberger

Steven Elliott

Kane G. Jennings

471h pH-Responsive Tethered Layers on Copolymer and Silicon Substrates

Keisha B. Walters

471i Smart Polymeric Surfaces—Responsiveness and Reconstruction

Julie A. Crowe

Jan Genzer

Session 476 - Self Assembly of Templating Inorganic Materials I

Chair: Hugh W. Hillhouse

Vice Chair: Michael S. Wong

- 476a** **Synthesis and Characterization of Mesoporous Silicate Films in Supercritical Carbon Dioxide through the Replication of Block Copolymer Templates**
Sumit Agarwal
Curran Chandler
James J. Watkins
- 476b** **Introduction of Novel Functionalities to Mesoporous Silica through Nitridation**
Tatsuya Okubo
Naotaka Chino
Sajo P. Naik
Toshiyuki Yokoi
- 476c** **Microstructure Engineering of Mesoporous Silica Films**
Hae-Kwon Jeong
Mathew Luebbers
Mark A. Shannon
Richard I. Masel
- 476d** **Gisaxs and Fesem as Tools to Investigate the Order and Orientation of Self-Assembled Mesoporous Silica Thin Films on Gold Substrates**
Michael P. Tate
Jonathan D. Kowalski
Brian W. Eggiman
Hugh W. Hillhouse
- 476e** **Influence of Ammonia Vapor Post-Treatment on the Structure of Mesoporous Silica Prepared with Mixed Cationic and Glycoside Surfactants**
Stephen E. Rankin
Rong Xing
- 476f** **Synthesis and Characterization of Vesicular Nanoparticles Formed by Fluorinated Surfactant Templating**
Bing Tan
Sandhya M. Vyas
Hans-Joachim Lehmler
Barbara L. Knutson
Stephen E. Rankin
- 476g** **Fabrication of TiO₂-SiO₂ Aerogel Monolith with Ordered Mesostructures**
Nan Yao
King Lun Yeung
- 476h** **Enhanced Infusion of Gold Nanocrystals into Mesoporous Silica with Supercritical Carbon Dioxide**
Gaurav Gupta
Parag S. Shah
Xiaogang Zhang
Aaron E. Saunders
Brian A. Korgel
Keith P. Johnston

476i Silicon Surface Functionalization by Uv-Initiated Alkene Hydrosilylation

*Alex Langner
Anthony Panarello
Sandrine Rivillon
Oleksiy Vassilyev
Johannes Khinast
Yves Chabal*

Session 486 - Advances in Nanolithography

Chair: Chih-hung (Alex) Chang

Vice Chair: Bruce J. Hinds

486a Intact Transfer of Layered Bionanocomposite Arrays

*Neeraj Kohli
Robert M. Worden
Ilsoon Lee*

486b Enhancement of Lithography Processes Using CO₂: CO₂-Modified Development and Post Applied Bake

*Amy E. Zweber
Joseph M. DeSimone
Ruben G. Carbonell*

486c Directed Self-Assembly of Block Copolymer Blends into Nonregular Device-Oriented Structures

*Mark P. Stoykovich
Marcus Mueller
Sang Ouk Kim
Harun H. Solak
Erik W. Edwards
Juan J. De Pablo
Paul F. Nealey*

486d Selective Growth of Zinc Oxide Nanowires Grown from Thin Film Multilayer Structure for Shadow Lithography

*Bing Hu
Nitin Chopra
Bruce Jackson Hinds*

486e Langmuir-Blodgett Technique as a Tool for the Synthesis of Nanostructures

*Xiaowei Teng
Xinyi Liang
Hong Yang*

486f Materials and Processes and High Resolution Patterning Using Thermal Cantilever Array Lithography

*Clifford L. Henderson
William P. King
Yueming Hua
Shubham Saxena*

Session 488 - Biomembranes

Chair: M. L. Gilchrist

Vice Chair: Surita R. Bhatia

488a Adhesion Behavior of Biomimetic Membranes

Maria M. Santore

488b A Molecular Dynamics Investigation of the Surface Activity of Components of Pulmonary Surfactant at the Air/Water Interface

Parag S. Adhangale

Donald Gaver

488c Determining the Effect of Cytoskeleton Disruption on Cell Rheology

Kathleen Miranda

Brenton D. Hoffman

Gladys Massiera

John Crocker

488d Interaction of Amphiphilic Molecules with Lipid Monolayers

Poonam Nigam

James Rathman

488e Afm Characterization of the Stability and Structure of Collagen Membranes

Adam T. Capitano

Ida L. Soto

Session 517 - Polymer Reaction Engineering Kinetics and Catalysis I

Chair: Julie L. Jessop

Vice Chair: Carlos Villa

517a Ethylene-Norbornene Copolymerizations Via Silica-Immobilized Ti Cgc-Inspired Polymerization Catalysts

Michael W. McKittrick

Christopher W. Jones

517b Kinetic Modeling of Acrylate Polymerization at High Temperature

Xinrui Yu

Linda J. Broadbelt

Robin A. Hutchinson

517c Kinetics and Morphological Development in Syndiotactic Styrene Polymerization over Heterogeneized Metallocene Catalysts

Kyu Y. Choi

Joongjin Han

517d Comparison of the Polymerization Kinetics of Bis(Triethoxysilyl)Ethane and Methyltriethoxysilane under Acidic Conditions

Jyothirmai Ambati

Stephen E. Rankin

517e Influence of Water on Cure Kinetics Via Eb-Irradiated Epoxy Resin

Jihean Lee

Giuseppe R. Palmese

517f The Effects of Raft Agent on Braching in a Free-Radical Polymerization

*Rujun Li
Joseph Schork*

517g Kinetic Modeling and Parameter Estimation of the Metallocene Catalyzed Slurry Polymerization of Propylene: Effect of Mao/Zr Ratio

*Bernabe Quevedo
E. Bryan Coughlin
Michael A. Henson*

Session 518 - Polymer Thin Films and Interfaces II

Chair: Erin Jablonski

Vice Chair: Jianzhong Wu

518a Equilibrium Self-Assembly of Rod-Coil Block Copolymer Thin Films

*Rachel A. Segalman
Bradley D. Olsen*

518b Mixed Lamellae of Symmetric Diblock Copolymer Thin Films

*Dong Meng
Qiang Wang*

518c Shear Alignment of Spherical-Phase Block Copolymer Thin Films

*Mingshaw W. Wu
Dan E. Angelescu
Douglas H. Adamson
Paul M. Chaikin
Richard A. Register*

518d Surface Energy Effects in Triblock Copolymer Thin Films

*Thomas H. Epps
Michael J. Fasolka*

518e Monte Carlo Simulations and Self-Consistent Mean Field Theory of Polyelectrolyte Brushes

*Gaurav Arya
Owen J. Hehmeyer
Athanasios Z. Panagiotopoulos*

518f Determination of Interfacial Properties of Polysiloxane-Water Systems Using Molecular Dynamics Simulations

*Ahmed E. Ismail
Gary S. Grest
David R. Heine
Mark J. Stevens
Mesfin Tsigie*

518g Strong Charge Inversion and Layer-by-Layer Assembly of Flexible Polyelectrolytes from Self-Consistent Field Calculations

Qiang Wang

518h Study of the Molecular Weight Dependence of Surface Tension of Low Molecular Weight Alkanes by Molecular Dynamics Simulation

*Chunli Li
Phillip Choi*

518i Surface Morphology and Interfacial Properties of Lubricant Nanofilms

*Qian Guo
Satoru Izumisawa
Haigang Chen
Myung S. Jhon*

Session 535 - Biofunctional Surfaces: From Fundamentals to Devices

Chair: Anthony M. Lowman

Vice Chair: David V. Schaffer

535a Molecular Dynamics Simulation of a Nanoscale Device for Fast Sequencing of DNA

*Christina M. Payne
Xiongce Zhao
Peter T. Cummings
James W. Lee*

535b A New Paradigm in Tendon Tissue Engineering

*Rita Abousleiman
Peter S. McFetridge
Vassilios I. Sikavitsas*

535c Real-Time Monitoring of *Streptococcus Mutans* Dental Biofilm Formation Using Quartz Crystal Microbalance

*Kawai Tam
Perla Ayala
Nichola Kinsinger
Nosang V. Myung*

535d Orientational Control of Immobilized Biomolecules on a Membrane Surface for Specific Protein Capture

*Sufi Ahmed
Timothy Barbari*

535e Adsorption of Dansylated Amino Acids on Molecularly Imprinted Surfaces: a Surface Plasmon Resonance Study

*Xiao Li
Scott Husson*

535f Modulation of Astrocyte Behavior Via Transforming Growth Factor & Beta-1 Conjugated Surfaces

*Christopher L. Klaver
Michael R. Caplan*

535g Surface Modification of Sapphire to Enhance Its Neural Biocompatibility

*Anfeng Wang
Paul G. Finlayson
Jie Li
Kelley Brabant
Carolyn A. Black
James P. McAllister
Ting Cao
Haiying Tang
Xuemei Liang
Steven O. Salley
Gregory W. Auner
K. Y. Simon Ng*

535h Binding of Target DNA with Overhanging Bases to DNA Probes in Lipid Bilayers and Micelles

*Bruno F. Marques
Shane T. Grosser
James W. Schneider*

Session 555 - Polymer Reaction Engineering Kinetics and Catalysis II

Chair: Sanjeev Katti
Vice Chair: U. Sundararaj

555a Polymerization Sequence and Dilution Effects on Ipn Formation

*Joseph R. Nowers
Balaji Narasimhan*

555b Reaction Engineering Aspects of a Tissue Adherent Hydrogel

*Erika Johnston
Hildegard Kramer
Noah Tubo
Frederick Tan
Luis Avila
Michael Philbrook
Kenneth Messier
Jeffery Kablik
Peter Jarrett
Art Coury
Robert Miller*

555c Photoinitiation and Monomer Ordering Phenomena in Polymerizations Conducted in Lyotropic Liquid Crystalline Phases

*Michael A. DePierro
Thomas J. Gioielli
C. Allan Guymon*

555d Kinetic Characterization of Surface-Initiated Controlled-Radical Photopolymerizations

*Santosh B. Rahane
S. Michael Kilbey II
Andrew T. Metters*

555e The Effect of Amines Catalyst on Benzothiazole Accelerated Sulfur Vulcanization

*Ayush Goyal
Priyan Patkar
Joshua Fulk
Venkat Venkatasubramanian
James M Caruthers*

555f Model for Polymer Microstructure Monitoring and Control in Solution Polymerization of Alkyl Acrylates

*Felix S. Rantow
Masoud Soroush
Michael C. Grady*

555g Continuous High-Temperature Polymerization of Mma at Pilot Scale

*Philip Nising
Thierry Meyer*

Session 556 - Polymer Thin Films and Interfaces III

Chair: Joseph L. Lenhart

Vice Chair: Theo W. deLoos

- 556a** **Investigation of Chemical Composition and Physical Properties of Photopolymerized Hybrid Resin Coatings**
Ying Cai
Julie L. Jessop
- 556b** **Patterned Ultrathin Polymer Films Using Thiol-Ene Polymerizations**
Vaibhav S. Khire
Adam Harant
Christopher N. Bowman
- 556c** **Low Temperature Growth of Thick Polystyrene Brushes Via Atrp**
Azadeh Samadi
Scott Husson
Michael Kilbey II
- 556d** **Atomic Transfer Radical Polymerization Synthesis of Magnetorheological Fluids**
Alan Fuchs
Ben Hu
Faramarz Gordaninejad
- 556e** **X-Ray Reflectivity Study of Properties of Mixed Bis-Aminosilane-Vinyl Triacetoxysilane Coatings**
Yimin Wang
Jan Ilavsky
Dale W. Schaefer
- 556f** **Chemical Vapor Deposition of Antimicrobial Polymer Coatings**
Tyler P. Martin
Karen K. Gleason
- 556g** **Plasma-Induced Graft Polymerization of Polyvinyl Acetate Nanofilms Onto Inorganic Oxide Surfaces**
Gregory T. Lewis
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- 556h** **Polybenzoxazole Films Fabricated Using Vapor Deposition Polymerization**
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Chair: Talid R. Sinno

Vice Chair: David S. Dandy

564a Chemical Vapor Deposition Applications in Thin Film Coatings for High-Temperature Lubrication

Anitha Nagarajan

Carolina Garrido

Wilfredo Morales

Jorge E. Gatica

564b Atomic-Scale Analysis of Radical Precursor and Hydrogen Surface Diffusion on Plasma-Deposited Amorphous Silicon Thin Films

Mayur S. Valipa

Tamas Bakos

Eray S. Aydil

Dimitrios Maroudas

564c Effects of Elastic Stress on Electromigration-Driven Void Dynamics in Metallic Thin Films

M. Rauf Gungor

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Dimitrios Maroudas

564d Defect Nucleation and Growth in Crystalline Silicon under Conditions of Generalized External Stress

Sumeet Kapur

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Lisa Lun

Andrew Yeckel

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Csaba Szeles

Michael Reed

Jeffrey J. Derby

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Chair: Charles B Musgrave

Vice Chair: Bridget R. Rogers

566a Controlled Doping in Ultra-Thin Metal Oxide Films by Radical-Enhanced ALD

Trinh T. Van

Roman Ostroumov

Kang Wang

John Bargar

Jane P. Chang

566b Atomic Layer Deposition and Film Characterization of Aluminum Oxide Grown on Si Using Tris(Diethylamino)Aluminum Precursor and Water

Ramarajesh R. Katamreddy

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Gregory Jursich

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566c Chemical Mechanisms of Contamination in Atomic Layer Deposition of HfO₂

*Atashi Mukhopadhyay
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566d Tert-Butylimido-Tris(Diethylamido)Tantalum and NH₃ Precursor Combination for ALD of TaN for Barrier Applications

*KeeChan Kim
Timothy J. Anderson
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566e Area Selective Atomic Layer Deposition Using Photodefinable Polymer Masks

*Clifford L. Henderson
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Chair: Christopher S. Brazel

Vice Chair: Tao L. Lowe

567a Electrospun Degradable Segmented Polyurethane Elastomers for Ligament Tissue Engineering

*CA Bashur
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567b L-Tyrosine Based Polyurethane Blends for Tissue Engineering Applications

*Debanjan Sarkar
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567c Manipulations in Hydrogel Degradation Behavior Enhance Osteoblast Function and Mineralized Tissue Formation

*Danielle S.W. Benoit
Kristi Anseth*

567d Alginate Hydrogel Mechanics Regulate Follicle Growth in a Three-Dimensional *in Vitro* Culture System

*Erin R. West
Pamela K. Kreeger
Jason W. Deck
Teresa K. Woodruff
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567e Long Term 3d Primary Hepatocyte Culture in Nano-Scaffold Hydrogel for Bioartificial Liver

*Sihong Wang
Deepak Nagrath
Francois Berthiaume
Martin L. Yarmush*

567f A Microfluidic Scaffold for Tissue Engineering

*Mario Cabodi
Nak Won Choi
Jason P. Gleghorn
Christopher S.D. Lee
Lawrence J. Bonassar
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567g Synthetic Scaffolds Mimicking Small Intestinal Submucosa

*Eric Maase
Bradley P. Kropp
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Chair: Efrosini Kokkoli

Vice Chair: Agnes Ostafin

578a Is Silicon Suitable for Making Implantable Biomedical Devices

*Anfeng Wang
Paul G. Finlayson
Jie Li
Kelley Brabant
Carolyn A. Black
James P. McAllister
Ting Cao
Haiying Tang
Xuemei Liang
Steven O. Salley
Gregory W. Auner
K. Y. Simon Ng*

578b Microrheological Probes for Amphiphilic Block-Co-Polypeptide Self-Assemblies

*Raymond S. Tu
Andrew P. Nowak
Timothy J. Deming
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578c Pegylated Bacteriophage for Identification of Tissue Homing Peptides

*Harry Bermudez
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578d Albumin-Derived Nanocarriers for the Display of Extracellular Matrix Ligands & Engineering Cell Adhesion and Motility

*Ram I. Sharma
Marian Pereira
Jean E. Schwarzbauer
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578e Directionally Guided Actin-Based Particle Motility in Vitro

*Kimberly A. Interliggi
Adam Feinberg
William Zeile
Suzanne Hens
Gary McGuire
Daniel L. Purich
Richard B. Dickinson*

578f Nanoparticles for the Treatment of Osteoporosis

*Ganesan Balasundaram
James C. Fleet
Connie M. Weaver
Alan M. Friedman
Ross V. Weatherman
Thomas J. Webster*

578g Layer-by-Layer Assembly of Nacre-like Nanostructured Composites with Antimicrobial Properties

*Paul Podsiadlo
Stephen Paternel
Zhengfei Zhang
Jean-Marie Rouillard
Jaebeom Lee
Jung Woo Lee
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578h Directed Calcium Deposition by Osteoblasts along Carbon Nanofiber Patterns in Polymers

*Dongwoo Khang
Michiko Sato
Thomas J. Webster*

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Chair: Kurt W Koelling

Vice Chair: U. Sundararaj

583a In Situ Measurements of Molecular Orientation in Commercial Thermotropic Liquid Crystalline Polymers in Transient Shear Flows

*Stanley Rendon
Wesley Burghardt
Robert Bubeck*

583b Rheology of Carbon Nanofiber/Polystyrene and Nanoclay/Polystyrene Melt Composites

*Jianhua Xu
Christopher Kagarise
Yingru Wang
Kurt W. Koelling
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583c Transient Rheology of a Polypropylene Melt Reinforced with Long and Short Glass Fibers

*Aaron P. R. Eberle
Donald G. Baird*

583d Rheology of Homopolymer and Blends of Dense Star Polystyrene Soft Nanospheres

*Ajay C. Kulkarni
Rangaramanujam M. Kannan*

583e Rotational Rheometry of Polymers under High Pressure Carbon Dioxide

*Maxwell J. Wingert
L. James Lee
David L. Tomasko
Kurt W. Koelling*

583f Rheostructural Study of a Discotic Thermotropic Liquid Crystalline Mesophase Pitch

*Santanu Kundu
Amod A. Ogale*

583g The Performance of Multiple-Mode Models in Single and Double Step-Strain Flows

*Bangwu Jiang
Prajakta A. Kamerkar
David J. Keffer
Brian J. Edwards*

583h Orientation Number in Elongational Flow of Polymer Melts and Solutions

*John R. Collier
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Session 584 - Polymers from Renewable Resources

Chair: John R. Dorgan

Vice Chair: Giuseppe R. Palmese

584a Fatty Acid Based Monomers for Fire Resistant Vinyl Ester and Unsaturated Polyester Resins

*Erde Can
Giuseppe R. Palmese*

584b Epoxidation of Soybean Oil in a Microemulsion-Assisted Environment

*David G. Rethwisch
Kaveri Jain
Peter Rasmussen
Katherine T. Rethwisch
Tonya L. Peeples
Alec B. Scranton*

584c The Rheology and Degradation of a Series of Pha-Based Copolymers

*Eickhoff James
Graham M. Harrison*

584d Surface Modification of Films of Pla, Pha, and Their Blends

*Rahul M. Rasal
Amol V. Janorkar
Andrew T. Metters
Douglas E. Hirt*

584e Moisture Sorption and Transport in Polylactide

*Richard A. Cairncross
Jeffrey G. Becker
Shri Ramaswamy
Ryan O'Connor*

584f Production of Well Dispersed Polymer Blends and Nanocomposites Using Renewable Polymers with Solid-State Shear Pulverization

*Amanda M. Walker
John M. Torkelson
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- 584g** **Synthesis of Poly(Butyl Acrylate)-G-Starch and Poly(Styrene)-G-Starch by Emulsion Photopolymerization to Produce Biodegradable Copolymers from Corn Starch**
Chris Comer
Julie L. Jessop
- 584h** **Prediction of Renewable Polymer Properties Using Quantum and Molecular Modeling**
James McAliley
Christopher O'Brien
David Bruce
- 584i** **Synthesis of Biodegradable Poly (L-Lactic Acid): Process Path Optimization**
Vimal Katiyar
Hemant Nanavati

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Chair: Bridget R. Rogers

Vice Chair: Katherine S. Ziemer

- 586a** **Controlling Ultrashallow Junction Formation through Surface Chemistry**
Edmund G. Seebauer
Kapil Dev
Charlotte T. M. Kwok
Richard D. Braatz
- 586b** **Directed Self Assembly of Si and Ge Nanocrystals on HfO₂ through Kinetically Driven Patterning**
Scott K. Stanley
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Sanjay K. Banerjee
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- 586c** **Grain Focused Simulation of Zirconia Cvd**
Max Bloomfield
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- 586d** **An Electrochemical Impedance Spectroscopy Study of Chloride and 3-Mercapto-1-Propanesulfonic Acid Interactions in Acidic Copper Electroplating Bath**
Hung-Ming Chen
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- 586e** **Characterization of Copper Chemical Mechanical Polishing in Nitric Acid Slurries**
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- 586f** **Decomposition Kinetics of Diethylzinc by Quantum Chemical Calculations**
Young Seok Kim
Yong Sun Won
Helena Hagelin-Weaver
Tim Anderson

586g First Principle Calculations of the Decomposition of N-Imido Tungsten Nitride Precursors

*Yong Sun Won
Young Seok Kim
Tim Anderson
Lisa McElwee-White*

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Chair: Sachin Velankar

Vice Chair: Clifford L. Henderson

590a Influence of Branching Distribution on the Physical Properties of High-Density Polyethylene

*Raj K. Krishnaswamy
Qing Yang*

590b An Alternative Method for Calibrating a Size-Exclusion Chromatograph (Sec) to Measure the Molar Mass Distribution of Polyethylenes

*Ryan Krenz
Eric Cheluget
Robert A. Heidemann*

590c Understanding the Structure Development in Hyperbranched Polymers: Comparison of Simulations and Experimental Results

*Cihan Oguz
Serkan Unal
Emel Yilgor
Martha A. Gallivan
Timothy E. Long
Iskender Yilgor*

590d The Effect of Chain Architecture on Polyolefin Dynamics: Quasielastic Neutron Scattering and Simulation

*Erin K. Boland
Matthew D. Eggert
Jiahong Liu
Janna K. Maranas*

590e Determining Branch Content in Polymers: a Novel Technique Combining Small Angle Scattering and Fractal Geometry

*Amit S. Kulkarni
Gregory Beaucage*

590f Study of Ziegler-Natta and Single-Site Linear Low-Density Polyethylene by Fuming Nitric Acid Etching, Gpc and ¹³C Solid-State NMR

*Mingtao Wang
Phillip Choi*

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Chair: Vadim V. Gulians

Vice Chair: Ilsoon Lee

594a Fibronectin/Polyelectrolyte Multilayer Assemblies: Film Formation and Cell Attachment Studies

*Corinne R. Wittmer
W. Mark Saltzman
Paul R. Van Tassel*

- 594b Biomimetic Interfaces for Characterizing Membrane Proteins**
Neeraj Kohli
Sachin S. Vaidya
Robert Y. Ofoli
Ilsoon Lee
Robert M. Worden
Devesh Srivastava
Rudy Richardson
- 594c Inorganic-Organic Composite Membrane Structure for Selective Ion Transport**
Deepak K. Singh
Jerry Y.S. Lin
John Cuppoletti
- 594d Biomimetic Interfaces Using Cell-Specific, Phage-Display-Selected Peptides**
Anka N. Veleva
Cam Patterson
Stuart L. Cooper
- 594e Biodegradable Covalently-Linked Laminin Peptide Gradients for Promotion and Assay of Cell Migration**
Matt J. Kipper
Hynda K. Kleinman
Francis W. Wang
- 594f Lipopeptide Ligands Presented in a Hybrid Bilayer Membrane Activate Cell Signaling and Support Hematopoietic Cell Growth**
James A. King
Shara M. Dellatore
Tor W. Jensen
Bi-Huang Hu
Phillip B. Messersmith
William M. Miller
- 594g Design of Novel Biomimetic Peptide-Amphiphiles for Functional Biomaterials**
Anastasia Mardilovich
Jennifer Craig
Ashish Garg
Matthew McCammon
Efrosini Kokkoli
- 594h Quantitative Adhesion Requirements for Intracellular Signaling, Cell Spreading and Cell Proliferation**
Niki Galownia
Melissa Davis
David Tirrell
Anand R. Asthagiri
- 594i In Vitro Investigations of Interactions between Amyloid Beta Peptides (1-40, 1-42) Structures and Substrates with Different Natures**
Jeffy Jimenez
Monica J. Escobar
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Chair: David W. Schmidtke

Vice Chair: Ravindra S Kane

- 595a** **Development and Characterization of Antibody Molecules on Peg Tethered Silicon-Based Biosensors by Atomic Force Microscopy**
Ting Cao
Anfeng Wang
Xuemei Liang
Haiying Tang
Gregory W. Auner
Steven O. Salley
K. Y. Simon Ng
- 595b** **Biomimetic Surfaces for the Detection of B-Amyloid**
James E. Henry
Dhara V. Patel
Mustafa Chowdhury
Gerard Cote
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- 595c** **Electrochemical Biosensor Platform Based on Nanofibrous Carbonaceous Supports**
Brittany Branch
Plamen Atanassov
- 595d** **Electrochemical Glucose Biosensor for Diabetes Management**
Becky L. Clark
Amos Mugweru
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- 595e** **Near Infrared Optical Biosensors Based on Single Walled Carbon Nanotubes**
Paul W. Barone
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- 595f** **Fabrication of Antibody Microarray Sensors Using Thermally Responsive Elastin-Protein a Fusion for Detection of Microbial Pathogens**
Di Gao
Joseph Cooke
Nicole McBean
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Ashok Mulchandani
Wilfred Chen
- 595g** **Photopolymerization for Signal Amplification in the Detection of Biomolecular Recognition Events**
Hadley D. Sikes
Ryan Hansen
Robert Jenison
Kathy Rowlen
Christopher N. Bowman

595h Development and Optimization of a Lab-on-a-Chip Device for Multiplexed Ultra-Sensitive Detection of Proteins

*Edgar D. Goluch
Dimitra G. Georganopoulou
Savka Stoeva
Jwa-Min Nam
Kashan A. Shaikh
Kee S. Ryu
Thomas N. Chiesl
Annelise E. Barron
Chad A. Mirkin
Chang Liu*

595i Biomems ELISA for Rapid Assessment of Markers in Serum

*Robert T. Larsen
Richard I. Masel*

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Chair: Linda Broadbelt

Vice Chair: Giuseppe R. Palmese

598a Quaternary Ammonium Surfactant Effects on Polymerization Rates in Clay-Polymer Nanocomposite Systems

*Kwame Owusu-Adom
C. Allan Guymon*

598b Kinetic Modeling of the Effect of Structural Heterogeneities on Polymer Degradation

*Seth E. Levine
Linda J. Broadbelt*

598c Effect of Cations on the Modulus of Immersed Nafion® Film by Dma

*Steve Sauerbrunn
Michael Zemo*

598d Thermoset Curing Schedule and Its Affect on the Final Properties

*Steve Sauerbrunn
Michael Zemo*

598e Cure and Hydrolysis of Cyanate Ester Systems

*Giuseppe R. Palmese
Xing Geng*

598f Cure Kinetics of Cross-Linked Copolymers of Dgeba Vinyl Ester and 2-Acrylamido 2-Methyl Propane Sulfonic Acid

*Mohamed Aflal M.R.
Giuseppe R. Palmese*

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Chair: Jan A. Puszynski

Vice Chair: Jorge E. Gatica

602a Characterization of Novel Polymer Assisted Thick Ta₂O₅ for High Temperature Application

Nicholas Ndiege

Vaidyanathan Subramanian

Edmund Seebauer

Mark A. Shannon

Richard I. Masel

602b Advanced Ceramic Materials for High Temperature Coal Combustion

Parveen Kumar

Vadim V. Guliants

602c Impurity Incorporation during the Sublimation Growth of Aluminum Nitride Crystals

J. H. Edgar

Zheng Gu

P Lu

L Du

602d Improved Estimates of High Temperature Fiber Bed Effective Emissivities from Variational Calculations

xiangnig Li

William Strieder

602e Novel Combustion Synthesis of Advanced Oxide Ceramics

Karen S. Martirosyan

Dan Luss

602f Kinetics and Product Composition of Exothermic Reacting Systems Consisting of Binary Nanopowders

Lori Groven

Jan A

Session 607 - Polymer Processing and Rheology II

Chair: Raj K. Krishnaswamy

Vice Chair: Victor Breedveld

607a Experimental Investigation of Film Formation: Film Casting

Kenneth K. Aniunoh

Graham M. Harrison

607b The Role of Shear and Extensional Rheology in Film Casting

Christopher W. Seay

Donald G. Baird

607c Morphology and Properties of Blown Films Prepared from Ionomer-Organoclay Nanocomposites

Rhutesh K. Shah

Rajendra K. Krishnaswamy

Donald R. Paul

- 607d** **Polymer Blends Processed by Solid-State Shear Pulverization: Compatibilization by Block Copolymer Addition and Basic Studies of Dispersed-Phase Morphology**
Ying Tao
Andrew Lebovitz
John Torkelson
- 607e** **Evolution of Crystalline Morphology in Poly(Trimethylene Terephthalate) and Ptt-Based Blends**
Sumod Kalakkunnath
Terry W. Humphries
Douglass S. Kalika
- 607f** **Analysis of Ductile and Brittle Failures from Creep Rupture Testing of Hdpe Pipes**
Raj K. Krishnaswamy
- 607g** **CFD Study of Flow and Heat Transfer in Miniature Mixers for Nanocomposites**
U. Sundararaj
Yun Bai
K Nandakumar
- 607h** **Mathematical Modeling of the Co-Rotating Twin Screw Extrusion Process and Experimental Studies**
Moinuddin Malik
Dilhan M. Kalyon

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Chair: Rachel A. Segalman

Vice Chair: Dean M. DeLongchamp

- 608a** **New Emissive Materials for Efficient and Stable Blue Organic Light Emitting Diodes**
Samson A. Jenekhe
Abhishek P. Kulkarni
Yan Zhu
Christopher J. Tonzola
Angela P. Gifford
- 608b** **Ultrathin Films by Covalent Molecular Assembly: Polythiophene-Polyimide Composites with Reduced Surface Resistivity**
Fengxiang Zhang
M. P. Srinivasan
- 608c** **Effect of Chemically Modified Dielectric Interfaces on Semiconducting Polymer Chain Orientation**
Brandon M. Vogel
Dean M. DeLongchamp
Daniel Fischer
Sharadha Sambasivan
Eric K. Lin

- 608d** **Measuring Structure and Order Development in Organic Semiconductor Films with Soft X-Ray Spectroscopy**
Dean M. DeLongchamp
Eric K. Lin
Daniel Fischer
Sharadha Sambasivan
Brandon M. Vogel
J. M. J. Frechet
Vivek Subramanian
Amanda R. Murphy
- 608e** **Reversible Switching of Conducting Polymer Films between Superhydrophobicity and Superhydrophilicity**
Lianbin Xu
Wilfred Chen
Ashok Mulchandani
Yushan Yan
- 608f** **Segregation, Leaching, and Adsorption of Small Molecules in Polymer Thin Films: Implications for Immersion Lithography**
Erin Jablonski
Wesley Reinhardt
Daniel Fischer
- 608g** **Plasma Treatment and Surface Analysis of Polyimide Films for an Electroless Copper Build-up Process**
Sue Ann Bidstrup Allen
D. Bhusari
Harley Hayden
Paul A. Kohl
- 608h** **Quantification of the Reaction-Diffusion Front in Photoresist Thin Films**
Bryan D. Vogt
Vivek M. Prabhu
Shuhui Kang
Eric K. Lin
Wen-li Wu
Sushil K. Satija
Karen Turnquest

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Chair: Constantinos Theodoropoulos

Vice Chair: Roger P. Pawlowski

- 609a** **Gallium Nitride Thin Film Growth Chemistry Modeling and Experimental Validation within a Move Reactor Showerhead System**
Rinku P. Parikh
Raymond A. Adomaitis
Gary W. Rubloff
Erin Robertson
Deborah Partlow
Darren Thomson
Michael Aumer

- 609b** **Development of Generalized Design Criteria for Vertical Chemical Vapor Deposition Reactors**
Joungmo Cho
T.J. Mountziaris
- 609c** **Computational Fluid Dynamics (CFD) Modeling of a Laser-Driven Aerosol Reactor**
Yuanqing He
Suddha S. Talukdar
Mark T. Swihart
- 609d** **Experimental Results from a Spatially Programmable Chemical Vapor Deposition System**
Ramaswamy Sreenivasan
Raymond A. Adomaitis
Gary W. Rubloff
Yuhong Cai
- 609e** **Non-Lithographic Micropatterning of Thin Crystal Film Layers and Bulk Micro-Machining Via Hydrogel Stamping**
Stoyan K. Smoukov
Christopher J. Campbell
Kyle J.M. Bishop
Bartosz A. Grzybowski

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Chair: Greg Thoma

Vice Chair: Christian Lastoskie

- 19a** **Modeling and Simulation of Fate and Transport of Chromium Species in the Atmosphere**
Mona E. Ossman
Ralph Kummler
- 19b** **Modeling Aerosol Transport in the Vicinity of Vegetative Canopies in the Urban Environment**
Jason Williams
Jessica N. Rendon
Elliott D. Eastep
Jeremy W. Leggoe
- 19c** **Heterogeneous Chemistry of Organic Compounds on Atmospheric Droplets**
Kalliat T. Valsaraj
Suresh Raja
- 19d** **Validation of Impact Maps Obtained with Dispersions Models through Neighbourhood Annotations of Annoyance, and Chemical Analysis**
José-Francisco Perales
Alejandra Ribes
Guillem Carrera
Luis Puigjaner
Xavier Roca
- 19e** **Environmental Fate of Brominated Flame Retardants in Lake Huron Sediments and Aquatic Organisms**
Christian M. Lastoskie
Dong Hee Lim
- 19f** **Evaluation of Drinking Water Contaminants Using Modeling**
Nicole Whittier
Deborah French McCay

19g Particle and Soluble Release of Organic Contaminants from the Sediment Bed

*Danny D. Reible
Louis J. Thibodeaux*

19h Predicting Enhanced Dispersion of Bacteria Due to Chemotaxis Using Volume Averaging Methods

*Karthik Narayanaswamy
Roseanne M. Ford
Brian D. Wood*

Session 20 - Environmental Impacts of Nanotechnology

Chair: Nada M Assaf-Anid

Vice Chair: John DiLoreto

20a Synthesis and Application of Ultrahigh Crystalline Titania Nanotubes

M.Alam Khan ,Hynchul Lee and O-Bong Yang Yang

20b Carbon Nanotubes: Assessing Potential Human and Ecological Uptake

*Elijah J. Petersen
Qingguo Huang
Walter J. Weber*

20c Oxide Nanoparticle Uptake in Human Lung Fibroblasts

*Ludwig Limbach
Robert N. Grass
Tobias J. Brunner
Wendelin J. Stark*

20d Energy Consumption during Nanoparticle Production: How Economic Is Dry Synthesis?

*Neil Osterwalder
Wendelin J. Stark*

20e Evaluation of Nanocrystalline Sorbents for Mercury Removal from Coal Gasifier Fuel Gas

*Raja A. Jadhav
Howard S. Meyer
Slawomir Winecki
Ronald W. Breault*

Session 54 - Chemicals from Waste Biomass

Chair: Mark Zappi

Vice Chair: Tod French

54a Production of Biodiesel from Wastes Associated with Meat Butchering Processes

*Tracy J. Benson
Mark Zappi
Todd French
Rafael Hernandez*

54b Production of Clean Synthetic Gas from Biomass Using a Downdraft Gasifier

*Prashanth R. Buchireddy
Mark Bricka
James Wooten
Wei Lin
Eugene Columbus*

- 54c** **Enhanced Ethanol Production from Food Processing Wastes Using Genetically Modified Cells**
Kripa K. RAO
Vaibhav Chaudhari
Dong-Shik Kim
Sasidhar Varanasi
- 54d** **Performance of a Pilot Scale Digester and Comparison with Laboratory Scale Units**
Mehul Vesvikar
Abhijeet Borole
Thomas Klasson
Khursheed Karim
Muthanna Al-Dahhan
David DePaoli
- 54e** **Potential of Animal Manure-Based Activated Carbons for Use in Heavy Metals Remediation**
Isabel Lima
- 54f** **Effect of Cultures Grown from Brewery Waste Waters on Kraft Lignin**
Aarti V. Gidh
Dinesh S. Talreja
Clint Williford
Alfred T. Mikell
- 54g** **Extraction and Production of Value-Added Products from Waste Feedstocks**
Todd French
Mark Zappi
Rafael Hernandez
Emily Easterling

Session 111 - Biodiesel Processing

Chair: Mark Zappi

Vice Chair: Rafael Hernandez

- 111a** **Transesterification of Triacetin and Esterification of Acetic Acid on Tungstated Zirconia**
Dora E. Lopez
Kaewta Suwannakarn
Yijun Liu
Edgar Lotero
David Bruce
James G. Goodwin
- 111b** **Production of Biodiesel Using an Integrated Extraction/Reaction Process**
Rafael Hernandez
Mark Zappi
Todd French
Jaricus Whitlock
Earl Alley
- 111c** **Production of a Low-Cost Biodiesel Using a Novel Bacterial-Based Feedstock**
Stephen Dufreche
Mark Zappi
Todd French
Darrell L. Sparks
Rafael Hernandez
Earl Alley

111d Issues with Biodiesel Purity and the Current Us Biodiesel Standard

Sandun D. Fernando

111e Transesterification Reaction Parameters Optimization for the Production of Ethyl Ester Using Waste Cooking Oil and Ethanol

Hatice Gecol

Sage Hiibel

Erdogan Ergican

Jason D Geddes

Glenn C Miller

Andy Goodrich

Session 134 - Retrofit Design for Better Economic and Environmental Performance

Chair: Andreas A. Linninger

Vice Chair: Mahmoud El-Halwagi

134a Retrofit of an Acrolein Production Process to Utilize Renewable, Bio-Based Feedstocks

Jeffrey R. Seay

Robert N. D'Alessandro

Mario R. Eden

134b Environmentally Friendly Heterogeneous Azeotropic Distillation System Design: Integration of Ebs Selection and Ips Recycling for Retrofitting

Weiyu Xu

Urmila Diwekar

134c Evaluating Waste Minimization Alternatives in a Chemical Plant

Iskandar Halim

Rajagopalan Srinivasan

134d Computational Approach to Quantify Condenser Operations

Romeo Ibrahim

Michalis Xenos

Andres Malcolm

Linas Mockus

Andreas A. Linninger

134e Pollution Prevention through Property-Based Design

Vasiliki Kazantzi

Xaioyun Qin

Dominic Chwan Yee Foo

Mahmoud El-Halwagi

134f Breakeven Costs of Distributed Advanced Technology Water Treatment Systems

John W. Norton

Walter J. Weber

Session 143 - Poster - Advances in Environmental Technology

Chair: David R. Shonnard

Vice Chair: Nick D. Hutson

143a Electrochemical Process for Oxidative Destruction of 4-Chlorophenol

Hao Zhang

George A. Sorial

- 143aa** **Evaluation of the Solar Zn/Zno Thermochemical Cycle for Sustainable Hydrogen Generation**
Christopher Perkins
Jeremy Zartman
Carl Bingham
Allan Lewandowski
Alan W. Weimer
- 143ab** **In-Situ Bioremediation of Sediments Contaminated with Polycyclic Aromatic Hydrocarbons (Pahs)**
Lei Wang
Rakesh Govind
Henry Tabak
- 143ac** **Magnetic Separation of Arsenic (V) from Water Using Coated Magnetic Particles**
Erdogan Ergican
Hatice Gecol
- 143ad** **Biofriendly Lubricants from Renewable Resources**
Marcel A. Liauw
Sven Eichholz
Sergio Sabater Prieto
Corinna Brinkmann
Adolf Eisentraeger
- 143ae** **Catalytic Hydrodechlorination over Pd Supported on Amorphous and Structured Carbon**
Claudia Amorim
- 143af** **Obtaining Activated Coal from Waste of Tanneries and Their Importance in the Removal of Chrome Hexavalente**
Fredy Colpas Castillo
Mario Riccio Molinares
Giselle Fernandez
- 143ag** **Characterization of Micellar Systems for Removal by Meuf of Refractory Organic from Contaminated Groundwater**
M. Kriburet
Jack Gilron
- 143b** **Heat and Mass Transfer in a Novel Copper Nanopowder/Silica Gel Bed**
Tsair-Wang Chung
Chia-Hsin Wu
Cheng-Yuan Wu
- 143c** **Evaluate the Bacterial Polysaccharide of Xanthan Gum for the Biosorption of Heavy Metals from the Aqueous Solution**
Tsair-Wang Chung
Mai-Tzu Chen
I-Ya Lin
- 143d** **Removal of as(V) by Chemically Modified Granular Activated Carbon**
lei Yang
- 143e** **Chemical Modification of Granular Activated Carbon for Enhancement of Arsenic Adsorption**
lei Yang
j. Paul Chen

- 143f Treatment of Waste Streams Containing Organic Compounds and Copper (II) Using Chelators**
*Worawan Kay Maketon
Kimberly Ogden*
- 143g Sediment and Contaminant Release during Gas Ebullition**
*QZ Yuan
Kalliat T. Valsaraj
CS Willson
Danny D. Reible*
- 143h Comprehensive Distributed Parameter Model of an Upflow Anaerobic Sludge Bed (Uasb) Reactor**
*S. J. Mu
Y. Zeng
P. Wu
S. J. Lou
Serge R. Guiot
B. Tartakovsky*
- 143i The Multimedia Integrated Environmental Management System Software Development**
*Mi-Sug Kim
JongHo Kim
Hyun-Soo Park
Yile-Sik Sun
Hong-Seok Kim
Honggon Kim
Jongheop Yi*
- 143j Development of Natural Zeolite Catalyst System to Simultaneous Reduction of Greenhouse Gas and Nitric Oxides from Nitric Acid Manufacturing Process**
*Min-Hye Seo
Soo-Tae Choo*
- 143k Basin Scale Modeling of Multiple Tracer Breakthrough in Fractured Limestone**
*Rugkiat Perkins
Greg J. Thoma
Ralph K. Davis*
- 143l Environmental Applications of Photocatalytic TiO₂ Films and Membranes**
*Hyeok Choi
Dionysios D. Dionysiou*
- 143m Recent Advances in Carbon Dioxide Capture and Separation Techniques for Power Generation Point Sources**
Henry W. Pennline
- 143n Environmental Challenges and Processes for Early Research & Development – a Case Study**
*Christopher N. Nilsen
Edward Nowak
Kirk Sorgi
Xini Zhang*

- 143o** **Analysis and Retrofit Design of Wastewater Treatment Facilities Using Process Simulation Tools**
Demetri P. Petrides
Charles Siletti
- 143p** **Asm1-Based Modeling and Simulation of a Full-Scale Simultaneous Nitrification and Denitrification Plant**
Chuang Wang
Yingzhi Zeng
Jing Lou
Ping Wu
- 143q** **Development of a New Dry Flue Gas Desulphurization Process Utilizing Calcium Silicate Hydrate in Waste Concrete**
Iizuka Atsushi
Yamasaki Akihiro
Yanagisawa Yukio
- 143r** **Chemical Modification of Sargassum Sp. for Enhancement of Heavy Metal Biosorption**
J. Paul Chen
Lei Yang
- 143s** **Low Temperature Stabilization of High Level Calcined Waste**
Anirudha Marwaha
- 143t** **Cyanobacterial Toxins: Treating the New Generation of Water Contaminants**
Maria G. Antoniou
Armah A. De la Cruz
Dionysios D. Dionysiou
- 143u** **Development of a New Recycling Process of Fine Aggregate from Waste Concrete Particles Using High-Pressure Carbon Dioxide Solution**
Masakazu Nakagawa
Atushi Iizuka
Minoru Fujii
Kazukiyo Kumagai
Akihiro Yamasaki
Kenji Hikino
Koichi Aoki
Yukio Yanagisawa
- 143v** **Selective Catalytic Reduction of NO with Methane or Ethanol over Silver-Alumina Catalysts in the Presence of High Concentrations of SO₂ and H₂O**
Xiaoyan She
Maria Flytzani-Stephanopoulos
- 143w** **Heavy Metal Recovery from Molten Fly Ashes by Chlorination**
Risehiro Nonaka
Katsuyasu Sugawara
Takuo Sugawara
- 143x** **Environmental Remediation of CCA Contaminated Wood Waste**
JA Tim Broussard

- 143y** **Kinetic Investigations of Propylene Epoxidation Using in Situ Generated H₂O₂ in CO₂ Solvent Media**
Deborah Boroughs
Qunlai Chen
Eric J. Beckman
Christopher B. Roberts
- 143z** **A Tool for Life Cycle Assessment of Recycling Residues from Waste Incineration in Road Constructions – Eartool**
Tapas K. Das
Gurbakhash S. Bhandar
- Session 200 - Applications of Environmental Catalysis: I**
Chair: Sibudjing (Jim) Kawi
Vice Chair: Robert W. Peters
- 200a** **Magnetically Recoverable TiO₂ Photocatalyst Particles by Means of Atomic Layer Deposition**
David M. King
Karen J. Buechler
Alan Weimer
- 200b** **Comparison of Various Oxidation Catalyst/Zeolite Systems for Treating Diesel Exhaust from Mobile Sources**
Adria F. Lotus
Robert W. Peters
- 200c** **Dual-Catalyst System for Lean Exhaust Aftertreatment**
Erik M. Holmgren
Matthew M. Yung
Umit S. Ozkan
- 200d** **Selective Catalytic Reduction of NO_x with NH₃ over Cu-ZSM-5 – the Effect of Changing the Gas Composition**
Hanna Sjøvall
Louise Olsson
Erik Fridell
Richard Blint
- 200e** **Comparison of Electrodes for Application in Anodic Oxidation of Wastewater Constituents**
Julia Zelenka
Wolfgang Gangl
Peter Letonja
Matthäus Siebenhofer
Rolf Marr
- 200f** **A Novel Synthesis of Sponge-Type Carbon Doped Titania Activated under Visible-Light**
Chang Yeon Yun
Mi Sun Hahn
Honggon Kim
Jongheop Yi
- 200g** **A Novel Process for Deep Desulfurization of Dibenzothiophene under Mild Conditions**
Dan Huang
Guangsheng Luo
Yujun Wang
Liming Yang

Session 234 - Remediation: In-Situ Chemical Oxidation

Chair: Mark Bricka

Vice Chair: Mark Zappi

234a Perchlorate Remediation by Zero Valent Iron

He Huang

George A. Sorial

234b Optimization of Insitu Chemical Oxidation Via the Elucidation of Key Mechanistic Processes Impacting Technology Maturation and Development of Effective Application Protocol

John M. Harden

Mark E. Zappi

W. Todd French

Chiang-Hai Kuo

William L. Kingery

234c Phytoremediation of Oxytetracycline from Wastewater

Ninad P. Gujarathi

Binbing Han

James C. Linden

Ranil Wickramasinghe

234d Development and Characterization of a Tubular High-Density Plasma Reactor for Water Treatment

Derek C. Johnson

David S. Dandy

234e Oxidation of Reactive Blue 19 Dye Wastewater in a Porous Electrode Ozone Generator and Reactor

Alexander P. Mathews

Kishora K Panda

234f Quantification of Reductive Species Produced by High Voltage Electrical Discharges in Water

Mayank Sahn

Wright C. Finney

Bruce R. Locke

234g Indirect Electrochemical Treatment of Textile Wastewater: Influence of Design and Operational Parameters on Color Removal

Vijayakumar Sundaram

Margaret J. Kupferle

Session 247 - Applications of Environmental Catalysis: II

Chair: Robert W. Peters

Vice Chair: Sibudjing (Jim) Kawi

247a Sulfate Radical Based Advanced Oxidation Technologies

George P. Anipsitakis

Dionysios D. Dionysiou

247b Ozone-Enhanced Catalytic Oxidation of Dimethyl Methylphosphonate and Dimethyl Sulfide

Cathrine B. Almquist

Timothy James Bittel

- 247c Photochemical Treatment of Herbicide/Pathogen Contaminated Agricultural Water in the Rio Grande Basin**
X. Ye
Daniel H. Chen
D. Flaherty
B. Wang
R. Tadmor
K. Sternes
- 247d Electrochemical and Photochemical Oxidation of Ethylenediaminetetraacetic Acid**
Wolfgang Gangl
Julia Zelenka
Peter Letonja
Matthäus Siebenhofer
Rolf Marr
- 247e Treatment of Nitroaromatic Contaminated Groundwater with Zero-Valent Metals and Advanced Oxidation Techniques**
Mathew Thomas
Rafael Hernandez
Chiang-Hai Kou
- 247f Using Fenton Chemistry for Wastewater Treatment of Organic Recalcitrant Substances**
Abel Mondelo Rodriguez
José Maria Ameneiros Martínez
Eduardo Marques Canosa
- 247g Mechanistic and Kinetic Studies of Heterogeneous Uv/Fenton Process for the Oxidation of Aqueous Organic Pollutants: Electron Transfer at Catalyst Surface to Initiate the Redox Process**
Qiang Wu
Jiyun Feng
Xijun Hu
Po-lock Yue

Session 263 - Homogenous and Heterogeneous Atmospheric Chemistry

Chair: Neil M. Donahue

Vice Chair: Athanasios Nenes

- 263a Multicomponent Aerosol Coagulation - Similarity Solutions and Moment Models**
R. Bertrum Diemer
Jon H. Olson
- 263b Developments in Atmospheric Homogeneous Nucleation**
Alicia J. Kalafut
Charles O. Stanier

263c Are Organic Surfactants Ubiquitous?

*Akua Asa-Awuku
Athanasios Nenes
Ryan Morrison
Amy Sullivan
Chris Hennigan
Rodney Weber
Song Gao
Richard C. Flagan
John H. Seinfeld*

263d Identification and Characterization of Semivolatile Organic Carbon Using Proton Transfer Reaction - Mass Spectrometry (Ptr-MS)

*Albert A. Presto
Kara E. Huff Hartz
Neil M. Donahue*

263e Hygroscopicity of Multi-Component Organic Aerosols Using an Environmental Scanning Electron Microscope

*Timothy M. Raymond
Richard Moore*

263f Heterogeneous Oxidation Kinetics of Organic Aerosols

*Neil M. Donahue
A. L. Robinson
K. E. Huff Hartz
A. M. Sage
E. Weitkamp*

263g Constraining the Mechanism and Kinetics of $\text{OH} + \text{NO}_2$ Using the Multiple-Well Master Equation

*Jieyuan Zhang
Neil M. Donahue*

263h Indirect Determinations of Integrated Br and Cl Concentrations in Barrow, Alaska

*Loredana Suci
Fei Gao
Valerie L. Young
Paul Doskey
Adam Keil
Aubrey Cavender
Paul B. Shepson*

Session 282 - Site Assessment and Remediation

Chair: Danny D. Reible

Vice Chair: Larry E. Erickson

282a Gis_em (Geographic Information System for Environmental Monitoring) - a Software Implemented at Paulinia Refinery (Replan) for Management of Environmental Data

*Luis T. Furlan
Carine D.D. Gennari Jungklaus
Hung Kiang Chang
Joseli Ferreira*

- 282b** **Environmental Community Impact Assessment Associated with a Multiuse Industrial Facility: Scientific Rigor, Uncertainties, Transparency and Participation of Stake Holders**
Yoram Cohen
Adrienne Katner
- 282c** **Solute Fate in Stratified Heterogeneous Media**
Julio A. Zimbron
Tom C. Sale
David S. Dandy
- 282d** **The Use of *Pisum Sativum* (Snow Pea) to Identify the Bioavailability of Lead in a Phosphate Stabilized Soil**
Mark Bricka
Brian S. Baldwin
Gene Fabian
- 282e** **Managing Arsenic Contaminated Soil, Sediment, and Industrial Waste with Solidification/Stabilization Treatment**
Sandip Chattopadhyay
Paul M. Randall
- 282f** **Active Capping of Contaminated Sediments**
Danny D. Reible
Gregory V. Lowry
- 282g** **Laboratory and Field Demonstration of Bioaugmentation for Remediation of Tetrachloroethylene**
sathishkumar Santharam
Jwan Ibbini
Larry Davis
Larry E. Erickson
- 282h** **Assessment of the Rhizosphere Effect in Phytoremediation of Pahs**
Greg J. Thoma
Thanh B. Lam
Khursheed Karim
Duane C. Wolf
Susan Ziegler

Session 458 - Environmental Applications of Adsorption

Chair: Nick D. Hutson

Vice Chair: Ravi Kumar

- 458a** **Role of Adsorption and Desorption Cycles in a 2-Bed Adsorber in Stabilizing Biofiltration Performance**
Daekeun Kim
Zhangli Cai
George A. Sorial
- 458b** **Activated Carbon Fibers Versus Gac**
Qiuli Lu
George A. Sorial

458c Control of Hydrocarbon Cold Start Emissions: a Search for Potential Adsorbents

*Abduljelil Ilyas
Hassan .M. Zahedi Niaki
Mladen Eic
Serge Kaliaguine*

458d Adsorptive Ozonation of Organic Pollutants in Zeolite Monolith: a Kinetic Study

*Tsung-Yueh Tsai
Masaki Sagehashi
Takao Fujii
Akiyoshi Sakoda*

458e Novel Economical Hg(0) Oxidation Reagent for Mercury Emissions Control from Coal-Fired Boilers

*Joo-Youp Lee
Tim C. Keener
Yuhong Ju
Rajender Varma
Subhas Sikdar*

458f A Theoretical Cluster Approach to Understanding Mercury Adsorption on Bromine-Embedded Activated Carbon

*Michael Brunetti
Jennifer Wilcox*

458g Development and Testing of Multipollutant Sorbents for Coal Flue Gas

*Brian C. Attwood
Nick D. Hutson*

Session 483 - Adsorption in Desulfurization

Chair: Santi Kulprathipanja
Vice Chair: Yoram Cohen

483a Modeling the Kinetics of the Sulfation Reaction of a Copper-Based Regenerable Sorbent Used in Flue Gas Desulfurization

*Vasudeo Gavaskar
Javad Abbasian*

483b Mass Transfer Study on Glass Fiber Entrapped H₂S Sorbents for Regenerable Continuous Batch Fuel Processing in Pemfc Applications

*Hongyun Yang
Noppadon Sathitsuksanoh
Yong Lu
Bruce J. Tatarchuk*

483c Biological Sulfate Reduction of Reverse Osmosis Brine Concentrate: Batch Reactor and Chemostat Studies

*Masoud Samee
Jaeyong Jung
Atosa Vahdati
Varadarajan Ravindran
Mark D. Williams
Massoud Pirbazari*

483d **Formula to Calculate the Rate of Biooxidation of Elemental Sulfur (Rbes) by Thiobacillus Thiooxidans Bacteria**
Salma Saddawi
Abha Saddawi
Colleen Elizabeth Stacy

483e **Interactions of Thiophene Molecules with Alkaline-Y Zeolites**
Cédric Laborde-Boutet
Guy Joly
Patrick Magnoux
Alexandre Nicolaos
Michel Thomas

483f **Removal of Trace Hydrogen Sulfide Contamination from Natural Gas by Pressure Swing Sorption**
Li Zhou

Session 9 - Advances at the Interface of Design & Control

Chair: Juergen Hahn

Vice Chair: Mario R. Eden

9a **Design and Control Considerations for Scale-up of a Cigs Inline Co-Evaporative Physical Vapor Deposition Process**
Kapil Mukati
Babatunde A. Ogunnaike
Robert W. Birkmire

9b **Computational Approach for Adjudging Feasibility of Acceptable Disturbance Rejection**
Vinay Kariwala
Sigurd Skogestad

9c **Issues on the Operability of Multivariable Non-Square Systems**
Christos Georgakis
Fernando Lima

9d **Determining Sensor Locations for Stable Nonlinear Systems: the Multiple Sensor Case**
Abhay K. Singh
Juergen Hahn

9e **Effect of Feed Composition on the Selection of Control Structures for High-Purity Binary Distillation Columns**
William L. Luyben

9f **Integration of Process Design and Control through Optimal Control**
Jigar Patel
Korkut Uygun
Yinlun Huang

Session 11 - Advances in Computational Methods and Numerical Analysis

Chair: Andrew Salinger

Vice Chair: Dimitrios V. Papavassiliou

11a **Continuation Algorithms for Space-Time Solutions, with Application to a Reactor Explosion Pde Model**
Andrew Salinger

- 11b** **A Fully Coupled Time Dependent 3-D Axisymmetric Simulation of an Evaporating Sessile Drop**
Ervina Widjaja
Michael T. Harris
- 11c** **Developing Quantitative, Multi-Scale Models for Melt Crystal Growth**
Andrew Yeckel
Paul Sonda
Lisa Lun
Thomas Jung
Georg Mueller
Jeffrey J. Derby
- 11d** **An Analysis of Multi-Physics Coupling Techniques for Large-Scale Applications**
Roger P. Pawlowski
Russell W. Hooper
Matthew M. Hopkins
- 11e** **Identification of All Solutions of Tpbv Problems**
Yue Chen
Vasilios Manousiouthakis
- 11f** **Global Optimization of Mixed-Integer Nonlinear Problems Using Interval Analysis**
Gang (Gary) Xu
Mark A. Stadtherr
- 11g** **Evaluation of the Integrate and the Combined Methods in Mixture Phase Equilibrium Calculations Using Equations of State**
Donald P. Visco
Sanjay K. Dube
- 11h** **Consistent Extraction of Multiple Level Sets Using the Conformal Voxels Method**
Max Bloomfield
Timothy S. Cale

Session 12 - Advances in Optimization I

Chair: Randy Esposito

Vice Chair: Marianthi Ierapetritou

- 12a** **Parametric Mixed-Integer Linear Programming: the General Case**
Alexander Mitsos
Paul I. Barton
- 12b** **Uncertainty Analysis of Milp Problems**
Zhenya Jia
Marianthi Ierapetritou
- 12c** **Improving Mixed Integer Linear Programming Formulations**
Archana Khurana
Arul Sundaramoorthy
I.A. Karimi
- 12d** **Integrating Cutting Planes into Solution Methods for Non-Linear Disjunctive Programming Problems**
Nicolas W. Sawaya
Ignacio E. Grossmann

- 12e** **Interior Point Solution of Multilevel Qp Problems Arising in Embedded Mpc Formulations**
Christopher L. E. Swartz
Rhoda Baker
- 12f** **Mip in Agent Systems: Algorithmic Collaboration or the Lack Thereof**
John D. Siirola
Steinar Hauan
- 12g** **Efficient Optimization Algorithm for Large Scale Problems in Nonlinear Stochastic Programming**
Yogendra Shastri
Urmila Diwekar

Session 27 - Integrating Data, Knowledge Models and Tools

Chair: Gary K. Stenerson

Vice Chair: Larry Megan

- 27a** **A Holistic Approach for Modeling Information and Knowledge in Development and Operations of Chemical Processes**
Chunhua Zhao
Girish Joglekar
Ankur Jain
Venkat Venkatasubramanian
Gintaras Victor Reklaitis
- 27b** **Cape-Open and Simulis Thermodynamics Enable You to Use Rigorous Thermodynamics in Matlab**
Michel Pons
Alain Vacher
- 27c** **Informatics Implementation in Exxonmobil Chemical Company**
Robert J. Wittenbrink
- 27d** **Integrating Product and Process Design Activities with Grid Technologies**
Patrick Linke
Antonis C. Kokossis
Athanasios I Papadopoulos
- 27e** **Integrating R&D Data within and across Functions**
Ari Purcell
- 27f** **Integrating Data, Knowledge Models and Tools round-Table Discussion**
Gary K. Stenerson
- 27g** **Model Based Design of Structured Polymers Using the Reverse Design Approach**
Vipasha Soni
Jens Abildskov
Gunnar E. Jonsson
Rafiqul Gani
Nikos Ch. Karayiannis
Vlasis Mavrantzas

Session 57 - DPS: Theory, Reduction, Control, and Computational Methods

Chair: Constantinos Theodoropoulos

Vice Chair: Panagiotis D. Christofides

57a Actuator/Sensor Scheduling for Distributed Processes with Quantized Control Systems

Nael H. El-Farra

57b Boundary Predictive Control of Diffusion-Reaction Processes with State and Input Constraints

Stevan Dubljevic

Panagiotis D. Christofides

57c Transport Limited Pattern Formation in Catalytic Reactors

Rachana Agrawal

Vemuri Balakotaiah

David H. West

57d Extended Irreversible Thermodynamics (E.I.T.) for Chemical Reactor Stability Analysis

Dimitrios I. Gerogiorgis

B. Erik Ydstie

57e Model Reduction Based Optimization for Distributed Parameter Systems

Eduardo L. Ortiz

Constantinos Theodoropoulos

57f Robust Control of Inhomogeneous Patterns in Reaction-Diffusion Systems Using Reduced Order Models

Carlos Vilas

Miriam R. García

Julio R. Banga

Antonio A. Alonso

Session 58 - Data Analysis: Design, Algorithms & Applications

Chair: Santhoji Katare

58a Data-Driven Soft Sensor Design - Application to Cement Kiln

Bao Lin

Bodil Recke

Jørgen Knudsen

Sten Bay Jørgensen

58b Overcoming False Positives (Type-I Errors) While Monitoring of Transient Operations Using Principal Component Analysis

Yew Seng Ng

Rajagopalan Srinivasan

58c An Improved Methodology to Determine the Stochastic-Based Accuracy of Data Reconciliation-Based Estimators in Linear Systems

DuyQuang Nguyen

Miguel J. Bagajewicz

58d Hierarchical K-Means Clustering Using Principal Components to Solve the Unsupervised Multi-Class Classification Problem

Syed B. Mohiddin

James Rathman

Chihae Yang

- 58e** **A Mixed-Integer Programming Approach to Multi-Class Data Classification Problem**
Metin Turkey
Fadime Uney
- 58f** **Validation of a Model for a Biodiesel Production Process through Model-Based Experiment Design for Parameter Precision**
Gaia Franceschini
Sandro Macchietto
- 58g** **Hybrid Modeling and Multi-Objective Optimization of an Industrial Hydrocracker**
Naveen Bhutani
Ajay K. Ray
Gade P. Rangaiah

Session 64 - Future Directions in Systems and Control

Chair: Francis J Doyle III

Vice Chair: Jay H. Lee

- 64a** **A Framework for Integrating Model Predictive Controllers to Control Large-Scale Systems**
Aswin N. Venkat
James B. Rawlings
Stephen J. Wright
- 64b** **Engineering Negative Feedback Regulation in Cells**
Kang Wu
Christopher V. Rao
- 64c** **Approximate Dynamic Programming Based Strategy for Markov Decision Problems in Process Control and Scheduling**
Jay H. Lee
- 64d** **Integrating Finance and Control for Process Operations**
Jeffrey C. Kantor
- 64e** **Integrating Physics and Process Control**
B. Erik Ydstie
- 64f** **Control Structure Design: New Developments and Future Directions**
Vinay Kariwala
Sigurd Skogestad
- 64g** **A Global Optimization Approach to the Design of Stabilizing Controllers**
YoungJung Chang
Nick Sahinidis

Session 86 - The Smart Plant: Opportunities in Operations, Security, and the Environment

Chair: Jimmy L. Humphrey

Vice Chair: Sara Frangiamore

- 86a** **The Smart Plant - Fundamentals and Opportunities**
Jimmy L. Humphrey

- 86b** **Combining Environmental Systems with Automated Process Controls at the Plant Level**
Andy Srinivasan
Tim Aldredge
Jerry O'Brien
- 86c** **The Smart Plant - Industrial Perspectives on the Vision and a Reasonable Path to Achievement**
Jerry N. Gipson
- 86d** **Real Time Optimization of Industrial Gas Networks**
Larry Megan
Randy Esposito
- 86e** **Developing a Manufacturing Control System Cybersecurity Program: Case Study and Developing Standards**
Dave Mills

86f **Three round Table Discussions on the Smart Plant Focusing on (1) Plant Operations (2) Plant Security (3) the Environment. Participants Receive a Free Summary Report. a Preliminary List of Participants Follows. Walk-Ins Are Encouraged to Participate**

Jimmy L. Humphrey
Sara Frangiamore
Vince Grassi
James F. Davis
Tim Aldredge
Gary K. Stenerson
Jerry O'Brien
Andy Srinivasan
Jerry N. Gipson
Dave Mills
Karl Schnelle
Larry Megan
Jonathan G. Herrmann
William M. Barrett
Kuyen Li
Michel Pons
Glenn Gilkey
Niels Sopnel
David S. Dickey
Gautham Parthasarathy
Wendy Foslien
Fred Reeve
Ioannis (Yannis) P. Androulakis
Peter Dawson
John Brady
Larry Stanton
Steven King
Miguel J. Bagajewicz
Raymond L. Smith
Son Huynh
Paul Bryan
Tim Oppelt
Terry Whitley
Ed Holt
Dan Rozinski
Michael Crocker
Thomas Norman
Sjoerd Bosch

Session 89 - Validated Computing and Deterministic Global Optimization

Chair: Luke E. Achenie

Vice Chair: Kyle V. Camarda

89a **Deterministic Global Optimization: What Can We Compute and What Can We Guarantee?**

Angelo Lucia

89b **Global Optimization for Parameter Estimation in Dynamic Systems**

Youdong Lin
Mark A. Stadtherr

89c **Solving Large Nonconvex Models with a Deterministic Global Optimization Solver**

Chao-Yang (Tony) Gau
Linus E. Schrage

- 89d** **Computation of Equilibrium States and Bifurcations in Ecosystem Models Using Interval Analysis**
Courtney R. Gwaltney
Mark A. Stadtherr
- 89e** **Deterministic Global Optimization Techniques for Solution of Nlp and Minlp Problems Using Piecewise Linear Relaxations with Applications in Metabolic Engineering**
Pradeep K. Polisetty
Eberhard Voit
Edward P. Gatzke
- 89f** **Interval Analysis of Ode Systems with Parametric Uncertainty**
Amrit Prasad
Luke E. K. Achenie

Session 104 - Advances in IT for Process Operations

Chair: Ioannis (Yannis) P. Androulakis

Vice Chair: Matt H. Bassett

- 104a** **Issues in Using Wireless Devices in Industrial Control Systems**
Srivastava Namburi
Harigopal Raghavan
Jagadeesh Brahmajosyula
Ravindra Singh
- 104b** **An Integrated Environment for Support of Process Operations**
Pablo A. Rolandi
Jose A. Romagnoli
- 104c** **Analysis of Fluctuations of Lumped Kinetics in Reactors**
Wei-Yin Chen
- 104d** **A Novel Framework and Tool for Dynamic Simulation of Supply Chains**
Suresh Pitty Sivanandam
Rajagopalan Srinivasan
I.A. Karimi
- 104e** **From Discovery to Manufacturing: Recipe Life Cycle Management**
Girish Joglekar
Chunhua Zhao
Venkat Venkatasubramanian
Gintaras Victor Reklaitis
- 104f** **A Simulation-Based Optimization Approach to the Evolution of an Advanced Life Support System for Mars Base**
Selen Aydogan
Seza Orcun
Gary Blau
Joseph F. Pekny
Gintaras V. Reklaitis

Session 106 - Advances in Optimization II

Chair: Marianthi Ierapetritou

Vice Chair: Randy Esposito

- 106a Particle Swarm Optimization in Discontinuous Function Spaces**
Arun Giridhar
Balachandra B. Krishnamurthy
Rakesh Agrawal
Venkat Venkatasubramanian
- 106b A Block-Bordered Interior Point Approach for the Solution of Multiperiod Nonlinear Programs**
Carl D. Laird
Lorenz T. Biegler
- 106c Strong Valid Inequalities and a Branch-and-Cut Algorithm for a Scheduling Mip Model**
Christos T. Maravelias
- 106d Parameter Estimation for Stochastic Differential Models: Application to a Model of Polymer Rheology**
Bernardino Pereira Lo
Andrew J. Haslam
Claire S. J. Adjiman
- 106e Simultaneous Large-Scale Parameter Estimation in Tubular Polymerization Reactors**
Victor M. Zavala
Lorenz T. Biegler
- 106f Robust and Efficient Algorithm for Optimizing Crude Oil Operations**
J. Li
Wenkai Li
I.A. Karimi
R. Srinivasan
- 106g A Novel and Effective Integer Optimization Approach for the Nsf Panel Assignment Problem: a Multi-Resource and Preference-Constrained Generalized Assignment Problem**
Stacy L. Janak
Martin S. Taylor
Christodoulos A. Floudas
Maria K. Burka
T. J. Mountziaris

Session 125 - Knowledge Management and Organizational Learning

Chair: Vince Grassi

Vice Chair: Fred Reever

- 125a Benchmarking Best Practices in Integrating Knowledge Management and Organizational Learning**
Wesley C. Vestal
- 125b Creating Competitive Advantage through Knowledge Management**
Nancy K. Cundiff

- 125c** **Resolving the Paradoxes of Technology and Training through the Management of Applied Knowledge**
Grant Dawson
Roger Wolf
- 125d** **The Future Vision of Learning**
Keith A. Johnston
- 125e** **Learning and Knowledge Management - the Bottom-Line Connection**
Fred Reeve

Session 164 - Fuel Cell Modeling

Chair: Edward P. Gatzke

Vice Chair: Ioannis (Yannis) P. Androulakis

- 164a** **A Deterministic Model for PEM Fuel Cells: Analysis of Water Management**
Shaoduan Ou
Luke E. Achenie
- 164b** **Dynamic Modeling and Analysis of PEM Fuel Cells for Startup from Subfreezing Temperatures**
Arun Pandey
Arvind Raghunathan
Nikunj Gupta
Mallika Gummalla
Cynthia York
Sergei Burlatsky
- 164c** **Macrohomogenous Modeling of Sofc: Analysis of Dry Methane Fuel**
Mohamadkheir Alkhateeb
J. Robert Selman
Satish J. Parulekar
Said Al-Hallaj
- 164d** **Dynamic Modeling of PEM Fuel Cell Power Plant**
Guangyan ZHU
Sitaram Ramaswamy
Partha Seshadri
- 164e** **The Development and Application of Symbolic Solutions for Ac Impedance Response of Electrochemical Power Sources**
Vinten Diwakar
Kartik Potukuchi
Venkat Subramanian
- 164f** **Online Estimation of Ato (Anode Tail Gas Oxidation) Catalyst Reaction Rate Parameter for Fuel Cell System**
Xinqun Huang
Lealon L. Martin

Session 176 - New Approaches to Integrating Plant Operations and Control Systems

Chair: Jeremiah P. OBrien

Vice Chair: James F. Davis

- 176a** **Session Introduction by Jerry O'Brien and Jim Davis**
Jeremiah P. OBrien
James F. Davis
- 176b** **An Integrated Framework for Stiction Diagnosis and Compensation**
Ranganathan Srinivasan
Raghunathan Rengaswamy
- 176c** **An E-Science Environment for Computation-Intensive Fire Modeling, Simulation and Research Collaborations**
Dongil Peter Shin
Myong Nam Park
- 176d** **Assessment of Robustness, Redundancy and Efficiency of Process Networks for Reliable Process Operation and Mode Switching**
Suttipong Songprawat
Ali Cinar
Fouad Teymour
- 176e** **Supervisory Control of Process Transitions: Challenges & Opportunities**
Rajagopalan Srinivasan
Ng Yew Seng
- 176f** **High-Throughput Experimentation and Novel Product Development in Cyber-Infrastructure Environments**
A. Kokossis
Patrick Linke
- 176g** **Roundtable Discussion on Cyber Infrastructure, Plant Operations and Controls**
Jeremiah P. OBrien
James F. Davis

Session 177 - Nonlinear Dynamics and Pattern Formation

Chair: Duane T. Johnson

Vice Chair: Prodromos Daoutidis

- 177a** **Non-Linear Analysis of Electromigration-Induced Surface Waves on Voids in Metallic Thin Films**
Jaeseol Cho
M. Rauf Gungor
Dimitrios Maroudas
- 177b** **Elastic Instability of Cubic Crystals under High Hydrostatic Tension: Atomic Pattern Formation Leading to Structural Transformation or Failure**
Hadrian Djohari
Frederick Milstein
Dimitrios Maroudas

- 177c** **Micropatterning Chemical Oscillations: Waves, Autofocusing and Symmetry Breaking in a Purely Oscillatory System**
Kyle J.M. Bishop
Marcin Fialkowski
Bartosz A. Grzybowski
- 177d** **Determination of Electrochemical Parameters of Surface Confined Species: from Nonlinear Dynamics and Pattern Formation to Electron-Transfer Characteristics**
Costas A. Anastassiou
Kim H. Parker
Danny O'Hare
- 177e** **Local Dosing for the Control of Spatiotemporal Patterns**
Jochen Lauterbach
Noah McMillan
Scott Neifert
Christopher Snively
- 177f** **Astrocyte Signaling in the Presence of Spatial Inhomogeneities**
Michail Stamatakis
Nikos V. Mantzaris

Session 189 - Symposium Honoring CACHE Award Recipients (Invited Papers)

Chair: Phillip R. Westmoreland

Vice Chair: Peter T. Cummings

- 189a** **2005 Cache Award for Excellence in Computing in Chemical Engineering Education: David M. Himmelblau**
Thomas F. Edgar
- 189b** **Recognition of the 2005 Cache Award for Innovations in Computer-Based Chemical Engineering Education**
Peter T. Cummings
- 189c** **Highlights and Perspectives from the Inaugural Cache Conference on Foundations of Systems Biology in Engineering**
Francis J. Doyle
- 189d** **Preview of Cpc⁷, the 7th International Conference on Chemical Process Control**
Michael A. Henson
Thomas A. Badgwell
- 189e** **Preview of Fomms 2006, the Third Conference on Foundations of Molecular Modeling and Simulation**
Joseph T. Golab
- 189f** **Chemsep 5: Software for Distillation, Absorption, and Extraction Operations**
Ross Taylor
- 189g** **New Features of Polymath Software for Numerical Analysis**
Michael B. Cutlip
Mordechai Shacham

Session 203 - CAST Plenary Session (Invited Papers)

Chair: Michael F. Malone

Vice Chair: Lorenz T. Biegler

- 203a** **Analysis and Formulation of a Class of Complex Dynamic Optimization Problems**
Shivakumar Kameswaran
Lorenz T. Biegler
- 203b** **Semicontinuous Reactive Distillation for Specialty Chemical Production: Economic Comparison with Batch and Continuous Processing**
Thomas A. Adams
Warren D. Seider
- 203c** **A New Look at Competing Reversible Reactions Leading to Optimal Operating Policies**
Derek W. Griffin
Jeffrey D. Ward
Duncan A. Mellichamp
Michael F. Doherty
- 203d** **Analysis of Flow-Induced and Impurity-Induced Step-Bunching Instabilities during the Growth of Crystals from Liquid Solutions**
Bing Dai
Jeffrey J. Derby
- 203e** **Cyber Infrastructure from a National Perspective: Any Room Left in in the Middle?**
Sangtae Kim
Miriam Heller

Session 239 - Poster Session: Recent Developments in Applied Mathematics and Numerical Analysis

Chair: Ray Adomaitis

Vice Chair: Nikolas Kazantzis

- 239a** **Hierarchical Analysis of Chemical Process System: Modeling and Optimization of Large-Scale System**
Marthen Luther Doko Doko
- 239b** **Computer-Aided Modelling > the Locality Principle**
Heinz Preisig
- 239c** **Semi-Analytical Solutions for Elliptic Partial Differential Equations**
Vinten Diwakar
Kartik Potukuchi
Venkat Subramanian
- 239d** **Model Reduction, Estimation and Control of Multiscale Systems**
Vinay Prasad
- 239e** **Object Descriptive Modeling Environment for Simulations at Nanoscale**
Alex Y. Sinyagin
Nicholas Kotov

- 239f** **Landmine Detection in Granular Beds: Behavior of Cumulative Surface Kinetic Energy**
Saravanan Swaminathan
Donald P. Visco
Surajit Sen
- 239g** **Analyzing the Reaction Mechanisms at Supercritical Conditions through Bifurcation Theory**
Naveed Aslam
Sermin G. Sunol
Aydin Sunol
- 239h** **Kinetic Analysis of the Envelope Stress Response during the Temperature Induced Periplasmic Expression of Recombinant Streptokinase in Escherichia Coli**
Balaji Balagurunathan
Guhan Jayaraman
- 239i** **Analysis of Endocytic Sorting on Regulation of Exogenous Antigen Presentation**
Hong Shen
W. Mark Saltzman

Session 240 - Poster Session: Recent Developments in Computers in Operations and Information Processing

Chair: Miguel J. Bagajewicz

Vice Chair: Matt H. Bassett

- 240a** **Scheduling Chemical Transshipment Operations in Maritime Transportation**
Cheng Huang
I.A. Karimi
- 240b** **Optimal Supply Chain of Light Aromatic Compounds**
Chuei-Tin Chang
Dong-Hsiung Kuo
- 240c** **Heuristic Decomposition Methods for Complex Sequential Industrial Scheduling Problems**
Pedro Castro
Carlos Mendez
Ignacio E. Grossmann
Jiro Harjunoski
Marco Fahl
- 240d** **Improved Genetic Algorithms for Deterministic Optimization and Optimization under Uncertainty**
Weiyu Xu
Urmila Diwekar
- 240e** **Strategy for the Diagnosis of a Biological Nutrient Removal Plant Using Projection Methods**
Daniel Aguado
Manuel Zarzo
Aurora Seco
Jose Ferrer

- 240f** **Coordinating Production and Transport Scheduling in Scm through Rigorous and Heuristic-Based Methods**
Anna Bonfill
Carlos Mendez
Antonio Espuña
Luis Puigjaner
- 240g** **Optimising Fruit Cultivars Irrigation Via a Hierarchical Partitioning Method**
C. Esther Van Cauwenberghe
J. Alberto Bandoni
- 240h** **Probability Model-Based Analysis of Tumor Vasculature Data**
Babatunde A. Ogunnaike
Claudio A. Gelmi
Amos Folarin
Sylvia Nagl
Moritz A. Konerding
- 240i** **Strategic Investment Planning in the Pulp and Paper Industry Using Mixed Integer Linear Programming**
Jerker Björkqvist
Janne Roslöf
- 240j** **Production Planning and Scheduling Practices in the Pharmaceutical and Specialty Chemical Industries**
Demetri P. Petrides
Charles Siletti
- 240k** **Web-Based Integrated Modeling for the Safety, Health, and Environment Management in Chemical Process**
Kyoungsoon Han
Sung Joon Ahn
Ku Hwoi Kim
Dongil Peter Shin
En Sup Yoon
- 240m** **A Study of Differential Evolution and Tabu Search for Benchmark and Phase Stability Problems**
Srinivas Mekapati
Gade P. Rangaiah
- 240n** **Developments in Computer-Aided Modelling**
Heinz Preisig
- 240o** **Automata as Fault-Detection Algorithms**
Heinz Preisig
- 240p** **Optimal Scheduling of Tanker Lightering Operations**
Cheng Huang
I.A. Karimi
- 240q** **Optimum Waste Interception with Energy Integration Targets**
Ahmad A. Hamad

- 240r** **Crystal Structure Determination from X-Ray Diffraction Data Using Triplet and Quartet Invariants**
Alexander B. Smith
Nick Sahinidis
- 240s** **Towards a Novel Optimisation Approach with Simultaneous Knowledge Acquisition for Distributed Computing Environments**
Patrick Linke
Antonios C Kokossis
Siyu Yang
- 240t** **Optimized Routing Methodology for Hazardous Materials Transportation**
Yuanhua QIAO
Mahmoud El-Halwagi
M. Sam Mannan
- 240u** **Symbolic Regression for Synthesis of Local Thermo-Physical Models**
Ying Zhang
Aydin Sunol
- 240v** **Optimal Design of Batch-Storage Network under Random Failures and Waste Treatment Processes**
Gyeongbeom Yi
Gintaras Victor Reklaitis
- 240w** **Development of a Feasibility Index for Bioprocess under Uncertainty**
Hyunkee Kim
Josh M. P. King
Nigel J. Titchener-Hooker
Yuhong Zhou
- 240x** **The Role of Wavelet Denoising in Improving Reconciliation and Interpretation in Plant Performance Analysis**
Patrick R. Hinkle
Dr. Colin S. Howat

Session 241 - Poster Session: Recent Developments in Information Technology

Chair: James F. Davis

- 241a** **Smart Enterprises: Integrated Environment for Hybrid Data-Driven/Model-Centric Support of Manufacturing Operations**
Pablo A. Rolandi
Jose A. Romagnoli
- 241b** **Advanced Computing for Chemical Plant Security Assessment**
Cristina Piluso
Korkut Uygun
Yinlun Huang
- 241c** **Solar: a Tool for Early Runaway Detection**
Helen H. Lou
Hima Bindu Pichika
- 241d** **Agent-Enabled Tools for the Dynamic Data Management in Chemical Process Operations**
Gao Ying
Antonios Kokossis

241e **The Smart Flow-Chart: Next Generation Access to Chemical Engineering Models, Data and Knowledge**
Gao Ying
Antonis C. Kokossis
Zhigang Shang

Session 242 - Poster Session: Recent Developments in Systems and Process Control

Chair: Richard D. Braatz

Vice Chair: Kenneth R. Muske

242a **Fuzzy Diagnosis Method for Process Systems with Coupled Loops**
Chuei-Tin Chang
Jung-Yang Chen

242b **Combined Data Reconciliation and Parameter Estimation**
Xuan-Tien Doan
Boon Sim Thian
Yen Yen Joe
Arthur Tay

242c **Stability of Equilibrium Staged Reactive Systems**
Yuan Xu
B. Erik Ydstie
Steinar Hauan

242d **Performance Assessment for Completely Unknown Siso and Mimo Systems Based on Gain and Phase Margins Using Modified Relay Feedback**
Jyh-Cheng Jeng
Hsiao-Ping Huang

242e **Distributed Partially Adaptive Data Reconciliation with Intelligent Sensor Network**
Yen Yen Joe
Zhong Qiang Ding
Keck Voon Ling
Jose A. Romagnoli

242f **A Novel Procedure for Oscillation Detection and Characterization of Oscillation in Control Loops**
Ranganathan Srinivasan
Raghunathan Rengaswamy

242g **Fault-Tolerant Control of Nonlinear Process Systems: Performance-Based Reconfiguration and Robustness**
Prashant Mhaskar
Adiwinata Gani
Panagiotis D. Christofides

242h **A Parametric Approach to Moving Horizon Constrained State Estimation**
Mark L. Darby
Michael Nikolaou

- 242i** **Estimation in Nonlinear Dynamic Systems Via Monte Carlo Sampling Versus Moving Horizon Estimation – Complementary or Competitive?**
Lixin Lang
Xiuyun Zhang
Bhavik R. Bakshi
Prem K. Goel
- 242j** **Quadratically Convergent Methods for Solving Quadratic Programs**
Benjamin J. Davis
Vasilios Manousiouthakis
- 242k** **Optimization-Based Design of Plant-Friendly Input Signals for Data-Centric Estimation and Control**
Daniel E. Rivera
Hyunjin Lee
Hans D. Mittelmann
Gautam Pendse
- 242l** **An Hybrid System for Robust and Transparent Process Fault Diagnosis**
Ignacio Yélamos
Estanislao Musulin
Luis Puigjaner
- 242m** **Practical Strategies for Using Signal Filters with Available Industrial Controllers**
Jeffrey Arbogast
Douglas Cooper
Robert Rice
- 242n** **Continuous-Time Block-Oriented Adaptive on-Line Modeling for Time Varying Systems**
Derrick Rollins
Stephanie Loveland
- 242o** **Control Structure Synthesis for Reactive Distillation Columns: a Methyl Acetate Case Study**
Nitin Kaistha
MV Pavan Kumar
- 242p** **Steady State Modeling of Reactive Distillation Using Homotopy Continuation**
Nitin Kaistha
MV Pavan Kumar
- 242q** **Predictive Control of Blood Glucose Concentration in Type I Diabetic Patients in Presence of Unmeasured Disturbances Using Identified Models**
Srinivas Karra

Session 243 - Poster Session: Recent Developments in Systems and Process Design

Chair: Gavin P. Towler

Vice Chair: Marianthi Ierapetritou

- 243a** **An Efficient Method for Computing Diffusivities in Polymer Nanocomposites**
Lakshmi Sridhar
Rakesh Gupta
Mohit Bharadwaj
GERARDO RUIZ
Luz Diaz

- 243b** **Multi-Objective Optimization of Membrane Reactor for Hydrogen Production**
Weifang Yu
Takao Ohmori
Takuji Yamamoto
Akira Endo
Masaru Nakaiwa
Naotsugu Itoh
- 243c** **Process Chemistry and Design Alternatives for Recovery of Dilute Acetic Acid through Esterification in Reactive Distillation**
Wan-Jen Hung
I-Kuan Lai
Hsiao-Ping Huang
Cheng-Ching Yu
Shih-Bo Hung
Min-Jer Lee
- 243d** **Optimum Design of Ethyl Acrylate Process with Coupled Reactor/Columns Configuration**
I-Lung Chien
Chien-Lin Kuo
- 243e** **Finding Exact Separation Boundaries in Chemically Reacting Systems**
Ross Taylor
Amanda Miller
Angelo Lucia
- 243f** **A Flexible Framework for Optimal Biorefinery Product Allocation**
Norman E. Sammons
Harry T. Cullinan
Mario R. Eden
- 243g** **Design of Industrial-Scale Crystallizers to Include the Effects of Macromixing and Micromixing on the Crystal Size Distribution**
Xing Yi Woo
Reginald B. H. Tan
Richard D. Braatz
- 243h** **Phenomena-Based Topological Representation of Chemical Processes**
Jorge A. Arizmendi-Sanchez
Paul N. Sharratt
Kevin Wall
- 243i** **Optimization under Uncertainty Applied to Optical Fiber and Pultrusion Processes**
Charles Acquah
Andryas Mawardi
Feng Zhang
Luke E. Achenie
Ranga Pitchumani
Eugene Santos
- 243j** **Steady State Multiplicity Analysis of Reaction-Separation Sequences for Deep Hydrodesulfurization of Diesel**
J. Carlos Cárdenas
Eduardo S. Pérez-Cisneros
Teresa López-Arenas

- 243k** **Investigating Reduce-Reuse-Recycle Strategies for Condensation Reactions**
Brian Cook
Manish Misra
- 243l** **Effect of Design Constraints on the Energy Efficiency of Multi-Effect Evaporative Crystallization Process**
Ken-Ichiro Sotowa
Katsuki Kusakabe
- 243m** **Combining Molecular and Chemical Process Simulation Using Step Potential Equilibria and Dynamics (Spead)**
Amanda D. Sans
Zeynep N. Gerek
Richard Elliott
- 243n** **A Simultaneous Model for Men Retrofit**
Cheng-Liang CHEN
Ping-Sung Hung
Ying-Jyuan Ciou
- 243o** **Conceptual Screening of Reactive Separation Process Options Using Aggregated Process Models**
Patrick Linke
Daniel Montolio-Rodriguez
- 243p** **Efficient Procedure for Estimating Process Design Reliability Coupled to Commercial Process Simulator**
Elim R. Myers
Colin S. Howat
- 243q** **Process Synthesis Using the Exergy Load Distribution Method**
A. Alarcón-García
R. Chavela-Guerra
L.G. Ríos-Casas
E. Mateos-Espejel
- 243r** **Combining Group Contribution and Property Clustering Techniques for Visual Solution of Process and Molecular Design Problems**
Fadwa T. Eljack
Mario R. Eden
Vasiliki Kazantzi
Mahmoud El-Halwagi
- 243s** **Simulation-Aided Optimization of Voc Recovery Using Condensation**
Ahmad A. Hamad
- 243t** **On Dimensionality of the Ar Construction**
Wen Zhou
Vasilios I. Manousiouthakis
- 243u** **Structured Phenomena-Based Modelling of Chemical Processes: a Pse Point of View to Support Innovative Process Design**
Jorge A. Arizmendi-Sanchez
Paul N. Sharratt

243v Impulse - Integrated Multiscale Process Units with Locally Structured Elements

Marcel A. Liauw

243w The Dynamic Modeling Framework for the Microbial Fuel Cell with Metabolic Flux Analysis and the Electrochemical Pemfc Model

Wonjun Park

Hyun Uk Kim

Il Moon

Session 314 - Dynamics and Control of Fuel Cell Systems I

Chair: Donald J. Chmielewski

Vice Chair: Mithun Kamat

314a Dynamics and Control of Phosphoric Acid Stationary Fuel Cell Power Plant

Mithun Kamat

Pete Foley

Paul Margiott

314b Sensor and Online Diagnostic Needs in Automotive Fuel Cells

Manish Sinha

314c Control Configuration Selection for Fuel Cell Stack Systems

Masoud Soroush

Yossef A. Elabd

314d Dynamic Operation of a 1.2 Kw PEM Fuel Cell

Benjamin J. Davis

Vasilios Manousiouthakis

314e Study of Dynamic Interactions of Various Phenomena in Proton Exchange Membrane Fuel Cells (Pemfc) Using Detailed Models for Multivariable Control

R. Madhusudana Rao

Raghunathan Rengaswamy

314f Optimal off-Line Trajectory Planning for Load Ramping of Hybrid Fuel Cell/Gas Turbine Power Generating Plants

Shivakumar Kameswaran

Daeho Ko

Lorenz T. Biegler

S. Tobias Junker

Hossein Ghezel-Ayagh

314g Power Control of a Polymer Electrolyte Membrane Fuel Cell

Donald J. Chmielewski

Kevin Lauzze

Session 316 - Emerging Cyber Infrastructure Trends and Capabilities

Chair: James F. Davis

Vice Chair: Maria K. Burka

316a Session Introduction by Jim Davis and Maria Burka

James F. Davis

Maria K. Burka

- 316b** **The National View of Cyber Infrastructure**
Sangtae Kim
Miriam Heller
- 316c** **Cyberinfrastructure Trends and the Influence on Engineering Research:**
Stanley Ahalt
- 316d** **An Ontology-Based Platform for the Systematic Management and Analysis of Chemical Engineering Knowledge**
Antonios Kokossis
Alexandros Kourakis
- 316e** **Cyberinfrastructure for Supporting the Development of Computational Models for Enterprise-Wide Optimization**
Ignacio E. Grossmann
- 316f** **Opportunities for Cyberinfrastructure Funding in Nsf's Engineering Directorate**
Maria K. Burka
- 316g** **Roundtable Discussion**
Maria K. Burka
James F. Davis

Session 320 - Fault Detection and Diagnosis I

Chair: Rajagopalan Srinivasan

Vice Chair: Leo H. Chiang

- 320a** **Industrial Implementation of on-Line Multivariate Quality Control**
Leo H. Chiang
Lloyd Colegrove
- 320b** **Multivariate Approaches for the Diagnosis of a Batch Chemical Process**
Manuel Zarzo
Alberto Ferrer
- 320c** **A Curve Fitting Method for Detecting Valve Stiction in Oscillating Control Loops**
Q. Peter He
Jin Wang
Martin Pottmann
S. Joe Qin
- 320d** **On-Line and off-Line Fault Detection and Diagnosis in Fed-Batch Fermentation**
Jon C. Gunther
Dale E. Seborg
- 320e** **Monitoring and Fault Detection of Catalytic Automotive Emission Control Systems**
Kenneth R. Muske
James C. Peyton Jones
Imad H. Makki
- 320f** **Augmented Dynamic Pca Approach for Online Monitoring of Multi-Stage Batch Processes**
Xuan-Tien Doan
Rajagopalan Srinivasan

320g Statistical Inference Methods for MIMO Control Performance Monitoring

*Jie Yu
S. Joe Qin*

Session 358 - Industrial Innovation in Process Design and Operations

Chair: Gautham Parthasarathy

Vice Chair: Gerhard Schembecker

358a Trayheart - Professional Hydraulic Column Design

*Andreas Wild
Volker Engel*

358b Optimization of Multiple Effect Distillation with Reduced Production Rates

*Katherine A. Schaperjahn
Edward P. Gatzke*

358c Innovative Process Flowschemes Using Advanced Fractionation Techniques

*Michael A. Schultz
Dennis E O'Brien*

358d Three-Dimensional Steady State Multiphysics CFD Modeling of a Novel Aluminium Reactor

*Dimitrios I. Gerogiorgis
B. Erik Ydstie*

358e Feasibility Studies on Complex Batch Reactive Distillation

*James Chin
JaeHoon Choe
Jae W. Lee*

Session 374 - Sensors and Sensor Networks in Operations and Control

Chair: Karlene A. Hoo

Vice Chair: Deepak Srinivasagupta

374a Real-Time Characterization of Ysz Film during Chemical Vapor Deposition Using an Extended Kalman Filter Based Soft Sensor

*Rentian Xiong
Martha Gallivan*

374b Optimal Sensor Placement for Water Distribution Network Security

*Yogendra Shastri
Urmila Diwekar*

374c A Federated Sensor Network Architecture for Data Rectification and Process Monitoring

*Yen Yen Joe
Zhong Qiang Ding
Keck Voon Ling
Jose A. Romagnoli*

374d Development of a Utility Function for Sensor Networks from a Fault Diagnosis Perspective

*Sridharakumar Narasimhan
Raghunathan Rengaswamy*

374e On a New Rigorous Methodology for Instrumentation Network Design

*Miguel J. Bagajewicz
Mayur Gala*

374f **Fault-Tolerant Control of Nonlinear Process Systems: Handling Sensor Malfunctions**

*Charles McFall
Adiwinata Gani
Prashant Mhaskar
Panagiotis D. Christofides
James F. Davis*

374g **Optimal Actuator Placement for Transport-Reaction Process Systems
Employing Spatial Controllability**

*Antonios Armaou
Michael Demetriou*

Session 375 - Simulation and Control of Electronic Materials Manufacturing Systems

Chair: Antonios Armaou

Vice Chair: Edmund G. Seebauer

375a **Using High Fidelity Simulation in the Design of Experiments for Optimizing Etch Uniformity
in Plasma Etching Reactors**

*Nirmal Tatavalli Mittadar
Demetre J. Economou
Michael Nikolaou
Jingang Yi
Simon McClatchie
Puneet Yadav
Andrew D. Bailey III*

375b **Application of a Geometrically-Based Uniformity Criterion for Film Uniformity Optimization in
a Planetary Gallium Nitride Cvd System**

*Rinku P. Parikh
Raymond A. Adomaitis*

375c **Effects of Sampling Rate, Metrology Delay and Process Hold on the Stability
of Run-to-Run Control**

*An-Jhih Su
Cheng-Ching Yu
Babatunde A. Ogunnaike*

375d **A New Bayesian Approach for Improved State Estimation in Semiconductor
Manufacturing Processes**

*Jin Wang
Q. Peter He*

375e **PIs Based Run-to-Run Controller**

*Junghui Chen
Fan Wang*

Session 379 - Systems Engineering Approaches in Biology

Chair: Victor R. Vasquez

Vice Chair: Scott Banta

- 379a Identifying the Interacting Positions of a Protein Using Boolean Learning and Support Vector Machines**
Anshul Dubey
Bernard Loo
Matthew J. Reaff
Jay H. Lee
Andreas S. Bommarius
- 379b Discovery and Analysis of Biological Control Laws**
Jamey D. Young
Doraiswami Ramkrishna
- 379c Ultrasensitivity in Genetic Networks Is a Key Requirement for Noise Mitigation**
Vinay Bavdekar
K.V. Venkatesh
Sharad Bhartiya
- 379d Optimization-Based Strategies for the Systematic Analysis and Therapeutic Disruption of Signal Transduction Networks**
Madhukar S. Dasika
Anthony P. Burgard
Costas D. Maranas
- 379e Boundary Value Formulation for the Sensitivity Analysis of Biological Oscillators with Application to the Circadian Oscillator**
A. Katharina Wilkins
Bruce Tidor
Paul I. Barton
- 379f Discovery of Cerebral Transport and Metabolic Reaction Properties by Problem Inversion**
Libin Zhang
MahadevaBharath R. Somayaji
Michalis Xenos
Andreas A. Linninger
- 379g Parameter Estimation in Yeast Fermentation**
Juan J. Arrieta-Camacho
Ricardo Pérez-Correa
Lorenz T. Biegler
- 379h An Optimization-Based Method for the Design of Robust Synthetic Switches in Biological Networks**
Nael H. El-Farra

Session 387 - Advances in Process Control

Chair: B. Wayne Bequette

Vice Chair: Michael Nikolaou

- 387a** **On Identification and Control of Reactive Extrusion Processes**
Swapnil C. Garge
Mark D. Wetzel
Babatunde A. Ogunnaike
- 387b** **Parameter Estimation and Output Feedback Nonlinear Model Predictive Control of an Industrial Batch Polymerization System**
Zoltan K. Nagy
Ruediger Franke
Bernd Mahn
F. Allgoewer
- 387c** **Optimal Projection of Nonlinear Volterra Models Onto the Laguerre Basis**
Abhishek S. Soni
Robert S. Parker
- 387d** **A Hidden Markov Model Based Approach to Process Identification and Estimation**
Wee Chin Wong
Jay H. Lee
- 387e** **Explicit Parametric Controller for a Batch Polymerization System**
Mariano Asteasuain
Konstantinos Kouramas
Vassilis Sakizlis
Efstratios N. Pistikopoulos
- 387f** **Global Solution of Nonlinear Optimal Control Problems**
Yue Chen
Vasilios Manousiouthakis
- 387g** **Active Disturbance Rejection Control (Adrc) - Application to Nonlinear Cstr**
Zhongzhou Chen
Sridhar Ungarala
Zhiqiang Gao

Session 397 - Dynamic Simulation and Optimization

Chair: Vipin Gopal

Vice Chair: Prasenjeet Ghosh

- 397a** **Order Reduction of a Large-Scale Index-2 Dae Model**
John D. Hedengren
Thomas F. Edgar
- 397b** **Dynamic Analysis and Controllability Issues in Reactive Distillation Columns**
Teresa Lopez-Arenas
Eduardo S. Perez-Cisneros
Rafiqul Gani
- 397c** **Constructing Tight Convex/Concave Relaxations of the Solutions of Parameter-Dependent Nonlinear Odes**
Benoit Chachuat
Paul I. Barton

397d Ant-Colony-System-Based Dynamic Optimization

*Jie Xiao
Yinlun Huang*

397e Dynamic Oil and Gas Production Systems Simulation and Optimization

*Dimitrios I. Gerogiorgis
Efstratios N. Pistikopoulos*

397f Reducing on-Line Computational Requirement for Real-Time Dynamic Optimization of a Nonlinear Integrated Plant

*Thidarat Tosukhowong
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*Michael Nikolaou
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Chair: Annette A. Johnston

Vice Chair: Subbarao Varigonda

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*Bharat Bhushan
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402b Fault-Tolerant Control of a Polyethylene Reactor

*Adiwinata Gani
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402c An Intelligent Pca Approach for on-Line Fault Isolation

*jun Liu
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402d Multi-Scale Fisher Discriminant Analysis

*Rudramurty Balla
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402e Nonlinear Diagonal Unknown Input Observers for Fault Diagnosis

*Pramod Vachhani
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402f Monitoring and Fault Diagnosis by Multivariate Statistical Methods in Chemical Processes

*Ridvan BERBER
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402g Probabilistic Sensor Fault Detection and Identification in Distributed Parameter Systems

*Swa Metta
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Chair: Christos Maravelias

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William L. Luyben

445b Qualitative Frameworks for Early Stage Process Design

*Paul N. Sharratt
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445c Finding Exact Separation Boundaries in Synthesis and Design

*Angelo Lucia
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445d Optimal Configuration, Design and Operation of Hybrid Batch Distillation/Pervaporation Processes

*Tajalasia M. Barakat
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445e Application of Primal-Dual Iteration to the Solution of Process Network Synthesis Problems

*Benjamin J. Davis
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445f Formulation of Search Spaces for Separation Networks

*Arun Giridhar
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*Naveed Aslam
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Chair: Ali Cinar

Vice Chair: Panagiotis D. Christofides

454a Agent-Based Control of Spatially Distributed Chemical Reactor Networks

*Eric Tatara
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454b Process Networks with Chemical Engineering Applications

*Kendell R. Jillson
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- 454c** **Multiphase Reaction Network Synthesis by the Ideas Approach**
Wen Zhou
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- 454d** **Network Analysis of Industrial and Ecological Systems and Its Implications to Sustainable Engineering**
Bhavik R. Bakshi
Nandan U. Ukidwe
- 454e** **Robustness of Networks in Particle Swarm Optimization**
Balachandra B. Krishnamurthy
Arun Giridhar
Priyan Patkar
Chunhua Zhao
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Michael Baldea
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- 454g** **Failure Analysis in Networked Process Control Systems with Control and Communication Constraints**
Nael H. El-Farra

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Chair: Michael A. Henson

Vice Chair: Mayuresh V. Kothare

- 469a** **Output-Feedback Nonlinear Model Predictive Control for Chemical Processes without the Need of Fast Observers**
Rolf Findeisen
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- 469b** **Approximate Dynamic Programming Based Strategy for Optimal Blending of Linear Model Predictive Controllers**
Jong Min Lee
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- 469c** **Static Anti-Windup Controller Synthesis Using Simulations Convex Design**
Pradeep Y. Tiwari
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- 469d** **A Thermodynamic Approach to the Stability of Equilibrium Mass Transfer Units and Multi-Stage Distillation Columns**
Luis T. Antelo
B. Erik Ydstie
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Sridhar Ungarala
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- 469f** **Nonlinear Mpc Using Multi-Parametric Nonlinear Programming Solutions**
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*Chuili Sun
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Chair: Shinji Hasebe

Vice Chair: Kevin C. Furman

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*Hong-Choon Oh
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*Mariana Badell
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477c **Optimal Operation of Semiconductor Manufacturing Supply Chains under Uncertainty Using Simulation-Based Optimization**

*Jay D. Schwartz
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477d **Approximate Dynamic Programming for Stochastic Inventory Control of Refinery Supply Chains**

*Jing Wei
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477e **Information Sharing in a Distributed Enterprise: Impact on Supply Chain Performance**

*Israel B. Owusu
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477f **A Model-Based Risk Management Strategy for Distributed Supply Chains**

*Arief Adhitya
Rajagopalan Srinivasan
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*Jose M. Pinto
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Chair: Yinlun Huang

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*Nikolaose Pratikakis
Tamir A. Hegazy
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- 496b** **Using Dynamic Flexibility Analysis to Integrate Design and Control under Uncertainty**
Andres Malcolm
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- 496c** **Improved Procedure for Estimating Process Design Reliability**
Elim R. Myers
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Bora Tarhan
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- 496e** **Generate Pareto Optimal Solutions for Scheduling Problems under Uncertainty Using Normal Boundary Intersection Technique**
Zhenya Jia
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- 496f** **Monitoring the Performance of Lp Optimization with Uncertain Parameters**
Thomas E. Marlin
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- 496g** **Managing Technological Risk in Process Design Using Detailed Models**
Rodrigo F. Blanco Gutierrez
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Chair: Donald J. Chmielewski

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- 497a** **Optimal Start-up of Micro Power Generation Processes Employing Fuel Cells**
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Alexander Mitsos
Paul I. Barton
- 497b** **Optimizing Model Complexity for System Level Models of Fuel Cell Power Systems**
karthik Subramanyan
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- 497c** **Study of Proton Exchange Membrane Fuel Cells (Pemfc) Using Detailed Models for Electrode Structure Optimization**
R. Madhusudana Rao
Raghunathan Rengaswamy
- 497d** **Optimal Heat Exchanger Network Design for Rapid Start-up Operation of Fuel Cell Systems**
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- 497e** **Simplifying PEM Fuel Cell Models without Compromising on Accuracy**
Vinten Diwakar
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497f Sustainable Power Measurement for a Microbial Fuel Cell

*Joseph Anthony Menicucci
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Enrico Marsili
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Chair: Edward P. Gatzke

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498a Predictive Control of Particulate Processes with Actuator/Sensor Faults

*Adiwinata Gani
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498b Liquid-Phase Synthesis of Nanoparticles: Particle Size Distribution Dynamics and Control

Nikos V. Mantzaris

498c Passivity Based Inventory Control of Particulate Systems

*Christy M. White
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498d Similarity Solution Existence Maps for Binary Rate Processes in Population Balances

*R. Bertrum Diemer
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498e Effects of More Realistic Single-Particle Rate Laws in the Eulerian Population-Balance Equation; Two Further Examples ('Growth' and Sintering)

*Daniel E. Rosner
Mauricio Zurita-Gotor*

498f Multi-Rate Model Predictive Control of Particle Size Distribution in an Emulsion Copolymerization Reactor

*Mustafa T. Dokucu
Myung-June Park
Francis J. Doyle III*

498g On the Numerical Solution of Bi-Variate Population Balance Equations under the Combined Action of Nucleation, Growth and Aggregation Mechanisms

*Aleck Alexopoulos
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Chair: S. Joe Qin

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520a Simpca with Modified Instrumental Variable to Improve Estimation Accuracy

*Jin Wang
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- 520b** **An Integrated Methodology for Plant-Friendly Input Signal Design and Control-Relevant Estimation of Highly Interactive Processes**
Hyunjin Lee
Daniel E. Rivera
- 520c** **Bayesian Latent Variable Regression of High Dimensional Data with Applications to Process Identification**
Hongshu Chen
Bhavik R. Bakshi
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- 520d** **Model Maintenance for Industrial Process Control**
Jinendra K. Gugaliya
Sachin C. Patwardhan
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- 520e** **Generic Procedure for Data-Driven Predictive Modelling for Control - Exemplified on a Cement Kiln**
Bao Lin
Bodil Recke
Torsten Vagn Jensen
Jørgen Knudsen
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- 520f** **Optimal Input Design for Identification of Nonlinear Systems**
Sridharakumar Narasimhan
Raghunathan Rengaswamy
- 520g** **Blind Identification for the Detection and Estimation of Valve Stiction**
Clare B. Schoene
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Chair: Vivek Julka

Vice Chair: Julie Zarraga

- 522a** **Modeling of Active Ingredient Loading in Microparticle Controlled-Delivery Systems**
Irene Kouskoumvekaki
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- 522b** **Morphological Considerations in Solvent Design for Ibuprofen**
Arunprakash T. Karunanithi
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- 522c** **Use of Pricing and Customer Satisfaction Measures in Consumer Product Design**
Miguel J. Bagajewicz
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522d Integrated Synthesis of Optimal Processes and Molecules for Solvent-Based Systems

*Patrick Linke
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522e A Computer-Aided Methodology for Solvent Selection for Reactions: Robust Design Formulation

*Milica Folic
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522f An Integrated Framework for the Computer-Aided Design of Engineering Rubbers

*Shivani Syal
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522g Visual Solution of Process and Molecular Design Problems by Combining Group Contribution and Property Clustering Techniques

*Fadwa T. Eljack
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Chair: Martha Gallivan

Vice Chair: Antonios Armaou

539a Distribution Dynamics of Complex Systems

*Young-Pyo Jeon
Benjamin J. McCoy*

539b A Mechanistic Model Describing Cooperative Calcium Dynamics

*Pauline Contou-Carrere
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539c Identification of Catalytic or Metabolic Pathways: a Graph-Theoretic Approach

*Shahram R. Shafie
L. T. Fan
Botond Bertok
Ferenc Friedler
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S.Y. Lee*

539d Sensitivity and Bifurcation Analysis of the Metabolism of *Escherichia Coli* at Optimal Enzyme Levels

*Francisco G. Vital-Lopez
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539e A Multi-Layer, Multi-Dimensional Framework for Modeling Tumor Growth

*Jia Li
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539f Emergence of Hierarchy in Foodwebs: a Paradigm for Efficient Transportation Networks

*Leaelaf M. Hailemariam
Arun V. Giridhar
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539g Structure and Evolution of Organic Chemistry

*Kyle J.M. Bishop
Marcin Fialkowski
Christopher J. Campbell
Bartosz A. Grzybowski*

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Chair: Urmila Diwekar

Vice Chair: Deepak Srinivasagupta

540a Traci Version 2.0 Increases Scientific Defensibility within Sustainability Metrics

Jane Bare

540b Global Optimization for the Synthesis of Integrated Water Systems in Chemical Processes

*Ramkumar Karuppiah
Ignacio E. Grossmann*

540c Sustainable Drug Manufacturing Planning under Different Regulatory Scenarios

*Andres Malcolm
Libing Zhang
Andreas A. Linninger*

540d Design of Sustainable Chemical Processes: Systematic Retrofit Analysis and Generation & Evaluation of Alternatives

*Ana I. C. S. G. Carvalho
Rafiqul Gani
Henrique A. S. Matos*

540e Simultaneous Process and Molecular Design through Property Integration for Sustainable Development

*Vasiliki Kazantzi
Xiaoyun Qin
Jagdish Rao
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540f Thermodynamics-Based Design of H₂ Storage in Clathrates

*Prasad Yedlapalli
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Chair: Lealon L. Martin

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541a Hybrid Process Design-Analysis in Pharmaceutical and Biochemical Industry

*Piotr Tomasz Mitkowski
Rafiqul Gani
Gunnar E. Jonsson*

- 541b** **A Systematic Approach for Automated Reaction Network Generation**
Shuo-Huan Hsu
Balachandra B. Krishnamurthy
Prathima Rao
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- 541c** **Application of State Space Modeling Techniques to Biological Systems**
Anthony B. D. Samuels
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Murni M. Ahmad
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- 541e** **Modeling Uncertainty Analysis in Distributed Systems**
Libin Zhang
Kedar Kulkarni
Andres Malcolm
Andreas A. Linninger
- 541f** **Application of Optimal Control Theory for Sustainable Ecosystem Management**
Yogendra Shastri
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Chair: Simone L Kothare

Vice Chair: Derrick Rollins

- 553a** **A Decomposition Approach for the Global Optimization of Linear Hybrid Systems**
Paul I. Barton
Cha Kun Lee
- 553b** **Hybrid System Framework for State Estimation in Systems with Wireless Devices**
Mohammad Emtiyaz Khan
Harigopal Raghavan
Jagadeesh Brahmajosyula
Santosh Kumar
Shankar Narasimhan
- 553c** **Control of Nonlinear Hybrid Systems Using Multiple Mid Models**
Nareshkumar N. Nandola
Sharad Bhartiya
- 553d** **An Optimization Based Approach for Stability Analysis of Nonlinear Model Predictive Controller**
Vivek Dua
- 553e** **Lyapunov-Based Predictive Control of Hybrid Systems**
Prashant Mhaskar
Nael H. El-Farra
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*Panagiotis D. Christofides
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553g Fault-Tolerant Process Control: Nonlinear Fdi and Reconfiguration

*Charles McFall
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Chair: Masoud Soroush

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557a Model Predictive Control of Weight-on-Bit near Its Optimum in Hydrocarbon Well Drilling: the Value of Constraints

*Ankur Awasthi
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557b Evaluation of Criteria for Selecting Temperature Control Trays in Distillation Columns

William L. Luyben

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*Dário A. F. Luís
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557d Control Loop Pairing Using Dynamic Performance

*Tom E. Marlin
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557e An Advanced Model for Optimal Operation of Emulsion Terpolymerization Processes: Application to Styrene/Mma/Ma

*M. H. Srouf
V. G. Gomes
J.A. Romagnoli*

557f Evaluation of a Two-Temperature Control Structure for a Two-Reactant/Two-Product Type of Reactive Distillation Column

*Devrim B. Kaymak
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*Mehmet Mercangöz
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Chair: Steinar Hauan

Vice Chair: Mayuresh V. Kothare

- 570a** **A Design and Operation Methodology for Man-Portable Power Generation**
Alexander Mitsos
Benoit Chachuat
Paul I. Barton
- 570b** **Data-Based and Model-Based Blockage Diagnosis Systems for Stacked Micro Chemical Plants**
Manabu Kano
Toku Fujioka
Osamu Tonomura
Shinji Hasebe
- 570c** **A Touch Mode Capacitance Type Injector Valve for a Microscale Gas Chromatography System**
Byunghoon Bae
Jea-Hyeong Han
Richard I. Masel
Mark A. Shannon
- 570d** **Towards a Co-Design Implementation of a System for Model Predictive Control**
Panagiotis Vouzis
Leonidas G. Bleris
Mayuresh V. Kothare
Mark Arnold
- 570e** **A Modular Simulation Framework for Microfluidic Chips**
Anton J. Pfeiffer
Xiang He
Tamal Mukherjee
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- 570f** **Performance Enhancement of Steam Methane Reforming in Tubular Packed-Bed Microreactors**
R. Rajasree
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- 570g** **Adaptive Optimization of Noisy Black-Box Functions Inherent in Microscopic Models**
Eddie Davis
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Chair: Dimitrios Varvarezos

Vice Chair: Dharmashankar Subramanian

- 582a** **A Novel Mixed-Time Mip Scheduling Model for Supply Chain Optimization**
Christos T. Maravelias

- 582b Global Optimization in Refinery Planning**
Basil Joffe
Dimitrios Varvarezos
Granville Paules
Tekin Kunt
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- 582c Simultaneous Planning and Scheduling for Multiproduct Continuous Plants**
Muge Erdirik Dogan
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Dan Wu
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Qiang Xu
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- 582f A Comparative Study of Continuous-Time Models for Short-Term Scheduling in Multipurpose Batch Plants**
Stacy L. Janak
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Wenkai Li
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Chair: John Corn

Vice Chair: Salma Saddawi

- 39a Preventing Fires and Explosions in Pilot Plants and Laboratory Units**
Richard Palluzi
- 39b Chemical Pilot Plant Safety**
Albert R. Muller
- 39c Insuring Safe Pilot Plant Operation**
Mike J. Doll
Jonathan H. Worstell
- 39d Che Safety Training & the Unit Operations Lab Are Synonymous!**
Loren B. Schreiber
Richard Crisler
- 39e Safety Taught as an Integral Part of the University Unit Operation Laboratory Experience**
John Corn

- 39f Risk Based Administration for Gas Processing Plants through the Implementation of a Risk Based Inspection Program**
Jose R. Aguilar-Otero
Berenice Cabello
Gerencia Unidad Regional Norte
Jesús H.G. García-Ortiz
Juan A. Lara-Magallanes

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Chair: John Corn

Vice Chair: Dennis Hendershot

- 80a Using Teamwork and Case Studies in-Class to Teach Chemical Engineering Safety**
Marina Miletic
- 80b Reactives, Explosives and Other Hazardous Materials: Avoiding the Big Bang**
Lisa Bognar Phillips
- 80c Pilot Plant Reactive Chemistry Incidents: Case Studies and Prevention**
Dennis Hendershot
Albert I. Ness
- 80d Implementation of Process Safety Standards in an R&D Environment**
Theodore Wells
Richard Fezza
- 80e The Battle of Safety Vs Non-Conductive Solvents and Non-Conductive Equipment**
Robert J. Prytko
- 80f Runaway Reaction ; Validating a Less Overestimating Vent Sizing Method**
Luc Vechot
Jean Pierre Bigot
Marc Kazmierczak
Patricia Vicot

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Chair: Korkut Uygun

Vice Chair: Karl R. Krause

- 132a Production of Oxidation-Resistant Nanosized Metal Powders**
Luis F. Hakim
Candace L. Vaughn
Alan W. Weimer
- 132b Development of a New Platform of Fluorinated Photoresist Polymers**
Karl R. Krause
Kenneth W. Leffew
George N. Lewis IV
A. Stephen Frobese
Mani P. Ganti
- 132c Design and Construction of a Dual Purpose Air Filter for Semiconductor Clean Rooms**
Ryan A. Sothen
Bruce J. Tatarchuk

132d Electrochemical Generator for the Supply of Arsine to the Ion Implant Market

*Reinaldo M. Machado
Christopher L. Hartz
James E. Hollen
Jeffrey R. Phillips
David Tavianini*

132e Converting Processes to Unfold the Potential of Nanoparticles

*Samuel Schaer
Dr. Steffen Pilotek
Dr. Frank Tabellion
Hans Naef*

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Chair: Mitch Loescher

Vice Chair: David Edwards

180a The Effect of Pilot Plant Cost Estimates on Research Economics

Richard Palluzi

180b Case Study: Pilot Plant Testing Results in Reduced Cost for a Liquid-Liquid Extraction Column

*Donald J. Glatz
Lori Mason*

180c To Build or to Contract: the Economics of Pilot Plant Decisions

*Janine A. Toner
Jonathan H. Worstell*

180d Use of Shortcut Methods in Process Development

Joseph Powell

180e Economic Frameworks for Solving Problems of Operations Management in Pilot Plants

Ed Baier

180f What We Mean When We Talk about Pilot Plants

*David Reeder
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180g Top Ten Economic Break Points in Pilot Plant Design and Construction

*David Edwards
H. Troy Wong*

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Chair: Randy Locke

Vice Chair: Qiang Xu

441a Short-Term, Medium-Term, and Reactive Scheduling of an Industrial Polymer Compounding Plant

*Stacy L. Janak
Christodoulos A. Floudas
Josef Kallrath
Norbert Vormbrock*

- 441b Plantwide Optimization of a Pulp Mill Process**
Mehmet Mercangöz
Francis J. Doyle
- 441c Dynamic Optimization of an Integrated Multi-Unit System under Failure Conditions**
Christopher L. E. Swartz
Anthony K.S. Balthazaar
- 441d Operator Training Using Chemcad Dynamic Simulation and Excel**
Muralidhar Satuluri
Colin S. Howat
- 441e Integrated Optimization of Refinery and Chemical Plant in Petrochemical Industry**
Chufu Li
Xiaorong He
Bingzhen Chen
Bo Chen
Zhenzhi Gong
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- 441f New Results for Measured Flash Point of Flammable Binary Mixtures**
Colin Kwabbi
Olurotimi Sonaike
Irvin Osborne-Lee
- 441g Process Optimization Using Local Models to Linearize Flash Calculations without Losing Accuracy**
Gang (Gary) Xu
David Van Peurseem

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Chair: Michael Hill

Vice Chair: Lionel O Young

- 521a Multiobjective Optimization of Multipurpose Batch Plants Using Superequipment Class Concept**
Andrej Mosat
Laurent Cavin
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- 521b A General Resource-Constrained Short-Term Scheduling Model for Multipurpose Batch Plants Using Synchronous Slots**
Arul Sundaramoorthy
I.A. Karimi
Yu Liu
- 521c A Cost-Effective and Common Sensical Approach to Batch Process Optimization - an Industrial Case-Study**
Prasanth Chandrahasan
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- 521d Process Optimization of Pulsed Pumping Remediation Systems**
Christian M. Lastoskie
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521e Optimization of Drying Process

*Yue Chen
Kostas Christoudoulou
Vasilios I. Manousiouthakis*

521f Achieving Product Specifications for Ethane through to Pentane Plus from NGL Fractionation Plants

*James Fleshman
Peter Alderton
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Chair: Helen H. Lou

Vice Chair: Yinlun Huang

573a A Framework for Optimal Utilization of Biomass Inputs in an Integrated Biorefinery

*Norman E. Sammons
Harry T. Cullinan
Mario R. Eden*

573b Process Integration Analysis of Sustainable Acrolein Production from Bioresources

*Jeffrey R. Seay
Robert N. D'Alessandro
Mario R. Eden*

573c A Conceptual Design Method of the Total Site Energy System in Process Industries

*Hangzhou Wang
Bingzhen Chen
Xiaorong He*

573d Solar-Thermal Production of Carbon Black in the Desert Sw

*Alan W. Weimer
Jeffrey Wyss
Janna Martinek
Michael Kerins
Raymond Hobbs
Allan Lewandowski*

573e Improving Profitability in the Corn-to-Ethanol Plant Using Simulation Technology

*Fan Mei
Martha Evans
Charles Carpenter
Milorad P. Dudukovic*

573f Process of Chemical Looping Combustion of Coal

*Gupta Puneet
Luis G. Velazquez-Vargas
Ted Thomas
Fan L.-S.*

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Chair: Helen H. Lou

Vice Chair: Randy Esposito

- 599a** **Avoiding Process over-Control and Process Plant Debottlenecking**
Jonathan H. Worstell
- 599b** **Estimating the Capacity of Simple Batch Processes**
James L. Manganaro
- 599c** **Non-Isothermal Reactor Network Synthesis through Ideas**
Wen Zhou
Vasilios I. Manousiouthakis
- 599d** **Optimized Heat and Power Exchange Network in Ethanol-Water Pressure Swing Distillation**
Xinqun Huang
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- 599e** **Use of Computational Fluid Dynamics for Catalyst Deactivation at Commercial Plants**
Sue Degaleesan
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- 599f** **Synergy Analysis of Collaborative Supply Chain Management in Energy Systems Using Multi-Period Milp**
Metin Turkey
Ahu Soylu
Kaoru Fujita
- 599g** **Castable Coating Experiment in the Primary Reformer to Avoid Fouling in the Convection Section Coils**
Sukardi Pawiradikrama
Hari Triwidodo

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Chair: Michael Poirier

Vice Chair: Thomas B. Calloway

- 155a** **Foaming and Antifoaming in Radioactive Waste Pretreatment and Immobilization Processes**
Darsh T. Wasan
Alex D. Nikolov
Krishna Vijayaraghavan
D. P. Lambert
T. Bond Calloway
Michael Stone
- 155b** **Gas and Oil Retention in Waste Slurries: Role of Particle Interactions**
Alex D. Nikolov
Darsh T. Wasan
Michael Stone
T. Bond Calloway
D. P. Lambert

155c Fractional Crystallization of Sodium Salts from Low- and Medium-Curie Wastes

*Hatem Alsyouri
George Dumont
Laurent Nassif
Ronald W. Rousseau*

155d Copper Catalyzed Peroxide Oxidation Testing for Tetraphenylborate Decomposition in Srs Tank 48h

*D. P. Lambert
Sam D. Fink
Thomas B. Peters*

155e Optimization of Ultrafilter Feed Conditions for Hlw Filtration Using Classical Filtration Models

*John Geeting
Rich Hallen
Reid Peterson*

Session 210 - Developments in Thermochemical and Electrolytic Routes to Hydrogen Production: Part I

Chair: Amy C. Taylor

Vice Chair: Maximilian B. Gorenssek

210a Hythec: Aims and First Assessments of an Ec Funded Project on Massive Scale Hydrogen Production Via Thermochemical Cycles

*Ray W. K. Allen
Bruce C. R. Ewan
Geoff H. Priestman
Rachael Elder
Alain Le Duigou
Jean-Marc Borgard
Bruno Larousse
Denis Doizi
C. Eysseric
Giovanni Cerri
Giovanni de Maria
Coriolano Salvini
Ambra Giovannelli
Martin Roeb
Nathalie Monnerie
Mark Schmitz
Christian Sattler
Arturo Buenaventura
Stephane Dechelotte
Olivier Baudouin*

210b A Standardized Method for Evaluating the Potential of Alternative Thermochemical Cycles

*Michele Lewis
Joseph Masin*

210c Assessing the Efficiency Limits for Hydrogen Production by Thermochemical Cycles

*Bruce C. R. Ewan
R W K Allen*

- 210d** **Production of H₂ by Hydrolysis of Zn Aerosol Freshly Made by Evaporation and Condensation**
Frank O. Ernst
Antonio Tricoli
Sotiris E. Pratsinis
Aldo Steinfeld
- 210e** **Reaction Kinetics and Modeling of the Aerosol Thermal Decomposition of ZnO in for Solar Thermochemical Production of H₂**
Christopher Perkins
Paul Lichty
Alan W. Weimer
- 210f** **Radiolytic Water Splitting: Demonstration at the Pm3-a Reactor**
Alfred Schneider

Session 258 - Developments in Thermochemical and Electrolytic Routes to Hydrogen Production: Part II

Chair: Maximilian B. Gorenssek

Vice Chair: Amy C. Taylor

- 258a** **Thermodynamic Efficiency Analysis of the S-I Process for Nuclear Hydrogen Production**
John P. O'Connell
K.P. Bellezza
P. Narkpresert
Maximilian B. Gorenssek
Paul M. Mathias
- 258b** **Experimental Study of the Bunsen Reaction for the S-I Thermochemical Cycle**
Giampaolo Caputo
Claudio Felici
Alberto Giaconia
Michela Lanchi
Raffaele Liberatore
Salvatore Sau
- 258c** **Comparison of Reactive Distillation and Extractive Distillation Flowsheets for the Sulfur-Iodine Thermochemical Cycle**
Lloyd C. Brown
Gottfried E. Besenbruch
Benjamin E. Russ
Robert T. Buckingham
- 258d** **Activity and Stability of Sulfuric Acid Decomposition Catalysts for Thermochemical Water Splitting Cycles**
Daniel M. Ginosar
Lucia M Petkovic
Kyle C Burch
- 258e** **Applicability of Inorganic Membranes for the Production of Hydrogen Using Nuclear Energy**
Brian L. Bischoff
Dane F. Wilson
Lawrence E. Powell
K. Dale Adcock

258f Use of Membranes and Reactive Distillation for the Separation of Hix in the Sulphur-Iodine Cycle

*Rachael H. Elder
Jean Marc Borgard
Geof H. Priestman
Bruce C. Ewan
Ray W. K. Allen*

258g Stability and Performance of Nafion-117 Membranes for the Concentration of Hi/Water and Hi/Water/Iodine Mixtures

*Frederick F. Stewart
Christopher J. Orme*

Session 301 - Application of Computer Modeling in the Nuclear Industry

Chair: Arlin Olson

Vice Chair: Ronald D. Denney

301a Simulations of Spouted Beds for Coating Triso Fuel Particles

*Sreekanth Pannala
Dhanunjay Boyalakuntla
Charles E. A. Finney
James H. Miller
Richard A. Lowden
C. Stuart Daw*

301b Modeling Hanford-Rpp Treated Low Feed Evaporation

Gene Daniel

301c Molecular Modeling of Crystalline Silicotitanate and Polyoxoniobate Ion Exchangers

*James P. Larentzos
Edward J. Maginn*

301d Modeling Offgas Systems for the Hanford Waste Treatment Plant

Frank G. Smith

301e Inl Sbw Steam Reforming Model

*Rick A. Wood
Barry H. O'Brien*

Session 348 - Developments in Thermochemical and Electrolytic Routes to Hydrogen Production: Part III

Chair: Ben Russ

Vice Chair: Amy C. Taylor

348a Engineering Process Model for High-Temperature Steam Electrolysis System Performance Evaluation

*Carl M. Stoots
James E. O'Brien
Michael G. McKellar
Grant L. Hawkes
J. Stephen Herring*

- 348b** **Materials Development for Improved Efficiency of Hydrogen Production by Steam Electrolysis and Thermochemical-Electrochemical Processes**
Jennifer R. Mawdsley
Deborah J. Myers
- 348c** **Conceptual Design and Projected Performance for a Hybrid Sulfur Process**
Maximilian B. Gorenssek
William A. Summers
Melvin R. Buckner
Zafar H. Qureshi
- 348d** **Electrochemical Generation of Hydrogen Via Gas Phase Oxidation of Sulfur Dioxide and Hydrogen Bromide**
John W. Weidner
PremKumar Sivasubramanian
Charles E. Holland
Francisco J. Freire
- 348e** **Hydrolysis of Calcium Bromide: Immobilization of the Reactant on a High Surface Area Support**
Vivek P. Utgikar
J. Paul Scott
Michael F. Simpson
- 348f** **An Assessment of the Efficiency of the Hybrid Copper-Chloride Thermochemical Cycle**
Michele Lewis
Joseph Masin

Session 405 - High Temperature Systems and Materials for Hydrogen Production: Part I

Chair: Steve Sherman

Vice Chair: Michael Simpson

- 405a** **Progress in High Temperature Materials and Systems in the U.S. DoE Nuclear Hydrogen Initiative**
Steven Randall Sherman
- 405b** **Characterization of Candidate Ceramic Materials for the High Temperature Sulfuric Acid Loop in the Si Process**
Merrill A. Wilson
Charles Lewinsohn
- 405c** **Application of Conjugate Heat Transfer and Flow Analyses for Design Optimization of the Si Decomposer**
Valery I. Ponyavin
- 405d** **Evaluation of Candidate Salts for Use as High Temperature Heat Transfer Agents**
David F. Williams
- 405e** **Inhibiting Corrosion by Molten Fluoride Salts: Investigations on FLiNaK**
Blandine F. Laurenty
Grant Fukuda
Darwin D. Damba
Per F. Peterson

405f Recent Advances in Redox-Based Corrosion Control in Molten Salts Suitable for Use in High Temperature Heat Transfer

Michael Simpson

Galen Smolik

John P. Sharpe

David Petti

Robert Anderl

Session 480 - The Flammable Gas Hazard and Advances in Actinide and High Level Waste Processes

Chair: Randall N. Robinson

Vice Chair: Edward Kyser

480a Development of a Liquid Jet Sludge Re-Suspension Model

George A.H. McArthur

Tim P. Tinsley

Donna McKendrick

480b Impact of Alkali Source on Vitrification of Srs High Level Waste

Michael Stone

David K. Peeler

Daniel P. Lambert

Donald H. Miller

Michael E. Smith

480c Determination of Bubble Size Distribution in an Oxide Reduction Electrochemical Cell

Supathorn Phongikaroon

Steven Herrmann

Shelly Li

Michael F. Simpson

480d Heat Transfer from Condensate Droplets Falling through an Immiscible Layer of Tributyl Phosphate

James Laurinat

480e 238pu Anion Exchange Column Safety during Flow Interruptions

Edward Kyser

James Laurinat

Session 502 - High Temperature Systems and Materials for Hydrogen Production: Part II

Chair: Steve Sherman

502a Commercial Alloys for Sulfuric Acid Vaporization in Thermochemical Hydrogen Cycles

Thomas M. Lillo

Karen M. Delezene-Briggs

502b Characterization of Structural Materials for Nuclear Hydrogen Generation

Ancila Kaiparambil

Radhakrishnan Santhanakrishnan

Ajit Roy

Bunsen Wong

502c Durability Analyses of a Silicon Carbide Based Decomposer for the Si Process

Merrill A. Wilson

502d Tensile Properties and Corrosion Susceptibility of Alloy C - 276 in S - I Environment

*Ajit Roy
Joydeep Pal*

502e Use of Alloy 800h as a Heat-Exchanger Structural Material

*Ajit Roy
Vinay Virupaksha*

502f Microscopic Characterization of Discontinuous Precipitation in a Nickel Aluminide Intermetallic Material

*Pankaj Kumar
Ranjit K. Ray
Ajit Roy*

Session 538 - Chemical Engineering Advances in the Nuclear Fuel Cycle

Chair: Stuart Arm

Vice Chair: Candido Pereira

538a Ionic Liquids in Actinide and Fission Product Separations: Progress and Prospects

*Mark L. Dietz
Dominique C. Stepinski
Mark P. Jensen
Paul G. Rickert
David J. Rausch*

538b Reprocessing Spent Nuclear Fuel Using Environmentally Sustainable Solvents

Chien M. Wai

538c Redox-Active Ligands Designed to Promote Am Separation from CM and Lanthanide Fission Products in Spent Nuclear Fuel

*Paul B. Duval
Eric M. Weis*

538d Lab-Scale Demonstration of the Urex+1 Process Using Spent Nuclear Fuel

*Candido Pereira
G. F. Vandegriff
M. C. Regalbuto
A. Bakel
D. L. Bowers*

538e Entrainment of Aqueous Hazes in Liquid-Liquid Extraction Equipment and Their Effect on Fission Product Carry-over in Fuel Processing Operations

Stuart Arm

Session 581 - Nuclear Hydrogen Production Process Design and Economics

Chair: William Summers

Vice Chair: Ben Russ

581a Nuclear Hydrogen for Production of Liquid Hydrocarbon Transport Fuels

Charles Forsberg

- 581b Hydrogen Costs for the Pbmr Thermal Reactor and the Westinghouse Process**
Edward J. Lahoda
Willem Kriel
Michael M. Nigra
Garrett T. McLaughlin
- 581c Development of Design and Simulation Model and Safety Study of Large-Scale Hydrogen Production Using Nuclear Power**
Sal B. Rodriguez
Randall O. Gauntt
Shripad T. Revankar
Karen Vierow
- 581d Generation of Hydrogen Using Electrolyzer with Sulfur Dioxide Depolarized Anode**
John L. Steimke
Timothy J. Steeper
- 581e Economic Analysis of Hydrogen Production Via Water-Splitting Using Nuclear Energy**
William A. Summers
Maximilian B. Gorenssek
- 581f Simulation of Decomposition of Sulfur Trioxide Gas on Self-Catalytic Metallic Material**
Kiran Kumar Muramalla
Yitung Chen
Anthony E. Hechanova

Session 10 - Advances in Animal and Insect Cell Culture

Chair: Sigma Mostafa

Vice Chair: Michael Betenbaugh

- 10a Baculovirus as a Tool for Eucaryotic Protein Expression in Mammalian Cells**
Ying-Wei Chiang
Kuei-Chun Wang
Jen-Te Lu
Chia-Wei Lai
Yao-Chi Chung
Yu-Chen Hu
- 10b Improved Oxygen Delivery to Hepatocytes Maintained within a Hollow Fiber Bioreactor Via Bovine Red Blood Cell Supplementation of Circulating Culturing Media**
Andre Palmer
Jason Gordon
Jesse Sullivan
- 10c Improving Culture of Islets of Langerhans: Removing Oxygen Limitations**
Michael James Rappel
Klearchos K. Papas
Efstathios S. Avgoustiniatos
Linda A. Tempelman
Clark K. Colton
- 10d Improving Therapeutic Protein Quality in Gs-Ns0 Cell Lines Using Culture Supplements**
Sigma S. Mostafa
Johnny Andraous

- 10e** **Genome-Wide Analysis of the Transcriptional Response of Murine Hybridomas to Osmotic Shock**
Susan Sharfstein
Duan Shen
- 10f** **Multi-Scale Characterization of Biomaterial-Hepatocyte Interactions Using Kinetic Fluorimetry and Microscopy Image Analysis**
Jeremiah Whittenton
Rashmi Sundararajan
Adam Capitano
- 10g** **Application of Microarrays to Reverse Engineer Attachment Dependence in Mammalian Cell Lines**
Pratik Jaluria
Michael Betenbaugh
Konstantinos Konstantopoulos
Joseph Shiloach

Session 13 - Advances in Protein Structure, Function, and Stability I

Chair: Jeffrey J. Gray

Vice Chair: Christopher J. Roberts

- 13a** **Protein Switches Created by Non-Homologous Recombination**
Gurkan Guntas
Jing Liang
Jin Ryoum Kim
Thomas J. Mansell
Jason Boock
Marc Ostermeier
- 13b** **An Engineered Chimeric Enzyme for Use in Drug Sensing, Discovery and Development**
David W. Wood
Georgios Skretas
- 13c** **De Novo Engineering of a Bacterial Disulfide Isomerase**
Laura Segatori
Silvia Arredondo
George Georgiou
- 13d** **Directed Evolution of Homing Endonuclease with Altered DNA Sequence Specificity**
Zhilei Chen
Huimin Zhao
- 13e** **Engineering of High Affinity Binding Peptides Using N-Terminal Bacterial Display**
Jeffrey J. Rice
Aaron Schohn
Patrick S. Daugherty
- 13f** **Computational Prediction of the Mab 806-Egfr Complex Structure by Combining Protein Docking with Computational and Experimental Mutagenesis**
Arvind Sivasubramanian
Ginger Chao
K. Dane Wittrup
Jeffrey J. Gray

13g **Measurements of Protein Folding and Unfolding Kinetic Pathways Using a Microfluidic Approach**

*Jinkee Lee
Joshua Ziperstein
Anubhav Tripathi*

Session 14 - Biomolecular Interactions in Intracellular Processes

Chair: S. Patrick Walton

Vice Chair: Arul Jayaraman

14a **Signal Transduction at Point-Blank Range: a Brownian Dynamics Study**

*Michael Monine
Jason Haugh*

14b **Effect of Nutrient Fluxes on Osteoblast Culture Survival**

*Agnes Ostafin
Stephanie M. Schmidt
Mark J. McCready*

14c **Elucidation of Intracellular Signaling Pathways in Shear-Activated Chondrocytes: a Role in Arthritis**

*Zachary R. Healy
Norman Lee
Paul Talalay
Thomas Kensler
Konstantinos Konstantopoulos*

14d **The Role of Jnk Signaling in Cell-Cell Adhesion and Differentiation of Epithelial Cells: Implications for Tissue Engineering of Stratified Epithelium**

*Piyush Koria
Stelios T. Andreadis*

14e **Single Molecule Kinetics of Reverse Transcriptase**

*Charles M. Schroeder
Sangjin Kim
Paul C. Blainey
X. Sunney Xie*

14f **Real-Time Visualization of One-Dimensional Diffusion of a Fluorescently Labeled Protein along Single DNA Molecules Aligned on a Surface**

*Ji Hoon Kim
Ronald G. Larson*

14g **Key Components for Transport through the Nuclear Pore Complex (Npc): Mechanisms Involved during Binding between Specific Karyopherins and Fg-Nups**

*Antoine Bouchoux
Amit Dutta
Georges Belfort*

Session 25 - Gene Delivery

Chair: Stelios T. Andreadis

Vice Chair: David V. Schaffer

25a Egf Receptor Signaling Affects Retroviral Gene Transfer to Primary Epidermal Cells

*Raghvendra Singh
Stelios T. Andreadis*

25b Engineering Enhanced Retroviral Vectors for Gene Therapy through the Generation and Selection of 6xhis Peptide Insertion Libraries into Vsv-G

*Julie H. Yu
David V. Schaffer*

25c Baculovirus Transduction of Human Mesenchymal Progenitor Cells Is Dependent on Differentiation Lineages

*Yi-Chen Ho
Kuei-Chun Wang
Shiaw-Min Hwang
Yu-Chen Hu*

25d Enhanced Stability of Retrovirus by Directed Evolution

*Halong Vu
Daniel W. Pack*

25e Population Dynamics of Defective Interfering Virus-like Particles

*Kristen Stauffer
John Yin*

25f Enhancement of Retroviral Transduction Using Electrical Fields

*Yu-Hsiang Lee
Ching-An Peng*

Session 34 - Pharmaceutical Product/Process Development & Scale-up: Part 1

Vice Chair: Michael B. Mackaplow

34a High Shear Wet Granulation: Scale-up Insights Derived from Granule Size and Porosity Measurements

*Sunil V. Jain
Maryam Moaddeb
Luke A. Kline
Russell V. Plank*

34b Use of a Novel Shear Cell to Study the Influence of Shear Intensity and Total Shear on the Properties of Pharmaceutical Blends

*Amit Mehrotra
Abdul M. Faqih
Marcos Llusa
Fernando J. Muzzio*

- 34c** **Enhancing the Physical Stability of Tablets through Moisture Control across the Pharmaceutical Process**
Luke Schenck
Brian Sell
Nick Birringer
Michelle Kenning
Russell Plank
- 34d** **Mixing Scale-up for Pharmaceutical and Biological Processes**
David S. Dickey
- 34e** **Biopharmaceutical Scale-up and Scale-down Using Fluid Mixing Analysis and Computational Fluid Dynamics (CFD)**
Richard D. LaRoche
- 34f** **Redundant Filtration Sizing and Scale up in Sterile Filtration Applications**
Pritipal S. Bhinder
Wenchang Ji
H. Gerald Sparks
Manpreet-Vick Wadhwa
Sugunakar Patro
Erwin Freund
- 34g** **Challenges of Scaling up a Highly Hydrophobic Corticosteroid**
Anayo M. Ukeje
Chirag D. Chodankar

Session 49 - Advances in Agricultural and Silvicultural Biotechnology and Plant Cell Culture

Chair: Gary F. Peter

Vice Chair: Mike (Chenming) Zhang

- 49a** **Hydrodynamic Shear in Plant Cell Suspension Cultures: Using Biological View to Understand the Engineering Problem**
Ying-jin Yuan
- 49b** **Modulating Ajmalicine Production from Cell Cultures of *Catharanthus Roseus* with the Application of Signal Transduction Molecules**
Carolyn WT Lee-Parsons
Seda Erturk
Amber Royce
- 49c** **The Study of Benzylisoquinoline Alkaloids Production by Analysis of Biosynthetic Pathway in *Eschscholtzia Californica***
Seok-Young Son
Hong Soon Rhee
Sung-Yong H. Yoon
Yoon-hi Choy
Jeong Jin Park
Jong Moon Park
- 49d** **Characterization of the Ecdysone Agonist-Inducible Promoter and the Ethanol Inducible Promoter in *Catharanthus Roseus* Hairy Roots**
Christie A. Peebles
Susan I. Gibson
Jacqueline V. Shanks
Ka-Yiu San

- 49e** **Derivation of Non-Anthocyanin-Producing Grape Cell Culture from a Stable Anthocyanin-Producing Grape Cell Culture: an Example of Reverse Engineering**
Chien-Kuo Wang
Michael L. Shuler
- 49f** **Protein Expression Profiles for Benzophenanthridine Alkaloids Production in *Eschscholtzia Californica* Induced by Elicitor**
Hwa-Young Cho
Sung-Yong H. Yoon
Jeong Jin Park
Jong Moon Park
- 49g** **Strategies for Extracting Recombinant Dog Gastric Lipase from Transgenic Corn Seed**
Qixin Zhong
Zhengrong Gu
Charles Glatz

Session 51 - Advances in Drug Delivery: Hydrogels and Fibrin gels

Chair: Stelios C. Tsinontides

Vice Chair: Tony J. Meehan

- 51a** **Antiproteolytic Action of Low-Dose Insulin Delivered Orally Using pH-Responsive Hydrogels**
Angela Panteloganis
Sundararajan V. Madhally
Mehmet Toner
- 51b** **Mucoadhesive Oral Insulin Delivery Systems Using Lectin Functionalized Complexation Hydrogels**
Kristy M. Wood
Nicholas A. Peppas
- 51c** **Enhanced Protein Delivery from Photopolymerized Hydrogels**
Chien Chi Lin
Andrew T. Metters
- 51d** **A Self-Folding Hydrogel Device for Oral Drug Delivery**
hongyan He
jingjiao Guan
Derek Hansford
James Lee
- 51e** **Diffusive and Convective Transport of Proteins in Fibrin Gels**
Jess V. Nauman
Phil G. Campbell
Frederick Lanni
John L. Anderson
- 51f** **Optimization of Parameters for Sustained Local Drug Delivery of Statins for the Prevention of Vascular Intimal Hyperplasia**
Anusha Vishwanathan
Stephanie T. Lopina
Steven P. Schmidt
Michelle Evancho-Chapman
Deenu G. Kanjickal
Aadithya Krishnan

51g **Ophthalmic Antihistamine Delivery Via Recognitive Contact Lenses for Allergic Relief**
Siddarth Venkatesh
Stephen P. Sizemore
Mark E. Byrne

Session 52 - Advances in Protein Structure, Function, and Stability: Part II

Chair: Christopher J. Roberts

Vice Chair: Jeffrey J. Gray

52a **The Effect of Various Small Heat Shock Proteins on Prevention of Beta Amyloid Aggregation and Toxicity**

Sungmun Lee
Theresa A. Good

52b **Identification of Inhibitory Binding Faces of β -Amyloid Fibril Formation**

Melissa A. Moss

52c **Cell Membrane-Mediated Amyloid-Beta Fibrillogenesis**

Eva Y. Chi
Canay Ege
Ka Yee C. Lee

52d **An Improved Model of Non-Native Protein Aggregation Kinetics**

Jennifer M. Andrews
Christopher J. Roberts

52e **Simulation of Polyglutamine Aggregation with an Intermediate Resolution Protein Model**

Alexander J. Marchut
Carol K. Hall

52f **Molecular Dynamics Simulations of Surfactant-Assisted Protein Folding in Vitro**

Diannan Lu
Zheng Liu
Jianzhong Wu

52g **Reversible Changes in Protein Secondary Structure with Light Using Photoresponsive Surfactants**

Shao-Chun Wang
C. Ted Lee

Session 76 - Pharmaceutical Product/Process Development & Scale-up: Part 2

Vice Chair: Michael B. Mackaplow, John F. Peragine

76a **Approaches to Accelerating Pharmaceutical Process Development and Scale-up**

Jeffrey Givand
Brad Holstine
Edward Smith
Lawrence Rosen
James Zega

76b **The Role of Simulation and Scheduling Tools in the Development and Manufacturing of Pharmaceutical Products**

Demetri P. Petrides
Charles Siletti

- 76c** **An Informatics Framework for Pharmaceutical Product Development**
Chunhua Zhao
Ankur Jain
Leaelaf M. Hailemariam
Girish Joglekar
Venkat Venkatasubramanian
Gintaras Victor Reklaitis
Kenneth R. Morris
Anthony Hlinak
Prabir K. Basu
- 76d** **Blister Push through Force and Tablet Three Point Bend Strength as Means of Predicting Deblistering Performance**
Justin D. Moser
Craig B. Ikeda
David Yao
Jeannie Chow
Tzyy-Show Chen
- 76e** **Adjuvant-Adsorbed Vaccine Susceptibility to Hydrodynamic Shear**
David J. Geer
Kenneth J. Ford
Li Shi
Suhas D. Shelukar
William A. Hunke
Scott D. Reynolds
- 76f** **Quantitative Determination of the Role of Geometric and Operating Variables on the Hydrodynamics of the Usp Dissolution Apparatus II**
Piero M. Armenante
Ge Bai
Russell V. Plank
Kenneth Ford
Michael Gentzler
Paul Harmon
- 76g** **Novel Mucoadhesive Formulations Employing pH Responsive Biomaterials**
J. Brock Thomas
Nicholas A. Peppas
James W. McGinity

Session 78 - Receptor-Mediated Phenomena

Chair: Julia Ross

Vice Chair: A. Omolola Eniola

- 78a** **Elucidation of the Spatial Pdgf Gradient Sensing Mechanism in Fibroblast Chemotaxis**
Ian Schneider
Jason Haugh
- 78b** **Gradients of Matrix-Bound Morphogens Created by Cells in 3d Dynamic Environments**
Mark E. Fleury
Cara-Lynn E. Helm
Melody A. Swartz

- 78c** **Micropatterned Surfaces for Controlling Cell Adhesion and Rolling**
Divya D. Nalayanda
David W. Schmidtke
- 78d** **Modulating Nuclear Receptors to Regulate Lipid and Glucose Homeostasis for Hepatic Functions in Lean and Fatty Hepatocytes Cultures**
Deepak Nagrath
Vanessa Lopez
Francois Berthiaume
Martin Yarmush
- 78e** **Global Intertrimer Cooperativity of Influenza Hemagglutinin Conformational Change**
Jeong H. Lee
Mark D. Goulian
Eric T. Boder
- 78f** **Cell-Specific and Ligand-Specific Parameters Affect Ligand Efficacy in a Kinetic Model of G Protein Coupled Receptor Signaling**
Tamara L. Kinzer-Ursem
Jennifer J. Linderman
- 78g** **Computational, Genetic, and Biochemical Analysis of Egfr Control by Multiple Feedback Loops**
Gregory T. Reeves
Rachel Kalifa
Daryl E. Klein
Diego Alvarado
Joseph B. Duffy
Mark A. Lemmon
Stas Shvartsman

Session 101 - Advances in Continuous Pharmaceutical Analysis and Processing

Chair: Subodh S. Deshmukh

Vice Chair: Sanjeev Katti

- 101a** **Application of Raman and Fbrm Techniques in the Development of Pharmaceutical Crystallization Processes**
Lifen Shen
Dimuthu Jayawickrama
Robert Wethman
Victor Hung
- 101b** **Using Process Analytics to Monitor Drying of an Organic Monohydrate**
Jennifer Kuehne
Charles Van Kirk
Elisabeth Corbett
Ariya Akthakul
- 101c** **Monitoring the Hydrolysis of Acetic Anhydride Using in-Situ Raman Spectroscopy and Novel Multivariate Data Analysis – Band-Target Entropy Minimization (Btem)**
Effendi Widjaja
Ying Yan Tan
Marc Garland

- 101d** **A Highly Integrated on-Chip Glycoprotein Processor for Rapid Sialic Acid Content Monitoring**
Jinpian Diao
Lincoln Young
Peng Zhou
Michael L. Shuler
- 101e** **Modeling and Control of Continuous Tumble Mixing of Granular Materials**
Carlos Velázquez-Figueroa
Andres F. Valencia-Agudelo
- 101f** **Continuous Reactive Precipitation in a Y-Mixer**
Jason M. Gillian
Donald J. Kirwan
- 101g** **Implementation of 3 Consecutive Continuous Reactions in the Pilot Plant for Gmp Production of Api**
Thomas L. LaPorte
Mourad Hamedi
Jeffrey DePue
Daniel Watson
Simon Leung
Daniel Hsieh
John Shabaker
Ehrlic Lo

Session 102 - Advances in Drug Delivery: Targeted Delivery

Chair: Rangaramanujam M. Kannan

Vice Chair: Suzie Pun

- 102a** **The Modular Antibody Targeting of Catalase Loaded Nanocarriers Provides Protection of Endothelial Cells from H₂O₂ Mediated Injury**
Tom Dziubla
Vladimir Shuvaev
Silvia Muro
Vladimir Muzykantov
- 102b** **Liver Targeting of Gold Nanoparticles: Effects of Size and Surface Modification on Preferential Hepatocyte Uptake**
Jamie M. Bergen
Horst von Recum
Thomas T. Goodman
Archna P. Massey
Suzie H. Pun
- 102c** **Controlling the Production of Exhaled Bioaerosols**
Jennifer Fiegel
Wiwik Wanatabe
Gerald G. Fuller
David Edwards

- 102d** **Formulation of the Anti-Inflammatory Cationic Lipid Dexamethasone-Spermine with Adenovirus for Targeted Gene Delivery to the Lung Airway Epithelia**
Amber R. Price
Jeff Gruneich
Maria Limberis
James M. Wilson
Scott L. Diamond
- 102e** **Targeted Delivery of Thrombolytic Agents Using Complexation and Conjugation with Dendritic Polymers**
Rajyalakshmi Inapagolla
Xiangtao Wang
Sujatha Kannan
Rangaramanujam M. Kannan
- 102f** **Poly(Lactide-Co-Glycolide) Nanoparticles for Targeted and Controlled Delivery of Doxorubicin for the Treatment of Cancer**
Tania Betancourt
Brandon Brown
Lisa Brannon-Peppas
- 102g** **Targeted Drug Delivery into the Human Brain**
MahadevaBharath R. Somayaji
Libin Zhang
Michalis Xenos
Srinivasa Kondapalli
Sinan Tumturk
Richard Penn
Andreas A. Linninger

Session 103 - Advances in Environmental Biotechnology II: Waste Remediation

Chair: Frank J. Loge

Vice Chair: David N. Thompson

- 103a** **Metabolic Engineering of Yeast for Bioaccumulation of Arsenic**
Wonkyu Lee
Dhawal Shah
Nancy A. DaSilva
Wilfred Chen
- 103b** **Role of Protein Binding in the Remediation of Pentachlorophenol from Aqueous Streams by a Two-Stage Bioreactor System**
Robert P. Chambers
Kristie J. Bethune
- 103c** **Biodegradation of Gaseous Mixtures in a Trickle Bed Air Biofilter**
Zhangli Cai
Daekeun Kim
George A. Sorial
- 103d** **Enzymatic Generation of Hydrogen Peroxide and Gluconic Acid Chelate for Chloro-Organic Destruction by Modified Fenton Reaction**
Deepak Ahuja
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*Agnes Ostafin
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*Abel Mondelo Rodriguez
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*Jaeyong Jung
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Vice Chair: Kyongbum Lee

110a Protein Loop Structure Prediction with Flexible Stem Geometries

*Martin Monnigmann
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*Alan Gilbert
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*Christian M. Lastoskie
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*Rajanikanth Vadigepalli
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*Evgeni Nikolaev
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110f Genetic Network Driven Control of Phbv Copolymer Composition

*Sergio Iadevaia
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*Andrea L. Knorr
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Chair: Russell A. Judge

Vice Chair: Abraham Lenhoff

116a Improving Success Rate in Protein Crystallization

Tangir Ahamed

Beatriz Alvarez Esteban

Marcel Ottens

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116b Protein Crystallization under Medically Relevant Conditions

Karsten Bartling

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Sameer Talreja

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116d Crystallization of Integral Membrane Proteins

Michael C. Wiener

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Chair: Cory J. Berkland

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Eric S. Richardson
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- 151g** **Modeling the Influence of Cyclodextrins on Oral Absorption of Saltform Drug in Immediate and Controlled Release Delivery**
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- 152a** **Fumaric Acid Production from Glucose and Cornstarch by Immobilized Cells of *Rhizopus Oryzae* in a Rotating Fibrous Bed Bioreactor**
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- 152b** **Enzymatic Extraction of Ferulic Acid from Agriculture Waste for High-Valued Products**
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Shara McClendon
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- 152d** **Isolation and Optimization of a Microbial Catalyst for the Conversion of Syngas to Ethanol and Acetic Acid**
Todd French
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- 152e** **Poop to Plastic: Commercial Production of Polyhydroxyalkanoates in Municipal and Industrial Wastewater Treatment**
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Erik R. Coats
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- 152f** **Nanobiocatalyst for the Synthesis of L-Lactic Acid from Carbon Dioxide**
Bilal El-Zahab
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Ellen C. San Nicolas
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- 153a** **Effect of Oxygen on the *E. Coli* Global Redox Sensing/Regulation Networks and Metabolic Flux Distribution Based on C-13 Labeling Experiments**
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- 153b** **Role of Pyruvate Dehydrogenase in the Anaerobic Fermentation of Sugars by *Escherichia Coli***
Abhishek Murarka
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- 153c** **Defining Gene Knockout Search Trajectories: Many Genotypes for the Same Phenotype?**
Hal S. Alper
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- 153d** **Determination of the Fractional Contribution of Individual Elementary Modes to the Overall Metabolism of *Escherichia Coli***
Aaron P. Wlaschin
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- 153e** **Engineering *Escherichia Coli* Solvent Tolerance Phenotypes to Improve Chemical Production**
Sara Ziesman
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- 153f** **Metabolic Engineering of Escherichia Coli for Sugar Nucleotide and Oligosaccharides Synthesis**
Zichao Mao
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- 153g** **Improving the Efficiency of Xylose Utilization and Xylitol Production in E. Coli**
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Vice Chair: Rajanikanth Vadigepalli

- 173a** **Modeling of Cell Culture Processes in a Micro Channel Reactor**
Khamir Mehta
Geeta Mehta
Shuichi Takayama
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- 173b** **Dynamic Modeling of Fatty Acid, Glucose, and Insulin Interactions**
Anirban Roy
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- 173c** **A Model of the Darwinian Evolution of Cancer Progression**
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- 173d** **Optimal Control of Cancer by Delivery of Chemotherapeutic Agents**
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- 173e** **Optimal Medication Strategies for the Early Stages of HIV Infection**
Samira Khalili
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- 173f** **The Role of Mathematical Modeling on the Optimal Control of HIV-1 Pathogenesis**
Marcel Joly
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- 173g** **Computational Design of RNA Interference Gene Therapy Strategies to Treat HIV-1 Infections and Block Viral Escape**
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- 191a** **Mass Transfer Rates and Initial Conditions Modulate the Growth Rates and Structure of Bioartificial Tissues**
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Jian Feng
Pauline A. Markenscoff
- 191b** **Strategies to Enhance Capillary Formation inside Biomaterials: a Computational Study**
Ehsan Jabbarzadeh
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Chong Wing Yung
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- 191e** **Perfluorocarbons for Enhanced Oxygen Transport in Tissue Engineering Devices**
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- 191g** **Characteristics of Btc Tet Cells for Use in the Cryopreservation of a Model Tissue Engineered Pancreatic Substitute**
Indra Neil Mukherjee
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- 194a** **Design Principles of Chemical Permeation Enhancers for Transdermal Drug Delivery**
Pankaj S. Karande
Amit K. Jain
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- 194b** **Fundamental Investigation of Transdermal Transport Models for Hydrophobic and Hydrophilic Drugs**
Joseph Kushner
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- 194c** **Transport of Amitriptyline across Capillary Walls in Isolated Rat Hearts**
Marissa Fallon
Jason A Flint
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- 194d** **A Facile and Reproducible in Vitro Blood-Brain Barrier Model**
Eric Shusta
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- 194e** ***in Vivo* Characterization of Microfluidic Probes for Convection Enhanced Drug Delivery**
Keith B. Neeves
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- 194f** **Novel Nanoparticles for Controlled Drug Delivery across the Blood-Brain Barrier**
Sailendra N. Nichenametla
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- 194g** **Experimental and Theoretical Modeling of Intracellular Drug Delivery Following Acoustic Cavitation**
Vladimir G. Zarnitsyn
Robyn K. Schlicher
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Vice Chair: Brent Peyton

- 195a** **Biological Sulfide Oxidation under Alkaliphilic Conditions**
Armando González-Sánchez
Sergio Revah
- 195b** **Kinetics and Metabolism of the Biodegradation of Vanillic Acid and Other Aromatic Compounds by a Halotolerant Alkaliphile from Soap Lake, Wa**
Catherine E. Albaugh
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- 195c** **Dramatic Stabilization of Proteins Adsorbed Onto C-60 Fullerenes**
Prashanth Asuri
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- 195d** **Discovery of a Filamentous Chaperone from a Hyperthermophile: Molecular Function and Potential Applications**
Timothy Whitehead
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- 195e** **Functional Genomics Analysis of Glucan Dimer Metabolism in the Hyperthermophilic Bacterium *Thermotoga Maritima***
Steven R. Gray
Shannon B. Conners
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- 195f** **Biochemical and Biotechnological Studies of Hyperthermophilic *Thermotoga* Xylose Isomerases for High Fructose Corn Syrup Production at Elevated Temperatures**
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- 195g** **Purification and Characterization a Novel Thermostable Endoglucanase from a Mesophilic Fungus for Bio-Chemimechanical Pulp, *Fusarium Oxysporum***
Shuyan Liu
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Chair: Francois Berthiaume

Vice Chair: Christina Chan

- 196a** **Metabolic Engineering of the Xylose Utilizing Thermophile *Thermoanaerobacterium Saccharolyticum* Jw/SI-Ys485 for Ethanol Production**
A. Joe Shaw
R. Lance Martin
Sunil G. Desai
Mike Tyurin
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Radhakrishnan Mahadevan
Anthony Burgard
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- 196c** **Activity of Cinnamate 4-Hydroxylase Towards Un-Natural Substrates**
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- 196d** **Metabolic Flux Analysis and Optimization of Metabolic Networks for Astaxanthin Production by Mixed Culture Systems of *Haematococcus Pluvialis* and *Phaffia Rhodozyma***
Xue-Ming Zhao
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196e High-Throughput Time-Series Metabolomic Analysis to Identify Regulation of *Arabidopsis Thaliana* Response to Elevated CO₂ by Sugar Signaling

*Harin H. Kanani
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196f Molecular Approaches for Identification of Metabolic Engineering Targets for Enhanced Paclitaxel Accumulation

*Susan C. Roberts
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Nadia Boutaoui
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196g Biosynthesis of Plant-Specific Flavanols and Anthocyanins in *Escherichia Coli*

*Joseph Chemler
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Chair: Harihara Baskaran

Vice Chair: Padma Rajagopalan

199a Non-Invasive Monitoring of Cellular Oxygenation within a Pancreatic Substitute

*Jeffrey D. Gross
Ioannis Constantinidis
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199b Hydrogel-Electrode Interfaces for Directed Tissue Remodeling in the Retinal Implant

*Jessica O. Winter
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*Jonathan W. Bender
Harold I. Friedman
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199d Optical Tweezers as a Sensor for Intracellular Mechanical Properties

*H. Daniel Ou-Yang
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199e A Study of Structure of *Aplysia Californica* Neuron Growth Cones Using Atomic Force and Epifluorescence Microscopy

*Emilie Grzywa
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199f Fluorescence Relaxation in 3d from a Diffraction-Limited Sink of Egfp or Source of Pagfp in Live Cho Cells

*Peter Calvert
Jon A. Peet
Alvina Bragin
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199g Evaluation of the Angiogenic Capacity of Small-Size Oligosaccharides of Hyaluronic Acid

*Harold Castano
Paul L. DeAngelis
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Chair: John H. Chon

Vice Chair: Jean-Francois Hamel

204a Assessing Robustness for Cell Line Selection

*Andrew M. Rusiniak
Gregory M. Mueller
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204b Analysis of Mab Production-Enhancing Compounds

*Tiffany D. Rau
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204c A Simple Strategy to Custom-Optimize Feed Streams for Fed-Batch Processes

*Pik Leng Wong
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204d Computational Approach to Characterization of Cell-Culture Bioreactors

*Kumar Dhanasekharan
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Kenneth Hamilton
Sanjeev Ahuja
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David Keller
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204e Method to Identify Significant Shifts in Nonlinear Systems

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204f Online Performance Monitoring of Recombinant Protein Production in a Fed-Batch Reactor

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204g Cell Culture and Fermentation Control and Data Management

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Chair: Christina Chan

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- 246a** **Increasing Flavonoid Production by Metabolic Pathway Engineering in Multiple Yeast Hosts**
Hanxiao Jiang
John A. Morgan
- 246b** **Quantitative Target Identification for Metabolic Engineering of Yeast *Saccharomyces Cerevisiae*: Impacts of Bioreactor Environment**
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- 246c** **Metabolic Profiling and Flux Analysis of in Vitro Adipogenesis**
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- 246d** **Adipocyte Metabolic Engineering for Increased Fatty Acid Oxidation through Uncoupling Protein over-Expression**
Arul Jayaraman
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- 246f** **Optimization and Control of Metabolic Activities in Hepatocytes**
Marianthi G. Ierapetritou
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- 246g** **Dynamic Metabolic Flux Analysis for Tissue Systems**
Korkut Uygun
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Chair: Rajanikanth Vadigepalli

Vice Chair: Kenneth J. Kauffman

- 248a** **Modeling and Analysis of Bone Growth and Remodeling**
Rolf Findeisen
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- 248b** **A Comprehensive Model of Intracranial Dynamics of the Human Brain**
Srinivasa Kondapalli
Michalis Xenos
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Richard Penn
Andreas A. Linninger
- 248c** **A 3d Algorithm Simulating Acid-Mediated Growth of Solid Tumors**
Gang Cheng
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Pauline A. Markenscoff
- 248d** **Pharmacokinetic Analysis of Motexafin Gadolinium in Mouse Tissues Using a Non-Invasive Optical Measurement System**
Stephen Chad Kanick
Julie L. Eiseman
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- 248f** **A Diffusion-Reaction Model for Integrin Clustering in Response to Cell Adhesion**
Erik S. Welf
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- 248g** **Hindered Convection-Diffusion Model of Ion Transport through Nanometer-Sized Gap-Junction Biological Pores**
Anshu Verma
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Chair: Michael M. Choi

Vice Chair: Mayur P. Lodaya

- 252a** **Pharmaceutical Coating Operations: Challenges and Opportunities in the Changing Regulatory Paradigm**
Mansoor A. Khan
- 252b** **Overview of Film-Coating Technologies in the Pharmaceutical & Nutritional Industries**
Stuart C. Porter
- 252c** **Encapsulation of Fine Pharmaceutics by an All-Dry Coating Process**
Kenneth K. S. Lau
Karen K. Gleason

252d Film Coating of Ultrafine Cohesive Particles through Innovative Approaches

*Jun Yang
Yuhua Chen
Yueyang Shen
Jose A. Quevedo
Rajesh Dave
Robert Pfeffer*

252e Discrete Element Model of a Horizontal Pan Tablet Coater

*Carl R. Wassgren
Vince Hoon
Jose Perez
Kenneth Morris*

252f Characterization of Spray Guns for the Tablet Coating Industry

Rudolf Schick

252g Understand Fluid-Bed Coating through Detailed Modeling

*Kumar Dhanasekharan
L. Srinivasa Mohan
Rod Ray
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Rick Falk
Josh Shockey
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Chair: Gregory W. Luli

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257a Ethanol as Transportation Fuel - Production Technology Developments

Charles D. Tereck

257b New Processing Traits for Plant-Based Production of Fuels and Chemicals

*R. Michael Raab
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Jeremy C. Johnson
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257c Acid-Functionalized Mesoporous Silica Catalysts for the Esterification of Fatty Acids in Beef Tallow

*Isa K. Mbaraka
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257d Preliminary Evaluation and Characterization of Acidophilic Methanogens for Increased Biological Methane Production

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257e Design, Construction and Operation of a Biodiesel Plant Using a Novel Feedstock

*Trey Fleming
Dean A. Blackwell*

- 257f** **Impact of Blending Traditional and Non-Traditional Lipid Feedstocks for the Production of Biodiesel**
David E. Neaves
Mark E. Zappi
Rafael Hernandez
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- 257g** **Effects of Ethanol as a Fuel Additive on General Aviation Aircraft Fuel System Electrochemical Corrosion**
Clifford E. George
Katie Schroeder
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Chair: Daniel W. Pack

Vice Chair: Lonnie D Shea

- 260a** **Self-Assembling Linear-Dendritic Hybrid Polymers for Receptor-Mediated Gene Delivery**
Kris C. Wood
Robert Langer
Paula T. Hammond
- 260b** **Quantitative Evaluation of the Role of Vector in the Dynamics of Antisense Effects**
Sumati Sundaram
Li Kim Lee
Charles Roth
- 260c** **Short and Long Time Dynamics of Synthetic Gene Vectors in Mammalian Cells**
Chinmay H. Pangarkar
Tuan A. Dinh
Samir Mitragotri
- 260d** **Engineering Substrate-Mediated Gene Delivery with Self-Assembled Monolayers**
Angela K. Pannier
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- 260e** **Engineering Bacterial Outer Membrane Vesicles for DNA Vaccine Delivery**
David Chen
Jae-Young Kim
Anne M. Doody
Matthew DeLisa
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- 260f** **A Viral/Non-Viral Hybrid Gene Delivery Vector**
Josh Ramsey
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James T. Koerber
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Chair: Padma J. Narayan

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- 297a** **Supercritical CO₂ Based Formation of Drugs and Proteins Nanoparticles and Microencapsulation for Sustained Release**
Amol J. Thote
Kayoko Ono
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- 297b** **Dry Powder Aerosols for Multi-Drug Resistant Tuberculosis (Mdr-Tb) Treatment**
Jennifer Fiegel
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- 297c** **Monodisperse Powders for Controlled Release Inhalation Therapy**
Cory Berklund
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- 297d** **Long-Circulating Nanoparticles through Red Blood Cell Attachment**
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- 297e** **Analysis of Transient Protein Distribution in Plga Microparticles during Polymer Degradation and in Vitro Release**
Aiyong Zhao
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- 297f** **Incorporating Eg Chains into Polyanhydrides: Consequences for Protein Stabilization and Delivery**
Maria P. Torres
Balaji Narasimhan
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- 297g** **Particle Design for Enhanced Dissolution Rates of Poorly Water Soluble Drugs**
Keith Johnston
Xiaoxia Chen
Jason McConville
Jason Vaughn
Kirk Overhoff
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Chair: Matthew P. DeLisa

Vice Chair: Xuejun (Sherry) Gu

- 299a** **Breaking the Degeneracy of the Genetic Code**
Inchan Kwon
David A. Tirrell

- 299b** **Ligand-Induced Protein Splicing: a General Way of Achieving Post-Translational Regulation of Protein Activity *in Vivo***
David W. Wood
Georgios Skretas
- 299c** **Strategies for Expanding the Repertoire of Proteins That Can Be Displayed on the Outer Surface of *E. Coli***
Jae-Young Kim
Gina Cremona
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- 299d** **Regulation of Cd47-Sirp α Interactions by Post-Translational Modifications**
Shyamsundar Subramanian
Eric T. Boder
Dennis E. Discher
- 299e** **Programmable, Ligand-Controlled Riboregulators of Gene Expression**
Travis S. Bayer
Christina Smolke
- 299f** **Effect of Culture Conditions on the Glycosylation of Human Secreted Alkaline Phosphatase (Seap) Expressed in Tobacco Nt1 Cell Suspension Cultures**
Alejandro Becerra-Arteaga
Michael L. Shuler
- 299g** **Improved Membrane Protein Expression Using Cell-Free Protein Synthesis**
Jessica J. Wu
James R. Swartz

Session 304 - Biomedical Applications of Systems Biology

Chair: Arul Jayaraman

Vice Chair: Yiannis Kaznessis

- 304a** **Genome-Scale Analysis of Translation in *S. Cerevisiae*: Insights into System Response and Regulation**
Vassily Hatzimanikatis
Amit Mehra
- 304b** **Computational Analysis of Combinatorial Gene Regulation in the Liver**
Joseph L. Vitolo
Ioannis (Yannis) P. Androulakis
Charles M. Roth
- 304c** **Graph Theory-Flux Analysis Framework for Tissue-Specific Modeling of Metabolic Network Structure and Function**
Ryan P. Nolan
Yaguang Si
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- 304d** **Knowledge-Based Integration of Metabolic and Genetic Information to Identify Targets of Fatty Acid Toxicity**
Shireesh Srivastava
Christina Chan

- 304e** **Advances in Metabolic Flux Analysis from Stable Isotope Experiments: Theory and Applications**
Maciek R. Antoniewicz
Joanne K. Kelleher
Gregory Stephanopoulos
- 304f** **Megakaryocyte Development Illuminated by Transcriptional Analysis**
Peter G. Fuhrken
Chi Chen
William M. Miller
Eleftherios T. Papoutsakis
- 304g** **Identification of Important Signaling Proteins and Stimulants for the Production of Cytokines in Raw 264.7 Macrophages**
Sylvain Pradervand
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Chair: Kristina D. Rinker

Vice Chair: Milica Radisic

- 306a** **Functional Tissue-Engineered Blood Vessels Derived-from Bone Marrow Mesenchymal Stem Cells**
Jin Yu Liu
Daniel D. Swartz
Lan Yao
Stelios T. Andreadis
- 306b** **Strength Enhancement for Arterial-Implantable Fibrin Based Tev**
Lan Yao
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- 306c** **How Differences in Vessel Wall Void Space between the Aorta and the Pulmonary Artery Induce Differences in Filtration and Macromolecular Transport**
Zhongqing Zeng
Kung-Ming Jan
David Rumschitzki
- 306d** **Engineering Functional Myocardium**
Christopher Cannizzaro
Hyoungshin Park
Sharon Gerech-Nir
Nicola Elvassore
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- 306e** **Oxygen Gradients Correlate with Decrease in Cell Density and Viability in Engineered Cardiac Tissue**
Milica Radisic
Jos Malda
Eric Epping
Wenliang Geng
Robert S. Langer
Gordana Vunjak-Novakovic

306f Development of a Bioactive Polysaccharide-Based Tissue Engineered Aortic Valve

*Dinesh Aggarwal
Jeff Clark
Henry L. Walters
Howard W.T. Matthew*

306g Quantifying the Effect of Aortic Valve Degradation Using Signal Processing Techniques

*Reetu Singh
Michael VanAuker
Babu Joseph
Leo Ondrovic
Joel Strom*

Session 317 - Engineering Improvements in Cancer Diagnosis and Therapy: Experimental and Computational Models

Chair: Charles Roth

Vice Chair: Neil S. Forbes

317a A Population Balance Model of Senescent Tumor Modeling and Cancer Treatment

*Jeffry A. Florian
Robert S. Parker*

317b Customized Leukemia Chemotherapy Using an Age-Structured Population Balance

*Eric Sherer
Doraiswami Ramkrishna
Robert Hannemann
Ann E. Rundell*

317c A Cell Culture Analog for Multidrug Resistant Cancer Chemotherapy Screening

*Daniel A. Tatosian
Michael L. Shuler*

317d The Correlation of the Cell Cycle-Dependent Cytotoxicity and Drug Penetration into Three Dimension Tissue

*Byoung-jin Kim
Neil S. Forbes*

317e Comparison of 3d and 2d Cell Culture Models for Toxicology Assays

*Anand Kumar
Moo-Yeal Lee
Jonathan S. Dordick
Douglas S. Clark*

317f Metabolic Flux Analysis of Tumor Evolved Breast Cells: Effect of Estrogen Stimulation and Comparison to Normal Cells

*Adam L. Meadows
Douglas S. Clark
Harvey W. Blanch*

317g Human Glioma Cells Undergoing Chemotherapy-Induced Apoptosis Exhibit Marked Reductions in Intracellular Phosphocholine and Phosphocreatine

*Anthony Mancuso
Aizhi Zhu
Nancy Beardsley
Matthew Milkevitch*

Session 351 - FPBE Division Plenary Lectures

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 351a** **Computational Fluid Dynamics of Viscoelastic Flow (Area 15a Plenary Lecture)**
Jozef L. Kokini

- 351c** **Magnetic Cell Separation: Bioprocess, Biomedical, or Biochemical Engineering? It's All Chemical Engineering to Me! (Area 15c Plenary Lecture)**
Jeffrey Chalmers

- 351d** **Tissue Engineering: Microsystems and Macrosystems for Functional Genomics, Metabolic Engineering, Stem Cell Differentiation and the Treatment of Liver Disease (Area 15d/E Plenary Lecture)**
Martin L. Yarmush

- 351e** **FPBE Award Lecture: New Technologies for Protein Engineering and Proteomic Analyses**
George Georgiou

Session 425 - Poster Session: Animal & Plant Cell Culture

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 425a** **Titration of Baculovirus Transducing Ability in Mammalian Cells**
Zun-Ren Chan
Chia-Wei Lai
Hsiao-Ping Lee
Huang-Chi Chen
Yu-Chen Hu

- 425b** **Engineering Select Physical Properties of Cross-Linked Red Blood Cells and a Simple a *Priori* Estimation of Their Efficacy as an Oxygen Delivery Vehicle within the Context of a Hepatic Hollow Fiber Bioreactor**
Jason Gordon
Andre F. Palmer

- 425c** **Modeling and Scale up a Fibrous Bed Bioreactor for Mammalian Cell Culture**
Anli Ouyang
Patrick Bennett
Shang-Tian Yang

- 425d** **Glycosylation of Influenza a Virus Hemagglutinin**
Jana Schwarzer
Michael W. Wolff
Erdmann Rapp
Julia K. Schmidt
Udo Reichl

- 425e** **Effects of Culture Conditions on Recombinant Protein Glycosylation in Cho Cell Culture**
Susan Sharfstein
Jong Hyun Nam

- 425f** **The Effect of Multiple Passes of Edr on Suspended Animal Cells**
Ruben D. Godoy
Jeffrey Chalmers

425g **Generation of Alloreactive T-Cells in-Vitro for Cellular Therapy**

*mei Shao
Sherif Farag
Jeffrey Chalmers*

Session 426 - Poster Session: Biocatalysis & Protein Engineering

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

426a **Heterologous Expression of Aedes Aegypti Densonucleosis Virus Structural Protein Using Pichia Pastoris**

*Rachel Specht
Dan Konet
Jonathan O. Carlson
Ranil Wickramasinghe*

426b **Pooling of Enzyme Libraries for High Throughput Biocatalyst Development**

*Karen M. Polizzi
Cody U. Spencer
Ichiro Matsumura
Anshul Dubey
Monal Patel
Jay H. Lee
Matthew J. Reaff
Andreas S. Bommarius*

426c **Optimizing Mixing in Micro-Bioreactors Used for High Throughput Screening of Suitable Biocatalysts in Industrial Fermentation**

*Xiaonan Li
Marcel Ottens
Gijs W.K. van Dedem
Luuk AM Van der Wielen
Michiel van Leeuwen
Walter van Gulik
Josef J. Heijnen
E.E. Krommenhoek
J.G.E. Gardeniers
A. van den Berg*

426d **Development of Rigorous Distance Bounds for Improved Protein Structure Prediction**

*Scott R. McAllister
Christodoulos A. Floudas*

426e **Incorporation and Labeling of an Aliphatic Ketone in Recombinant Proteins**

*James A. Van Deventer
A. James Link
Yi Tang
Pin Wang
David A. Tirrell*

426f **A Novel Systems Engineering Approach for in Silico Sequence Selection in De Novo Protein Design**

*Ho Ki Fung
Christodoulos A. Floudas*

- 426g High-Throughput Biocatalysis on Microarrays for Synthesis and Screening of Small Molecule Therapeutics**
*Disha Ahuja
Lakshmi Santhanam
Sarah Brooks
Sylvain Antoniotti
Jonathan S. Dordick*
- 426h Stabilization of Interface-Binding Chloroperoxidase**
*Ravindrabharathi Narayanan
Ping Wang*
- 426i Integration of Relaxing Substrate Inhibition and Competitive Inhibition of Lipoygenase by Dmf in Aerobic Catalysis**
*Yun Fang
Yafen Su
Yongmei Xia
Yan Cai
Qilei Zhang
Hongli Xu
Hui Long*
- 426j Solvent Strategies of Asymmetric Reducing Synthesis Ethyl (R) -2-Hydroxy-4-Phenylbutyrate Catalyzed by Yeast**
*Yugang Shi
Yun Fang
Yongmei Xia
Hongping Wu
Feng Li*
- 426k Blue Fluorescent Protein Variants with Enhanced Brightness from a Computationally Designed Library**
*Marco A. Mena
Paul H. Bessette
Karen Y. Dane
Patrick S. Daugherty*
- 426l Residue-Rotamer-Reduction for Fast Protein Side-Chain Conformation Prediction**
*Wei Xie
Nick Sahinidis*
- 426m Toward the Transition State: Further Docking Studies on Family 47 Alpha-1,2-Mannosidases**
*Chandrika Mulakala
Peter J. Reilly*
- 426n Combined Simulation Approach of Atomistic and Continuum Models for the Thermodynamics of Lysozyme Crystals**
*Jaeeon Chang
Abraham Lenhoff
Stanley Sandler*

- 426o** **Quantification of Binary Diffusion in Protein Crystals**
Luuk AM Van der Wielen
Rajamani Krishna
Adrie J. J. Straathof
Aleksandar Cvetkovic
Cristian Piciooreanu
- 426p** **Molecular Simulation and Energy Landscape Analysis of Mechanical Unfolding of the Titin Protein**
Dan Lacks
Nhat-Hang Duong
Nathan Duff
- 426q** **Directed Evolution of Homing Endonuclease with Novel DNA Sequence Specificity**
Zhilei Chen
Huimin Zhao
- 426r** **Cell-Free Production of Proteins Requiring Disulfide Bonds**
Kurtis Knapp
James R. Swartz
- 426s** **Peptide Microarray-Based Mapping of Prion Transmission Barriers**
Peter M. Tessier
Susan Lindquist

Session 427 - Poster Session: Biological Transport, Migration, and Adhesion

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 427a** **Multiphase Hemodynamic Analysis of Cardiovascular Systems**
Jonghwun Jung
Ahmed Hassanein
- 427b** **Interplay between Soluble and Membrane-Tethered Extracellular Signals Dictates Cell Patterning during Worm Development**
Claudiu A. Giurumescu
Anand R. Asthagiri
- 427c** **Determining Diffusion Parameters of Rat Tumor Tissue Using Fluorescent Visualization Methods**
Clifford D. Buescher
Nilmini S. Wijeratne
Karlene A. Hoo
Herbert F. Janssen
- 427d** **Anoxic Region in Tissue by Theory of Krogh in Cartesian Coordinates**
Kal Renganathan Sharma
- 427e** **Stochastic Modeling of Extrinsic Blood Coagulation Dynamics**
William S. Denney
Ken Lo
Scott L. Diamond

- 427f** **Mobile-Surface-Charge Model for the Accurate Prediction of Cell Surface Charge from Electrophoretic Mobility Data**
James P. Camp
Adam T. Capitano
- 427g** **Surface Modification of Bovine Red Blood Cells with Methoxypoly(Ethylene Glycol)**
Sharon I. Gundersen
Andre F. Palmer
- 427h** **Solution for the Diffusive Interaction from a Spherical Source to an Internally Reactive Spherical Sink**
Nyrée V. McDonald
William C. Strieder
- 427i** **Identification of Shear Stress-Responsive Elements of the Cyclooxygenase-2 Gene in Human Chondrocytes**
Kelly J. Hardesty
Zachary R. Healy
Thomas Kensler
Konstantinos Konstantopoulos
- 427j** **Effect of Cyclic Stretch on the Migration of Endothelial Cells**
Cole T. Quam
Luis Cheng Sun
Ming-Wei Li
Yan-Ting Shiu
- 427k** **Pleiotropic Responses Mediated by Cd47-Sirp α Binding: Adhesion as a Common Link**
Shyamsundar Subramanian
Eric T. Boder
Dennis E. Discher
- 427l** **Effects of a Biocide and a Biocide Enhancer on *Srb* Growth and Biocorrosion**
Kaili Zhao
Jie Wen
Tingyue Gu
Srdjan Nesic
- 427m** **Mass Transfer Effects on the Biofilms Due to *Desulfovibrio Desulfuricans***
Jie Wen
Kaili Zhao
Tingyue Gu
Srdjan Nesic
- 427n** **Signal Transduction Reactions at Cell Membranes: Comparison of Continuum Theory and Brownian Dynamics Simulations**
Michael Monine
Jason Haugh
- 427o** **Engineering of the LuxI-LuxR Quorum Sensing System for Increased Functionality**
Daniel J. Sayut
Lianhong Sun

- 427p** **Motility Quorum Sensing Locus (Mqsa, B3022) Links Autoinducer 2 and Biofilm Formation in *Escherichia Coli* K12**
Andrés F. González Barrios
Ronjung Zuo
William Bentley
Yoshifumi Hashimoto
Li Yang
Thomas K. Wood
- 427q** **Ylih and Ycep Regulate *Escherichia Coli* K12 Biofilm Formation through Ai-2 and Indole**
Joanna Domka
Ian K. Kaye
Thomas K. Wood
- 427r** **Chemotaxis Machinery of *Salmonella Typhimurium* Controls Its Accumulation in Tumors**
Rachel W. Kasinskas
Neil S. Forbes
- 427s** **Ydgg (Renamed Sqsa) Controls Biofilm Formation in *Escherichia Coli* K12 by Altering Secretion of the Quorum-Sensing Signal Autoinducer-2**
Moshe Herzberg
Andrés F. González Barrios
Youngsoon Um
William E. Bentley
Ian K. Kaye
Thomas K. Wood
- 427t** **Multiscale Modeling of Neutrophil Rolling over a Selectin-Coated Surface**
Parag Pawar
Sameer Jadhav
Charles Eggleton
Konstantinos Konstantopoulos

Session 428 - Poster Session: Biomaterials and Tissue Engineering

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 428a** **Physical Properties of the Native and Engineered Vitreous Humor, Cornea, and Sclera**
Charles S. Nickerson
Matthew S. Mattson
Changjun Yu
Daniel M. Schwartz
Robert H. Grubbs
Julia A. Kornfield
- 428b** **High Throughput Solid Form Screening on Functionalized Nanoengineered Surfaces**
Alfred Y. Lee
In Sung Lee
Allan S. Myerson
- 428c** **Perfusion Flow Affects Human Mesenchymal Stem Cell Expansion, Ecm Structure, and Progenicity in 3d Scaffolds**
Feng Zhao
Warren Grayson
Teng Ma

- 428d Intermittent Fluid Flow Alters Mechanotransductive Signaling and Osteoblastic Differentiation of Bone Marrow-Derived Progenitor Cells**
*Michelle R. Kreke
Lindsay Sharp
William R. Huckle
Aaron S. Goldstein*
- 428e Effect of Fluid Shear Stress on the Differentiation of Endothelial Progenitor Cells**
*Taylor J. Moore
Yan-Ting Shiu*
- 428f Modeling Cell-Matrix Interactions and Nutrient Transport in Cell Scaffolds Possessing Inverted Colloidal Crystal Geometry**
*Sachin Shanbhag
Jung Woo Lee
Nicholas A. Kotov*
- 428g Design of a Flow Perfusion Chamber for the Reconstruction of Urinary Bladder**
*Jose F. Alvarez-Barreto
Y. Zhang
Bradley P. Kropp
Vassilios I. Sikavitsas*
- 428h Patterns of Colonization and Growth of Mammalian Cells Cultured in Rotating Discs**
*María José Rivas-Arreola
María Teresa Collados-Larrumbe
Mario M. Alvarez*
- 428i Polymeric Biomaterials: Compatibility of Medical-Grade Polymers with Dense CO₂**
*Aidarís Jimenez
Thomas A. Davis
Michael A. Matthews
Gary Lee Thompson
Kevin Crocker
Jeff Lyons
Arthur Trapotsis*
- 428j Development of a Mathematical Model for a 3-D Perfused Bone Marrow Culture System**
*Chi Yip Joan Ma
Athanasios Mantalaris
Xiao Yun Xu*
- 428k Optimization of Tissue Disaggregation**
*Bhavya Mehta
Jeffrey Chalmers*
- 428l The Development of a Three-Dimensional Microscale Cell Culture Analog Device for Toxicity Study**
*Xinran Li
Michael L. Shuler*
- 428m Controlled Expression of Insulin from Genetically Modified Tissue Engineered Skin Substitutes for Treatment of Diabetes**
*Pedro Lei
Adebimpe M. Ogunade
Stelios T. Andreadis*

428n Development of a Physiologically Relevant Experimental Model for Organ-Scale Metabolic Analysis and Engineering: Meeting the Oxygen Requirements of an Isolated Perfused Rat Liver

*Maria-Louisa Izamis
Francois Berthiaume
Martin L. Yarmush*

428o Substrate Softness Directs Differentiation of Human Stem Cells

*Adam Engler
Dennis E. Discher*

428p Guiding Human Embryonic Stem Cell Fate Choice to the Keratinocyte Lineage

*Sean P. Palecek
Lin Ji
Juan J. De Pablo*

428q Isolated, Perfused Organ Model for Studying Stem Cell Survival and Differentiation

*Flora Felsovalyi
Martin Cerff
Roberto Plasenzotti
Barbara Kapeller
Yelena Akelina
Edward F. Leonard*

428r Characterizing the Effects of Electrical Stimulation on Neural Progenitor Cell Behavior

*Carlos A. Ariza
Surya K. Mallapragada*

Session 429 - Poster Session: Biosensors

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

429a Dynamics of Immobilized Ssdna for DNA Microarrays

Min Sun Yeom

429b Quantitative Design Approach for a Multi-Analyte Acoustic-Wave Sensor

*Jane E. Valentine
Todd M. Przybycien
Steinar Hauan*

Session 430 - Poster Session: Downstream Bioprocessing

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

430a A New Method for the Synthesis of Gigaporous Polymer Beads

*Weiqing Zhou
Guanghui Ma
Tingyue Gu*

430b Isolation and Purification of a Pharmaceutically Active Secondary Metabolite Via Solid Phase Extraction

*Lisa Dietrich
F. Patrick Gailliot*

- 430c Refolding Kinetics of a Recombinant Fusion Protein without Chaotropic Agents**
Esteban Jaramillo Freydell
Maarten van der Cammen
Michel Eppink
Marcel Ottens
Gijs van Dedem
Luuk van der Wielen
- 430d Improvement upon Bioseparation by Altering the Host Genome**
Rajaramesh Varakala
Ralph Henry
Robert R. Beitle
- 430e Circumventing the Effects of High Binding Immobilized Metal Affinity Chromatography Contaminants**
Ryan Haley
Ralph Henry
Robyn Goforth
M. M. Ataa
Robert R. Beitle
- 430f The Potential for Exploiting Surface Hydrophobicity Differences for Recovery of Recombinant Proteins from Corn Using Aqueous Two-Phase Partitioning**
Zhengrong Gu
Charles E. Glatz
- 430g Simultaneous Stabilization and Extraction of Antioxidant Species from *Vitis Vinifera***
Robert R. Beitle
Anirban Roy
Luke Howard

Session 431 - Poster Session: Drug and Gene Delivery

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 431a Mathematical Modeling of Drug Release, Absorption and Clearance after Intramuscular Injection of Suspensions**
Parag Garhyan
Paramita Bandyopadhyay
- 431b Engineered Lipid-Based 'Polysomes' for Targeted Multimodal Therapy of Disseminated Metastatic Cancer**
Chun-Chia Huang
Min-Yuan Chang
Shrirang Karve
Stavroula Sofou
- 431c The Surfactant-Modified Hfa-134a|Water Interface: Towards Novel Pmdi-Based Formulations for the Delivery of Small Polar and Biomolecular Species**
Sandro R. P. Da Rocha
Parthiban Selvam
Udayan Chokshi

- 431d Dendrimer-Based Nanodevices for Asthma Drug Delivery: Synthesis, in-Vitro and in Vivo Studies**
Rangaramanujam M. Kannan
Rajyalakshmi Inagopalla
Sujatha Kannan
Omathanu Pillai
Mary Lieh-Lai
David Bassett
- 431e DNA and RNA Delivery and Transfection Mediated by Electroporation and Ultrasound**
Vladimir G. Zarnitsyn
Mark R. Prausnitz
- 431f The Effect of Terminal Group Modification on the Solution Properties of Dendrimers: a Molecular Dynamics Simulation Study**
Nicholas W. Suek
Monica H. Lamm
- 431g Photocontrol of DNA Condensation Using Photoresponsives Surfactants**
Anne-Laure M. Le Ny
C. Ted Lee
- 431h A Novel Serum-Stable Micelle System for Controlled Release of Rapamycin**
M. Laird Forrest
Glen S. Kwon
- 431i Preparation and Characterization of Nanospheres Composed of Water-Soluble Chitosan and Proteins by Spg (Shirasu Porous Glass) Membrane Process for Use as a Delivery System of Bioactive Ingredient**
Chong-Tai Kim
Chul-Jin Kim
Yong-Jin Cho
Bo-Youn Chun
- 431j Preparation and Characterization of Paclitaxel Loaded Polymer Vesicle Formulations**
Shuliang Li
Belinda M. Byrne
JoEllen J. Welsh
Andre F. Palmer
- 431k Nonviral Transfection of Cells Suspended in Resonant Acoustic Fields**
Yu-Hsiang Lee
Ching-An Peng
- 431l In Vitro Studies of Ferromagnetic Coils for Implant Assisted Magnetic Drug Targeting**
Armin D. Ebner
Misael O. Aviles
James A. Ritter
- 431m Hydrolysable Prodrugs of Geldanamycin for Efficient Nanoencapsulation and Sustained Release**
M. Laird Forrest
Glen S. Kwon

- 431n** **Development of Thermally Responsive Graft Copolymers for High Temperature-Activated Drug Delivery**
Induvadana Ankareddi
Christopher S Brazel
- 431o** **Dynamic Self-Assembly and Characterization of DNA-Polycation Nanoparticles**
Jingjiao Guan
Zhengzheng Fei
Yihua Loo
Kam W. Leong
L. James Lee
- 431p** **Micro- and Nano-Particles Developed by Electrohydrodynamic Atomization for the Sustained Delivery of Paclitaxel to Treat C6 Glioma**
Jingwei Xie
Chi-Hwa Wang
- 431q** **High Gradient Magnetic Implants: a More Effective Approach to Magnetic Drug Targeting**
Armin D. Ebner
James A. Ritter
- 431r** **Calcium Alginate Gel Beads Synthesis by Electrodipersion in Vegetable Oils**
Yinyan Zhao
You-Yeon Won
Michael T. Harris

Session 432 - Poster Session: Engineering Treatment and Analysis of Diseases

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 432a** **Evaluation of Leukemia Patient Non-Compliance during Maintenance Chemotherapy: a Population Balance Model of Rbc Maturation**
Eric Sherer
Doraiswami Ramkrishna
Robert Hannemann
Ann E. Rundell
- 432b** **Microdevice for High Throughput Analysis of Cross-Talk between Signaling Pathways: Application to Heat Shock and Apoptosis Responses in Liver Cells**
Sihong Wang
Kevin R. King
Pohun C. Chen
Francois Berthiaume
Mehmet Toner
Arul Jayaraman
Martin L. Yarmush
- 432c** **A Multi-Dimensional Somatic Evolution Model for in Vivo Tumor Growth**
Korkut Uygun
Jia Li
Yinlun Huang

- 432d Modeling of Microbial Population Response to Antimicrobial Agents: a High-Throughput Drug Development Tool**
Michael Nikolaou
A. N. Schilling
V. H. Tam
D. A. Melnick
- 432e Human Glioma Cells Exhibit Marked Reductions in ¹³C NMR-Detected Tca Cycle Activity and Oxygen Consumption during Late-Stage Apoptosis**
Anthony Mancuso
Nancy Beardsley
Aizhi Zhu
- 432f Burst Size Distributions from Measurements of Single Cells Infected with Vesicular Stomatitis Virus**
Ying Zhu
John Yin
- 432g The Role of Aquaporins-1 in H₂O Transport across the Endothelium of the Aorta**
Jimmy Deon Toussaint
Yixin Shou
David Rumschitzki
Kung-Ming Jan
- 432h Biochemical Characterization of Arma, a 16s Rrna Methyltransferase Which Confers Resistance to Aminoglycosides**
Grace F. Liou
Marc Galimand
Patrice Courvalin
- 432i Effect of Aggregate Morphology of a Non-Disease Associated Protein on the Cellular Metabolic Response and Viability of Human Epithelial Cells in Vitro**
Adam L. Meadows
Troy Cellmer
Rutger Douma
John M. Prausnitz
Harvey W. Blanch
- 432j Regulation of Apoptosis by Free Fatty Acids and Tnf- α : Role of Double-Stranded RNA-Dependent Protein Kinase (Pkr)**
Xuerui Yang
Zheng Li
Shireesh Srivastava
Christina Chan
- 432k Gas Transport in the Conducting Airways: an Axisymmetric Single-Path Model**
Srinath Madasu
Ali Borhan
James Ultman
- 432l Detection of Disseminated Tumor Cells in Bone Marrow of Breast Cancer Patients**
Xiaodong Tong
Kristie Melnik
Stephan Braun
Maciej Zborowski
Jeffrey Chalmers

432m A General Purpose Processor Implementation of Mpc for Insulin Delivery Devices

*Leonidas G. Bleris
Mayuresh V. Kothare*

432n A Closed-Loop Monitoring Strategy for Type 1 Diabetes Patients

*Daniel A. Finan
Dale E. Seborg*

432o Characterization of Beta-Amyloid Toxicity of P19 Embryonal Carcinoma Stem Cell during Development

*In Hong Yang
Theresa A. Good*

432p In-Vitro Model of Hepatic Ischemia/Reperfusion Injury

*Laurent Barbe
Herman Tolboom
Yaakov Nahmias
Francois Berthiaume
Martin Yarmush*

Session 435 - Poster Session: Green Biotechnology

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

435a Biofiltration of Hydrophobic Vocs with Filamentous Fungi: Modeling and Experimentation

*Alberto Vergara-Fernández
Brice Van-Haaren
Sergio Revah*

435b Utilization of *Triadica Sebifera* as a Novel Biodiesel Feedstock

*Scott D. Crymble
Mark E. Zappi
Rafael Hernandez
W. Todd French
Brian S. Baldwin
Donald Thomas*

435c Effect of Microwave on Cellulase-Catalyzed Reaction

*Wei Xin
Wei-Can Zhang
Pei-Ji Gao*

435d Enzyme and Acid Mediated Production of Microcrystalline Cellulose from Agricultural Wastes

*Foster Agblevor
Waleed, K. El-Zawawy*

435e Growth Kinetics of Xanthan Production from Uneconomical Agricultural Products with *Xanthomonas Campestris* Tistr 1100

*Sasithorn Kongruang
Monwadee Thakonthawat
Roongchawee Promtu*

- 435f** **An Integrated Photosynthesis Model for the Biological Production of Hydrogen Using Microalga**
Wonjun Park
Il Moon
- 435g** **Evaluation of Fungal Growth Kinetics and Organic Acid Production Using Chemostats**
Chris F. Wend
Andy J. Zwoster
Danielle L. Wharton
Mark G. Butcher
- 435h** **Selection of Warm-Season Grass and Other Feedstocks for Biomass Gasification**
Brian S. Baldwin
Eugene Columbus
- 435i** **Improving Ethanol Yields from Lignocellulosic Biomass Using a Novel Pretreatment**
Katherine A. Standish
David J. Dixon
Patrick C. Gilcrease
- 435j** **Enhancing Biological Methane Production from Biomass**
Michael S. Green
Patrick C. Gilcrease
- 435k** **Heterocyst Differentiation and H₂ Production in N₂-Fixing Cyanobacteria**
Neissa M. Pinzon-Gamez
Sathish Sundaram
Lu-Kwang Ju
- 435l** **Production of Galacto-Oligosaccharides from Whey Lactose by Using Two-Step Immobilized Enzyme Reactor**
Juan Ignacio Sanz Valero
Shang-Tian Yang
- 435m** **An Environmental Friendly Pretreatment of Biomass for the Production of Xylooligosaccharide and Other Value-Added Products**
Bin Wang
Hao Feng
Hans Blaschek
- 435n** **Production of Polyhydroxyalkanoates from Cellulosic Feedstocks Using *Ralstonia Eutropha***
Panchali Chakraborty
Kasiviswanathan Muthukumarappan
William Gibbons

Session 436 - Poster Session: Metabolic Engineering & Systems Biology

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 436a** **Enzyme Assay Microarrays for Biomarker Detection**
Dhaval N. Gosalia
William S. Denney
Cleo Salisbury
Jonathan Ellman
Scott L. Diamond

- 436b** **Analysis of Cell Population Distributions Using Fluorescence Microscopy**
Konstantinos Spetsieris
Stephanie Portle
Nikos V. Mantzaris
Kyriacos Zygorakis
- 436c** **Genomic Analysis of Hepatic Metabolite Pools**
R. Michael Raab
Matthew S. Wong
Gregory Stephanopoulos
- 436d** **Involvement of Saturated Fatty Acids in the Pathogenesis of Alzheimer'S Disease**
Sachin Patil
Christina Chan
- 436e** **Immune Activation in Response to Short Interfering Rnas (Sirnas) and Implications for RNA Interference (Rnai) in Mammalian Cells**
Joseph A. Gredell
S. Patrick Walton
- 436f** **Membrane Descriptions for a Mathematical Model of a Minimal Cell**
Mariajose Castellanos
Sam Lai
Keiichiro Kushiro
Michael L. Shuler
- 436g** **Genome-Wide Screening for Solvent Tolerance Genes in *Clostridium Acetobutylicum***
Jacob R. Borden
Eletherios T. Papoutsakis
- 436h** **Construction of a Genetic Toggle Switch for Polyhydroxyalkanoate Production in *Escherichia Coli***
Thomas B. Causey
Stephanie Portle
Ka-Yiu San
Nikos V. Mantzaris
George N. Bennett
- 436i** **Cell Phase Mapping from Cytometry**
Alan W. Mahoney
- 436j** **Overexpression of Geraniol 10-Hydroxylase and 1-Deoxy-D-Xylulose 5-Phosphate Synthase in *Catharanthus Roseus* Hairy Roots**
Ryan Peacock
Christie A. Peebles
Susan I. Gibson
Jacqueline V. Shanks
Ka-Yiu San
- 436k** **Improved Parameter Estimation and Accuracy Using the Bootstrap Method**
Milind Joshi
Andreas Seidel-Morgenstern
Andreas Kremling

- 436l** **Metabolic Engineering of *Artemisia Annua* Hairy Roots**
Christie A. Peebles
David J. Morales
Ka-Yiu San
- 436m** **Population Distribution Patterns in Cells with Oscillatory Genetic Network Dynamics**
Stephanie Portle
Mary L. Harrison
Ka-Yiu San
George N. Bennett
Nikos V. Mantzaris
- 436n** **Identification of Organic Acid Tolerance Genes in *E. Coli* for Biorefinery Applications**
Tanya Warnecke
Michael D. Lynch
Dr. Ryan T. Gill
- 436o** **Challenges of Photoautotrophic *Mfa*: a Transient Isotopic Labeling Approach**
Avantika A. Shastri
John A. Morgan
- 436p** **Metabolic Engineering Bacteria for in Vitro Drug Metabolism**
Jamie E. Prior
Uwe Christians
Ryan T. Gill
- 436q** **Using Inverse Metabolic Engineering to Restore Antibiotic Sensitivity in a Resistant *P. Aeruginosa* Isolate**
Julie Struble
Ryan T. Gill
- 436r** **An Improved Pca Approach for Microarray Data Analysis**
Derrick Rollins
Dongmei Zhai
Ramon Gonzalez
- 436s** **Stochastic Simulations of Cell Population Dynamics**
Michail Stamatakis
Nikos V. Mantzaris

Session 437 - Poster Session: Pharmaceutical Technology

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 437a** **Simulation of Particle Movement in a Pan Coating Device Using Discrete Element Modeling and Its Comparison with Video-Imaging Experiments**
Preetanshu Pandey
Yongxin Song
Ferhan Kayihan
Richard Turton

- 437b** **Systematic Modeling of Knowledge in Pharmaceutical Product Formulation**
Ankur Jain
Chunhua Zhao
Girish Joglekar
Leaelaf M. Hailemariam
Venkat Venkatasubramanian
Gintaras Victor Reklaitis
- 437c** **A Novel Method for the Quantitative Mapping of the Density Profile of Roller Compacted Ribbons Via near-Infrared Reflectance Spectroscopy**
Jeannie Chow
Nathan C. Pixley
Craig B. Ikeda
Celia N. Cruz
Justin D. Moser
- 437d** **Prediction of Equilibrium Partitioning of Pharmaceuticals in Octanol-Water and Water-Surfactant Systems**
Irina Smirnova
Matthias Buggert
Ludmila Mokrushina
Wolfgang Arlt
Reinhard Schomaecker
- 437e** **Recovery of Asymmetric Homogeneous Catalysts Using CO₂**
Jason P. Hallett
Jie Lu
Pamela Pollet
Charles L. Liotta
Charles A. Eckert
Philip G. Jessop
- 437f** **Pattern Recognition for Characterization of Pharmaceutical Powders**
Alvaro Realpe
Carlos Velázquez
- 437g** **Control of Batch Cooling Crystallization of Glycine**
Jia Wei Chew
Simon N. Black
Pui Shan Chow
Reginald B. H. Tan
- 437h** **Safe Handling of Potent Active Pharmaceutical Ingredients (Apis) in Kilogram Quantities**
Christopher N. Nilsen
Sergio Cesco-Cancian
Kirk Sorgi
Xini Zhang
- 437i** **Developing and Implementing High-Throughput Screening of Pharmaceutical Salts and Polymorphs**
Raeann Wu
Dimitris Papoutsakis
Peter Karpinski

- 437j Optimization of Monoclonal Antibody Production Using Process Simulation and Scheduling Tools**
Demetri P. Petrides
Charles Siletti
- 437k Inverse-Qsar for Pharmaceutical Development Using the Signature Descriptor: Application to Γ -Secretase and Cox-II Inhibitors**
Derick C. Weis
Crystal R. Childers
Donald P. Visco
Shawn Martin
Jean-Loup Faulon
- 437l Application of Raman Spectroscopy in High-Throughput Salt and Polymorph Screening**
Lili Feng
Piotr H. Karpinski
- 437m Solving the Inverse-Qsar Problem with Signature Using a Reduced System**
Derick C. Weis
Donald P. Visco
Richard LeBorne
Shawn Martin
Jean-Loup Faulon
- 437n Use and Implementation of Pat Tools for Particle System Characterization and Reaction Analysis**
Benjamin Smith
Will Kowalchuk
Terry P. Redman
- 437o Rapid Response of Large-Scale Influenza Vaccine Production for a Pandemic**
Lyle R. Lash
Henry Y. Wang
- 437p Adapting Traditional Microemulsion Phase Behavior Techniques to Pharmaceutical Formulation**
Ashkan Kamali
Craig McKelvey

Session 438 - Poster Session: Upstream Bioprocessing

Chair: Kenneth F. Reardon

Vice Chair: E. Terry Papoutsakis

- 438a Liquid-Solid Circulating Fluidized Beds: an Immobilized Bioreactor from a Product Inhibition Perspective**
Umang J. Trivedi
Amarjeet S. Bassi
Jesse Zhu
- 438b Monte Carlo Simulation of Dynamic Behavior of Bacteria during Disinfection**
L. T. Fan
A. Argoti
S. T. Chou

- 438c Spore Germination and Cell Immobilization of *Rhizopus Oryzae* in a Rotating Fibrous Bed Bioreactor for Controlling Morphology and Improving Lactic Acid Production**
Nuttha Thongchul
Shang-Tian Yang
- 438d Bioreactor Production of Probiotic Bacteria, Lactic Acid and Lactate Dehydrogenase by Fermentation with *Lactobacillus Acidophilus***
Robert P. Chambers
Haodi Dong
- 438e Effect of Carbon Sources on Propionic Acid Fermentation by *Propionibacterium Acidipropionici***
Supaporn Suwannakham
Shang-Tian Yang
- 438f Hydrodynamic Study of Gas Recirculation Aerobic Bioreactors Using Radio Active Particle Tracking and Gamma Ray Tomography**
Rajneesh Varma
Muthanna Al-Dahhan
- 438g Mechanisms of Supercritical Carbon Dioxide Sterilization of Bacterial Spores**
Jian Zhang
Michael A. Matthews
Nishita Dalal
Alvin Fox
Karen Fox
Jason Hemmer
Martine LaBerge
Michael Drews
Michael Stump
- 438h Stochastic Grey-Box Modelling of Industrial Fermentation**
Jan K. Rasmussen
Henrik Madsen
Sten Bay Jørgensen
- 438i Computer-Assisted Optimization of Hplc Separation for Simultaneous Quantification of Substrates and Products in Microbial Fermentation**
Yandi Dharmadi
Ramon Gonzalez
- 438j Towards the Commercial Production of Pharmaceutical Proteins Using Cell-Free Systems**
Michael C. Jewett
Kara A. Calhoun
James R. Swartz
- 438k Influence of Moderate Electric Field Frequency on the Growth Kinetics of *Lactobacillus Acidophilus***
Laleh Loghavi
Sudhir K. Sastry
Ahmed E. Yousef
- 438l Quantitative Analysis of Exopolysaccharide Production in a Stirred Tank Bioreactor**
Sasithorn Kongruang
Sumonthip Kongtun

438m Static and Dynamic Characteristics of Commensalistic Cultures with Kinetic Feedback

*Satish J. Parulekar
Parag Ingle*

438n Modeling and Optimization of DNA Plasmid Production from E. Coli Fermentation

*Mahitha Balguri
Jared R. Piccini
William J. Kelly
Kenneth R. Muske*

442a Laminar Flow Based Microreactor for Efficient Regeneration of Nicotinamide Cofactors for Biocatalysis

*Seong Kee Yoon
Cheikhou Kane
Eric R. Choban
Theodore Tzedakis
Paul J. A. Kenis*

Session 442 - Advances in Biocatalysis and Protein Engineering I

Chair: Andreas S. Bommarius

Vice Chair: William A. Apel

442b Development of a Phosphite Dehydrogenase-Based Nicotinamide Cofactor Regeneration System

*Tyler Johannes
Huimin Zhao*

442c The Use of Fed Batch Cultivation for Achieving High Cell Densities for the Pilot Scale Production of a Recombinant Protein (Phenylalanine Dehydrogenase) in Escherichia Coli

*eilis m. Faulkner
Mark Barrett
Sola Okor
Francesca Paradisi
Paul Engel
Brian Glennon*

442d Characterization and Comparison of Alkyl Hydroperoxide Reductase and Water-Forming Nadh Oxidase

*Rongrong Jiang
Bettina R. Riebel
William B. Wellborn
Andreas S. Bommarius*

442e Engineering Microorganisms for Plant Estrogen Production

*Joseph E. Leonard
Yajun Yan
Mattheos Koffas*

442f Partial Characterization of Dihydrobenzophenanthridine Oxidase and Its Role with Elicitation

*Jeong Jin Park
Hwa-Young Cho
Sung-Yong H. Yoon
Seok-Young Son
Hong Soon Rhee
Jong Moon Park*

442g Orthric Rieske Dioxygenases for Degrading Aromatic Pollutants

*Thomas K. Wood
Brendan G. Keenan
Thammajun Leungsakul*

Session 446 - Application of ChE Fundamentals to Active Pharmaceutical Ingredient (API) Process Development

Chair: Shailendra V. Bordawekar
Vice Chair: Shekhar K. Viswanath

446a Solvent and Catalyst Recovery in the Pharmaceutical Manufacturing Industry

*Jason Davis
Joseph T. Sullivan
Nick Anousis*

446b Batch Grinding Kinetics and Particle Shape of Active Pharmaceutical Ingredients by Fluidized-Bed Jet-Milling

*Tadashi Fukunaka
Boris Golman
Kunio Shinohara*

446c Drying of a Monohydrate Api under Thermodynamically Safe Conditions

*G. Scott Jones
Raymond Scaringe
Shawn Yin*

446d Estimating Solubility of Organic Salts with Enrtl-Sac Model

*Chau-Chyun Chen
Yuhua Song*

446e Trouble-Shooting of High Residual Solvent during Drying of Biological Derived Api

*Yubo Yang
Stephen Tyler
Kenneth Wilson*

446f Studying Hydraulic Deterioration of Large Scale Chromatography Columns

*Harish Santhanam
Yi Xie*

446g Development of Efficient and Robust Nitro Reduction Process: Catalyst Selection and Thermo-Kinetic Understanding

*Jale Muslehiddinoglu
Srinivas Tummala
Nicolas Cuniere
William Merkl
Richard Schild
Lucius Rossano*

Session 451 - Cell Adhesion and Migration

Chair: Gilda A. Barabino

Vice Chair: Michael R. King

- 451a The Traction Stresses of Neutrophils during Adhesion and Chemokinesis**
Lee Smith
Helim Aranda-Espinoza
Micah Dembo
Daniel A. Hammer
- 451b Cyclic Migratory Behavior of Neutrophils in Selectin Coated Capillary-Sized Micropipettes**
Prithu Sundd
Xiaoyan Zou
Douglas J. Goetz
David F.J. Tees
- 451c Shear-Induced Mechanical Shedding of L-Selectin on Neutrophils Can Explain the Shear Threshold Effect at Higher Shear**
Dooyoung Lee
Michael R. King
- 451d Biophysical and Biochemical Characterization of Selectin-Ligand Interactions Pertinent to Metastasis**
Susan L. Napier
William D. Hanley
Konstantinos Konstantopoulos
- 451e Investigation of *Staphylococcus Aureus* Biofilms: Quantification and Characterization of Planktonic Cells Eroding under Physiologically Relevant Fluid Shear Conditions**
Patrick Ymele-Leki
Julia M. Ross
- 451f The *Candida Albicans* Adhesion Receptor Eap1 Regulates Adhesion and Biofilm Formation *in Vitro* and *in Vivo***
Sean P. Palecek
Fang Li
Joel Wagner
- 451g Analysis of Biofilm Architecture in *Escherichia Coli* Strains**
Andrés F. González Barrios
Moshe Herzberg
Jintae Lee
Thomas K. Wood

Session 457 - Engineering Improvements in Cancer Diagnosis and Therapy: Novel Therapeutic Approaches

Chair: Charles M. Roth

Vice Chair: Neil S Forbes

- 457a Isolation of Tumor Targeting Peptides Using Fluorescent Bacterial Display Libraries**
Karen Y. Dane
Jeffrey J. Rice
Patrick S. Daugherty

- 457b Targeting L-Methioninase to Human Cancer Cells**
Naveen R. Palwai
Xiao-Ping Zang
J. Thomas Pento
Roger G. Harrison
- 457c Engineering Antibodies against the Epidermal Growth Factor Receptor to Block Dimerization**
Ginger Chao
Mark Olsen
Alejandro Wolf-Yadlin
K. Dane Wittrup
- 457d Targeting Cd47 as an Apoptotic Trigger of Human Lung Carcinoma Tumors**
Fariyal Ahmed
Shyamsundar Subramanian
M. Tewari
Dennis E. Discher
- 457e Design of Effective Cancer Treatment Strategies Using Systemically Delivered Sirna: Insights from in Vivo Studies and a Mathematical Model of RNA Interference**
Derek W. Bartlett
Mark E. Davis
- 457f Novel Alternating Copolymer Structures for Targeted in Vivo Imaging and Therapy in Cancer**
Michelle T. Hardiman
Jin Zhou
Robert J. Fisher
Clark K. Colton
Rajesh Kumar
Rahul Tyagi
Virinder S. Parmar
Arthur C. Watterson
- 457g The Scale-up of T Cell Depletion for Mismatched Bone Marrow Transplants**
Ying Xiong
Xiaodong Tong
Sherif Farag
Jeffrey Chalmers

Session 479 - Systems Engineering of Biotechnological and Pharmaceutical Processes

Chair: Radhakrishnan Mahadevan

Vice Chair: Costas D. Maranas

- 479a A Structured Model to Represent Sequential Substrate Uptake during Rifamycin B Fermentation in Complex Media**
Pramod P. Wangikar
Prashant Bapat
K V Venkatesh
- 479b Cybernetic Modeling Approach for Analysis and Redesign of Biochemical Pathways**
Jamey D. Young
Doraiswami Ramkrishna

- 479c** **Modelling and Bifurcation Studies of a Two-Stage Continuous Bioreactor for the Production of Poly-Beta-Hydroxybutyrate (PHB)**
Mark A. Pinto
Charles D. Immanuel
- 479d** **Metabolic Engineering of Escherichia Coli through in Silico Design and Experimental Evolution**
Stephen S. Fong
Anthony Burgard
Costas D. Maranas
Bernhard O. Palsson
- 479e** **Dynamic Flux Balance Analysis of Yeast Primary Metabolism in Fed-Batch Culture**
Jared Hjersted
Michael A. Henson
Radhakrishnan Mahadevan
- 479f** **Dynamics of Cell Populations Carrying Gene-Switching Networks with Fluorescent Protein Markers of Different Half-Lives**
Stephanie Portle
Thomas B. Causey
Ka-Yiu San
George N. Bennett
Nikos V. Mantzaris
- 479g** **Comprehending the Molecular Portraits of Hyper-Producers in Bioprocessing**
Gargi Seth
Robin J. Philp
Mugdha Gadgil
Miranda Yap
Wei-Shou Hu

Session 484 - Advances in Biocatalysis and Protein Engineering II

Chair: Andreas S. Bommarius

Vice Chair: William A. Apel

- 484a** **Application of the Consensus Concept for Increased Thermostability of Glucose Dehydrogenase**
Eduardo Vazquez-Figueroa
Javier Chaparro-Riggers
Andreas S. Bommarius
- 484b** **Examining Beta-Glucosidase Reaction Kinetics by Isothermal Titration Microcalorimetry**
Tina Jeoh
John O. Baker
Eric. E. Jarvis
Mushedha K. Ali
Michael E. Himmel
William S. Adney
- 484c** **Synthesis and Tandem Mass Spectrometric Characterization of Tailored Co-Oligopeptides**
Santhana Srinivasan
hareesh Palli
Shubhen Kapila
Daniel Forciniti
Paul Nam

- 484d** **Solid-Phase Combinatorial Biocatalysis of the Natural Product Bergenin**
Umar Akbar
Douglas S. Clark
Jonathan S. Dordick
- 484e** **Increasing the Synthetic Utility of Penicillin G Acylase by Rational and Directed Evolution**
Karen M. Polizzi
Javier Chaparro-Riggers
Bernard Loo
Augustin Luna
Eduardo Vazquez-Figueroa
Andreas S. Bommarius
- 484f** **Activation of Enzymes in Hexane Using an Inert Support**
Peter Pfromm
Mary E. Rezac
Yvonne Hoffmann
Kerstin Wuerges
Peter Czermak
- 484g** **Enhance and Modulate Substrate Permeability for Whole-Cell Biocatalysis through Cellular Membrane Engineering**
Ye Ni
Xuan Guo
John Reye
Rachel Ruizhen Chen

Session 487 - Advances in Systems Biology: Experimental Methods and Applications

Chair: Matthew P. DeLisa

Vice Chair: Charles M. Roth

- 487a** **Genomics Tools for Elucidating the Function of Trait Conferring Genes**
Michael D. Lynch
Tanya Warnecke
Amarjeet Singh
Ryan T. Gill
- 487b** **Proteomics-Based Systems Biology Study of the Phosphorus Starvation Response in the Cyanobacterium *Synechocystis* Sp. Strain Pcc6803**
Chee Sian Gan
Nigel G. Ternan
Geoffrey McMullan
Kenneth F. Reardon
Phillip C. Wright
- 487c** **Enabling Cell Factory Design through High-Throughput and Quantitative Metabolome Analysis**
Michael C. Jewett
Jens Nielsen

- 487d** **Study of Heat Shock Effects on Inflammatory Signaling Using a Microfluidic Living Cell Array**
Sihong Wang
Kevin R. King
Kenneth J. Wieder
Mehmet Toner
Arul Jayaraman
Martin L. Yarmush
- 487e** **A High-Throughput Screen for Poly-3-Hydroxybutyrate for Inverse Metabolic Engineering of Recombinant *Escherichia Coli* and *Synechocystis Pcc 6803***
Keith E. Tyo
Hang Zhou
Hal S. Alper
Gregory Stephanopoulos
- 487f** **Systematic Analysis of Erbb Induced Signaling, Proliferation, and Migration**
Neil Kumar
Alejandro Wolf-Yadlin
Forest White
Douglas Lauffenburger
- 487g** **High Throughput Approach to Drug Discovery: Sars Coronavirus - a Case Study**
Dhaval N. Gosalia
Graham Simmons
Scott L. Diamond
Paul Bates

Session 490 - Cardiovascular Systems in Health and Disease

Chair: Kristina D. Rinker

Vice Chair: Edgar A. O Rear

- 490a** **The Effects of Transforming Growth Factor β 1 Stimulation on Endothelial Cell Physiology Are Influenced by Shear Stress**
Kristina D. Rinker
Robert D. Shepherd
- 490b** **Nitric Oxide Inhibits Endothelial Receptor Expression and Sickle Red Blood Cell Adhesion Induced by Cytokine Stimulation**
Amanda R. Owings
Timothy M. Wick
- 490c** **Leukocyte Margination in Microfabricated Blood Vessels**
Lance L. Munn
Sergey Shevkoplyas
Chenghai Sun
Mark W. Bitensky
Aaron Mulivor
- 490d** **Nanoscale Macromolecules for Modulating Cell-Ldl Interactions**
Nicole M. Plourde
Nicole Iverson
Evangelia Chnari
Jinzhong Wang
Kathryn Urich
Prabhas Moghe

- 490e** **Thrombogenic Protein Microarrays for in Vitro Coagulation Studies under Flow**
Uzoma M. Okorie
Scott L. Diamond
- 490f** **Tocopherols and Cehcs Modulate Platelet Thrombus Formation**
Durga Prasanthi Sarvepalli
Kenneth Hensley
Matthias Ulli Nollert
- 490g** **Cryopreservation of Human Platelets with a Trehalose-Based Formula**
Ying Nie
Juan J. de Pablo
Sean P. Palecek
- 495a** **Investigation of Chemical Effects on Neural Progenitor Cell Adhesion and Differentiation Using Micropatterned Substrates**
Erin Boote Jones
Jennifer Recknor
Donald S. Sakaguchi
Surya K. Mallapragada
- Session 495 - Culture Strategies to Enhance Engineered Tissue Phenotype**
Chair: Aaron S. Goldstein
Vice Chair: Vassilios I. Sikavitsas
- 495b** **Application of Micropatterning Techniques to Co-Culture Systems for Hepatic Tissue Engineering**
Cheul H. Cho
Jae-Sung Park
Francois Berthiaume
Arno W. Tilles
Mehmet Toner
Martin L. Yarmush
- 495c** **Preventing Hepatocyte Steatosis by Co-Culture with Adipocytes during Plasma Exposure**
Deepak Nagrath
Vanessa Lopez
Francois Berthiaume
Martin Yarmush
- 495d** **Morphological and Functional Responses of Hepatocytes Cultured on Glycosaminoglycan-Chitosan Membranes**
Therese Bou-Akl
Basak Saygili
Howard W.T. Matthew
- 495e** **Using Bone-like Ecm Produced in Vitro to Influence Osteoblastic Differentiation of Marrow Stromal Cells**
Upma Sharma
Quynh Pham
Neha Datta
Antonios Mikos

495f Seeding of Scaffolds for Tissue Engineering in a Flow Perfusion Bioreactor Improves Efficiency and Cell Distribution

*Jose F. Alvarez-Barreto
Shawna Linehan
Jessica Yankovich
Robert L. Shambaugh
Vassilios I. Sikavitsas*

495g Bioreactor Optimization of Scaffold Seeding for Cartilage Tissue Engineering

*Bahar Bilgen
Ericka M. Bueno
Gilda A. Barabino*

Session 506 - Intracellular Processes

Chair: Chetan J. Gadgil

Vice Chair: Jason M. Haugh

506a Altered Egfr Trafficking and Signaling in Iressa-Sensitive Human Cell Lines

*Matthew J. Lazzara
Paul Jasper
Peter Sorger
Douglas A. Lauffenburger*

506b Experimentation, Modeling and Parameter Sensitivity Analysis Suggest a Role of Erk in Receptor down-Modulation during T Cell Signaling

*Yanan Zheng
Marietta Harrison
Ann Rundell*

506c Cell Fate Determination by Multiple Signaling Pathways: Genome-Wide Analysis and Modeling of Pattern Formation in *Drosophila* Egg Development

*Nir Yakoby
Chris A. Bristow
Rachel Kalifa
Gertrud Schupbach
Stas Shvartsman*

506d Apoptotic Signaling Pathways in Megakaryocytes

*Lisa M. Giammona
Eleftherios T. Papoutsakis
William M. Miller*

506e Topology and Dynamics of Pro-Mitogenic B-Catenin Signaling in Mammary Epithelial Cells

*Nicholas A. Graham
Anand R. Asthagiri*

506f Determination and Analysis of the Dynamic Mechanisms That Precede Long-Term Depression in Cerebellar Purkinje Cells

*Nicholas Hernjak
Boris M. Slepchenko
Leslie M. Loew*

506g Modeling of Heterotrimeric G-Protein Mediated Calcium Response in Raw 264.7 Macrophage Cells

*Mano R. Maurya
Shankar Subramaniam*

Session 528 - Adhesion Receptors of Eukaryotic and Prokaryotic Cells

Chair: A. Omolola Eniola

Vice Chair: Michael R. King

- 528a Leukocyte Firm Adhesion in Capillary-Sized, Selectin Coated Micropipettes**
Prithu Sundd
Xiaoyan Zou
Douglas J. Goetz
David F.J. Tees
- 528b Pharmacologically-Induced Changes in Neutrophil Membrane Mechanics Regulate the Psgl-1/P-Selectin Adhesion Lifetime**
Kathryn E. Edmondson
Scott L. Diamond
- 528c Micropatterns of P-Selectin Enhance Cell Capture and Rolling**
John P. Gentile
Nichola Charles
Gabor Csucs
Michael R. King
- 528d The Effects of Cytoskeleton Disruption in Membrane Tether Formation and Leukocyte Rolling**
Alexander Christov
David W. Schmidtke
- 528e Early Versus Late Growth *S. Aureus* Adhesion to Immobilized Platelets under Physiological Shear Regimes**
Niraj P. E. George
Konstantinos Konstantopoulos
Julia M. Ross
- 528f Removal of Adhered Bacteria by Surfactant and Shear**
Margot Vigeant
Sam N. Rothstein
Jonathan J. Cacciatore
- 528g Dynamic Relationships among Pi 3-Kinase Signaling, Contact Area Spreading, and Cell Polarization Following the Attachment of Fibroblasts to Surfaces**
Michael Weiger
Jason Haugh

Session 530 - Advances in Biocatalysis and Protein Engineering III

Chair: William A. Apel

Vice Chair: Andreas S. Bommarius

- 530a Bacterial Substrate Display: a New Method for Profiling Protease Activity**
Kevin T. Boulware
Patrick S. Daugherty
- 530b Computational Design of Arac Protein with Novel Effector Specificity**
Hossein Fazelinia
Patrick C. Cirino
Costas D. Maranas

- 530c** **Directed Evolution of Specific Receptor-Ligand Pairs for Use in the Creation of Gene Switches**
Karuppiah Chockalingam
Huimin Zhao
- 530d** **An Engineered Genetic Approach to Isolating Functional Proteins Expressed from De Novo Libraries**
Adam C. Fisher
Matthew DeLisa
- 530e** **Generating Libraries for Directed Evolution of Proteins – Comparison of Recombination-Dependant Pcr and DNA Shuffling**
Bernard Loo
Alicia Powers
Javier Chaparro
Andreas S. Bommarius
- 530f** **Engineering and Selection of Ligand-Binding Gfp Variants and Antibodies Via Tat Display**
Danielle Tullman-Ercek
Brian Ribnicky
George Georgiou
- 530g** **Laboratory Evolution of a Fluorinated Protein**
Soojin Son
David A. Tirrell

Session 531 - Advances in Bioreactors

Chair: Jeffrey Chalmers

Vice Chair: Semsı Ensari

- 531a** **Controlling *Rhizopus Oryzae* Biofilm Growth and Lactic Acid Production in a Rotating Fibrous Bed Bioreactor**
Nuttha Thongchul
Shang-Tian Yang
- 531b** **Investigation of Shear Stress- and Hypoxia-Induced Mammalian Cell Damage in Aerated Bioreactors**
Athanas A. Koynov
Johannes Khinast
- 531c** **Modeling of Oxygenation within a Hepatic Hollow Fiber Bioreactor with Modified Oxygen Carriers Supplemented to the Circulating Media**
Jesse Sullivan
Andre Palmer
- 531d** **Production of *Bacillus Subtilis* Enzymes in a Microscale Bioreactor**
Janine Reimann
Gopal Chotani
Tim Dodge
Alfred Gaertner

531e **Design and Fabrication of a Polymer-Based, Instrumented Microbioreactor for High-Throughput Continuous Microbial Cell Cultures**
Zhiyu Zhang
Paolo Boccazzi
Hyun-Goo Choi
Gerardo Perozziello
Oliver Geschke
Anthony J. Sinskey
Klavs F. Jensen

531f **Microalgal Fermentation Scale-up Considerations,**
Weiwei Hu
Jeffrey Chalmers
Ray Gladue
Jon Hansen

531g **The Influence of Kinetic and Spatial Segregation on Fate of Commensalistic Cultures**
Satish J. Parulekar
Parag Ingle

Session 533 - Advances in Systems Biology: Computational Methods and Applications

Chair: Charles Roth

Vice Chair: Matthew DeLisa

533a **Generalization of Network Component Analysis**
Linh My Tran
Simon J. Galbraith
James C. Liao

533b **Mixed-Integer Reformulations of Network Component Analysis**
Eric Yang
Joseph Vitolo
Charles Roth
Ioannis (Yannis) P. Androulakis

533c **Data Integration and Bioinformatics in the Analysis of Developing Tissues**
Chris A. Bristow
Nir Yakoby
Rachel Kalifa
Gertrud Schupbach
Stas Shvartsman

533d **An Optimization Framework for Identifying Reaction Activation/Inhibitor or Elimination Candidates for Overproduction in Microbial Systems**
Priti Pharkya
Costas D. Maranas

533e **Analysis of the Thermodynamic Feasibility of a Genome Scale Metabolic Model**
Matthew D. Jankowski
Christopher Henry
Linda Broadbelt
Vassily Hatzimanikatis

533f **A New Milp Based Approach for *in Silico* Reconstruction of Metabolic Networks and Its Application to Marine Cyanobacterium *Prochlorococcus Marinus***

Xiaoxia (Nina) Lin
Aaron Brandes
Jeremy Zucker
George M. Church

533g **Sensitivity Analysis in Biological Modeling: an Application in the Model Development of Staphylococcal Enterotoxin B Pre-Apoptotic Pathways**

Rudiyanto Gunawan
Stephanie R. Taylor
Francis J. Doyle

Session 560 - Stem Cell Engineering

Chair: Sundararajan V. Madihally

Vice Chair: S. Patrick Walton

560a **Microbioreactor Array for Controlled Differentiation of Human Embryonic Stem**

Nicola Elvassore
Sharon Gerecht-Nir
Christopher Cannizzaro
Robert Langer
Gordana Vunjak-Novakovic
Elisa Figallo

560b **Fluid Dynamics of a Rotating Bioreactor: Application to the Expansion of Encapsulated Embryonic Stem Cells**

Sandeep A. Chandarana
Xiao Yun Xu
Athanasios Mantalaris

560c **Effects of Oxygen on Murine Embryonic Stem Cell Energetics and Growth**

Daryl E. Powers
Ryan B. Huang
Clark K. Colton

560d **Influence of Matrix Architecture on Esc Differentiation and Proliferation**

Yan Huang
Mbonda Siewe
Sundararajan V. Madihally

560e **Induction of Embryonic Stem Cells into Endoderm Hepatic Lineage**

Cheul H. Cho
Natesh Parashurama
Mara L. Macdonald
Arno W. Tilles
Francois Berthiaume
Martin L. Yarmush

560f **Lineage Switching of Hematopoietic Cells in Response to Changes in Culture Conditions**

Li Ting Huang
Chi Chen
E. Terry Papoutsakis
William M. Miller

560g **Differentiation Characteristics of Bone Marrow Derived Mesenchymal Stem Cells on Immobilized Glycosaminoglycans**

Basak Saygili

Howard W.T. Matthew

Session 36 - Portable Power Systems

Chair: Ronald S. Besser

Vice Chair: Tom R. Marrero

36a **Integrated Partial Oxidation and Purification Microsystems for Autothermal Production of Hydrogen from Methanol**

Kishori T. Deshpande

Benjamin A. Wilhite

M. A. Schmidt

Klavs F. Jensen

36b **Thermal Integration Issues in Micro Fuel Processor: Development of an Integrated Silicon Microreactor Based Methanol Steam Reformer as a Model**

Keyur Shah

Ronald S. Besser

36c **High Performing Air Breathing Passive Direct Formic Acid Fuel Cell (Dfafc)**

Su Ha

Zachary Dunbar

Richard I. Masel

36d **Si-Based Microfabricated Liquid Fuel Cell System Featuring High Aspect Ratio Micro-Pillars for Selective Electrocatalyst Deposition**

Allen CH Feng

Guizhen Yan

Zhiyong Xiao

Philip CH Chan

I.-Ming Hsing

36e **Test and Evaluation of the Smart Fuel Cell C20-Mp Direct Methanol Hybrid Fuel Cell System as a Soldier Power Source**

Jonathan M. Cristiani

Nicholas X. Sifer

Session 126 - NO_x and SO_x Control Technology

Chair: Hossein Hariri

Vice Chair: Atanas Serbezov

126a **A Successful SnCR Design with CFD Applications in a Gas Fired Co Boiler**

Quang H. Nguyen

Wei Zhou

David Moyeda

Roy Payne

Richard Suter

126b **Kinetics of NO_x Absorption into Aqueous Solutions of Oxone**

Yusuf G. Adewuyi

- 126c Absorption with Photochemical Oxidation of Sulfur Dioxide in Sulfuric Acid**
Christoph Gruber
Gunther Kracker-Semler
Matthäus Siebenhofer
Rolf Marr
- 126d Charge Transfer Reactions Have a Negligible Contribution on Nox Conversion in Nonthermal Plasma Reactor**
Gui-Bing Zhao
Morris D. Argyle
Maciej Radosz
- 126e Post-Combustion Reduction of Nitrogen Oxide from Stationary and Mobile Sources**
Wei-Yin Chen
Benson Gathitu
- 126f Surface Reaction Mechanism for Reduction of No by C3h6 under Lean Burn Conditions**
Dinesh Mantri
Viral Mehta
Preeti Aghalayam

Session 156 - Biobased/Green Materials and Processing Technology: Invited Talks I

Chair: Amar K. Mohanty

Vice Chair: William J. Orts

- 156a Renewable Polymers for Sustainable Growth**
Joseph V. Kurian
- 156b Truly Green Composites: Fibre, Polymer & Interface Characterisation**
Alexander Bismarck
Alexis Baltazar y Jimenez
- 156c New Opportunities for Agricultural Materials**
Carmela A. Bailey
- 156d Natural Fibers – a Novel Approach to Reinforcing Automotive Composites**
Kelly Williams
Cynthia M Flanigan
Ellen C Lee
Debbie F Mielewski
Dan Q Houston
- 156e Panel Discussion I**
Amar K. Mohanty

Session 201 - Biobased/Green Materials and Processing Technology: Invited Talks II

Chair: Amar K. Mohanty

Vice Chair: William J. Orts

- 201a Drivers, Standards, and Technology Exemplars for Biobased Products**
Ramani Narayan

201b Prospective on Biobased Materials: Opportunities and Challenges

*Syed H. Imam
Gregory M. Glenn
William J. Orts
Justin Shey
Gregory M. Gray
Bor-Sen Chiou
Artur P. Klamczynski
Delilah F. Wood*

201c Legume Protein and Starch as a Source for Biodegradable Plastic Materials

*Elda M. Salmoral
M. E. González
M. Floccari
M. P. Mariscal*

201d Emerging Opportunities and Challenges for Biobased Products

Bhima Vijayendran

201e Panel Discussion II

Amar K. Mohanty

Session 250 - Biobased/Green Materials and Processing Technology: Invited Talks III

Chair: Amar K. Mohanty

Vice Chair: William J. Orts

250a Ecobionanocomposites: a New Class of Green Materials

John R. Dorgan

250b Environmentally Friendly Polymers and Composites for Military Applications

*John J. La Scala
James M. Sands
Giuseppe R. Palmese*

250c Microcellular Polylactide (PLA) Nanocomposites

*Lih-Sheng Turng
Shaoqin Gong
Adam Kramschuster
Tongnian Li*

250d From a Kraft Mill to a Forest Products Biorefinery

Adriaan Van Heiningen

250e Panel Discussion III

Amar K. Mohanty

Session 336 - Nanotechnology in Biobased/Green Materials

Chair: Yulin Deng

Vice Chair: Joseph V. Kurian

336a Cellulose Nanofibers Extracted from Microcrystalline Cellulose and Corn Stover

*Tao Wang
Manju Misra
Bruce E. Dale
Lawrence T. Drzal*

- 336b Water-Based Nanostructured Composite for Paper Barrier Coating**
*Yulin Deng
Qunhui Sun
Joseph Schork*
- 336c Recovery of Molybdate Catalyst from Pulp Bleaching Effluent by Cationic Surfactants**
*Bandaru V. Ramarao
Raymond Francis
Nilay Sameer
Ashok Nayar
Aparna Ramarao*
- 336d New Biobased Nanocomposite Materials from Toughened Bacterial Bioplastic and Titanate Modified Clay**
*Yashodhan S. Parulekar
Amar K. Mohanty*
- 336e Nucleating Effect of Expanded Graphite Nanoplatelets on Poly(Hydroxybutyrate)**
*Dana G. Miloaga
Manju Misra
Lawrence T. Drzal*

Session 448 - Biobased/Green Materials: General Session

Chair: Joseph V. Kurian

Vice Chair: Christopher L. Verrill

- 448a Dendritic Hyperbranched Polymer Modified Bioplastics: a New Hope in Green Material Research**
*Amar K. Mohanty
Rahul Bhardwaj*
- 448b Factors Influencing the Sustainability of Bio-Based Propanediol**
*Robert W. Sylvester
Carina Alles
Joseph Kurian
Carl Musk
Robin Jenkins
Susanne Veith*
- 448c Compatibilizing Effect of Epm-G-Ma in Sorona®/Epdm Incompatible Blends**
*Indose Aravind
Sabu Thomas
Joseph V. Kurian*
- 448d Studies on Wood and Other Natural Fiber Reinforced Poly(Lactic Acid) Composites**
*Manju Misra
Masud Huda
Lawrence T. Drzal
Amar K. Mohanty*
- 448e Using the Mexican Cactus as a Natural-Based Separating Agent in a Filter for Removing Contaminants in Drinking Water**
*Kevin A. Young
Alessandro Anzalone
Norma A. Alcantar*

448f Evaluation of Compostability of Commercially Available Biodegradable Packages in Real Composting Conditions
Kale Gaurav
Sher Paul Singh
Rafael Auras

Session 463 - Green Processing Technology for Forest- and Agricultural-based Products

Chair: Kiran K Reddy

Vice Chair: Steve R. Duke

463a Novel Approach for Producing High Yield and High Brightness Tmp in Peroxide Bleaching
Yulin Zhao
Yulin Deng

463b Role of Amphiphilic Additives in Determining the Extent of Fragmentation in Water-Based Acrylic Pressure Sensitive Adhesive Films during Recycling Operations
Xing Geng
Steven J. Severtson
Larry Gwin

463c Process Systems Considerations in Forest Biorefineries with Thermochemical Processing of Wood Wastes
William J. Frederick
Matthew J. Reaff
Farminder S. Anand
Kristiina Iisa
Charles E. Courchene

463d Detailed Analysis of Modifications in Lignin after Treatment with Cultures Screened for Lignin Depolymerizing Agents
Aarti V. Gidh
Dinesh S. Talreja
Clint Williford
Alfred T. Mikell

463e Visualizations of Bubble-Contaminant Interactions in Deinking Flotation
Zachery I. Emerson
Gopal A. Krishnagopalan
Steve R. Duke

463f Process Optimization in Synthesis of Lubricants: from Ome to Hism
Marcel A. Liauw
Sven Eichholz
Sergio Sabater Prieto

Session 545 - Isolation and Purification of Chemicals from Renewable Feedstocks

Chair: Adriaan van Heiningen

Vice Chair: Ranil Wickramasinghe

545a Kinetics of the Dissolution of Hemicellulose from Softwood under Alkaline Conditions
Hans Theliander
Harald Breid
Alexandra Wigell

- 545b** **Extraction of Hemicellulose from Mixed Southern Hardwood Using Hot Water Extraction**
Adriaan Van Heiningen
Mehmet Sefik Tunc
Kimberley MacEwan
- 545c** **Process Considerations When Selecting Black Liquor Gasifiers**
William J. Frederick
Scott Siquefield
Kristiina Iisa
Christopher Young
- 545d** **A Novel Process for Separation of Lignin from Kraft Black Liquor**
Hans Theliander
Fredrik Öhman
Peter Axegård
Per Tomani
- 545e** **Liquefaction of Pulverized Ligneous Biomass Powder in Hot Compressed Water by Using Microwave Heating**
Nobuhiko Okada
Nobusuke Kobayashi
Jun Kobayashi
Guilin Piao
Shigenobu Hatano
Yoshinori Itaya
Shigekatsu Mori
- New Value-Added Sustainable Green/Biobased Materials from the Byproducts of Corn Ethanol Industries: Challenges and Opportunities**
Amar K. Mohanty
Qiangxian Wu
Dinesh Aithani

The session papers for sessions 108 and 304 were not available at time of production

Session 193 - Professional Progress Award Lecture

Chair: Arup K. Chakraborty

193a **Professional Progress Award Lecture**

Arup K. Chakraborty

Session 327 - Incorporating New Technologies into Chemical Engineering Education

Chair: Jennifer S. Curtis

Vice Chair: David L. Silverstein

327a **Demonstrating an Exception to Le Chatelier's Principle with the Ammonia Synthesis Reaction: the Effects of Nonideality and a Molecular Simulation Study**

Mark J. Uline
Pei Yoong Koh
Elias I. Franses
David S. Corti

- 327b** **Microelectromechanical Systems (Mems) - an Authentic Interdisciplinary Educational Experience**
Joseph J. Biernacki
Glenn Cunningham
Satish M. Mahajan
Christopher Wilson
Wil Clouse
- 327c** **Adoption of a High Performance Learning Environment (Hi-Pele) in a Capstone Process Instrumentation and Controls Course**
Adrienne R. Minerick
Pedro E. Arce
- 327d** **The Merlot Database: Peer-Reviewed Online Learning Objects**
Valerie L. Young
- 327e** **Teaching Transport Phenomena with CFD**
David B. Henthorn
- 327f** **Numerical Problem Solving in Undergraduate Reaction Engineering**
Satish J. Parulekar

Session 452 - Chemical Industry Nanotechnology Initiatives

Chair: Sharon Robinson

Vice Chair: David DePaoli

- 452a** **Nni-Chemical Industry Consultative Board for Advancing Nanotechnology**
Donald B. Anthony
Jack Solomon
- 452b** **Estimation of the Economic Effect of Nanomaterials in the Chemical Industry**
Gary R. Thayer
Fred Roach
Lori Dauelsberg
- 452c** **Nanomaterials Esh Literature Database**
Kristen Kulinowski
Tim Borges
- 452d** **Research Needs for Nanotechnology Commercialization**
William J. Grieco
David DePaoli
- 452e** **Developing Nanotechnology: Perspectives on Benefits and Risks**
Emory A. Ford

Session 552 - New Technologies for Experimentation over the Internet

Chair: Oscar D. Crisalle

Vice Chair: Edward P. Gatzke

552a A Suite of Web-Accessible Experiments for Teaching Heat Transfer

*Clark K. Colton
Kenneth A. Smith
William H. Dalzell
Anna Pisania
David Saylor
V.Faye McNeil
Siddhartha Sen*

552b Low Cost Experimental Kits for Undergraduate Process Control Education

*Christopher E. Long
Charles Holland
Edward P. Gatzke*

552c Design Criteria for Constructing a Web-Accessible Virtual Control Laboratory

*Oscar D. Crisalle
Christopher S. Peek
Denis Gillet*

552d Membrane Gas Separation through the Internet

*Jim Dolgoff
Bei Xu
G. Glenn Lipscomb
Kevin Pugh
Svetlana Beltyukova
Neville G. Pinto*

552e Web-Based Remote Experiments with a Real Technical Plant in Chemical Engineering Education

*Andreas Klein
Christopher Hausmanns
Guenter Wozny*

Session 16 - Catalysis for Pharmaceuticals and Fine Chemicals I

Chair: Christopher W. Jones

Vice Chair: Christopher T. Williams

16a Templated Organic-Inorganic Active Sites for Bifunctional Heterogeneous Catalysis

*Alexander Katz
John D. Bass
John Daniels*

16b Asymmetric Hydrosilylation of Imines Using a Chiral Ansa-Titanocene Catalyst: Mechanistic Studies and Reaction Kinetics

*Heidrun Woelfler
Anthony Panarello
Harald Raupenstrauch
Johannes Khinast*

- 16c** **Immobilised Enzyme to Perform Enantiomerically Pure Reductive Aminations in Presence of Organic Solvents**
Francesca Paradisi
Andrea Gualandi
Paola Galletti
Daria Giacomini
Gianfranco Cainelli
Paul C. Engel
- 16d** **Investigation of Transition Metal Leaching from Supported Pd Catalysts during the Heck Reaction**
Surbhi Jain
Yaying Ji
Robert J. Davis
- 16e** **Hydrogenation of Amino Acid by Asymmetric Homogeneous Catalyst**
Daniel Hsieh
Steve S.Y. Wang
Lin Dong
Xuebao Wang
Christopher Wood
Brent Nielsen
San Kiang
- 16f** **Solvent Tolerant Enzyme and Microbial Systems for Biocatalytic Processes**
Kehinde S. Bankole
Michael Gyamerah
- 16g** **Polymer-Immobilized Co-Salen Catalysts for the Hydrolytic Kinetic Resolution of Racemic Epoxides**
Xiaolai Zheng
Michael Holbach
Marcus Weck
Christopher W. Jones

Session 26 - INVITED: In Honor of the Wilhelm Award Recipient I

Chair: Raffaella Ocone

Vice Chair: David S. Rumschitzki

- 26a** **Remembrance of Richard Herman Wilhelm**
James Wei
- 26b** **Teh Chung Ho and Hydrodynamic Stability Theory**
Morton Denn
- 26c** **Novel Techniques for Multiphase Reactors**
M. P. Dudukovic
- 26d** **Single Event Kinetic Modeling of Complex Catalytic Processes**
Gilbert F. Froment
- 26e** **Extension of Structure Oriented Lumping to Vacuum Residua**
Stephen B. Jaffe

Session 38 - Reactions in Near Critical and Supercritical Fluids I

Chair: Bala Subramaniam

Vice Chair: Keith W. Hutchenson

- 38a Hydrogenation of Unsaturated Carbonyls in ScCO₂ as Reaction Medium over Ni-Supported Catalysts**
Endalkachew Sahle-Demessie
Sridara Chandra Sehker
- 38b Catalytic Hydroformylation of Higher Olefins in CO₂-Expanded Media: Kinetic, Mechanistic and Economic Aspects**
Hong Jin
Anindya Ghosh
Jing Fang
Jon Tunge
Bala Subramaniam
- 38c Mixing Effects on Homogeneous Catalytic Hydroformylation of 1-Octene in CO₂ - Expanded Solvent**
Debangshu Guha
M. P. Dudukovic
P. A. Ramachandran
Bala Subramaniam
- 38d Polyethylene Glycol: a Benign Solvent for Fine Chemical Synthesis**
Elizabeth M. Giambra
Jason P. Hallett
Jie Lu
Jackson Ford
Charles L. Liotta
Charles A. Eckert
- 38e Heterogeneous Catalysis of Methyl Acetate Formation in Compressed Carbon Dioxide**
Stephan Schwinghammer
Matthäus Siebenhofer
Rolf Marr
- 38f Zeolite-Based Friedel-Crafts Acylation of Anisole in Supercritical Carbon Dioxide: Kinetics and Mechanisms**
Yusuf G. Adewuyi
- 38g Theoretical Study of the Decomposition Mechanism of a Free Radical Initiator and Solvent Effects on the Reaction**
Zhihui Gu
Yixuan Wang
Perla B. Balbuena

Session 63 - Fundamentals of Oxide Catalysis

Chair: Joseph H. Holles

Vice Chair: Concetta LaMarca

- 63a** **Oxidative Dehydrogenation of Lower Alkanes over Oxide Catalysts Using N₂O as an Oxidant**
Matthew P. Woods
Chang Liu
Rick B. Watson
Umit S. Ozkan
- 63b** **The Mechanism and Kinetics of Methane Oxidation to Formaldehyde over MoO₃/SiO₂**
Alexis T. Bell
Nicholas Ohler
- 63c** **Combined Leis/Surface Chemical Probe Study of Topmost Surface Chemistry of Multicomponent Bulk Mo-V-O Catalysts for Propane (Amm)Oxidation**
Rishabh Bhandari
Vadim V. Guliants
Hidde Brongersma
Arie Knoester
- 63d** **Catalytic Oxidation of Dichlorobenzene over V₂O₅/TiO₂ in the Presence of Water**
Casey E. Hetrick
Yu Su
Michael D. Amiridis
- 63e** **Influence of the Morphology of the Oxide Supports on Catalytic Performances of V/SiO₂ and V/MgO Catalysts in Methanol Partial Oxidation**
Yu-Chuan Lin
Keith L. Hohn
- 63f** **Effect of Surface Promoters (Te, Nb and Sb) on Propane Oxidation to Acrylic Acid over Model Bulk Mixed Mo-V-O Catalysts**
Rishabh Bhandari
Balasubramanian Swaminathan
Vijay Vasudevan
Vadim V. Guliants
- 63g** **Adsorption Microcalorimetry Investigation of Nanocrystalline Mixed Metal Oxides**
Eric J. Doskocil
Paul C. Emberton
Samuel E. Yoder
- 63h** **Density Functional Study of Adsorbates and Cationic Metal/Ceria Surfaces**
N. A. Deskins
Abhijit A. Phatak
Fabio H. Ribeiro
Kendall T. Thomson
- 63i** **Dehalogenation of Dichloroethylene Isomers on α -Cr₂O₃ (1012)**
Mary A. Minton
David F. Cox

Session 67 - Honoring Eli Ruckenstein on his 80th Birthday I

Chair: Panagiotis (Peter) Smirniotis

- 67a** **Effect of Wall Hindrance on Brownian Motion and Mobility**
Dennis C. Prieve
- 67b** **Structural Transitions in Two-Dimensional Charged and Hard-Sphere Systems**
Darsh T. Wasan
S.C. Wu
A.D. Nikolov
- 67c** **Micellar Networks in Surfactant Solutions**
Eric W. Kaler
Maidar Parikh
Dganit Danino
- 67d** **Non-Isothermal Brownian Motion in Gases**
Howard Brenner
- 67e** **Novel Computational Probes of Diffusive Motion**
M. Scott Shell
Frank H. Stillinger
Thomas Lombardo
Pablo G. Debenedetti
- 67f** **Making Room for Intuition in Molecular Simulation**
David A. Kofke
Di Wu

Session 68 - INVITED: In Honor of the Wilhelm Award Recipient II

Chair: Raffaella Ocone

Vice Chair: David Rumschitzki

- 68a** **Olefin Epoxidation on Silver: from Mechanism to Catalyst Design**
Mark A. Barteau
- 68b** **Catalyst and Process Issues Related to the Production of Ulsd**
Henrik Topsoe
- 68c** **Supported Metal Cluster Catalysts for Hydrocarbon**
Bruce C. Gates
- 68d** **Science and Technology of Deep Desulphiding of Oil Refinery Streams**
Jacob A. Moulijn
Michiel Makkee
Daniel van Herk
Joana Tsou
Nathalie Marquez
Michiel T Kreutzer
- Use of Zeta Potential Measurements in Catalyst Characterization**
Stuart L. Soled

Session 113 - Catalysis for Pharmaceuticals and Fine Chemicals II

Chair: Christopher T. Williams

Vice Chair: Christopher W. Jones

- 113a** **Enantioselective Surface Chemistry of Chiral Alkyl Bromides on Naturally Chiral Copper Surfaces**
David M. Rampulla
Andrew J. Gellman
- 113b** **Zeolite and Metal Oxide Catalysts for the Production of Dimethyl Sulfide and Methanethiol**
Craig P. Plaisance
Kerry Dooley
- 113c** **Mechanistic Investigation of Higher Olefin Epoxidation: Styrene Oxide and 1-Epoxy-3-Butene**
Michael C.N. Enever
Mark A. Barteau
- 113d** **Synthesis of Fine Chemicals in Zeolite Membrane Microreactors**
Wai Ngar Lau
Siu Ming Kwan
King Lun Yeung
- 113e** **Hydrogenation of Alpha-Methylstyrene to Cumene Via an Electrochemical Route**
Debalina Dasgupta
Kanchan Mondal
Gautham B. Jegadeesan
Tomasz Wiltowski
Shashi Lalvani
- 113f** **Inserting Ethoxyl into Ethyl Acetate Catalyzed by Inorganic Al-Mg Oxides**
Yun Fang
Yongan Shen
Yongmei Xia
Shirun Ji
Yiyu Wang
Bing Tan

Session 114 - Catalyst Design Using High-throughput Experimentation

Chair: W. Nicholas Delgass

Vice Chair: Jochen Lauterbach

- 114a** **High-Throughput Experimentation and Statistical Design of Experiments**
Jochen Lauterbach
Rohit Vijay
Christopher Snively
- 114b** **An Integrated Approach to Catalyst Design: Model Guided High Throughput Experimentation**
Prasenjeet Ghosh
Anantha Sundaram

- 114c** **A Statistical Methodology for Building Catalytic Reaction Models with High Throughput Experimentation**
Shuo-Huan Hsu
Gary E. Blau
James M. Caruthers
W. Nicholas Delgass
Fabio H. Ribero
Venkat Venkatasubramanian
- 114d** **Alkylation of Deactivated Aromatic Compounds Using Zeolites**
Joeri Denayer
Sophie Van der Beken
Eileen Dejaegere
Gino V. Baron
- 114e** **Selective High Throughput Combinatorial Studies of Oxidative Methanol Reforming to Hydrogen on Multi-Component Catalysts**
Eduardo E. Wolf
Stephen J. Schuyten
- 114f** **Combinatorial Synthesis and High Throughput Screening of Carbide and Nitride Supported Methanol Steam Reforming Catalysts**
Worajit Setthapun
Shyamal K. Bej
Levi T. Thompson
- 114g** **Discovery Informatics for Catalyst Design: Single Site Olefin Polymerization Catalysts**
James M. Caruthers
W. Nicholas Delgass
Mahdi Abu-Omar
Kendall T. Thomson
Venkat Venkatasubramanian
Gary E. Blau
Thomas A. Manz
Grigori Medvedev
Jesmin Haq
Krista A. Novstrup
Khamphee Phomphrai
Shalini Sharma
Balachandra B. Krishnamurthy

Session 122 - Honoring Eli Ruckenstein on his 80th Birthday II

Chair: T. J. Mountziaris

- 122a** **Hot Spots Formation in Packed Bed Reactors**
Dan Luss
- 122b** **Control of Polymer Molecular Architecture through Catalysis and Reaction Engineering**
W. Harmon Ray
- 122c** **Computational Chemistry – a Tool for Gaining Insights into the Progress of Catalyzed Reactions**
Alexis T. Bell
- 122d** **Molecular Organometallic Chemistry and Catalysis on Oxide and Zeolite Surfaces**
Bruce C. Gates

122e Desulfurization of Transportation Fuels by Adsorption

*Arturo J. Hernández-Maldonado
Frances H. Yang
Ambal Jayaraman
Gongshin Qi
Elizabeth A. Wang
Ralph T. Yang*

122f Transport Insights

Edwin N. Lightfoot

Session 133 - Reaction Engineering for the Pharmaceutical Industry

Chair: Shekhar K. Viswanath

Vice Chair: Xing Wang

133a Predictive Kinetic and Reactor Modeling Using AspenTech BatchCAD

*John W. Shabaker
Srinivas Tummala
Simon (Shun-Wang) Leung
Ehrlic T. Lo
Sunil S. Patel
San Kiang*

133b Stoichiometric Modeling of Complex Pharmaceutical Reactions

*Christos Georgakis
Rongrong Lin*

133c Modeling Competitive Liquid Reactions

*Genong Li
Ying Liu
Graham Goldin
Rodney O. Fox
Kumar Dhanasekharan*

133d Production of Mycophenolic Acid by Immobilized Cells of *Penicillium Brevi-Compactum* in a Rotating Fibrous Bed Bioreactor

*zhinan Xu
Shang-Tian Yang*

133e Expedite Development and Commercialization of Pharmaceuticals with Process Modeling and Scheduling Tools

*Charles Siletti
Demetri P. Petrides*

133f Modeling and Reactor Design for a Highly Exothermic Reactive System

*Steven H. Chan
Steve S.Y. Wang
San Kiang*

Session 165 - Fundamentals of Environmental Catalysis I

Chair: Will Medlin

Vice Chair: Panagiotis (Peter) Smirniotis

- 165a** **Oxidation of No and Co over Cobalt Based Metal Oxide Supported Catalysts**
Matthew M. Yung
Erik M. Holmgren
Umit S. Ozkan
- 165b** **No Oxidation Reaction Kinetics on Pt/Al₂O₃ Catalyst**
Shadab Mulla
Nan Chen
Lasitha Cumararatunge
W. Nicholas Delgass
Fabio H. Ribeiro
William S. Epling
- 165c** **Co Oxidation by High-Concentration Oxygen Phases on Pt(111)**
Alex L. Gerrard
Jason F. Weaver
- 165d** **Flame-Made Pt/Ceria/Zirconia for Low-Temperature Oxygen Exchange**
Wendelin J. Stark
Marek Maciejewski
Jan-Dierk Grunwaldt
Sotiris E. Pratsinis
Alfons Baiker
- 165e** **Designing Pd-on-Au Bimetallic Nanoparticle Catalysts for Trichloroethene Hydrodechlorination**
Michael S. Wong
Michael O. Nutt
Kimberly N. Kowalski
Joseph B. Hughes
- 165f** **Development of Highly Active Porous TiO₂-P25 Composite Thick Films for Water Purification**
Yongjun Chen
Dionysios D Dionysiou
- 165g** **Effects of Cation Migration upon Energetics of Fe/Zsm-5 Catalyzed Reactions**
Carl R. Lund
Bin Chen
- 165h** **Catalytic Wet Oxidation of Wastewater Contaminants with Mn/Ce Catalyst**
Clayton B. Maugans
Bryan Kumfer

Session 188 - Structured Catalytic Reactors: Monoliths and Membranes

Chair: Yi Jiang

Vice Chair: Kurt Vanden Bussche

- 188a** **Effect of Flow Maldistribution on Multiphase Monolith Reactor Performance**
Shaibal Roy
Muthanna Al-Dahhan

- 188b** **Removal of Hydrogen Sulfide in Coal Gases Using a Monolithic Catalyst Reactor**
Kyung C. Kwon
Tristan J. Tinsley
Robie Lewis
- 188c** **Catalytic Hot Gas Cleaning with Monoliths in Biomass Gasification in Fluidized Bed. Modeling of the 2nd Generation Two Layers Monolithic Reactor**
Jose Corella
Jose M. Toledo
Gregorio Molina
Diego Salgado
- 188d** **Hydrogen Production from Oxidative Steam Reforming of Methanol over**
Nergul Taylan
Erdogan Gulari
- 188e** **Chemical Reactive Control of Hcci Engines**
Theodore T. Tsotsis
Jeffrey A. Langille
Jyh-Yih Ren
Fokion Egolfopoulos
Hai Wang
- 188f** **Functionalized Membranes for Acid Catalysis**
Stephen M. Ritchie
Tapan N. Shah
- 188g** **Mathematical Modeling of a Photochemical Film Reactor**
Krishna Gopal Singh
Sandeep Mourya
Ashok N. Bhaskarwar

Session 216 - Fundamentals of Environmental Catalysis II

Chair: Panagiotis (Peter) Smirniotis

Vice Chair: Will Medlin

- 216a** **Role of Polar Stratospheric Clouds & Catalysts in Ozone Destruction**
Kishore Mohan
Aishwarya Lakshmi
Bharath Selvan
Chandrasekhara Bharadwaj
- 216b** **Tap® and Bench-Scale Reactor Studies of Nox Storage and Reduction on Model Pt/Bao/Al₂O₃ and Pt/Al₂O₃**
Vinay S. Medhekar
Pranav Khanna
Michael P. Harold
Vemuri Balakotaiah
- 216c** **Steam Effect on No_x Reduction over Pt-Bao/Al₂O₃ Catalyst**
Xiaoyin Chen
Johannes Schwank

- 216d** **Understanding of Nox Storage/Release Mechanism over Pt-Bao/Al₂O₃ Lean Nox Trap Catalysts**
Do Heui Kim
Ja Hun Kwak
Janos Szanyi
Tamas Szailer
Charales Peden
Jonathan Hanson
- 216e** **Plasma-Catalyst System for Diesel Nox Reduction Using Ethanol and E-Diesel: Laboratory Reactor and Engine Dynamometer Tests**
Byong K. Cho
Jong-Hwan Lee
Chris C. Crellin
Joel G. Toner
- 216f** **Co Containing Nox Storage and Reduction Catalysts Explored Via High-Throughput Experimentation**
Jochen Lauterbach
Rohit Vijay
Christopher Snively
- 216g** **Novel Low Temperature Nox Removal for Diesel Exhaust**
Hiu Ying Law
Mayfair C. Kung
Harold H. Kung
- 216h** **Nox Reduction by Urea under Lean Conditions over Cu/Alumina Catalyst**
Erol Seker
Erdogan Gulari
Nail Yasyerli
Christine Lambert
Robert Hammerle

Session 251 - Chemical Reactor Dynamics

Chair: Jason M. Keith

Vice Chair: Vemuri Balakotaiah

- 251a** **Determination of the Effect of Water and Carbon Dioxide Addition into the Reactor Feed in Fischer-Tropsch Synthesis**
Debby Brink
Diane Hildebrandt
David Glasser
- 251b** **Reformer Performance for Co-Current and Counter Current Flow Mode**
Keyur Patel
Aydin Sunol
- 251c** **Dynamics of Ignition and Front Propagation in Polymer Electrolyte Membrane Fuel Cells**
Jay B. Benziger
I.G. Kevrekidis
E.-S. J. Chia

251d Transversal Hot Zone Formation in Adiabatic Packed Bed Reactors

*Ganesh Viswanathan
Aditya Bindal
Johannes Khinast
Dan Luss*

251e Optimization of Periodically Operated Reactor

*Yue Chen
Vasilios Manousiouthakis*

251f Nonlinear Dynamics of Forced Catalytic Converters

*Milos A. Marek
Petr Koci
Vladimir Nevoral
Matyas Schejbal
Milan Kubicek*

251g Periodic Nox Storage and Reduction (Nsr) for Lean Burn Engines

*Manish Sharma
Michael P. Harold
Vemuri Balakotaiah*

Session 264 - INVITED: In Honor of the Catalysis and Reaction Engineering Division Practice Award Recipient

Chair: Hugh Stitt

Vice Chair: Maria Flytzani-Stephanopoulos

264a Internal Combustion Engine to the Hydrogen Economy: New Catalysts and Reactor Designs

R. J. Farrauto

264b Catalysis and the Hydrogen Economy

John Armor

264c Technical Challenges in a Multi-Generation Energy Economy

Edward Wolynic

264d Application of Lean Nox Trap Technology

*Bob McCabe
Joseph Theis*

Session 268 - Monoliths with Reactive Flow: Modeling and Experimentation

Chair: Yi Jiang

Vice Chair: Olaf Deutschmann

268a Catalytic Autoignition of Higher Alkane Partial Oxidation on Rh-Coated Foams

*Kenneth A. Williams
Lanny D. Schmidt*

268b Partial Oxidation of Methane Using Metal-Substituted Hexaaluminate Catalysts on Porous-Foam Supports

*Huayang Zhu
Robert J. Kee
Jeffrey R. Engel
David T. Wickham*

- 268c Analytical Method of Lines for Predicting Multiple and Asymmetric Steady States in Catalytic Monolith Reactors - Diffusive Transport**
Venkat Subramanian
Vinten Diwakar
- 268d Meso-Scale Modelling of Reactions and Transport in Digitally Reconstructed Porous Catalyst: Co Oxidation on Pt/Al₂O₃**
Petr Koci
Frantisek Stepanek
Milan Kubicek
Milos A. Marek
- 268e Detailed Numerical Modeling of Catalytic Monolith Reactors**
Steffen Tischer
Olaf Deutschmann
- 268f Hydrotreating Reaction Performance over CoMo-Catalyzed γ -alumina Monolith Catalyst**
Wei Liu

Session 289 - Poster Session: Kinetics, Catalysis and Reaction Engineering

Chair: Jack R. Hopper

Vice Chair: Helen H. Lou

- 289a Effect of Molybdenum Loading on Iron-Based Fischer-Tropsch Catalyst**
Wenping Ma
James H. Wright
Edwin L. Kugler
Dady B. Dadyburjor
- 289aa Comparison of Nanostructured Au-CeO₂ and Au-FeOx Catalysts for the Wgs and Co Oxidation Reactions**
Weiling Deng
Colin Carpenter
Howard Saltsburg
Maria Flytzani-Stephanopoulos
- 289ab Hydrodynamic and Mass Transfer Parameters in a Slurry Bubble Column Reactor Operating under Fischer-Tropsch Conditions**
Laurent Sehabiague
Romain O. Lemoine
Arsam Behkish
Yannick J. Heintz
Badie I. Morsi
- 289ac Exploratory Studies on the Oxidation of Cyclohexane in the Presence of Heterogeneous Binuclear and Mononuclear Cu Complex Using Oxygen**
K.S. Anisia
Anil Kumar
- 289ad Influence of the Zeolite Structure, in Mo/Zeolite-Alumina Catalysts, on the Hydroconversion of a Model Mixture of N-Heptane-Methylcyclohexane-Toluene**
Horacio González
Jorge Ramírez
Gutiérrez-Alejandre Aída
Jose Luis Rico
Javier Lara

- 289ae** **Iron and Cobalt Supported Au Catalysts for the Selective Oxidation of Co**
Xin Zhao
Shane Kjergaard
Susan M. Stagg-Williams
- 289af** **Microwave-Assisted Synthesis of Racemic α -Hydroxy Acids**
Yun Fang
Haitao Yu
Yongmei Xia
Bing Tan
Jing Wu
- 289ag** **Synthesis and Characterization of Vanadia-Titania Aerogel Catalysts**
Dong Jin Suh
Tae-Jin Park
Jinsoon Choi
Chee Burm Shin
- 289ah** **Catalytic Wet Oxidation of Lactose**
Joseph H. Holles
Yah Nan Chia
- 289ai** **Catalytic Decomposition of Sulfur Trioxide with Metallic Catalysts for the Is Cycle of Thermochemical Hydrogen Production**
Tae-Ho Kim
Gyeong-Taek Gong
Byung Gwon Lee
Kwang-Deog Jung
Honggon Kim
Kwan-Young Lee
Hee-Young Jeon
Chae-Ho Shin
- 289aj** **A Density Functional Theory Study of Methane Activation on Pd/Pdo Based Catalysts**
Brian R. Kromer
Kendall T. Thomson
Fabio H. Ribeiro
- 289ak** **Reaction of Young Chars with Oxygen**
Wei-Yin Chen
Shaolong Wan
Guang Shi
- 289al** **The Thermal Dissociation of H₂O**
N. K. Srinivasan
Joe V. Michael
- 289am** **Analytical Expression for the Non-Isothermal Effectiveness Factor: the Nth-Order Reaction in a Slab Geometry**
Enrique Munoz Tavera
- 289an** **A Solid State NMR Study of the Surface Reaction of the Supported Palladium Catalyzed Hydrodechlorination of Trichloroethylene**
Watanee Sriwatanapongse
Martin Reinhard
Christopher Klug

- 289ao Interactions of Sulfur with Carbides and Nitrides**
Maha R. Hammoud
Shyamal K. Bej
Levi T. Thompson
- 289ap Electrochemical Characterization of Pt/Ti and Pt/Au/Ti Electrodes for a Micro Fuel Cell**
André D. Taylor
Levi T. Thompson
- 289aq Mechanistic and Kinetic Studies of Heterogeneous Uv/Fenton Process for the Oxidation of Aqueous Organic Pollutants: Electron Transfer at Catalyst Surface to Initiate the Redox Process**
Qiang Wu
Xijun Hu
Po-lock Yue
- 289b Low Temperature Selective Catalytic Reduction of No with NH_3 over Manganese Oxides**
Min Kang
Eun Duck Park
Ji Man Kim
Jae Eui Yie
- 289c Semi-Continuous Gas-Liquid Catalyzed Reaction of O-Phenylene Diamine and Carbon Disulfide by Tertiary Amine**
Maw Ling Wang
Biing-Lang Liu
- 289d Decomposition of Ethylene Carbonate during the Vacuum-Distillation with Residual Ionic Liquid-Based Zinc Tetrahalide Catalysts**
Hoon Sik Kim
Palgunadi Jelliarko
Je Seung Lee
So Young Lee
Honggon Kim
Sang Deuk Lee
Byoung Sung Ahn
- 289e Improved Exploitation of Fixed-Bed Reactor Experiments for Estimating Kinetic Parameters**
Milind Joshi
Andreas Seidel-Morgenstern
- 289f Comparison of Wet or Flame-Made Hydrogenation Catalysts**
Neil Osterwalder
Wendelin J. Stark
- 289g Nanocomposite Catalysts for High-Temperature Processes**
Tom Sanders
Mark Kirchhoff
Ullrich Specht
Götz Vesper
- 289h In-Situ Measurement of Temperature Dynamics during Catalytic Hydrogen Production from Methane in a Reverse-Flow Reactor**
Tengfei Liu
Goetz Vesper

- 289i** **Preparation and Characterization of Acidic Ionic Liquids for Alkylation of Isobutene with 2-Butene**
Kye Sang Yoo
Honggon Kim
Dong Ju Moon
Panagiotis (Peter) Smirniotis
- 289j** **Solid Acid Catalyzed Esterification of Free Fatty Acids in Oil Using CO₂ Enhanced Media**
Lina Zhao
Susan M. Stagg-Williams
- 289k** **Ceria Supported Catalysts for the Low Temperature Water Gas Shift Reaction**
Brian Morrow
Derek Breid
Susan M. Stagg-Williams
- 289l** **A Step toward Understanding the Time, Temperature and Trace Species Concentration Dependencies of Thermal Deposition from Aviation Fuels**
Randall Boehm
- 289m** **An Efficient Approach for Saccharification of Cellulose from Biomass for Ethanol Production**
Anantharam P. Dadi
Constance A Schall
Sasidhar Varanasi
- 289n** **Conceptual Design of Continuous Processes for Carbon Nanotubes Based on Total Cost and Life-Cycle Assessment**
Ralph W. Pike
Adedeji Agboola
Helen H. Lou
Jack R. Hopper
Carl L. Yaws
- 289o** **Dft Calculations of TiO₂ Atomic Layer Deposition**
Heath Turner
Zheng Hu
- 289p** **Olefin Polymerization by Single-Site Ti and Zr Aryloxide Complexes**
Thomas A. Manz
Kendall T. Thomson
James M. Caruthers
W. Nicholas Delgass
- 289q** **Computational Modeling of Group 4 Metallocenes: Geometry Prediction and Reactivities**
Heidrun Woelfler
Harald Raupenstrauch
Johannes Khinast
- 289r** **Waste Incineration in Fluidized Bed: Testing Total Oxidation Catalysts at Pilot Scale for Gas Clean up**
Jose Corella
Jose M. Toledo
Diego Salgado
Gregorio Molina

- 289s** **The Effect of Electrode Properties on Direct and Indirect Electrochemical Oxidation of Acetaldehyde**
Martin Ernst
Matthäus Siebenhofer
Rolf Marr
Edgar Ahn
Thomas Hilber
- 289t** **Kinetics and Phase Equilibria in Biphasic Ionic Liquid/CO₂ Systems**
Azita Ahosseini
Wei Ren
Aaron M. Scurto
- 289u** **Molecular Based Kinetic Modeling of Hds-Fcc Process**
Ryuzo Tanaka
Craig A. Bennett
Michael T. Klein
- 289v** **Magnetospirillum Magnetotacticum as Active Catalysts for the Growth of Carbon Nanotubes**
Nitin Kumar
Wayne Curtis
Jong-in Hahm
- 289w** **Screening the Effect of the Probability of Chain Growth on the Efficiency of the Fischer-Tropsch Synthesis Process Design**
Peter Mukoma
Diane Hildebrandt
David Glasser
- 289x** **Preparation of Supported Catalysts: Effect of pH**
Azzeddine Lekhal
Benjamin J. Glasser
Johannes Khinast
- 289y** **Immobilization of Lipase Onto Mesoporous Silica: Study of Kinetic Parameters and Mass Transfer Effects Using a Continuous Micro Reactor Setup**
Hemachand Jaladi
Vadim V. Guliants
Neville G. Pinto
- 289z** **Dft Investigation of Platinum Nanoparticles on Graphite**
Chethan Acharya
Heath Turner
- Neural Networks for Modeling of Chemical Reaction Data: a Step by Step Methodology, Support for Reactor Design and Simulation**
Peyman Yamin
Shohreh Fatemi

Session 307 - Catalytic Hydrogen Generation for Fuel Cell Applications I

Chair: Maria Flytzani-Stephanopoulos

Vice Chair: Dragomir B. Bukur

- 307a Study of Water-Gas Shift (Wgs) and Methanation Reaction on Supported Group Viii Catalysts**
Abhijit A. Phatak
Kyung Min Lee
Patrick Figaro
Saket Rai
Guanghai Zhu
Kendall T. Thomson
W. Nicholas Delgass
Fabio H. Ribeiro
- 307b On the Selectivity of CuO/CeO₂ Catalysts for the Preferential Oxidation of CO in H₂-Rich Gases**
Tiziana Caputo
Luciana Lisi
Raffaele Pirone
Gennaro Russo
- 307c Nanogold Particle-Oxide Interaction for the Water Gas Shift Reaction**
Danny Pierre
Maria Flytzani-Stephanopoulos
Mark E. Bussell
Weiling Deng
Gajanthan Balakaneshan
- 307d Thermocatalytic Hydrogen Production Via Oxygen-Free Methane Aromatization**
Alaa Kababji
John Wolan
Elias Stefanakos
- 307e Use of Bimetallic Carbide Catalyst for Steam Reforming of Alcohols for Hydrogen Formation**
Huifeng Shao
Wenping Ma
Edwin L. Kugler
Dady B. Dadyburjor
- 307f Effect of pH on Morphology of Y₂O₃ Nanoparticles and on Their Performance as Supports for Ni-Based Ethanol Reforming Catalysts**
G. Sun
K. Hidajat
S. Kawi
- 307g Ni₃Al Intermetallics Catalyst for Hydrogen Generation from Methanol**
Ya Xu
Dong Hyun Chun
Satoshi Kameoka
Masahiko Demura
Kyosuke Kishida
An-pang Tsai
Toshiyuki Hirano

Session 343 - Catalyst Deactivation I

Chair: Dady B. Dadyburjor

Vice Chair: Suljo Linic

- 343a Deactivation of Supported Nanocrystalline Gold Water Gas Shift Catalysts**
Chang Hwan Kim
Levi T. Thompson
- 343b Deactivation Characteristics of Cr-Free Fe-Based High Temperature Water-Gas Shift Catalysts**
LingZhi Zhang
Xueqin Wang
Umit S. Ozkan
- 343c Kinetics of Catalyst Deactivation in a Novel Diesel Steam Reforming System**
Sandeep Goud
Martin Abraham
William A. Whittenberger
- 343d Deactivation of Catalysts in Removal of Hydrogen Sulfide in Coal Gases as Liquid Sulfur**
Kyung C. Kwon
Tristan J. Tinsley
Robie Lewis
- 343e Kinetics of Catalyst Deactivation during Hydrogen and Ncm Production by Ccvd**
Antonio Monzón
Nuria Latorre
Teresa Ubieto
Ana Valera
Eva E. Romeo
Carlos Royo
Jose I. Villacampa

Session 344 - Catalytic Hydrogen Generation for Fuel Cell Applications II

Chair: Maria Flytzani-Stephanopoulos

Vice Chair: Dragomir B. Bukur

- 344a Methane Oxidation on Noble Metals for Hydrogen Production: a Hierarchical, Multiscale Microkinetic Modeling Approach**
Ashish B. Mhadeshwar
Dionisios G. Vlachos
- 344b Stratified Catalysts for Methane Partial Oxidation**
Gisele Tong
Julie Flynn
Corey A. Leclerc
- 344c A Systematic Microkinetic and Mechanistic Analysis of the Water-Gas-Shift Reaction Kinetics on Low and High Temperature Shift Catalysts**
Caitlin A. Callaghan
Ilie Fishtik
Ravindra Datta

344d Direct Vs Indirect Oxidation Pathways in Autothermal Catalytic Partial Oxidation of Methane over Pt

*Tengfei Liu
Cynthia Snyder
Goetz Vesper*

344e Alcohol Steam Reforming for Hydrogen Production

*Rick B. Watson
Paul Matter
Drew Braden
Hua Song
Umit Ozkan*

344f Hydrogen Production from Ethanol and Methanol over Sol-Gel Synthesized Mixed Oxides Catalysts

*Erol Seker
Erdogan Gulari*

344g Pure Hydrogen from Natural Gas

*Piotr Dydo
Kanchan Mondal
Agnieszka Konieczny
Tomasz Wiltowski*

Session 390 - Catalyst Deactivation II

Chair: Dady B. Dadyburjor

Vice Chair: Suljo Linic

390a Fundamental Insights into Sintering of Ag/ α -Al₂O₃ Catalysts

*Randall Meyer
John Lockemeyer
Donald Reinalda
Randy Yeates
Michael Lemanski
Matthew Neurock*

390b Sintering Studies on Model Catalytic Systems

*Andrew T. DeLaRiva
Thomas W. Hansen
Abhaya K. Datye*

390c Fundamental Study of the Interaction of Jp-8 Reformate Components with Sofc Anode Catalyst

*Eranda Nikolla
Johannes Schwank*

390d Role of Cerium for the Stability of CuHM Catalyst by HCl to Reduce NO with NH₃

*Jin Woo Choung
In-Sik Nam*

390e Coking Mechanism and Promoter Design for Ni-Based Catalysts: a First Principles Study

*Xu Jing
Mark Saeys*

Session 391 - Catalytic Hydrogen Generation for Fuel Cell Applications III

Chair: Dragomir B. Bukur

Vice Chair: Maria Flytzani-Stephanopoulos

- 391a** **Hydrogen from Methanol in a Dual Membrane Atr Reactor**
James Lattner
Balamurali Krishna
Michael P
- 391b** **Hydrogen Production from Syngas Using Metal Oxide Composite Particles**
Luis G. Velazquez-Vargas
Gupta Puneet
Ted Thomas
Fan L.-S.
- 391c** **Membrane Reactor Design for Thermally Balanced Hydrogen Production**
Stas A. Simakov
Moshe Sheintuch
- 391d** **Thermally Integrated Methane Fuel Processor**
Will Northrop
Levi Thompson
- 391e** **Hydrogen Production by Methanol Reforming in Supercritical Water**
Jayant B. Gadhe
Ram B. Gupta
- 391f** **Hydrogen Generation by Propane Reforming in a Novel Micro Channel Reactor**
Vaidyanathan Ravi Subramanian
Edmund G. Seebauer
Richard I. Masel

Session 462 - Green Chemistry and Reaction Engineering

Chair: DongShik Kim

Vice Chair: Russell F. Dunn

- 462a** **Carbonation of Barium Sulfide in a Foam-Bed Reactor**
Amit A. Gaikwad
Niyantha Challapalli
Ashok N. Bhaskarwar
- 462b** **Enzymatic Polymerization and Curing of Natural Phenolic Compounds**
Rahul Chelikani
Kim Dong Shik
- 462c** **Energy Efficient Vapor Phase Oxidation of Methanol Using Ozone and Catalytic Reactor**
Cathrine Almquist
Endalkachew Sahle-Demessie
Sridara Chandra Sehker
Julia Sowash
Felisha Lotspiech

- 462d** **Comparison of Hydrothermal Four Component Movable Catalyst for Propane Oxidation and Ammoxidation**
Salil R. Bhatt
Neelakandan Chandrasekaran
Vadim V. Gulians
- 462e** **Hydrogen Production from Biomass Wastes through Ethanol Fermentation and Catalytic Reforming**
Vaibhav Chaudhari
Sadashiv Swami
Martin Abraham
Dong-Shik Kim
- 462f** **High Surface Area Nitrides: New Base Catalysts**
Randolph C. McGee
Shyamal K. Bej
Levi T. Thompson
- 462g** **Reactors for Solid-Acid Catalyzed Alkylation Processes**
Subramanya Nayak
R.C Ramaswamy
P. A Ramachandran
M. P Dudukovic
- 462h** **Production of Hydrogen and Sulfur from Hydrogen Sulfide in a Nonthermal-Plasma Pulsed Corona Discharge Reactor**
Gui-Bing Zhao
Sanil John
Ji-Jun Zhang
Morris D. Argyle
Jerry C. Hamann
Suresh S. Muknahallipatna
Stanislaw Legowski

Session 472 - Process Intensification and Multifunctional Reactors: I

Chair: Frits Dautzenberg

Vice Chair: Nick Collins

- 472a** **Criteria for Successfully Combining a Reactor with a Separation Process**
Francesco Citro
Reuel Shinnar
- 472b** **Design of a Tame Reactive Distillation Process Using Feasible Regions**
Scott L. Turnberg
Warren R. Hoffmaster
Steinar Hauan
- 472c** **Design and Operation of Simulated-Moving-Bed Reactors**
Guido Stroehlein
Ralf Proplesch
Yolanda Assuncao
Marco Mazzotti
Massimo Morbidelli

472d Mixing and Reaction in a Novel Spinning Disk Reactor

*Laurence R. Weatherley
Greg Robertson*

Session 491 - Catalysis with Microporous and Mesoporous Materials I

Chair: Daniel F. Shantz

Vice Chair: Kendall T. Thomson

491a Modeling Propane Aromatization on H₂Sm-5 and Ga/H₂Sm-5

*Gowri Krishnamurthy
Aditya Bhan
Shuo-Huan Hsu
Yogesh Joshi
W. N. Delgass
J. M. Caruthers
G. E. Blau
K. T. Thomson
Venkat Venkatasubramanian*

491b A Photocatalytic Study of Ets-10 for the Oxidation of Organic Compounds

*Michael J. Nash
Raul F. Lobo
Douglas Doren
Anne-Marie Zimmerman*

491c A Comparative Study of N-Octane Aromatization over Modified Mfi- and Mel-Type Zeolite Catalysts

*Tanate Danuthai
Siriporn Jongpatiwut
Thirasak Rirksomboon
Somchai Osuwan
Daniel E. Resasco*

491d Synthesis and Characterization of Mesoporous Zsm-12 by Using Carbon Particles

*Xiaotong Wei
Panagiotis (Peter) Smirniotis*

491e In-Situ Studies of [Fe,Al]Mfi Catalyzed Oxidation of Benzene to Phenol

*Jerome B. Taboada
Guido Mul
Isabel W.C.E. Arends
Arian R. Overweg*

491f Comparative Study of the Hydrogenation of Tetralin on Supported Ni, Pt, and Pd Catalysts

*Siraprapha Dokjampa
Siriporn Jongpatiwut
Thirasak Rirksomboon
Somchai Osuwan
Daniel E. Resasco*

491g N-Octane Aromatization over Pt Supported on Small Crystal of KI Zeolite

*Supak Trakarnroek
Siriporn Jongpatiwut
Thirasak Rirksomboon
Somchai Osuwan
Daniel E. Resasco*

Session 519 - Process Intensification and Multifunctional Reactors: II

Chair: Nick Collins

Vice Chair: Frits Dautzenberg

519a Process Intensification: Mass Transfer Characterization of Slug Flow in a Narrow Channel Reactor

Srinivasan Ambatipati

Roshan J.J Jachuck

519b Photo-Polymerization of Butyl Acrylate Using a Narrow Channel Reactor

Venkata Nekkanti

Roshan J.J. Jachuck

519c Theoretical Studies on Sorption-Enhanced Hydrogen Production

Georgios Koumpouras

Esat Alpay

Frantisek Stepanek

519d Autothermal Methane Reforming in a Reverse-Flow Reactor

Tengfei Liu

Hakan Temur

Goetz Vesper

519e Process Intensification Using Continuous Processes in the Synthesis of Pharmaceutical Intermediates

Chenchi Wang

Wendy Yang

Prashant Deshpande

Thomas LaPorte

Session 536 - Catalysis with Microporous and Mesoporous Materials II

Chair: Kendall T. Thomson

Vice Chair: Daniel F. Shantz

536a Synthesis and Characterization of Highly Ordered Ni-MCM-41 Mesoporous Molecular Sieves

Yanhui Yang

Sangyun Lim

Guoan Du

Chuan Wang

Yuan Chen

Dragos Ciuparu

Gary L. Haller

536b Co Methanation on Metal Incorporated MCM-41 Catalysts

Chuan Wang

Sangyun Lim

Guoan Du

Yanhui Yang

Gary L. Haller

536c Sintering and Reactivity Studies on Au Catalyst Supported on Aerosol-Derived Spherical Mesoporous Silica Substrates

John P. Gabaldon

Mangesh T. Bore

Abhaya K. Datye

- 536d** **Low Temperature Co Oxidation Using Microfibrous Entrapped Catalysts for Fire Escape Mask Application**
Mukund Karanjikar
Bruce Tatarchuk
- 536e** **Novel Mesoporous Niobium Oxide and Mixed Nb-Based Oxides for Oxidative Dehydrogenation and Ammoxidation of Propane**
Li Yuan
Lingyan Song
Vadim V. Guliants
- 536f** **Thermodynamic Modeling of Ion Exchange Resin Catalyzed Liquid Phase Esterification**
Tuomo Sainio
Erkki Paatero
- 536g** **Oxidation of Cyclohexane in Presence of Cu Complex Supported on Zirconium Pillared Clay Catalyst Using Oxygen**
K.S. Anisia
Anil Kumar

Session 547 - Microreactors: Fundamentals and Applications

Chair: Prasanna V. Joshi

Vice Chair: Agnes Ostafin

- 547a** **Ni₃Al Foil as a Catalyst Precursor for Methanol Decomposition**
Dong Hyun Chun
Ya Xu
Masahiko Demura
Kyosuke Kishida
Myung Hoon Oh
Toshiyuki Hirano
Dang Moon Wee
- 547b** **Microfibrous Supported Catalysts/Sorbents – Micro Structured Systems with Enhanced Contacting Efficiency**
Ranjeeth Kalluri
Donald Cahela
Bruce Tatarchuk
- 547c** **The Effect of Microreactor Geometry on Performance**
Richard I. Masel
Edmund G. Seebauer
Vaidyanathan Ravi Subramanian
Zheng Ni
- 547d** **Engineering of Mass Transfer Boundary Layers in Laminar Flow-Based Microreactors**
Seong Kee Yoon
Geoff Fichtl
Paul J. A. Kenis
- 547e** **Effect of Microchannel Configuration and Bend Geometries on Dispersion in Micro-Channel Reactors**
Adarsh D. Radadia
Richard Masel
Mark shannon
Keith Cadwallader

547f Multistep Synthesis of Tetrazole Compounds in Microchemical Systems

*Jason G. Kralj
Edward R. Murphy
Michael D. Williams
Robert N. Renz
Klavs F. Jensen*

547g Microchannel Based Liquid Separation Utilizing Pervaporation Process

*Sudhir Ramprasad
James D. Palmer*

Session 568 - Combustion Reaction Engineering I

Chair: Soundar S. Kumaran
Vice Chair: William H. Green

568a Flame Structure in Microcombustion

*Adrian D. Armijo
Shaurya Prakash
Mark Shannon
Craig Miesse
Richard I. Masel*

568b A New Adaptive Representation of Complex Kinetic Models

*Ipsita Banerjee
Marianthi Ierapetritou
Ioannis (Yannis) P. Androulakis
Tien Phong Huynh*

568c Initiation in CH_4/O_2 : High Temperature Rate Constants for $\text{CH}_4 + \text{O}_2 \rightarrow \text{CH}_3 + \text{HO}_2$

*N. K. Srinivasan
Joe V. Michael
L.B. Harding
S. J. Klippenstein*

568d Obtaining Accurate Solutions Using Reduced Chemical Kinetic Models

*Oluwayemisi Oluwi Oluwole
William H. Green*

568e Intra-Bubble Combustion: the Thin Flame Limit

*Manuel Arias-Zugasti
Daniel E. Rosner*

Session 571 - Fundamentals of Supported Catalysis I

Chair: Eric J. Duskocil
Vice Chair: Susan M. Stagg-Williams

571a Carbide and Nitride Supported Water Gas Shift Catalysts

*Timothy E. King
Shyamal K. Bej
Levi T. Thompson*

- 571b Gas-Induced Stability of Ceria-Based Wgs Catalysts**
Weiling Deng
Howard Saltsburg
Maria Flytzani-Stephanopoulos
Xianqin Wang
Jonathan Hanson
José A. Rodriguez
- 571c In-Situ Ftir and Xas Study of the Evolution of Surface Species during Transient Co Oxidation on Supported Au/Tio₂**
Juan D. Henao
Tiziana Caputo
Jeff H. Yang
Mayfair C. Kung
Harold H. Kung
- 571d Isotopic Transient Analysis of Co Oxidation over Alumina and Titania Supported Au Catalysts**
Jason T. Calla
Robert J. Davis
- 571e Development of a Viable Reaction Mechanism for the Epoxidation of Propylene over Au/Ts-1**
Bradley M. Taylor
Lasitha Cumararatunge
Jochen Lauterbach
W. N. Delgass
- 571f Characterization and Kinetic Evaluation of Silver-Containing Bimetallic Catalysts Prepared Via Electroless Deposition**
Melanie Schaal
Christopher Williams
John Monnier
Anna Pickerell
Trang Hoang
- 571g Characterization of Dendrimer-Derived Supported Metal Nanoparticles**
D. Samuel Deutsch
Attilio Siani
Oleg Alexeev
Christopher T. Williams
Michael D. Amiridis

Session 596 - Combustion Reaction Engineering II

Chair: William H. Green

Vice Chair: Soundar S. Kumaran

- 596a Novel Chemical Mixtures for Hydrogen Generation by Combustion**
Evgeny Shafirovich
Victor Diakov
Arvind Varma
- 596b Studies on Combustion of Single Ni-Coated Al Particles in Normal and Reduced Gravity**
Evgeny Shafirovich
Timothy A. Andrzejak
David G. Taylor
Arvind Varma

596c Carbonaceous Nanoparticles in Combustion: a Multiscale Perspective

Angela Violi

596d A Systematic Approach to Predicting Combustion Chemistry

William H. Green

596e Methodology for the Simulation of Complex Hydrocarbon Mixtures

Eric G. Eddings

Shihong Yan

Hongzhi Zhang

Christopher M. Thurston

Nathan B. Marsh

Adel F. Sarofim

Christopher J. Montgomery

Viswanath Katta

596f Development of a New Composite School Bus Test Cycle and the Effect of Fuel Type on Mobile Emissions from Three School Buses

Daniel Sujo

J. Hearne

A. Toback

J. Akers

R. P. Hesketh

A. J. Marchese

Session 601 - Fundamentals of Supported Catalysis II

Chair: Susan M. Stagg-Williams

Vice Chair: Eric J. Doskocil

601a Stochastic and Dimensional Analysis of High-Pressure Hydrogen Adsorption Via Spillover on Carbon Supported Catalyst

Puja Jain

Angela D. Lueking

601b Sic Supported Vpo Catalyst for the Partial Oxidation of N-Butane to Maleic Anhydride

Alaa Kababji

John Wolan

601c Isotopic Labeling Study of Low Temperature Scr of No with Nh3 Using 15no, 15nh3 and 18o2 Labeled Gases over Mnox/Tio2 Catalysts

Neeraja Ettireddy

Robert Pardemann

Ettireddy P. Reddy

Panagiotis (Peter) Smirniotis

601d Ultrasonic Degradation of Phenol in the Presence of Composite Particles of Tio₂ and Activated Carbon

Masaki Kubo

Hiroto Fukuda

Xin Juan Chua

Toshikuni Yonemoto

- 601e** **Vanadia Catalyzed Vapor Phase Oxidation of Methanol in the Presence of Ozone**
Sridara Chandra Sehker
Endalkachew Sahle-Demessie
Julia, E. Sowash
Cathrine B. Almquist
- 601f** **Novel Wox Catalysts Grafted on Mesoporous Silica by Atomic Layer Deposition: Role of Tungstates Morphology in Methanol Dehydration**
Jose E. Herrera
Ja Hun Kwak
Jianzhi Hu
Yong Wang
Charles H. F. Peden

Session 160 - Developments in Intermolecular Potential Models

Vice Chair: Jeffrey J. Potoff

- 160a** **Transferable Potentials Optimized for Mixed Site-Site Interactions**
Amanda D. Sans
Neil H. Gray
Richard Elliott
- 160b** **Solvation Study Using Gaussian Charges Particles and GCPM Water Model**
Peter J. Dyer
Peter T. Cummings
- 160c** **Molecular Modeling of Chemical Warfare Agents**
Jeffrey J. Potoff
Maria Coscione
Ganesh Kamath
Lech Czerwinski
- 160d** **Development of Polarizable Force Fields for Application to Molecular Dynamics Simulations of Biological Molecules**
Sandeep A. Patel
Charles L. Brooks, III
- 160e** **Development and Application of the Trappe Force Field**
J. Ilja Siepmann
Collin D. Wick
John M. Stubbs
Ling Zhang
Neeraj Rai
- 160f** **Force Field Parameter Development for Pyridine, Pyrazine, Pyrimidine, Pyridazine and S-Triazene**
David Rigby
Rajiv J. Berry
- 160g** **Development of Classical Force Field for the Chemical Bonding between Benzenedithiolate and Gold**
Yongsheng Leng
Predrag S. Krstic
Jack C. Wells
Peter T. Cummings
David J. Dean

160h **Close Contact Penalty Functions in Direct Space Methods and Energetic Considerations in Structure Refinement**
Cikui Liang

Session 208 - Computational Genomics

Chair: Rajanikanth Vadigepalli

Vice Chair: S. Patrick Walton

208a **DNA Sequencing by Hybridization with Errors Via Integer Programming**
YoungJung Chang
Nick Sahinidis

208b **Sporulation Regulons and Their Prediction in Clostridia**
Carlos J. Paredes
Keith V. Alsaker
Eleftherios T. Papoutsakis

208c **An Integer Optimization Framework for Selecting Informative Genes**
James Wu
Ioannis (Yannis) P. Androulakis

208d **Development of a Mechanistic Model for Sugar-Utilization Regulatory Systems**
Ryan Peacock
Jiangfeng Zhu
Jacqueline V. Shanks
Ramon Gonzalez
Ka-Yiu San

208e **Inferring Pathways That Confer a Cellular Phenotype by Integrating Gene Expression and Metabolic Profiles**
Zheng Li
Shireesh Srivastava
Xuerui Yang
Christina Chan

208f **Chemogenomic Analysis of Signaling Pathways for Reactive Nitrogen Oxide Species in Escherichia Coli**
Laura R. Jarboe
Daniel Hyduke
Linh My Tran
James C. Liao

208g **Dynamical Analysis of an Integrated Signaling Network at a Genome-Scale**
Jong Min Lee
Jason Papin

Session 224 - Multiscale Modeling and Simulation Methods

Chair: Randy Snurr

Vice Chair: Monica H. Lamm

224a **Coarse Projective Molecular-Dynamics Integration for the Study of Structural Transitions in Condensed Matter**
Miguel A. Amat
Ioannis G. Kevrekidis
Dimitrios Maroudas

- 224b** **Development of a Multiscale Scheme for Modeling Fluid Phase Concentration Variations in Two Dimensions for Catalytic Flow Reactors**
Debarshi Majumder
Linda Broadbelt
- 224c** **Multiscale Modeling of Receptor-Mediated Platelet Adhesion to Surfaces under Flow**
Nipa Mody
Michael R. King
- 224d** **Spanning Time and Length Scales in Simulations of Polymer Solutions**
O. Berk Usta
A.J.C LADD
Jason E. BUTLER
- 224e** **Using Bead-Spring Repulsions to Model Entanglement Interactions in Brownian Dynamics of Bead-Spring Chains**
Sean P. Holleran
Ronald G. Larson
- 224f** **Peo/Pmma Blend: a Coarse-Grained Approach to Observe Entangled Dynamics**
Praveen K. Depa
Janna K. Maranas

Session 321 - Frontiers of Molecular Simulation (Invited Talks)

Chair: Grant S. Heffelfinger

Vice Chair: David M. Ford

- 321a** **Frontiers of Molecular Simulation**
Juan J. De Pablo
- 321b** **Monte Carlo Simulation of Molecular Adsorption**
Paul R. Van Tassel
- 321c** **The Multi-Scale Simulation Challenge for Biomolecular Systems**
GREGORY A. Voth

Session 345 - Computational Biology: Part I

Chair: Vassily Hatzimanikatis

Vice Chair: Michael R. King

- 345a** **Transcriptional Dynamics - a New Approach to Identification of Genetic Networks**
Ian J. Laurenzi
- 345b** **Transcriptional Regulatory Network Reconstruction Via Integer Linear Programming**
Joao M. S. Natali
Jose M. Pinto
- 345c** **Design Principles in Biological Oscillation**
Jason K. Suen
Eileen Fung
James C. Liao

- 345d** **A Deterministic Model of Circadian Rhythmicity in *Drosophila***
Robert S. Kuczenski
Kevin C. Hong
Kelvin H. Lee
- 345e** **Extrinsic and Intrinsic Cell Population Heterogeneity in Genetic Networks with Positive Feedback Loop Architecture**
Nikos V. Mantzaris
- 345f** **Stochastic Gene Expression in a Lentiviral Positive Feedback Loop: HIV-1 Tat Fluctuations Drive Phenotypic Diversity**
Leor S. Weinberger
John C. Burnett
Jared E. Toettcher
Adam P. Arkin
David V. Schaffer
- 345g** **Model-Driven Engineering of Regulatable Gene Networks**
Yiannis N. Kaznessis
Vassilis Sotiropoulos
- 345h** **The Dynamics of Single-Substrate Continuous Cultures: an Integrated Model of Bacterial Cell**
Shakti Gupta
Sergei S. Pilyugin
Atul Narang

Session 372 - Recent Advances in Molecular Simulation I

Chair: Fernando A Escobedo

Vice Chair: Shekhar Garde

- 372a** **Multiscale Modeling and Density of States Monte Carlo of Different Glass Formers**
Qi Sun
Jayeeta Ghosh
Florence Pon
Roland Faller
- 372b** **Order Parameter Density of States Monte Carlo Simulations**
Manan Chopra
Juan J. De Pablo
- 372c** **Towards More Realistic Nonequilibrium Molecular Dynamics Simulations**
Jerome P. Delhommelle
- 372d** **Rapid Shear Viscosity Calculation by Momentum Impulse Relaxation Molecular Dynamics (Mir-MD)**
Manish S. Kelkar
Edward J. Maginn
- 372e** **A Hamiltonian-Based Algorithm for Rigorous Molecular Dynamics Simulation in the Nve, Nvt, Npt, and Nph Ensembles**
David J. Keffer
Chunggi Baig
Brian Edwards

372f Probing Ion Energetics in the Gramicidin a Channel Using Non-Additive Force Fields

*Sandeep A. Patel
Charles L. Brooks, III*

372g Importance of Including Long-Range Interactions in Simulations of Biologically Relevant 2d Surfaces

*Jeffery B. Klauda
Xiongwu Wu
Richard W. Pastor
Bernard R. Brooks*

Session 393 - Computational Biology: Part II

Chair: Vassily Hatzimanikatis

Vice Chair: Michael R. King

393a Changes and Challenges: Gist, Mutated C-Kit and Imatinib Resistance

*Sabrina Prici
Marco Ferrone
Maria Silvia Paneni
Maurizio Fermeglia
Elena Tamborini
Silvana Pilotti
Marco A. Pierotti*

393b Where Are We in HIV Research? a Novel, Computer-Based Strategy for Predicting Resistance to HIV-1 Nrtis

*Sabrina Prici
Marco Ferrone
Maria Silvia Paneni
Maurizio Fermeglia*

393c Computational Quantum Chemistry for Drug Screening Using the Conjugate Capping Method for Full Protein-Inhibitor Energy Prediction

*Rishi R. Gupta
Luke E. Achenie*

393d Structure and Dynamics of Lipid Membranes: How Can Simulations Aid Experiments?

*Jeffery B. Klauda
Bernard R. Brooks
Richard W. Pastor*

393e Influence of Anionic and Zwitterionic Membrane Interfaces on Structure of Antimicrobial Peptides and Implications on Peptide Toxicity and Activity: a Molecular Dynamics Simulation Investigation

*Himanshu Khandelia
Yiannis Kaznessis*

393f Structural and Dynamic Properties of Mixed Bilayer Systems with Cryoprotectants

Amadeu K. Sum

393g Prediction of Pka Shifts in Proteins Using a Discrete Rotamer Search and the Rosetta Energy Function

*Ryan Marques Harrison
Jeffrey J. Gray*

393h A New Model for Simulation of Long DNA

*Thomas A. Knotts
Nitin Rathore
Juan J. De Pablo*

Session 419 - Recent Advances in Molecular Simulation II

Chair: Kristen A. Fichthorn

Vice Chair: Tushar Jain

419a Test of Viscoelastic Models for Predicting the Rheological Properties of Short-Chain Liquid Alkanes under Shear and Planar Elongational Flow Using Nonequilibrium Molecular Dynamics Simulations

*Chunggi Baig
Bangwu Jiang
Brian J. Edwards
David J. Keffer
Hank D. Cochran*

419b Calculation of Solvation Properties Using a Combined Expanded Ensemble – Transition Matrix Monte Carlo Approach

*Thomas W. Rosch
Jeffrey R. Errington*

419c Investigations of Hydrophobic Mismatch in Lipid/Peptide Systems by Molecular Dynamics Simulations

*Senthil K. Kandasamy
Kyle R. Allison
Ronald G. Larson*

419d First Principles Monte Carlo Simulations of Water and Hydrogen Fluoride

*Matthew J. McGrath
J. Ilja Siepmann
I.-F. Will Kuo
Christopher J. Mundy*

419e Density-of-States Simulation of Collapse of Confined Heteropolymers

*Yelena R. Slizberg
Cameron F. Abrams*

419f Quantum Mechanical Single Molecule Partition Function from Path Integral Monte Carlo Simulations

*Shaji Chempath
Cristian Predescu
Alexis T. Bell
Arup Chakraborty*

419g Feature Activated Molecular Dynamics Simulation of Void Cavitation in Crystalline Silicon under Dynamic Tension

*Manish Prasad
Sumeet Kapur
Talid R. Sinno*

419h **A Domain Decomposition Based Parallel Monte Carlo Simulation Scheme for Simulations of Very Large Systems**
Joydeep Mukherjee
Stephanie L. Teich-McGoldrick
Sharon C. Glotzer

419i **Off-Lattice Dynamic Monte Carlo Simulations of Aggregation and Gelation**
Rafael Salazar
Lev Gelb

Session 455 - Computation and Theory of Phase Equilibria

Chair: David A. Kofke

Vice Chair: Monica H. Lamm

455a **Phase Transitions and Criticality in Small Nanoscale Systems**
Alexander V. Neimark
A. Vishnyakov

455b **Finite-Size Scaling Monte Carlo Simulations of Tricritical Behavior**
Gerassimos Orkoulas

455c **Thermodynamics of Symmetric Dimers: Lattice Dft Predictions and Simulations**
Yiming Chen
G.L. Aranovich
M.D. Donohue

455d **Development and Application of Mayer Sampling Methods for the Evaluation of Cluster Integrals**
Andrew J. Schultz
David A. Kofke

455e **Studying Thermophysical Properties with Molecular Dynamics**
Jared T. Fern
David J. Keffer
William V. Steele

455f **Determination of Interfacial Tension in Binary Mixtures Using Transition-Matrix Monte Carlo**
Vincent K. Shen
Jeffrey R. Errington

455g **Modeling Co₂ Solubility in Ionic Liquids Using Semi-Grand Ensemble Hybrid Monte Carlo**
Haizhong Zhang
Edward J. Maginn

455h **Force Field Parameterization and Calculation of Phase Equilibria for Organic Nitro Compounds**
David Rigby
Rajesh Khare

Session 456 - Computational Biology: Part III

Chair: Vassily Hatzimanikatis

Vice Chair: Louis A. Clark

- 456a** **Antibody Affinity Maturation Using Computational Protein Design**
Shaun M. Lippow
Bruce Tidor
K. Dane Wittrup
- 456b** **Ipro: Iterative Protein Redesign and Optimization Procedure: Application to Three Case-Studies**
Manish C. Saraf
Brian A. Canada
Costas D. Maranas
- 456c** **An Informatics Analysis of the in Vivo Affinity Maturation Process -- Learning from Nature's Evolution of Protein-Protein Interfaces**
Louis A. Clark
Herman Van Vlijmen
- 456d** **Characterization of Protein Sequence Landscapes Using Flat-Histogram Monte Carlo Algorithms**
M. Scott Shell
Pablo G. Debenedetti
Athanasios Z. Panagiotopoulos
- 456e** **Atomic Molecular Dynamical Modeling of a Large Protein Complex: Stf-Fviiia**
Coray M. Colina
Robert E. Duke
Divi Venkateswarlu
Lalith Perera
Tom Darden
Lee G Pedersen
- 456f** **Unfolding a Linker between Helical Repeats**
Vanessa Ortiz
Steven O. Nielsen
Michael L. Klein
Dennis E. Discher
- 456g** **Molecules Losing Space: an Entropy Calculation of Ache-Fas2 Association**
Tushar Jain
David Minh
J. Andrew McCammon
- 456h** **Visualization and Characterization of Protein Conformational Space Via Geometric Techniques**
Pramod P. Wangikar
Ashish Tendulkar
Babatunde A. Ogunnaike

Session 475 - Recent Advances in Molecular Simulation III

Chair: Paulette Clancy

Vice Chair: Talid R. Sinno

- 475a** **A Unified Methodological Framework for the Simulation of Non-Isothermal Ensembles**
Fernando Escobedo
- 475b** **Automatic Differentiation for Molecular Simulation**
Derya B. Ozyurt
Paul I. Barton
- 475c** **Improving Free Energy Calculations: Staging Sampling and Fail-Safe Bias Detection**
Di Wu
David A. Kofke
- 475d** **Detailed Balance and Markov Chain Monte Carlo Simulation with Sequential Updating**
Ruichao Ren
Gerassimos Orkoulas
- 475e** **A Molecular Design Approach to Peptide Stabilization**
Sarah Thompson
Sandipan Sinha
Elizabeth Topp
Kyle V. Camarda
- 475f** **Molecular Simulation of the Thermophysical Properties of Fluids: Phase Behavior and Transport Properties**
Richard J. Sadus
- 475g** **Rheological and Structural Studies of Liquid Decane, Hexadecane, and Tetracosane under Planar Elongational Flow Using Nonequilibrium Molecular Dynamics Simulations**
Chunggi Baig
Brian J. Edwards
David J. Keffer
Hank D. Cochran
- 475h** **Structure and Electronic Properties of Acene-Functionalized Polyhedral Oligomeric Silsesquioxanes (Poss) Molecules**
Feng Qi
Murat Durandurdu
John Kieffer
- 475i** **First-Principles Studies of the Electronic Properties of HfO₂ on SiC**
Jongwoo Choi
Carey Tanner
Jane P. Chang

Session 493 - Computational Studies of Self Assembly

Chair: Venkat Ganesan

Vice Chair: Hank Ashbaugh

- 493a** **Self-Assembly of Spherical Micelles: Mean-Field Modeling Approaches**
Kevin B. Towles
Nily Dan
Igal Szleifer

- 493b** **Modeling Virus Capsid Assembly Dynamics**
Michael F. Hagan
David Chandler
- 493c** **A Better Understanding of the Porphyrin Stacks: Experiments, Molecular Modeling and Simulation**
Lu Yang
Huisheng Peng
Yunfeng Lu
Hank Ashbaugh
- 493d** **Self-Assembly and Phase Behavior of Model Nanoparticles with Attached Chains**
Jonathan R. Davis
T. Kyle Vanderlick
Athanassios Z. Panagiotopoulos
- 493e** **Understanding Precise Packings in Self-Assembled Convex Structures**
Ting Chen
Zhenli Zhang
Sharon C. Glotzer
- 493f** **Self Assembly of Colloidal Particles of Cuboidal Geometry – a Monte Carlo Simulation Study**
Bettina S. John
Fernando Escobedo
- 493g** **Monte Carlo Simulations of the Influence of Nanoscale Confinement on Surfactant Mesophases**
Stephen E. Rankin
Venkat R. Koganti
Wei Li
Frank Van Swol
Anthony P. Malanoski
- 493h** **Self-Assembly of Polymer-Tethered Nanorods**
Mark A. Horsch
Zhenli Zhang
Sharon C. Glotzer
- 493i** **Self Assembly of 1,4-Benzenedithiolate-Tetrahydrofuran Mixtures on Gold Surface: a Monte Carlo Simulation Study**
Xiongce Zhao
Yongsheng Leng
Peter T. Cummings

Session 494 - Computational and Functional Genomics

Chair: Jeffrey D. Varner

Vice Chair: S. Patrick Walton

- 494a** **A Mathematical Programming Network Model for Gene Pathway Analysis**
Rishi R. Gupta
Luke E. Achenie
- 494b** **Non-Additive Force Fields for Ions: Charge Equilibration Models for Chloride, Sodium, and Potassium Ions**
Sandeep A. Patel

- 494c** **A Bioinformatics Approach to the Analysis of Combinatorial Transcriptional Regulation**
Sarita Nair
Praveen Chakravarthula
Rajanikanth Vadigepalli
- 494d** **A Network Decomposition Framework for Integration of Knowledge on Regulatory Networks in Biological Systems**
Yandi Dharmadi
Ramon Gonzalez
- 494e** **Distance-Dependent Force Field Using a High Resolution Decoy Set**
Rohit Rajgaria
Scott R. McAllister
Christodoulos A. Floudas
- 494f** **Determination of Metabolically Distinct Cellular Physiologies Using Metabolic Rate Screening**
R. Robert Balcarcel
- 494g** **New Approaches for Enabling Temporal Expression Profiling Analysis**
Eric Yang
Joseph Vitolo
Charles Roth
Ioannis (Yannis) P. Androulakis
- 494h** **Transcriptional Profiling of Engineered Skin: the Role of Air-Liquid Interface on Epidermal Development and Stratification**
Piyush Koria
Stelios T. Andreadis

Session 505 - Industrial Applications of Computational Chemistry and Molecular Simulation I

Chair: Phillip R. Westmoreland

Vice Chair: Clare McCabe

- 505a** **Crystal Packing Simulations - the Impact of Torsion Angles on Polymorph Formations**
Paul H. Young
Howard Y. Ando
- 505b** **Many-Scale Molecular Modeling of Pet/Pen Blends**
Maurizio Fermeglia
Marco Ferrone
Paolo Cosoli
Stefano Piccarolo
Giuseppe Mensitieri
Sabrina Pricl
- 505c** **Multiscale Modelling of Sibs and Sulfonated Sibs Copolymers**
Jan Andzelm
James Sloan
Eugene Napadensky
Steven McKnight
David Rigby
- 505d** **Molecular Dynamics Simulation of Proton Diffusion in Sulfonated Polymer Membranes**
James C. Moller
Rajiv J. Berry

505e **First Principles Based Kinetic Modeling of Industrial Catalytic Reactions: Hydrogenation of Mono Aromatic Compounds**
Mark Saeys
Joris W. Thybaut
M.F. Reyniers
Matthew Neurock
Guy B. Marin

505f **An Investigation of Light Alkane Conversion Reactions on Zeolites with a Cluster Approach**
Xiaobo Zheng
Paul Blowers

505g **Dft Study and Kinetic Model of Deamidation: Applications to Protein Stabilization**
Baron Peters
Bernhardt L. Trout

Session 510 - Molecular Simulation and Computation of Fuel Cells and Electrochemistry I

Chair: Perla B. Balbuena

Vice Chair: Jorge Seminario

510a **Multi-Paradigm Multi-Scale Simulations for Fuel Cell Catalysts and Membranes**
William A. Goddard
Boris Merinov
Seung Soon Jang
Adri von Duin
YunHee Jang
Weiqiao Deng
Timo Jacob

510b **Alloy Surface Segregation in Reactive Environments Via Density Functional Theory and Atomistic Thermodynamics**
John Kitchin
Karsten Reuter
Matthias Scheffler

510c **Experimental and Theoretical Studies of Metal-Supported Pt Monolayer Catalysts for the Oxygen Reduction Reaction**
Anand Nilekar
Ye Xu
J. Zhang
M. B. Vukmirovic
Radoslav R. Adzic
Manos Mavrikakis

510d **Insights into the Overpotential for Oxygen Reduction on Pt and Pt Skin Alloys: a Comparison of Theory and Experiment**
Matthew Neurock
Michael J. Janik
Sally A. Wasileski
Alfred Anderson
Sanjeev Mukerjee

510e **Large-Scale, First-Principles Screening of Alloys for Heterogeneous Catalysis**
Jeff Greeley
Karsten W. Jacobsen
Jens K. Nørskov

510f Thermodynamic Guidelines for Determining Efficient Oxygen-Reduction Catalysts

*Perla B. Balbuena
Yixuan Wang
Sergio R. Calvo
Luis A. Agapito
Liuming Yan
Jorge M. Seminario*

510g A Density Functional Model for Tuning the Charge Transfer between the Platinum Catalyst Electrode and Chemisorbed Species Via the Electrode Potential

Pezhman Alireza Shirvanian

Session 544 - Industrial Applications of Computational Chemistry and Molecular Simulations II

Chair: Phillip R. Westmoreland

Vice Chair: Clare McCabe

544a Comparing Model Asphalt Systems Using Molecular Simulation

*Liqun Zhang
Michael L. Greenfield*

544b The Molecular Modeling and Design of High Performance Biodegradable Lubricants

*Mary J. Bidy
Michael J. Tupy
Juan J. de Pablo*

544c Design of New Lubricant Formulations through Mechanistic Modeling

*Jim Pfaendtner
Q. Jane Wang
Linda Broadbelt*

544d Solubilities of Phenol and Dihydroxybenzenes in Water and Water/Ethanol Mixtures Using Monte Carlo Simulations

*Divesh Bhatt
J. Ilja Siepmann*

544e Phase Equilibria and Transport in Carbon Dioxide Expanded Solvents

*Brian B. Laird
Yao A Houndonougbo
Jianxin Guo
Gerry Lushington
Krzysztof Kuczera*

544f Multilevel Modeling of Complex Systems

*Steen Christensen
Jens Abildskov
Günther Peters
Flemming Yssing Hansen*

544g Generalized UNIQUAC-QSPR Model for Vapor-Liquid Equilibria Prediction of Binary Mixtures

*Devipriya Ravindranath
Srinivasa S. Godavarthy
Rob L. Robinson
Khaled A. M. Gasem*

Session 548 - Molecular Simulation and Computation of Fuel Cells and Electrochemistry II

Chair: Perla B. Balbuena

Vice Chair: Jorge Seminario

548a Photoexcitation Dynamics in Nanomaterials

Oleg Prezhdo
Walter Duncan
Svetlana Kilina
Bradley Habenicht

548b Investigation of Corannulene as Molecular System for Hydrogen Storage

Lawrence G. Scanlon
Michael A. Rottmayer
Perla B. Balbuena
Yingchun Zhang
Giselle Sandi
William A. Feld
James Mack

548c Theoretical Investigations of Solid Oxide Fuel Cell Anode Materials

Gerardine G. Botte
Andres I. Marquez

548d Ab Initio Studies of Gas Stabilities and Occupation in Clathrate Hydrates

Susan Rempe

548e Mesoscale Simulations of Hydrated Nafion Membranes

Aleksey Vishnyakov
Alexander V. Neimark

Session 565 - Application of Multiscale Modeling Techniques

Chair: Gyeong S. Hwang

Vice Chair: Martha C. Mitchell

565a Computation of the Vibrational Spectra of Hydrogen-Bonded Aggregates in Solution Using Multiscale Modeling Approaches

J. Ilja Siepmann
John M. Stubbs

565b On-Lattice Kinetic Monte Carlo Simulations of Point Defect Aggregation in Entropically Influenced Crystalline Systems

Jianguo Dai
Talid R. Sinno

565c Relaxation of Lattice-Mismatch Strain in $\text{Si}_{1-x}\text{Ge}_x$ Thin Films on Si Substrates: Modeling and Comparisons with Experiments

Kedarnath Kolluri
Luis A. Zepeda-Ruiz
Dimitrios Maroudas

- 565d Multiscale Simulation Studies on Mechanisms of Poration for Hydrolytically Degradable Diblock Copolymer Membranes**
Vanessa Ortiz
Steven O. Nielsen
Michael L. Klein
Dennis E. Discher
- 565e Multiscale Systems Engineering with Application to Copper Electrodeposition**
Mohan Karulkar
Feng Xue
Timothy O. Drews
Yuan He
Xiaohai Li
Effendi Rusli
Richard C. Alkire
Richard D. Braatz
- 565f Multiscale Modeling for Quality-Constrained Thin-Film Development in Automotive Coating Material Applications**
Jia Li
Yinlun Huang

Session 569 - Computation and Modeling of Environmental Processes

Chair: Yoram Cohen

Vice Chair: Manish Misra

- 569a Simulation of Biotrickling Filters Using Novel Foams for Treating Odors and Volatile Compounds**
Juan Goncalves
Rakesh Govind
- 569b Wavelet Modeling of Dissolved Oxygen Variations in Mobile Bay**
Manish Misra
Kyeong Park
- 569c Seasonal and Ontogenetic Diet Changes in Aquatic Food Webs Result in Surprising Bioaccumulation Patterns**
Luis A. N. Amaral
Carla Ng
Kimberly Gray
- 569d Controlling Environmental Risk to an Urban Stream Via Tmdl: Ballona Creek Case Study**
Rita A. Kampalath
- 569e Molecular Simulations for Environmental Property Predictions: an Efficient Sampling Approach**
Saadet Ulas Acikgoz
Urmila Diwekar
- 569f Dft Study of Trichloroethylene Chemisorption to Iron Surfaces Using Density Functional Theory**
Paul Blowers
Nianliu Zhang
James Farrell

569g Modeling Multiple Emissions in a River

*Luis T. Furlan
Jose Roberto Nunhez
M. B. Machado
E. Tomaz*

Session 591 - Supercooled Liquids and Nucleation

Chair: Sharon C. Glotzer
Vice Chair: David S. Corti

591a Statistical Mechanics of Nucleation: Replacement Partition Function

Isamu Kusaka

591b Monte Carlo Simulation Study of Crystal Nucleation in Binary Hard Sphere Liquids

*Sudeep Punnathanam
Peter A. Monson*

591c Nucleation and Growth of Quasicrystals

*Aaron S. Keys
Sharon C. Glotzer*

591d Nucleation and Crystallization from Supercooled Liquids of Nitrogen and Carbon Dioxide

*Jerome P. Delhommelle
Jean-Marc Leyssale
Claude Millot*

591e Effect of Diffusion on Precipitate Nucleation and Growth

*Jiankuai Diao
Rafael Salazar
Kenneth Kelton
Lev Gelb*

591f Relationship between Supercooled Water's Phase Behavior and That of Its Binary Mixtures with Non-Polar Solutes

*Swaroop Chatterjee
Pablo G. Debenedetti*

Session 597 - Computational and Modeling Studies of Porous Materials

Chair: Kendall T. Thomson
Vice Chair: Jeffrey J. Potoff

597a Development of Realistic Models of MCM-41 Materials for Gas Adsorption Studies

*Benoit Coasne
Francisco R. Hung
Keith E. Gubbins*

597b Coarse-Grained Modeling of Sol-Gel Materials

Lev Gelb

597c Modeling Porous Carbons by Reverse Monte Carlo and Simultaneous Energy Minimization

*Surendra K. Jain
Jorge P. Pikunic
Roland J.-M. Pellenq
Keith E. Gubbins*

- 597d** **Calibration of an Electronegativity Equalization Method Based on Dft Results to Evaluate the Partial Charges, Global Softness, and Local Softness of Zeolite Structures**
Luis Bollmann
Hugh W. Hillhouse
W. Nicholas Delgass
- 597e** **Self-Assembly of Ordered Organic-Inorganic Materials**
Alessandro Patti
Allan D. Mackie
Flor R. Siperstein
- 597f** **Modeling and Simulation of the Formation of Carbon Molecular Sieves by Carbon Deposition: Non-Linear Stochastic Approach**
A. Argoti
L. T. Fan
W. P. Walawender
S. T. Chou

Session 612 - Theory and Computational Studies of Adsorption

Chair: Karl Johnson

Vice Chair: Alberto Striolo

- 612a** **Density Functional Theory Study of Low-Temperature Si Epitaxial Growth**
Javier Rosado
Deepthi Gopireddy
Christos G. Takoudis
- 612b** **A Dft Study of Mercury Capture on Paper Waste Derived Sorbents**
Xinxin Li
Paul Blowers
- 612c** **Quantum Sieving of Hydrogen Isotopes in Carbon Nanotubes**
Giovanni Garberoglio
Karl Johnson
- 612d** **Investigation of the Phase Behavior of a Fluid in the Vicinity of a Nanowire**
Jeffrey R. Errington
Nathaniel S. Ives
- 612e** **Competitive Adsorption of H₂-CH₄-CO₂ Binary Mixtures on Porous Carbons**
Farida D. Lamari
Benno P. Weinberger
Dominique Levesque
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