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Tina M. Nenoff
The Role of Diffusion in Separation of Gas Mixtures Using a Range of Zeolite Membranes: a Molecular Dynamics Study
Wei Jia
Sohail Murad

Modeling Permeation in Nanoporous Media with Lattice Density Functional Theory
Daniel Matuszak
Gregory L. Aranovich
Marc D. Donohue

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Chair: Darrell Velegol
Vice Chair: Peter N Pintauro

A Hydrodynamic/Brownian Motion Model of Thermal Diffusion in Liquids
James R. Bielenberg
Howard Brenner

Inducing a Sol-Gel Transition in Clay Suspensions Using Added Nanoparticles
John Y. Walz
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Effects of Particle Concentration on Efficiency of Chemical Mechanical Planarization
Yuri Solomentsev

Tirn of Ac Electrically Driven Motion of a Single Microparticle near Platinum and Indium-Tin-Oxide Electrodes
Dennis C. Prieve
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Diffusiosmosis of an Electrolyte Solution along a Plane Wall
Hsien C. Ma
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Porous Polyurethane Foam Scaffolds for Bone Tissue Engineering
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Jian Zou
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Lee R. White
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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. Teclemariam
Susan J. Muller

221b Concentration Effects on Chain Migration in Microfluidic Flow
Yeng-Long Chen
Juan P. Hernández-Ortiz
Hongbo Ma
Michael D. Graham
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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 Blawzdziewicz
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J. A. Given
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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
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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  
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Teppei Ishikawa  
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Session 231 - Particulate and Multiphase Flow  
Chair: Nina C. Shapley  
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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  
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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 Blawzdziewicz
Eligiusz Wajnryb

231j DNS of Dense Suspensions: Instabilities in Liquid-Fluidized Beds
Jacobus J. Derksen
Paul E. Kelly
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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
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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
  Samantha 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 FåHraeus 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

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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 Hydrotopes
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

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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-Il 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 C02-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
**Mobility of DNA on Supported Lipid Bilayers**
Chakradhar Padala
Richard Cole
Sanat K. Kumar
Ravi S. Kane

**Non-Natural, Helical Peptoid Mimics of Lung Surfactant Protein B: Interactions with a Lipid Film**
Shannon L. Seurynck
Ann Czyzewski
Nathan J. Brown
Lauren Floyd
Annelise E. Barron

**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

**Overcoming Mass Transport Limitations in Plasmon Resonance Biosensor**
lixiao Zeng
Xuerong Li
Athar H. Chishti
Christos G. Takoudis

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Chair: Vinay K. Gupta
Vice Chair: Jan Sefcik

**Structuring of Nanoparticles and Micelles Confined between Surfaces**
Aysen Tulpar
Babak Fazelabdalabadi
Paul R. Van Tassel
John Y. Walz

**Dynamics of Microparticles at Oil-Water Interfaces**
Sowmitri Tarimala
Chih-yuan Wu
Lenore L. Dai

**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.

**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 Alkysiloxane 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

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    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
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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 Nanothin 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 Vlcek
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
Monodisperse Core-Shell Silica Nanoparticle Dispersions in Liquid CO2
Stephanie S. Adkins
Jasper L. Dickson
Keith P. Johnston

Microencapsulation of Hydrophilic Additives into Colloidal Polymers with the Aid of Compressed Carbon Dioxide
Matt Yates
X Chen
Z Dong
N Finn
W Yin

Formation Mechanism and Properties of Nanoparticles Produced by Supercritical Fluid Extraction of Emulsions
Boris Y. Shekunov
Pratibhash Chattopadhyay
Jeff Seitzinger
Robert Huff
Adam Gibson

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

Catalysis and Recycling of Metal Nanoparticles Stabilized by Microemulsions
Chien M. Wai

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

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

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
The Effect of Serum Proteins and Hydrophilic Polymers on the Transport of Model Lung Surfactant
Patrick C. Stenger
Jonathan G. Fernsler
Joseph A. Zasadzinski

Competitive Adsorption of Fibrinogen and Dipalmitoylphosphatidylcholine at the Air/Aqueous Interface
Sook Heun Kim
Elias I. Franses

Drying and Swelling of Surfactant Films
Zhiyong Gu
Paschalis Alexandridis

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

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

CO2-Induced Plasticization and Viscosity Reduction in Pharmaceutical Polymers
Dehua Liu
Hongbo Li
David Tomasko
Geert Verreck
Albertina Arien
Peeters Jef
Brewster Marcus

Supercritical Carbon Dioxide Exfoliated Polymer Nanocomposites
Steven E. Horsch
Gulay K. Serhatkulku
Rangaramanujam M. Kannan
Esin Gulari

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

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  
Amyn 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 Electrospray 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 Yung 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
Christian 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 Uchymiaik
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. Bergroth
      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
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
Sangyoup 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
Membrane Science and Intelligent Therapeutics
Nicholas A. Peppas

Tools for the Fast Development of Membrane Processes
Nigel Titchener-Hooker

Session 170 - Microdevices in Separations
Chair: Anup K. Singh

Focusing, Collection, and Metering of DNA Using Microfabricated Electrode Arrays
Faisal Shaikh
Victor M. Ugaz

Miniaturized High-Performance Liquid Chromatography (HPLC) System Using Capillary-Scale Electrokinetic Micropumps
Kamlesh D. Patel
Robert W. Crocker

Blood Cell Separation Issues in Miniature Blood Diagnostic Kits
Ronghui Zhou
Hsueh-Chia Chang

Rapid Bacteria Trapping Using Micro-Fluidic Vortex Flow
Zachary R. Gagnon
Hsueh-Chia Chang

Development of Environmentally Sensitive Affinity Hydrogels for Bioseparations in Microdevices
Ganapathysubramanian Iyer
Viranga Tillekeratne
Maria Coleman
Arunan Nadarajah

Micro-Structured Membrane Dispersion Mixer and Its Characteristics
Guangsheng Luo
Guiguang Chen
Jianhong Xu
Jiading Wang

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 Kulprathipanja

Design and Synthesis of Optimized SOFC 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 Pemfc
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-Polymide 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. Kayıran
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 Bhown

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-CO₂ 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 Nesci
Sankara Papavinasam
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-Acryl 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 Iliás
      Katif Peay
      Kingsley Nelson
      Vincent Morehead
      Willie Arnold

298d  A Novel Evaluation and Characterization Technique for Solvent Resistant Nanofiltration (Srnf) and Reverse Osmosis (Srro) 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
      Vladimirost Nikolakis

308b  Different Methods for Mesoporous Silica Synthesis and Their Effects on Surface Properties
      Asli Ertan
      Surendra N. Tewari
      Orhan Talu
Effect of Surface Chemistry on the Sorption, Wetting and Phase Behavior of Water and Simple Fluids in Novel Ordered Mesoporous Materials
Matthias Thommes

Removal of Ammonium and Organic Compounds by Ion Exchange and Adsorption
Laurence R. Weatherley
Tony Jorgensen

Synthesis and Characterization of Microfibrous Media Supported K2co3 for CO2 Capture
Noppadon Sathitsuksanoh
Hongyun Yang
Yong Lu
Donald R. Cahela
Bruce J. Tatarchuk

Characterization of Cr(VI) Ion Exchange with Hydrotalcite
Patricia A. Terry

Characterization of Metal-Organic Framework as Novel Adsorbent
Zheng Ni
Richard I. Masel
Keith Cadwallader
Mark Shannon
John Jerrell

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

Antisolvent Crystallization and Mixing in Porous Hollow Fiber Devices
Dimitrios M. Zarkadas
Kamalesh K. Sirkar

Using Complex Crystallizer Configurations in a Batch System to Affect Crystal Size and Morphology
Ronald W. Rousseau
José R. Méndez del Río

Effect of Molecular Speciation of Impurities on Amino Acid Crystallization
Sendhil K. Poormachary
Pui Shan Chow
Reginald B. H. Tan

Estimation of Critical Supersaturation Using a Microdroplet Evaporation Technique
Guangwen He
Venkateswarlu Bhamidi
Reginald B. H. Tan
Paul J. A. Kenis
Charles F. Zukoski
Adaptive Neuro-Fuzzy Modeling of Protein Crystal Nucleation Kinetics
Rajendrakumar A. Gosavi
Constance A. Schall
Sasidhar Varanasi
Devinder Kaur

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

Fabrication and Characterization of Zeolite/Polymer Mixed Matrix Nano-Composite Hollow Fiber Membranes
Tai-Shung Chung
Lan Ying Jiang
Yi Li
Santi Kulprathipanja

Mixed Matrix Speek Based Membranes for Direct Methanol Fuel Cell
Vladimir M. Linkov
Shan Ji
Guntars Vaivars
Ben Bladergroen
Gerhard Gericke

Macrovoids in Mixed Matrix Hollow Fiber Membranes
Shabbir Husain
William J. Koros

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

Nanoparticles Embedded Membrane Reactor for the Reductive Degradation of Chlorinated Organics: Tce and Pcb Studies
Yit Hong Tee
D. Bhattacharyya

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
Xiwu 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
Pyoungho 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
Yeo 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 Pvsas 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. Odueyungbo

392a  Simulation of Centrifugal Recovery of Protein in Biopharmaceutical
       Production Using Atspin Simulator
       Wallace W.- Leung
Continuous Centrifugation of Adenovirus Infected Cell Culture Lysates
Jon Shanter
Michael Laska
John Konz
Hari Pujar

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

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

Control of Polymorph Crystallization Via Quasi-Emulsions
Xing Wang
Donald J. Kirwan

Polymorph Screening Using Microfluidics
Venkateswarlu Bhamidi
Guangwen He
Paul J. A. Kenis
Charles F. Zukoski

Polymorphic Behaviour and Morphology of an Anti-Viral/HIV Drug: Stavudine
Sohrab Rohani
Mahmoud Mirmehrabi

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

Chiral Resolution Via Diastereomeric Salt Crystallization
Arthur W.H. Lam
Ka Ming Ng

Using Fbrm Measurements, Fines Destruction and Varying Cooling Rates to Control Paracetamol Csd in a Batch Cooling Crystallizer
Ronald W. Rousseau
Stephanie Barthe

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. Odueyungbo

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
Djavania A Luz
Caroline V Gonçalves
Anne K. O. Rodrigues
Fábio R C Silva
Célio L Cavalcante Jr
Dâa 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-Jilil
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
Mixed Gas Selectivities and Permeabilities for Carbon Dioxide/Methane Separation Using Room Temperature Ionic Liquid Membranes

Prem K. Kilaru
Michael McShea
Paul Scovazzo

Correlation of Structure and Function for CO2 Permeation in Polyphosphazene Membranes

Frederick F. Stewart
Christopher J. Orme

Hydrogen Sulfide Removal with Polymer Membranes for Fuel-Cell Applications

Jin Huang
Jian Zou
W.S. Winston Ho

Crosslinking of High Free Volume Polymers for the Separation of Organic Vapors from Permanent Gases

Scott D. Kelman
Benny D. Freeman

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

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

A Numerical Method for the Accurate Simulation of Fast Cyclic Adsorption Processes

Stefano Brandani
Hyungwoong Ahn

Psa Cycle Selection for Binary Gas Separations – Dual Reflux, Rectifying or Stripping Cycles?

Paul A. Webley
David T. Kearns

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
Tareg M. Al-Soudani

515h  Propylene Purification by Applying & Pi - 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. Dhanasekaran

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 Hatziavramidis
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. Odueyungbo

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. Odueyungbo

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
Enantioseparation of D,L-Tryptophan with a New Chiral Selector through Solvent Extraction
Bin Tan
Guangsheng Luo
Xuan Qi
Jiading Wang

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

A New Pulverized Biomass Utilization Technology
Shigekatsu Mori

Transient 3-Dimensional Behavior of Gas-Solid Fluidization Measured Using Electrical Capacitance Volume Tomography (Ecvt)
Bing Du
Warsito Warsito
L.S. Fan

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

Homogeneous Gas Fluidization: Kinematic and Dynamic Wave Velocities, Particle Mobility and Apparent Suspension Viscosity
Katia Gallucci
Lorenzo G. Gibilaro

The Hydrodynamics of a Rotating Fluidized Bed
Maureen A. Howley
Robert Pfeffer

The Effect of Gas-Solids Dispersion on a Two Fluid Model of a Transport Gasifier
Chris Guenther
Ron Breault

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
Co-Synthesis of $H_2$ and Zno Nanoparticles by in-Situ Zn Aerosol Formation and Hydrolysis
Frank O. Ernst
Antonio Tricoli
Sotiris E. Pratsinis
Aldo Steinfeld

Synthesis of Tellurium Dioxide Nanoparticles by Spray Pyrolysis
Hongwang Zhang
Mark T. Swihart

Ultrafine Particles for Catalytic Applications Made by Spray-Pyrolysis
George Fotou
Miodrag Oljaca
Toivo Kodas
Jiang-Ping Sen
Qi Fu
Jian Zheng

Synthesis of Iron Oxide Nanoparticles in Counterflow Diffusion Flame Reactor
Hector Ruiz
Chris S. Randall
Paul C. Hogrebe
Yangchuan Xing

Biodegradable, Nanoparticulate Polymer Fillers
Stefan Loher
Matthias Huber
Wendelin J. Stark

Generation of Tailored Microparticles by Photopolymerization of Monodisperse Droplets
Asit K. Ray
Zhiqiang Gao

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

Modeling of Heat Transfer in Granular Flow in Rotating Vessels
Bodhisattwa Chaudhuri
Fernando J. Muzzio
M. Silvina Tomassone

Parameter Characterization for Drying of Porous Spherical Particles
James L. Manganaro

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. Silvina 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 Electrospray 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. Odueyungbo

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
Jonghwan 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
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

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

Coarse-Graining of Two-Fluid Models for Fluidized Gas-Particle Suspensions
Arthur T. Andrews
Sankaran Sundaresan

Preconditioning for the Simultaneous Solution of Gas-Solid Flows
Juray De Wilde
Edward Baudrez
Geraldine J. Heynderickx
Guy B. Marin

Consistency of Fully Developed and Periodic Simulations in Gas/Solids Flow in a Riser
Sofiane Benyahia
Madhava Syamlal
Thomas O’Brien

Simulating the Hydrodynamics of Spouted Beds Using a Continuum Formulation
Dhanunjay (Jay) S. Boyalakuntla
Sreekanth Pannala
Carles E. A. Finney
Stuart C. Daw

Modeling of Slow-Frictional Flow in CFD Eulerian Framework
Peter Spicka

Granular Attrition as a Diffusion Phenomenon
Eldin Wee Chuan Lim
Chi-Hwa Wang

Rotating Fluidized Bed an Efficient Polymerization Reactor
Azita Ahmadzadeh
Hamid Arastoopour
Fouad Teymoour

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
Christopher 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
Kuochen 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 Krumbeich
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
Keirnan 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
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
The Unsteady Drag Force on a Cylinder Immersed in a Dilute Granular Flow
Carl R. Wassgren
Rahul Bharadwaj
Roberto Zenit

Granular Flow of Wet Solids in a Four Bladed Mixer
Azzeddine Lekhal
Johannes Khinast
Benjamin J. Glasser

Flow-Induced Dilation of Fine Powders in a Rotating Drum
Abdul M. Faqih
Bodhisattwa Chaudhuri
Fernando J. Muzzio
M. Silvina Tomassone

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

Modifying Bandgap of TiO2-Based Nanoparticles by Cation Doping
Wey Yang Teoh
Lutz Maedler
Rose Amal
Sotiris Pratsinis

Coating Nanoparticles by Atomic Layer Deposition in a Rotary Fluidized Bed: Al2O3 Ald on ZrO2
Jarod A. McCormick
Alan W. Weimer
Steven M. George

Microfluidic Synthesis and Surface-Engineering of Colloidal Nanoparticles
Saif A. Khan
Klavs F. Jensen

Flame Synthesis of Doped ZnO Nanorods
Murray J. Height
Lutz Mädler
Frank Krumeich
Sotiris E. Pratsinis

Tuning the Reactivity of Nanoparticles and Nanoparticle Mixtures
Anand Prakash
Alon V. McCormick
Michael Zachariah

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 Electrospray 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. Madhally
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 Khandelia

4ae **Thermodynamic and Kinetic Modeling of Protein Phase Transition Related to Diseases and Drug Development through Control of Protein-Protein Interactions**
Sungmun Lee

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
Double Sided Thin Film Membranes
Tracy Q. Gardner
John L. Falconer
Richard D. Noble

Solution-Phase Growth of Nanostructures
Timothy O. Drews

Enantioselectivity on Naturally Chiral Copper Surfaces
David M. Rampulla

Systematic Approaches to the Protein Engineering of Highly Specific Receptor-Ligand Pairs
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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
Maria 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 Granjjeiro 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  
Klavs 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
Session 363 - Mixing Issues in Industrial Processes II
Chair: David S. Dickey
Vice Chair: Midey Chang-Mateu

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

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
Maria Irene Sánchez
Josefina Castillo-Reyna
Jorge Eugenio Moreno
Mario M. Alvarez
Continuous-Phase Mixing in Reactive Bubble Swarms with Fully Resolved Dynamic Interfaces
Athanas A. Koynov
Johannes Khinast

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

Laboratory/Pilot Plant Experimentation for Developing a Liquid-Liquid Mixing Process Involving Complex Chemical Reactions
Ramesh R. Hemrajani

Performance of Surface Feed with Pbtu and Varying Reaction Kinetics
Dwight Hirschfield
Sujit Bhattacharya
Suzanne Kresta

Modelling and Design of Non-Ideally Mixed Batch and Semi-Batch Reactor Systems
Xiaoping Zheng
Constantinos Theodoropoulos

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

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

Modeling and Optimization of Fluid-Wall Aerosol Reactors for Solar Thermochemical Hydrogen Production
Christopher Perkins
Paul Lichty
Carl Bingham
Alan W. Weimer

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

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

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 Shyianovskii
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
Esmaiel Jabbari

50c Solid-Phase Synthesis of Functionalized Peptides as Enzymatically Degradable Crosslinkers for Fabrication of Tissue Engineering Scaffolds
Xuezhong He
Esmaiel 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

Geometric 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. Guliants
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
Electroless Deposition of Transparent Conducting Zn$_2$Sno$_4$ for Solar Cell Applications

Rong Zhang
Lei Kerr
Shashi Lalvani
Gautham B. Jegadeesan

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

Computer Aided Design for Engineering Elastomers

Ayush Goyal
Priyan Patkar
Shivani Syal
Jun Caoj
Venkat Venkatasubramanian
James M Caruthers

An Investigation of Nickel-Based Amorphous Alloys and Their Corrosion Products

Noppadon Sathitsuksanoh
Kanchan Mondal
Shashi Lalvani

Dynamic Modeling of Solid-State Polymerization of Bisphenol a in a Moving Packed Bed Reactor

Yuesheng Ye
Kyu Y. Choi

Morphology, Composition and Thermal Stability of Flame-Made Zirconia-Based Mixed Oxides

Rainer Jossen
Martin C. Heine
Sotiris E. Pratsinis
Kamal M. Akhtar

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

Chemical Vapor Deposition Copolymerization of Functionalized Paracyclophanes: an Approach Towards Multivalent Surface Coatings

Yaseen Elkasabi
Hsien-Yeh Chen
Joerg Lahann

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-Garcia Eduardo
Torres-Lugo Madeline
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

The Kinetics and Mechanism of Rapid Nickel Oxalate Thermal Decomposition
Casey Carney
Christopher Gump
Alan W. Weimer

Microinjection Molding of Microstructures - Experimental and Numerical Simulation
Abdessalem Derdouri
Florin Ilinca
Jean-Francois Hétu

Combinatorial Studies of Phase Behavior in Polyanhydride Blends
Jon B. Thorstenson
Balaji Narasimhan

Polymeric Nano-Porous Materials Prepared Via Interfacial Polymerization in Soft Ionic Liquids
Chien-Yueh Huang
Lining Zhu
Mu-Ping Nieh
Jing Zhang
Jing Wu

Towards Molecular Simulation of Polythiophene Oligomers
Michael L. Hobbs
Michael L. Greenfield

Polyimide-Polysiloxane Segmented Copolymers for Fuel Cell Applications
Lijun Zou
Mitchell Anthamatten

Real-Time and in-Process Monitoring and Control of Polymerization Processes
Eric J. Hukkanen

Functional Polymer-Polymer Nanocomposites
Mohamed Aflal M.R.
Giuseppe R. Palmese

Experimental Study of Slip Flow in the Semi-Hyperbolically Converging Dies
Prajakta A. Kamerkar
Brian J. Edwards

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 Multi-hole 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
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142bb  Material and Process Approaches to the Fabrication of Hierarchically Structured Tissue
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Andrew S. Cho
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       Sharon Y. Wong
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157b  Synthesis and in Vitro Characterization of a Triblock Copolymer Carrier for Sirna
       Tatiana Segura
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157c  An Anionic Polymer Enhances Cationic Lipid-Mediated Delivery of Antisense Oligonucleotides
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157d  Multilayered Polyelectrolyte Films for the Localized Delivery of DNA to Cells
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174c  Determination of Zeolite Nanoparticle Morphology Evolution Mechanism from Simulations and Saxs/Tem Measurements
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Takumi Hawa
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J. Alex Lee
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Chair: Jing Wu
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Yan Geng
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187g Crystalline Structure Formations under Steady-State Isothermal Planar Elongational Stretching of N-Alkanes: a Molecular Dynamics Study
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187h Characterization of Mechanical Property Variations in Pressure Sensitive Adhesive Films Using Quasi-Static and Dynamic Nanoindentation
Ryan P. Verhulst
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187i High-Throughput Screening of Mechanical Properties in Polymers
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Erin E. Falco
Scott J. Roth
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Chair: John P. Fisher
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202b  Spontaneous Formation of Gelatin-Polycaprolactone Matrices for Tissue Engineering
Sean Duguay
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202c  Synthesis and Characterization of Amphiphilic Block Copolymers, Self-Assembly Behavior and Drug Delivery Applications
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206b  In Situ Real-Time Diagnostics for Studying the Structural Evolution of Nanocrystalline Silicon Thin Films during Plasma Deposition
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206c  Roll-to-Roll Initiated Chemical Vapor Deposition (Icvd) of Functional, Flexible Nanomaterials
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Chair: John J. La Scala
Vice Chair: Amod A. Ogale

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Wade S. DePolo
Don Baird
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207b Al2O3-Reinforced Epoxy Composites with Enhanced Fracture Toughness: a Sem, Rheology and Mechanical Study
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Richard Parnas

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207d Synthesis of Surface-Functionalized Nanotube-Polymer Network Composites
Mary E. Sullivan
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207e Viscoelastic Investigations of End-Tethered Silica-Poly(Butyl Acrylate) Nanocomposites
Vivek Goel
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Caroline H. Nam
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Aaron E. Saunders
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Daniel F. Shantz
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Vice Chair: Michael C- Huang

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Mustafizur Rahman
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Efficient Modelling of Phase Equilibria of Polydisperse Polymer Systems Using the Saft Equation of State
Nikolaos M.P. Kakalis
Constantinos C. Pantelides

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

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Living Radical Photografting - a Versatile Technique for Engineering Biofunctional Surfaces
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233g pH and Salt Responsive Peg Sams on Polyelectrolyte Multilayer
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233h Evaluation of Polymer and Self-Assembled Monolayer Coated Silicone Surfaces to Reduce Neural Cell Growth
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Vice Chair: Zhong-Ren Chen

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Katsuyuki Wakabayashi
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236b The Role of Positive Counterion in Ethylene-Methacrylic Acid Copolymer Blends with Nylon
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236c Improved Polarizable Potential Model and Simulation Study of Aqueous Systems of Polyethylene Oxide and Inorganic Salts
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Vice Chair: Deepak Srinivasagupta

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George J. Papakonstantopoulos
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Chair: Hugh W. Hillhouse
Vice Chair: Stephen E. Rankin

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George L. Athens
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Microfabrication of Mesoporous Silica Films for Mems Applications
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Venkat R. Koganti
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Synthesis of Tantalum Pentoxide Films for High Temperature Applications
Vaidyanathan Ravi Subramanian
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Michael P. Tate
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272i **Hydrophilic and Antimicrobial Zeolite Coatings**  
Cory R. O’Neill  
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Chair: Rajesh Khare  
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Randolph D. Williams  
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276b **Measurement of the Solubility of Poly(Methyl Methacrylate)-Methyl Methacrylate System in Supercritical CO2 and Their Modeling Using Saft**  
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276c **Modelling the Solubility of Chitosan in Supercritical Carbon Dioxide through Saft**  
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276d **Extrapolating Molecular Models of Thermodynamic Properties to Polymeric Species**  
Fadime S. Baskaya  
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276e **Predicting Solubilities in Polymer Systems Using Cosmo-Rs**  
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S. M. Waziri  
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276f **The Role of Curvature Dependent Free Energy in the Behavior of Polymer Vesicles and Composite Droplets**  
Kurt A. Smith  
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276g **Computation of the Nonhomogeneous Equilibrium Phase Behavior of a Rigid Rod System**  
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Robert A. Brown  
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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
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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
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Mohamed Aflal M.R.
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Chair: Zhong-Ren Chen
Vice Chair: Ronald C. Hedden

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Ranjan Banerjee
Kartic C. Khilar
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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
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283d In-Situ Monitoring of Photopolymerization Using Microrheology
Ryan P. Slopek
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283e  Highly Responsive Self-Assembled Gels from Block Copolymers in Liquid Crystal Solvent
Neal Scruggs
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283f  Pulverization of Rubber with or without Carbon-Black under High Normal and Shear Forces
Jatin Kumar
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283g  A Gaussian Slip-Link Model for Cross-Linked Polymers
Mahnaz Eskandari
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283h  Co-Crystallization of Ethylene-Propylene-Diene Elastomer with Polyethylene Plastomers
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Vice Chair: Alon V. McCormick

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332b  Polymerization in Surfactant Solutions
Eric W. Kaler

332c  Biomolecular Interfaces Using Liquid Crystalline Materials
Nicholas L. Abbott

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Bradley F. Chmelka

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Eray S. Aydil

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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
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Marco Giacinti Baschetti
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350c Configurational Diffusion of Small Molecules through Nano-Confined Polymers
Amit Kumar
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350d Dual Mode Transport with Finite Hole-Filling Kinetics in Glassy Polymers
Juchen Guo
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350e Diffusion in Polymeric Systems: Arrhenius and Free-Volume Equivalence
Narayan Ramesh
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350f Deliquescence, Diffusion, and Crystal Nucleation in Levitated Polyethylene Oxide
Adam P. Olsen
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Julia A. Kornfield

350g Experimental and Theroretical Investigation of Multicomponent Solvent Removal from Semicrystalline Polymers
Sim-Siong Wong
Sacide Alsoy Altinkaya
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
Oluwasijibomi 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
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
Zhaozhong 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  Comparision 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
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 Vassylyev  
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 Co$_2$: Co$_2$-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 Methytriethoxysilane under Acidic Conditions
       Jyothirmai Ambati
       Stephen E. Rankin

517e  Influence of Water on Cure Kinetics Via Eb-Irradiated Epoxy Resin
       Jihane Lee
       Giuseppe R. Palmese
The Effects of Raft Agent on Braching in a Free-Radical Polymerization
Rujun Li
Joseph Schork

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

Equilibrium Self-Assembly of Rod-Coil Block Copolymer Thin Films
Rachel A. Segalman
Bradley D. Olsen

Mixed Lamellae of Symmetric Diblock Copolymer Thin Films
Dong Meng
Qiang Wang

Shear Alignment of Spherical-Phase Block Copolymer Thin Films
Mingshaw W. Wu
Dan E. Angelescu
Douglas H. Adamson
Paul M. Chaikin
Richard A. Register

Surface Energy Effects in Triblock Copolymer Thin Films
Thomas H. Epps
Michael J. Fasolka

Monte Carlo Simulations and Self-Consistent Mean Field Theory of Polyelectrolyte Brushes
Gaurav Arya
Owen J. Hehmeyer
Athanassios Z. Panagiotopoulos

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 Tsige

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

Study of the Molecular Weight Dependence of Surface Tension of Low Molecular Weight Alkanes by Molecular Dynamics Simulation
Chunli Li
Phillip Choi
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

Molecular Dynamics Simulation of a Nanoscale Device for Fast Sequencing of DNA
Christina M. Payne
Xiongce Zhao
Peter T. Cummings
James W. Lee

A New Paradigm in Tendon Tissue Engineering
Rita Abousleiman
Peter S. McFetridge
Vassilios I. Sikavitsas

Real-Time Monitoring of Streptococcus Mutans Dental Biofilm Formation Using Quartz Crystal Microbalance
Kawai Tam
Perla Ayala
Nichola Kinsinger
Nosang V. Myung

Orientational Control of Immobilized Biomolecules on a Membrane Surface for Specific Protein Capture
Sufi Ahmed
Timothy Barbari

Adsorption of Dansylated Amino Acids on Molecularly Imprinted Surfaces: a Surface Plasmon Resonance Study
Xiao Li
Scott Husson

Modulation of Astrocyte Behavior Via Transforming Growth Factor & Beta-1 Conjugated Surfaces
Christopher L. Klaver
Michael R. Caplan

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
Haiyin 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 Triacetoxyisilane 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
Yoram Cohen

556h Polybenzoxazole Films Fabricated Using Vapor Deposition Polymerization
Mitchell Anthamatten
Xichong Chen

556i Vapor-Based Polymer Coatings for Surface Engineering of Microfluidic Devices
Hsien-Yeh Chen
Joerg Lahann
Session 564 - Transport Phenomena in Electronic Materials Processing
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
Tamás Bakos
Eray S. Aydil
Dimitrios Maroudas

564c Effects of Elastic Stress on Electromigration-Driven Void Dynamics in Metallic Thin Films
M. Rauf Gungor
Vivek Tomar
Dimitrios Maroudas

564d Defect Nucleation and Growth in Crystalline Silicon under Conditions of Generalized External Stress
Sumeet Kapur
Talid R. Sinno

564e Analysis of an Industrial Electro-Dynamic Gradient Process for Czt Growth
Lisa Lun
Andrew Yeckel
Prodromos Daoutidis
Csaba Szeles
Michael Reed
Jeffrey J. Derby

Session 566 - Atomic Layer Deposition
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
Ronald Inman
Axel Soulet
Gregory Jursich
Christos G. Takoudis
566c Chemical Mechanisms of Contamination in Atomic Layer Deposition of Hfo2
Atashi Mukhopadhyay
Charles B. Musgrave

566d Tert-Butylimido-Tris(Diethylamido)Tantalum and NH3 Precursor Combination for Ald of Tan for Barrier Applications
KeeChan Kim
Timothy J. Anderson
Lisa McElwee-White

566e Area Selective Atomic Layer Deposition Using Photodefinable Polymer Masks
Clifford L. Henderson
Dennis W. Hess
Ashwini Sinha

Session 567 - Biomaterial Scaffolds for Tissue Engineering
Chair: Christopher S. Brazel
Vice Chair: Tao L. Lowe

567a Electrospun Degradable Segmented Polyurethane Elastomers for Ligament Tissue Engineering
CA Bashur
SA Guelcher
Aaron S. Goldstein

567b L-Tyrosine Based Polyurethane Blends for Tissue Engineering Applications
Debanjan Sarkar
Stephanie T. Lopina

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
Lonnie D. Shea

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
Abraham D. Stroock
567g Synthetic Scaffolds Mimicking Small Intestinal Submucosa
Eric Maase
Bradley P. Kropp
H. K. Lin
Y. Zhang
Sundararajan V. Madhally

Session 578 - Nanostructured Biomaterials
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
Victor Breedveld

578c Pegylated Bacteriophage for Identification of Tissue Homing Peptides
Harry Bermudez
Jeffrey A. Hubbell

578d Albumin-Derived Nanocarriers for the Display of Extracellular Matrix Ligands & Engineering Cell Adhesion and Motility
Ram I. Sharma
Marian Pereira
Jean E. Schwarzbauler
Prabhas V. Moghe

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
Nanoparticles for the Treatment of Osteoporosis
Ganesan Balasundaram
James C. Fleet
Connie M. Weaver
Alan M. Friedman
Ross V. Weatherman
Thomas J. Webster

Layer-by-Layer Assembly of Nacre-like Nanostructured Composites with Antimicrobial Properties
Paul Podsiadlo
Stephen Paternel
Zhengfei Zhang
Jean-Marie Rouillard
Jaebom Lee
Jung Woo Lee
Erdogan Gulari
Nicholas A. Kotov

Directed Calcium Deposition by Osteoblasts along Carbon Nanofiber Patterns in Polymers
Dongwoo Khang
Michiko Sato
Thomas J. Webster

Session 583 - Polymer Processing and Rheology I
Chair: Kurt W Koelling
Vice Chair: U. Sundararaj

In Situ Measurements of Molecular Orientation in Commercial Thermotropic Liquid Crystalline Polymers in Transient Shear Flows
Stanley Rendon
Wesley Burghardt
Robert Bubeck

Rheology of Carbon Nanofiber/Polystyrene and Nanoclay/Polystyrene Melt Composites
Jianhua Xu
Christopher Kagarise
Yingru Wang
Kurt W. Koelling
Stephen E. Bechtel

Transient Rheology of a Polypropylene Melt Reinforced with Long and Short Glass Fibers
Aaron P. R. Eberle
Donald G. Baird

Rheology of Homopolymer and Blends of Dense Star Polystyrene Soft Nanospheres
Ajay C. Kulkarni
Rangaramanujam M. Kannan

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
   Xiaoling Wei
   Simioan Petrovan
   Nicholas E. Hudson

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
   John R. Dorgan
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

Prediction of Renewable Polymer Properties Using Quantum and Molecular Modeling

James McAliley
Christopher O'Brien
David Bruce

Synthesis of Biodegradable Poly (L-Lactic Acid): Process Path Optimization

Vimal Katiyar
Hemant Nanavati

Session 586 - Reaction Kinetics in Electronic Materials Processing
Chair: Bridget R. Rogers
Vice Chair: Katherine S. Ziemer

Controlling Ultrashallow Junction Formation through Surface Chemistry

Edmund G. Seebauer
Kapil Dev
Charlotte T. M. Kwok
Richard D. Braatz

Directed Self Assembly of Si and Ge Nanocrystals on HfO₂ through Kinetically Driven Patterning

Scott K. Stanley
Sachin V. Joshi
Sanjay K. Banerjee
John G. Ekerdt

Grain Focused Simulation of Zirconia Cvd

Max Bloomfield
Zhe Song
Bridget R. Rogers
Timothy S. Cale

An Electrochemical Impedance Spectroscopy Study of Chloride and 3-Mercapto-1-Propanesulfonic Acid Interactions in Acidic Copper Electroplating Bath

Hung-Ming Chen
Satish J. Parulekar
Alan Zdunek

Characterization of Copper Chemical Mechanical Polishing in Nitric Acid Slurries

Moganty Surya Sekhar
S Ramanathan

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

Session 590 - Structure and Properties of Polymers IV: Effects of Polymer Architecture
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
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Janna K. Maranas

590e  Determining Branch Content in Polymers: a Novel Technique Combining Small Angle
Scattering and Fractal Geometry
Amit S. Kulkarni
Gregory Beaucage

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Chair: Vadim V. Guliants
Vice Chair: Ilsoon Lee

594a  Fibronectin/Polyelectrolyte Multilayer Assemblies: Film Formation and Cell Attachment Studies
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W. Mark Saltzman
Paul R. Van Tassel
594b Biomimetic Interfaces for Characterizing Membrane Proteins
Neeraj Kohli
Sachin S. Vaidya
Robert Y. Ofoli
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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

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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
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594i In Vitro Investigations of Interactions between Amyloid Beta Peptides (1-40, 1-42) Structures and Substrates with Different Natures
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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 Β-Amyloid
James E. Henry
Dhara V. Patel
Mustafa Chowdhury
Gerard Cote
Theresa A. Good

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
Michael V. Pishko

595e Near Infrared Optical Biosensors Based on Single Walled Carbon Nanotubes
Paul W. Barone
Seunghyun Baik
Daniel A. Heller
Michael S. Strano

595f Fabrication of Antibody Microarray Sensors Using Thermally Responsive Elastin-Protein a Fusion for Detection of Microbial Pathogens
Di Gao
Joseph Cooke
Nicole McBean
Jerome S. Schultz
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
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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  
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### 595i Biomems ELISA for Rapid Assessment of Markers in Serum

Robert T. Larsen  
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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  
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#### 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  
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Giuseppe R. Palmese
602a Characterization of Novel Polymer Assisted Thick Ta2o5 for High Temperature Application
Nicholas Ndilege
Vaidyanathan Subramanian
Edmund Seebauer
Mark A. Shannon
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602b Advanced Ceramic Materials for High Temperature Coal Combustion
Parveen Kumar
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602c Impurity Incorporation during the Sublimation Growth of Aluminum Nitride Crystals
J. H. Edgar
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602d Improved Estimates of High Temperature Fiber Bed Effective Emissivities from Variational Calculations
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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
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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
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

Evolution of Crystalline Morphology in Poly(Trimethylene Terephthalate) and Ptt-Based Blends
Sumod Kalakkunnath
Terry W. Humphries
Douglass S. Kalika

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Raj K. Krishnaswamy

CFD Study of Flow and Heat Transfer in Miniature Mixers for Nanocomposites
U. Sundararaj
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Samson A. Jenekhe
Abhishek P. Kulkarni
Yan Zhu
Christopher J. Tonzola
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Ultrathin Films by Covalent Molecular Assembly: Polythiophene-Polyimide Composites with Reduced Surface Resistivity
Fengxiang Zhang
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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
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Brandon M. Vogel
J. M. J. Frechet
Vivek Subramanian
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608e Reversible Switching of Conducting Polymer Films between Superhydrophobicity and Superhydrophilicity
Lianbin Xu
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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 Movpe 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
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609e Non-Lithographic Micropatterning of Thin Crystal Film Layers and Bulk Micro-Machining Via Hydrogel Stamping
Stoyan K. Smoukov
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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. Eastepp
Jeremy W. Leggoe

19c Heterogeneous Chemistry of Organic Compounds on Atmospheric Droplets
Kalliat T. Valsaraj
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19d Validation of Impact Maps Obtained with Dispersions Models through Neigbourgh 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
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19f Evaluation of Drinking Water Contaminants Using Modeling
Nicole Whittier
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19g  Particle and Soluble Release of Organic Contaminants from the Sediment Bed
  Danny D. Reible
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19h  Predicting Enhanced Dispersion of Bacteria Due to Chemotaxis
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  Karthik Narayanaswamy
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  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
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    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
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20e  Evaluation of Nanocrystalline Sorbents for Mercury Removal from Coal Gasifier Fuel Gas
    Raja A. Jadhav
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    Slawomir Winecki
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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
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Dong-Shik Kim
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54d Performance of a Pilot Scale Digester and Comparison with Laboratory Scale Units
Mehul Vesvikar
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Muthanna Al-Dahhan
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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

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Chair: Mark Zappi
Vice Chair: Rafael Hernandez

111a Transesterification of Triacetin and Esterification of Acetic Acid on Tungstated Zirconia
Dora E. Lopez
Kaewta Suwanakarn
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 Hibel
   Erdogan Ergican
   Jason D Geddes
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   Andy Goodrich

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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
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134d  Computational Approach to Quantify Condenser Operations
   Romeo Ibrahim
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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
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Vice Chair: Nick D. Hutson

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   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
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j. Paul Chen
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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
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143i The Multimedia Integrated Environmental Management System Software Development
Mi-Sug Kim
JongHo Kim
Hyun-Soo Park
Yile-Sik Sun
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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

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Edward Nowak
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| 143p | Asm1-Based Modeling and Simulation of a Full-Scale Simultaneous Nitrification and Denitrification Plant  
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| 143q | Development of a New Dry Flue Gas Desulphurization Process Utilizing Calcium Silicate Hydrate in Waste Concrete  
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| 143r | Chemical Modification of Sargassum Sp. for Enhancement of Heavy Metal Biosorption  
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| 143s | Low Temperature Stabilization of High Level Calcined Waste  
Anirudha Marwaha |
| 143t | Cyanobacterial Toxins: Treating the New Generation of Water Contaminants  
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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  
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Kenji Hikino  
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| 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  
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| 143w | Heavy Metal Recovery from Molten Fly Ashes by Chlorination  
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Taku 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
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143z A Tool for Life Cycle Assessment of Recycling Residues from Waste Incineration in Road Constructions – Eartool
Tapas K. Das
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200a Magnetically Recoverable TiO2 Photocatalyst Particles by Means of Atomic Layer Deposition
David M. King
Karen J. Buechler
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200b Comparison of Various Oxidation Catalyst/Zeolite Systems for Treating Diesel Exhaust from Mobile Sources
Adria F. Lotus
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200c Dual-Catalyst System for Lean Exhaust Aftertreatment
Erik M. Holmgreen
Matthew M. Yung
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200d Selective Catalytic Reduction of Nox with NH3 over Cu-ZSM-5 – the Effect of Changing the Gas Composition
Hanna Sjovall
Louise Olsson
Erik Fridell
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200e Comparison of Electrodes for Application in Anodic Oxidation of Wastewater Constituents
Julia Zelenka
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200f A Novel Synthesis of Sponge-Type Carbon Doped Titania Activated under Visible-Light
Chang Yeon Yun
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200g A Novel Process for Deep Desulfurization of Dibenzothiophene under Mild Conditions
Dan Huang
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Chair: Mark Bricka
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234a Perchlorate Remediation by Zero Valent Iron
He Huang
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234b Optimization of In situ 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
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James C. Linden
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234d Development and Characterization of a Tubular High-Density Plasma Reactor for Water Treatment
Derek C. Johnson
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Alexander P. Mathews
Kishora K Panda

234f Quantification of Reductive Species Produced by High Voltage Electrical Discharges in Water
Mayank Sahni
Wright C. Finney
Bruce R. Locke

234g Indirect Electrochemical Treatment of Textile Wastewater: Influence of Design and Operational Parameters on Color Removal
Vijayakumar Sundaram
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Chair: Robert W. Peters
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247a Sulfate Radical Based Advanced Oxidation Technologies
George P. Anipsitakis
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247b Ozone-Enhanced Catalytic Oxidation of Dimethyl Methylphosphonate and Dimethyl Sulfide
Cathrine B. Almquist
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247c Photochemical Treatment of Herbicide/Pathogen Contaminated Agricultural Water in the Rio Grande Basin
X. Ye
Daniel H. Chen
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247d Electrochemical and Photochemical Oxidation of Ethylenediaminetetraacetic Acid
Wolfgang Gangl
Julia Zelenka
Peter Letonja
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247e Treatment of Nitroaromatic Contaminated Groundwater with Zero-Valent Metals and Advanced Oxidation Techniques
Mathew Thomas
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247f Using Fenton Chemistry for Wastewater Treatment of Organic Recalcitrant Substances
Abel Mondelo Rodriguez
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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
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Chair: Neil M. Donahue
Vice Chair: Athanasios Nenes

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R. Bertrum Diemer
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263b Developments in Atmospheric Homogeneous Nucleation
Alicia J. Kalafut
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263c  Are Organic Surfactants Ubiquitous?
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     Athanasios Nenes
     Ryan Morrison
     Amy Sullivan
     Chris Hennigan
     Rodney Weber
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     Richard C. Flagan
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     Albert A. Presto
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263e  Hygroscopicity of Multi-Component Organic Aerosols Using an Environmental Scanning Electron Microscope
     Timothy M. Raymond
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263f  Heterogeneous Oxidation Kinetics of Organic Aerosols
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     A. L. Robinson
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     Jieyuan Zhang
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263h  Indirect Determinations of Integrated Br and Cl Concentrations in Barrow, Alaska
     Loredana Suciu
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     Valerie L. Young
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     Luis T. Furlan
     Carine D.D. Gennari Jungklaus
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282b Environmental Community Impact Assessment Associated with a Multiuse Industrial Facility: Scientific Rigor, Uncertainties, Transparency and Participation of Stake Holders
Yoram Cohen
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282c Solute Fate in Stratified Heterogeneous Media
Julio A. Zimbron
Tom C. Sale
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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
Daekuen 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 Iliyas
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
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483c Biological Sulfate Reduction of Reverse Osmosis Brine Concentrate: Batch
Reactor and Chemostat Studies
Masoud Samee
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Mark D. Williams
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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*  
*Aлексandre Nicolaos*  
*Micel Thoma*

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*  
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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. Sirola
    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
    Rafiul 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 CatalyticReactors
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. Garcia
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
**Session 58 - Data Classification Problem**

A Mixed-Integer Programming Approach to Multi-Class Data Classification Problem
Metin Turkay
Fadime Uney

Validation of a Model for a Biodiesel Production Process through Model-Based Experiment Design for Parameter Precision
Gaia Franceschini
Sandro Macchietto

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

A Framework for Integrating Model Predictive Controllers to Control Large-Scale Systems
Aswin N. Venkat
James B. Rawlings
Stephen J. Wright

Engineering Negative Feedback Regulation in Cells
Kang Wu
Christopher V. Rao

Approximate Dynamic Programming Based Strategy for Markov Decision Problems in Process Control and Scheduling
Jay H. Lee

Integrating Finance and Control for Process Operations
Jeffrey C. Kantor

Integrating Physics and Process Control
B. Erik Ydstie

Control Structure Design: New Developments and Future Directions
Vinay Kariwala
Sigurd Skogestad

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

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
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 Reever
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
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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 Reever

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 Pandy
Arvind Raghunathan
Nikunj Gupta
Mallika Gummalla
Cynthia York
Sergei Burlatsky

164c Macrophomogenous 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
Sitar 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
Xinquan Huang
Lealon L. Martin
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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**  
*Mihail Stamatakis*  
*Nikos V. Mantzaris*

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**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 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
Iiro Harjunkoski
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 Cauwenbergh
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
Kyounghoon 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
Antonis 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
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Vasiliki Kazantzi
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Jagdish Rao
Mahmoud El-Halwagi

540f  Thermodynamics-Based Design of H2 Storage in Clathrates
Prasad Yedlapalli
Sangyong Lee
Jae W. Lee

Session 541 - Design of Integrated Chemical and Biological Systems
Chair: Lealon L. Martin
Vice Chair: Victor R. Vasquez

541a  Hybrid Process Design-Analysis in Pharmaceutical and Biochemical Industry
Piotr Tomasz Mitkowski
Rafiqul Gani
Gunnar E. Jonsson
A Systematic Approach for Automated Reaction Network Generation
Shuo-Huan Hsu
Balachandra B. Krishnamurthy
Prathima Rao
Chunhua Zhao
Suresh Jagannathan
Venkat Venkatasubramanian

Application of State Space Modeling Techniques to Biological Systems
Anthony B. D. Samuels
Susan Sharfstein
Lealon Martin

Systematic Design of Aqueous Two-Phase Extraction for Protein Separation
Murni M. Ahmad
Steinar Hauan
Todd M. Przybycien

Modeling Uncertainty Analysis in Distributed Systems
Libin Zhang
Kedar Kulkarni
Andres Malcolm
Andreas A. Linninger

Application of Optimal Control Theory for Sustainable Ecosystem Management
Yogendra Shastri
Urmila Diwekar

Session 553 - Optimization and Control of Hybrid Systems
Chair: Simone L Kothare
Vice Chair: Derrick Rollins

A Decomposition Approach for the Global Optimization of Linear Hybrid Systems
Paul I. Barton
Cha Kun Lee

Hybrid System Framework for State Estimation in Systems with Wireless Devices
Mohammad Emtyaz Khan
Harigopal Raghavan
Jagadeesh Brahmajosyula
Santosh Kumar
Shankar Narasimhan

Control of Nonlinear Hybrid Systems Using Multiple Mld Models
Nareshkumar N. Nandola
Sharad Bhartiya

An Optimization Based Approach for Stability Analysis of Nonlinear Model Predictive Controller
Vivek Dua

Lyapunov-Based Predictive Control of Hybrid Systems
Prashant Mhaskar
Nael H. El-Farra
Panagiotis D. Christofides
Hybrid Predictive Control: Discrete Actuation and Sensing
Panagiotis D. Christofides
Prashant Mhaskar
Nael H. El-Farra

Fault-Tolerant Process Control: Nonlinear Fdi and Reconfiguration
Charles McFall
Adiwinata Gani
Prashant Mhaskar
Panagiotis D. Christofides
James F. Davis

Session 557 - Process Control Applications
Chair: Masoud Soroush
Vice Chair: David H. Gay

Model Predictive Control of Weight-on-Bit near Its Optimum in Hydrocarbon Well Drilling: the Value of Constraints
Ankur Awasthi
M. Nikolaou

Evaluation of Criteria for Selecting Temperature Control Trays in Distillation Columns
William L. Luyben

Application of a Lyapunov-Based Nonlinear Controller to a Reactor with Highly Exothermic Reactions
Dário A. F. Luis
A. Astolfi
L. Kershenbaum

Control Loop Pairing Using Dynamic Performance
Tom E. Marlin
Yongsong Cai

An Advanced Model for Optimal Operation of Emulsion Terpolymerization Processes: Application to Styrene/Mma/Ma
M. H. Srour
V. G. Gomes
J.A. Romagnoli

Evaluation of a Two-Temperature Control Structure for a Two-Reactant/Two-Product Type of Reactive Distillation Column
Devrim B. Kaymak
William L. Luyben

Mathematical Modeling and Model Based Control of a Pulp Mill Powerhouse
Mehmet Mercangöz
Francis J. Doyle
Session 570 - Design & Operation of Micro-Processes
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
      Steinar Hauan

570f  Performance Enhancement of Steam Methane Reforming in
      Tubular Packed-Bed Microreactors
      R. Rajasree
      Ravi Kumar V
      B.D. Kulkarni

570g  Adaptive Optimization of Noisy Black-Box Functions Inherent in Microscopic Models
      Eddie Davis
      Marianthi Ierapetritou

Session 582 - Planning and Scheduling
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
Christodoulos A. Floudas

582c Simultaneous Planning and Scheduling for Multiproduct Continuous Plants
Muge Erdirk Dogan
Ignacio E. Grossmann

582d Hierarchical Approach for Production Planning and Scheduling under Uncertainty
Dan Wu
Marianthi Ierapetritou

582e Real-Time Dynamic Hoist Scheduling under Uncertainties
Qiang Xu
Yinlun Huang

582f A Comparative Study of Continuous-Time Models for Short-Term Scheduling in Multipurpose Batch Plants
Stacy L. Janak
Munawar Shaik Abdul
Christodoulos A. Floudas

582g Planning under Correlated and Truncated Price and Demand Uncertainties
Wenkai Li
I. A. Karimi
R. Srinivasan

Session 39 - Safety in Design and Operation - Pilot Plants and Unit Operation Labs: I
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

Session 80 - Safety in Design and Operation - Pilot Plants and Unit Operation Labs: I I
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

Session 132 - Process Development and Manufacturing for Novel, High-Tech Materials
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

Session 180 - Pilot Plant Economics
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
Timothy Oolman

180g Top Ten Economic Break Points in Pilot Plant Design and Construction
David Edwards
H. Troy Wong

Session 441 - Advancement in Manufacturing Tech
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
Quan Liu

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 Peursem

Session 521 - Process Optimization
Chair: Michael Hill
Vice Chair: Lionel O Young

521a Multiobjective Optimization of Multipurpose Batch Plants Using Superequipment Class Concept
Andrej Mosat
Laurent Cavin
Ulrich Fischer
Konrad Hungerbühler

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 Chandrachasan
Sheetal K. Bafna

521d Process Optimization of Pulsed Pumping Remediation Systems
Christian M. Lastoskie
Craig M. Tenney
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
Essam Bahnassi
Abdul Rahman Khouri

Session 573 - Innovative Feedstocks and Energy Utilization for Sustainable Process Development
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.
Session 599 - Debottlenecking of Manufacturing Processes
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
      Lealon L. Martin

599e  Use of Computational Fluid Dynamics for Catalyst Deactivation at Commercial Plants
      Sue Degaleesan
      Janine A. Toner
      Jonathan H. Worstell

599f  Synergy Analysis of Collaborative Supply Chain Management in Energy Systems Using Multi-Period Milp
      Metin Turkay
      Ahu Soylu
      Kaoru Fujita

599g  Castable Coating Experiment in the Primary Reformer to Avoid Fouling in the Convection Section Coils
      Sukardi Pawiradikrama
      Hari Triwidodo

Session 155 - Advances in Separations and Immobilization of Nuclear Waste
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 Tetrphenylborate 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. Gorensek

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 H\textsubscript{2} 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. Gorensek
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. Gorensek
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
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

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

Simulations of Spouted Beds for Coating Triso Fuel Particles
Sreekanth Pannala
Dhanunjay Boyalakunta
Charles E. A. Finney
James H. Miller
Richard A. Lowden
C. Stuart Daw

Modeling Hanford-Rpp Treated Law Feed Evaporation
Gene Daniel

Molecular Modeling of Crystalline Silicotitanate and Polyoxoniobate Ion Exchangers
James P. Larentzos
Edward J. Maginn

Modeling Offgas Systems for the Hanford Waste Treatment Plant
Frank G. Smith

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

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
Materials Development for Improved Efficiency of Hydrogen Production by Steam Electrolysis and Thermochemical-Electrochemical Processes
Jennifer R. Mawdsley
Deborah J. Myers

Conceptual Design and Projected Performance for a Hybrid Sulfur Process
Maximilian B. Gorensek
William A. Summers
Melvin R. Buckner
Zafar H. Qureshi

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

Hydrolysis of Calcium Bromide: Immobilization of the Reactant on a High Surface Area Support
Vivek P. Utgikar
J. Paul Scott
Michael F. Simpson

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

Progress in High Temperature Materials and Systems in the U.S. Doe Nuclear Hydrogen Initiative
Steven Randall Sherman

Characterization of Candidate Ceramic Materials for the High Temperature Sulfuric Acid Loop in the Si Process
Merrill A. Wilson
Charles Lewinsohn

Application of Conjugate Heat Transfer and Flow Analyses for Design Optimization of the Si Decomposer
Valery I. Ponyavin

Evaluation of Candidate Salts for Use as High Temperature Heat Transfer Agents
David F. Williams

Inhibiting Corrosion by Molten Fluoride Salts: Investigations on Flinak
Blandine F. Laurenty
Grant Fukuda
Darwin D. Damba
Per F. Peterson
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

Development of a Liquid Jet Sludge Re-Suspension Model
George A.H. McArthur
Tim P. Tinsley
Donna McKendrick

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

Determination of Bubble Size Distribution in an Oxide Reduction Electrochemical Cell
Supathorn Phongikaroon
Steven Herrmann
Shelly Li
Michael F. Simpson

Heat Transfer from Condensate Droplets Falling through an Immiscible Layer of Tributyl Phosphate
James Laurinat

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

Commercial Alloys for Sulfuric Acid Vaporization in Thermochemical Hydrogen Cycles
Thomas M. Lillo
Karen M. Delezene-Briggs

Characterization of Structural Materials for Nuclear Hydrogen Generation
Ancila Kaiparambil
Radhakrishnan Santhanakrishnan
Ajit Roy
Bunsen Wong

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. Vandegrift
     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. Gorensek

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
Efstatios 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 Ryoun 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 Pantelogianis
Sundararajan V. Madihally
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
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 ß-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
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

Blistering Performance
Justin D. Moser
Craig B. Ikeda
David Yao
Jeannie Chow
Tzyy-Show Chen

Adjuvant-Adsorbed Vaccine Susceptibility to Hydrodynamic Shear
David J. Geer
Kenneth J. Ford
Li Shi
Suhas D. Shelukar
William A. Hunke
Scott D. Reynolds

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

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

Elucidation of the Spatial Pdgf Gradient Sensing Mechanism in Fibroblast Chemotaxis
Ian Schneider
Jason Haugh

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
A Highly Integrated on-Chip Glycoprotein Processor for Rapid Sialic Acid Content Monitoring
Jinpian Diao
Lincoln Young
Peng Zhou
Michael L. Shuler

Modeling and Control of Continuous Tumble Mixing of Granular Materials
Carlos Velázquez-Figueroa
Andres F. Valencia-Agudelo

Continuous Reactive Precipitation in a Y-Mixer
Jason M. Gillian
Donald J. Kirwan

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

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

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

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
Mahadeva Bharath 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
Daekun Kim
George A. Sorial

103d Enzymatic Generation of Hydrogen Peroxide and Gluconic Acid Chelate for Chloro-Organic Destruction by Modified Fenton Reaction
Deepak Ahuja
D. Bhattacharyya
Leonidas Bachas
103e  Optimizing Carbon Dioxide Utilization by Photosynthetic Bacteria
    Agnes Ostafin
    Darcy D. LaClair

103f  Development of a Combined Wastewater Treatment Process for Organic Recalcitrant Substances
    Abel Mondelo Rodriguez
    José Maria Ameneiros Martinez
    Eduardo Marques Canosa

Biological Sulfate Reduction of Reverse Osmosis Brine Concentrate: Batch Reactor and Chemostat Studies
    Jaeyong Jung
    Masoud Samee
    Atosa Vahdati
    Varadarajan Ravindran
    Mark D. Williams
    Massoud Pirbazari

Session 110 - Applied Mathematics in Bioengineering
Chair: Kenneth J. Kauffman
Vice Chair: Kyongbum Lee

110a  Protein Loop Structure Prediction with Flexible Stem Geometries
    Martin Monnigmann
    Christodoulos A. Floudas

110b  Automated Flow Cytometry for Identification of Population Balance Models
    Alan Gilbert
    James A. Kacmar
    Friedrich Srienc

110c  Chemoattractant-Mediated Biofilm Growth on Surfaces
    Christian M. Lastoskie
    Sydney B. Forrester

110d  A Multicellular Dynamic Model of Neuron-Astrocyte Metabolic Interactions in the Brain
    Rajanikanth Vadigepalli
    Radhakrishnan Mahadevan

110e  A General Hybrid Optimization Framework for the Optimal Modulation of Enzyme Levels Using Large-Scale Kinetic Models of Bacterial Metabolism
    Evgeni Nikolaev
    Priti Pharkya
    Antonios Armaou
    Costas D. Maranas

110f  Genetic Network Driven Control of Phbv Copolymer Composition
    Sergio Iadevaia
    Nikos V. Mantzaris

    Development of a Bayesian-Based Framework for Identification of Most Probable Biochemical Reaction Network
    Andrea L. Knorr
    Ranjan Srivastava
Session 116 - Crystallization of Biological Macromolecules in the Structural Genomics Era
Chair: Russell A. Judge
Vice Chair: Abraham Lenhoff

116a Improving Success Rate in Protein Crystallization
Tangir Ahamed
Beatriz Alvarez Esteban
Marcel Ottens
Luuk AM Van der Wielen

116b Protein Crystallization under Medically Relevant Conditions
Karsten Bartling
Athanassios Sambanis
Ronald W. Rousseau

116c Determination of Protein Crystallization Kinetics Using a Regulated Evaporation Method
Sameer Talreja
Charles F. Zukoski
Paul J. A. Kenis

116d Crystallization of Integral Membrane Proteins
Michael C. Wiener

116e Novel Protein Crystallization Strategies
Soojay Banerjee

116f Fluorescent Approaches to High Throughput Crystallography
Marc L. Pusey
Elizabeth L. Forsythe
Aniruddha Achari

116g Mitigation of Radiation Damage to Protein Crystals Using a Helium Cryostream
Unmesh N. Chinte
B. Leif Hanson
Alan Pinkerton
Constance Schall

Session 151 - Advances in Drug Delivery: Novel Delivery Mechanisms
Chair: Cory J. Berkland
Vice Chair: Moriah Nof

151a Molecularly Designed Mucoadhesive pH Responsive Tethered Biomaterials
Joshua B. Thomas
James W. McGinity
Nicholas A. Peppas

151b Development of a Long-Lasting Silicone Catheter Impregnated with Rifampicin
Xuemei Liang
Anfeng Wang
Haiying Tang
Ting Cao
Steven O. Salley
James P. McAllister
K. Y. Simon Ng
151c Cytotoxic Activity, Transport, and Drug Release Mechanisms of Dendrimer-Methotrexate Conjugates on Sensitive and Resistant Cancer Cell Lines
Sezen Gurdag
Rangaramanujam M. Kannan
Sarah Staples
Larry Matherly

151d Ultrasonic Drug Release from Micelles Correlates with Subharmonic Emission
Ghaleb A. Husseini
Mario A. Diaz de la Rosa
Eric S. Richardson
Douglas A. Christensen
William G. Pitt

151e The Effects of Pharmaceuticals and Cell Media on the Micellar Structure and Gelation Behavior of Peo-Ppo-Peo Copolymers
Praveen K. Sharma
Surita R. Bhatia

151f Colloidal Polyelectrolyte Complexes for Drug Delivery: Implications of Molecular Characteristics on Targeting and Uptake by Vascular Endothelial Cells
Sean M. Hartig
R. Robert Balcarcel
Jeffrey M. Davidson
Ales Prokop

151g Modeling the Influence of Cyclodextrins on Oral Absorption of Saltform Drug in Immediate and Controlled Release Delivery
Ece D. Gamsiz
Avinash G. Thombre
Lee A. Miller
Rebecca L. Carrier

Session 152 - Advances in Environmental Biotechnology I: Green Bioprocessing
Chair: David N. Thompson
Vice Chair: Frank J. Loge

152a Fumaric Acid Production from Glucose and Cornstarch by Immobilized Cells of Rhizopus Oryzae in a Rotating Fibrous Bed Bioreactor
Hanjing Huang
Shang-Tian Yang

152b Enzymatic Extraction of Ferulic Acid from Agriculture Waste for High-Valued Products
Hyun-Dong Shin
Shara McClendon
Frank Taylor
Rachel Ruizhen Chen

152c Optimization of Microbial Xylitol Production from Corn Cobs Based on a Metabolic Reaction Model
Jun-ichi Horiuchi
Kiyoshi Tada
152d  Isolation and Optimization of a Microbial Catalyst for the Conversion of Syngas to Ethanol and Acetic Acid
   Todd French
   Mark Zappi
   Emily Easterling
   Lew Brown
   Magan Green
   Eugene Columbus

152e  Poop to Plastic: Commercial Production of Polyhydroxyalkanoates in Municipal and Industrial Wastewater Treatment
   Frank J. Loge
   Erik R. Coats
   Michael P. Wolcott
   Armando McDonald

152f  Nanobiocatalyst for the Synthesis of L-Lactic Acid from Carbon Dioxide
   Bilal El-Zahab
   Ping Wang

152g  An Extractive Fermentation Process for Enhanced Acetate Production from Biomass
   Ellen C. San Nicolas
   Shang-Tian Yang

Session 153 - Advances in Metabolic Engineering: Prokaryotes
Chair: Francois Berthiaume
Vice Chair: Huimin Zhao

153a  Effect of Oxygen on the E. Coli Global Redox Sensing/Regulation Networks and Metabolic Flux Distribution Based on C-13 Labeling Experiments
   Jiangfeng Zhu
   Sagit Shalel Levanon
   George Bennett
   Ka-Yiu San

153b  Role of Pyruvate Dehydrogenase in the Anaerobic Fermentation of Sugars by Escherichia Coli
   Abhishek Murarka
   Ramon Gonzalez

153c  Defining Gene Knockout Search Trajectories: Many Genotypes for the Same Phenotype?
   Hal S. Alper
   Gregory Stephanopoulos

153d  Determination of the Fractional Contribution of Individual Elementary Modes to the Overall Metabolism of Escherichia Coli
   Aaron P. Wlaschin
   Cong T. Trinh
   Friedrich Srienc

153e  Engineering Escherichia Coli Solvent Tolerance Phenotypes to Improve Chemical Production
   Sara Ziesman
   Amarjeet Singh
   Ryan T Gill
153f  Metabolic Engineering of Escherichia Coli for Sugar Nucleotide and Oligosaccharides Synthesis
Zichao Mao
Anne Ruffing
Hyun-Dong Shin
Rachel Ruizhen Chen

153g  Improving the Efficiency of Xylose Utilization and Xylitol Production in E. Coli
Patrick C. Cirino
Reza Khankal
Jonathan W. Chin

Session 173 - Modeling, Analysis, and Control in Biomedicine
Chair: Robert S. Parker
Vice Chair: Rajanikanth Vadigepalli

173a  Modeling of Cell Culture Processes in a Micro Channel Reactor
Khamir Mehta
Geeta Mehta
Shuichi Takayama
Jennifer J. Linderman

173b  Dynamic Modeling of Fatty Acid, Glucose, and Insulin Interactions
Anirban Roy
Robert S. Parker

173c  A Model of the Darwinian Evolution of Cancer Progression
Kim Seng Cheong
Shamsuzzaman Farooq
Richard D. Braatz

173d  Optimal Control of Cancer by Delivery of Chemotherapeutic Agents
Pinky Dua
Vivek Dua
Efstratios N. Pistikopoulos

173e  Optimal Medication Strategies for the Early Stages of HIV Infection
Samira Khalili
Antonios Armaou

173f  The Role of Mathematical Modeling on the Optimal Control of HIV-1 Pathogenesis
Marcel Joly
Jose M. Pinto

173g  Computational Design of RNA Interference Gene Therapy Strategies to Treat HIV-1 Infections and Block Viral Escape
Joshua N. Leonard
David V. Schaffer
Session 191 - Transport Phenomena in Tissue Engineering
Chair: Aaron S. Goldstein
Vice Chair: Vassilios I. Sikavitsas

191a Mass Transfer Rates and Initial Conditions Modulate the Growth Rates and Structure of Bioartificial Tissues
Kyriacos Zygourakis
Jian Feng
Pauline A. Markenscoff

191b Strategies to Enhance Capillary Formation inside Biomaterials: a Computational Study
Ehsan Jabbarzadeh
Cameron F. Abrams

191c Traceable H\textsubscript{i}l2 Secretion in Enzyme Crosslinked Gelatin Cellular Scaffolds
Chong Wing Yung
Timothy Barbari
William E. Bentley
Gregory F. Payne

191d Modulation of Liver Functions Expressed by Hepg2 Cells by Limiting Oxygen Diffusion
James P. Camp
Adam T. Capitano

191e Perfluorocarbons for Enhanced Oxygen Transport in Tissue Engineering Devices
Kyuongsik Chin
Surita R. Bhatia
Susan C. Roberts

191f Protection of Microencapsulated Islets from Hypoxia by Perfluorocarbon
Amy S. Lewis
Robert J. Fisher
Abdulkadir Omer
Gordon C. Weir
Clark K. Colton

191g Characteristics of Btc Tet Cells for Use in the Cryopreservation of a Model Tissue Engineered Pancreatic Substitute
Indra Neil Mukherjee
Ying Ching Song
Athanassios Sambanis

Session 194 - Advances in Drug Delivery: Biological Barrier Transport
Chair: Tao L. Lowe
Vice Chair: Cory J. Berkland

194a Design Principles of Chemical Permeation Enhancers for Transdermal Drug Delivery
Pankaj S. Karande
Amit K. Jain
Samir Mitragotri

194b Fundamental Investigation of Transdermal Transport Models for Hydrophobic and Hydrophilic Drugs
Joseph Kushner
Daniel Blankschtein
Robert Langer
Transport of Amitriptyline across Capillary Walls in Isolated Rat Hearts
Marissa Fallon
Jason A Flint
Timothy E Morey
Donn M Dennis
Anuj Chauhan

A Facile and Reproducible in Vitro Blood-Brain Barrier Model
Eric Shusta
Anthony R. Calabria
Christian Weidenfeller

in Vivo Characterization of Microfluidic Probes for Convection Enhanced Drug Delivery
Keith B. Neeves
William L. Olbricht
W. Mark Saltzman

Novel Nanoparticles for Controlled Drug Delivery across the Blood-Brain Barrier
Sailendra N. Nichenametla
Annie Mitsak
James Bauer
Young Shin Kim
Tao L. Lowe

Experimental and Theoretical Modeling of Intracellular Drug Delivery Following Acoustic Cavitation
Vladimir G. Zarnitsyn
Robyn K. Schlicher
Christina Allen
Mark R. Prausnitz

Session 195 - Advances in Extreme Bioprocessing and Biocatalysis
Chair: Vicki S. Thompson
Vice Chair: Brent Peyton

Biological Sulfide Oxidation under Alkaliphilic Conditions
Armando González-Sánchez
Sergio Revah

Kinetics and Metabolism of the Biodegradation of Vanillic Acid and Other Aromatic Compounds by a Halotolerant Alkaliphile from Soap Lake, Wa
Catherine E. Albaugh
Brent Peyton

Dramatic Stabilization of Proteins Adsorbed Onto C-60 Fullerenes
Prashanth Asuri
Sandeep S. Karajanagi
Ravi S. Kane
Jonathan S. Dordick

Discovery of a Filamentous Chaperone from a Hyperthermophile: Molecular Function and Potential Applications
Timothy Whitehead
Boonchai B Boonyaratanakomkit
Douglas S Clark
195e  Functional Genomics Analysis of Glucan Dimer Metabolism in the Hyperthermophilic Bacterium Thermotoga Maritima
Steven R. Gray
Shannon B. Conners
Clemente I. Montero
Robert M. Kelly

195f  Biochemical and Biotechnological Studies of Hyperthermophilic Thermotoga Xylose Isomerases for High Fructose Corn Syrup Production at Elevated Temperatures
Kevin L. Epting
Claire Vieille
J. Gregory Zeikus
Robert M. Kelly

195g  Purification and Characterization a Novel Thermostable Endoglucanase from a Mesophilic Fungus for Bio-Chemimechanical Pulp, Fusarium Oxysporum
Shuyan Liu
Xuemei Lu
Xinyuan Duan
Peiji Gao

Session 196 - Advances in Metabolic Engineering and Bioinformatics: From Prokaryotes to Eukaryotes
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
Lee R. Lynd

196b  Engineering Geobacter Metabolism for Enhanced Electricity Generation
Radhakrishnan Mahadevan
Anthony Burgard
Christophe H. Schilling
Derek R. Lovley
Mounir Izallalen

196c  Activity of Cinnamate 4-Hydroxylase Towards Un-Natural Substrates
Hao Chen
John A. Morgan

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
Qing-Lin Dong
Tao Chen
Hong-Wu Ma
High-Throughput Time-Series Metabolomic Analysis to Identify Regulation of Arabidopsis Thalina Response to Elevated Co₂ by Sugar Signaling
Harin H. Kanani
Bhaskar Dutta
John Quackenbush
Maria I. Klapa

Molecular Approaches for Identification of Metabolic Engineering Targets for Enhanced Paclitaxel Accumulation
Susan C. Roberts
Nathan Ezekiel Nims
Camille Dubois
Nadia Boutaoui
Kham Vongpaseuth
Elsbeth Walker

Biosynthesis of Plant-Specific Flavanols and Anthocyanins in Escherichia Coli
Joseph Chemler
Yajun Yan
Mattheos Koffas

Session 199 - Analytical Techniques in Cell and Tissue Engineering Applications
Chair: Harihara Baskaran
Vice Chair: Padma Rajagopalan

Non-Invasive Monitoring of Cellular Oxygenation within a Pancreatic Substitute
Jeffrey D. Gross
Ioannis Constantinidis
Athanassios Sambanis

Hydrogel-Electrode Interfaces for Directed Tissue Remodeling in the Retinal Implant
Jessica O. Winter
Stuart Cogan
Joseph F. Rizzo

In Vivo Monitoring of Tissue Mechanical Properties during Wound Healing
Jonathan W. Bender
Harold I. Friedman
Victor Giurgiutiu
Black Mandi
Chris Watson

Optical Tweezers as a Sensor for Intracellular Mechanical Properties
H. Daniel Ou-Yang
Elizabeth A. Rickter
Meron Mengistu
Linda Lowe-Krentz

A Study of Structure of Aplysia Californica Neuron Growth Cones Using Atomic Force and Epifluorescence Microscopy
Emilie Grzywa
Aih Cheun Lee
Daniel Suter
Gil U. Lee
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
Edward N. Pugh
William E. Schiesser

Evaluation of the Angiogenic Capacity of Small-Size Oligosaccharides of Hyaluronic Acid
Harold Castano
Paul L. DeAngelis
Vassilios I. Sikavitsas

Session 204 - Cell Culture Process Development and Monitoring
Chair: John H. Chon
Vice Chair: Jean-Francois Hamel

Assessing Robustness for Cell Line Selection
Andrew M. Rusiniak
Gregory M. Mueller
Steven T. Rose
Guillermo Miroquesada
Xuejun (Sherry) Gu

Analysis of Mab Production-Enhancing Compounds
Tiffany D. Rau
R. Robert Balcarcel

A Simple Strategy to Custom-Optimize Feed Streams for Fed-Batch Processes
Pik Leng Wong
Sherri Spear
Jane McIninch
Claudia W. Buser
John H. Chon

Computational Approach to Characterization of Cell-Culture Bioreactors
Kumar Dhanasekharan
John Strauss
Atul Gupta
Kenneth Hamilton
Sanjeev Ahuja
Basav Ghosh
David Keller
Alex Fotopoulos

Method to Identify Significant Shifts in Nonlinear Systems
Steven T. Rose

Online Performance Monitoring of Recombinant Protein Production in a Fed-Batch Reactor
Mahalingam Velu
Guhan Jayaraman

Cell Culture and Fermentation Control and Data Management
Meg Kay
Session 246 - Advances in Metabolic Engineering and Bioinformatics: Eukaryotes
Chair: Christina Chan
Vice Chair: Carolyn WT Lee-Parsons

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
Liqing Wang
Vassily Hatzimanikatis

246c Metabolic Profiling and Flux Analysis of in Vitro Adipogenesis
Yaguang Si
Ryan P. Nolan
Kyongbum Lee

246d Adipocyte Metabolic Engineering for Increased Fatty Acid Oxidation through Uncoupling Protein over-Expression
Arul Jayaraman
Santosh Palani
Yaguang Si
Kyongbum Lee

246e A Comprehensive Insulin Signaling Model for Predicting Phenotypes Using Expression Data
Ganesh Sriram
James C. Liao
Katrina M. Dipple

246f Optimization and Control of Metabolic Activities in Hepatocytes
Marianthi G. Ierapetritou
Nripen S. Sharma
Hong Yang
Stephen A. Guzikowski
Martin L. Yarmush
Charles M. Roth

246g Dynamic Metabolic Flux Analysis for Tissue Systems
Korkut Uygun
Howard W. Matthew
Yinlun Huang

Session 248 - Applied Mathematics in Biomedical Systems
Chair: Rajanikanth Vadigepalli
Vice Chair: Kenneth J. Kauffman

248a Modeling and Analysis of Bone Growth and Remodeling
Rolf Findeisen
Frank Allgower
A Comprehensive Model of Intracranial Dynamics of the Human Brain
Srinivasa Kondapalli
Michalis Xenos
Mahadeva Bharath R. Somayaji
Richard Penn
Andreas A. Linninger

A 3d Algorithm Simulating Acid-Mediated Growth of Solid Tumors
Gang Cheng
Kyriacos Zygourakis
Pauline A. Markenscoff

Pharmacokinetic Analysis of Motexafin Gadolinium in Mouse Tissues Using a Non-Invasive Optical Measurement System
Stephen Chad Kanick
Julie L. Eiseman
Erin Joseph
J. Guo
Robert S. Parker

Mathematical Model of Il-6 Signal Transduction in Hepatocytes
Abhay K. Singh
Arul Jayaraman
Juergen Hahn

A Diffusion-Reaction Model for Integrin Clustering in Response to Cell Adhesion
Erik S. Welf
Ulhas P. Naik
Babatunde A. Ogunnaike

Hindered Convection-Diffusion Model of Ion Transport through Nanometer-Sized Gap-Junction Biological Pores
Anshu Verma
Bruce J. Nicholson
Johannes M. Nitsche

Session 252 - Coating and Encapsulation of Nutraceutical & Pharmaceutical Products
Chair: Michael M. Choi
Vice Chair: Mayur P. Lodaya

Pharmaceutical Coating Operations: Challenges and Opportunities in the Changing Regulatory Paradigm
Mansoor A. Khan

Overview of Film-Coating Technologies in the Pharmaceutical & Nutritional Industries
Stuart C. Porter

Encapsulation of Fine Pharmaceuticals 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
Lisa Graham
Rick Falk
Josh Shockey
Leah Appel

Session 257 - Developments in Biobased Alternative Fuels
Chair: Gregory W. Luli
Vice Chair: Brian Duff

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
Kyle L. Jensen
Jeremy C. Johnson
Karl Ruping
Humberto De la Vega

257c Acid-Functionalized Mesoporous Silica Catalysts for the Esterification of Fatty Acids in Beef Tallow
Isa K. Mbaraka
Brent H. Shanks

257d Preliminary Evaluation and Characterization of Acidophilic Methanogens for Increased Biological Methane Production
Katherine A. Taconi

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
Todd French

257g Effects of Ethanol as a Fuel Additive on General Aviation Aircraft Fuel System Electrochemical Corrosion
Clifford E. George
Katie Schroeder
Tieling Xie

Session 260 - Engineering Approaches in Gene Delivery
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
Lonnie D. Shea

260e Engineering Bacterial Outer Membrane Vesicles for DNA Vaccine Delivery
David Chen
Jae-Young Kim
Anne M. Doody
Matthew DeLisa
David Putnam

260f A Viral/Non-Viral Hybrid Gene Delivery Vector
Josh Ramsey
Daniel W. Pack

260g Directed Evolution of Aav to Generate Mutants with Enhanced Transport Properties
James T. Koerber
Narendra Maheshri
David V. Schaffer
Session 297 - Advances in Drug Delivery: Microparticles
Chair: Padma J. Narayan
Vice Chair: Suhas D. Shelukar

297a  Supercritical CO2 Based Formation of Drugs and Proteins Nanoparticles and Microencapsulation for Sustained Release
       Amol J. Thote
       Kayoko Ono
       Ram B. Gupta

297b  Dry Powder Aerosols for Multi-Drug Resistant Tuberculosis (Mdr-Tb) Treatment
       Jennifer Fiegel
       Lucila García-Contreras
       Katharina Elbert
       Anthony Hickey
       David Edwards

297c  Monodisperse Powders for Controlled Release Inhalation Therapy
       Cory Berkland
       Matthew Arnold

297d  Long-Circulating Nanoparticles through Red Blood Cell Attachment
       Elizabeth L. Chambers
       Samir Mitragotri

297e  Analysis of Transient Protein Distribution in Plga Microparticles during Polymer Degradation and in Vitro Release
       Aiying Zhao
       Victor G.J. Rodgers

297f  Incorporating Eg Chains into Polyanhydrides: Consequences for Protein Stabilization and Delivery
       Maria P. Torres
       Balaji Narasimhan
       Surya K. Mallapragada

297g  Particle Design for Enhanced Dissolution Rates of Poorly Water Soluble Drugs
       Keith Johnston
       Xiaoxia Chen
       Jason McConville
       Jason Vaughn
       Kirk Overhoff
       Michal Matteucci
       Matthew Crisp
       Robert Williams

Session 299 - Advances in Protein Expression and Post-Translational Modification
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
Matthew P. DeLisa

299d Regulation of Cd47-Sirpα 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. Wuu
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
Kyongbum Lee

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
Mano R. Maurya
Shankar Subramaniam

Session 306 - Cardiovascular Tissue Engineering
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
Stelios T. Andreadis

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
Hyounghin Park
Sharon Gerecht-Nir
Nicola Elvassore
Robert Langer
Gordana Vunjak-Novakovic

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 Populataion 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. Realff  
    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 Lipoxygenase 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 Picioreanu

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
Jonghwan 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  Anoroxic 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-Sirpα 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 Mechano-transductive 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
Maria José Rivas-Arreola
Maria Teresa Collados-Larrumbe
Mario M. Alvarez

428i  Polymeric Biomaterials: Compatibility of Medical-Grade Polymers with Dense CO2
Aidaris 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-WaveSensor
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 Chaotrope 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. Ataai
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
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

DNA and RNA Delivery and Transfection Mediated by Electroporation and Ultrasound
Vladimir G. Zarnitsyn
Mark R. Prausnitz

The Effect of Terminal Group Modification on the Solution Properties of Dendrimers: a Molecular Dynamics Simulation Study
Nicholas W. Suek
Monica H. Lamm

Photocontrol of DNA Condensation Using Photoresponsive Surfactants
Anne-Laure M. Le Ny
C. Ted Lee

A Novel Serum-Stable Micelle System for Controlled Release of Rapamycin
M. Laird Forrest
Glen S. Kwon

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

Preparation and Characterization of Paclitaxel Loaded Polymer Vesicle Formulations
Shuliang Li
Belinda M. Byrne
JoEllen J. Welsh
Andre F. Palmer

Nonviral Transfection of Cells Suspended in Resonant Acoustic Fields
Yu-Hsiang Lee
Ching-An Peng

In Vitro Studies of Ferromagnetic Coils for Implant Assisted Magnetic Drug Targeting
Armin D. Ebner
Misael O. Aviles
James A. Ritter

Hydrolysable Prodrugs of Geldanamycin for Efficient Nanoencapsulation and Sustained Release
M. Laird Forrest
Glen S. Kwon
Development of Thermally Responsive Graft Copolymers for High Temperature-Activated Drug Delivery

Induvadana Ankareddi
Christopher S Brazel

Dynamic Self-Assembly and Characterization of DNA-Polycation Nanoparticles

Jingjiao Guan
Zhengzheng Fei
Yihua Loo
Kam W. Leong
L. James Lee

Micro- and Nano-Particles Developed by Electrohydrodynamic Atomization for the Sustained Delivery of Paclitaxel to Treat C6 Glioma

Jingwei Xie
Chi-Hwa Wang

High Gradient Magnetic Implants: a More Effective Approach to Magnetic Drug Targeting

Armin D. Ebner
James A. Ritter

Calcium Alginate Gel Beads Synthesis by Electrodispersion 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

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

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

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
A General Purpose Processor Implementation of Mpc for Insulin Delivery Devices
Leonidas G. Bleris
Mayuresh V. Kothare

A Closed-Loop Monitoring Strategy for Type 1 Diabetes Patients
Daniel A. Finan
Dale E. Seborg

Characterization of Beta-Amyloid Toxicity of P19 Embryonal Carcinoma Stem Cell during Development
In Hong Yang
Theresa A. Good

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

Biofiltration of Hydrophobic Voc's with Filamentous Fungi: Modeling and Experimentation
Alberto Vergara-Fernández
Brice Van-Haaren
Sergio Revah

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

Effect of Microwave on Cellulase-Catalyzed Reaction
Wei Xin
Wei-Can Zhang
Pei-Ji Gao

Enzyme and Acid Mediated Production of Microcrystalline Cellulose from Agricultural Wastes
Foster Agblevor
Waleed, K. El-Zawahy

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 Zygourakis

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
**Session 436 - Poster Session: Metabolic Engineering**

**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 Wannecke  
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

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**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
Optimization of Monoclonal Antibody Production Using Process Simulation and Scheduling Tools
Demetri P. Petrides
Charles Siletti

Inverse-Qsar for Pharmaceutical Development Using the Signature Descriptor: Application to \( \Gamma \)-Secretase and Cox-II Inhibitors
Derick C. Weis
Crystal R. Childers
Donald P. Visco
Shawn Martin
Jean-Loup Faulon

Application of Raman Spectroscopy in High-Throughput Salt and Polymorph Screening
Lili Feng
Piotr H. Karpinski

Solving the Inverse-Qsar Problem with Signature Using a Reduced System
Derick C. Weis
Donald P. Visco
Richard LeBorne
Shawn Martin
Jean-Loup Faulon

Use and Implementation of Pat Tools for Particle System Characterization and Reaction Analysis
Benjamin Smith
Will Kowalchyk
Terry P. Redman

Rapid Response of Large-Scale Influenza Vaccine Production for a Pandemic
Lyle R. Lash
Henry Y. Wang

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

Liquid-Solid Circulating Fluidized Beds: an Immobilized Bioreactor from a Product Inhibition Perspective
Umang J. Trivedi
Amarjeet S. Bassi
Jesse Zhu

Monte Carlo Simulation of Dynamic Behavior of Bacteria during Disinfection
L. T. Fan
A. Argoti
S. T. Chou
Spore Germination and Cell Immobilization of *Rhizopus Oryzae* in a Rotating Fibrous Bed Bioreactor for Controlling Morphology and Improving Lactic Acid Production
Nuttah Thongchul
Shang-Tian Yang

Bioreactor Production of Probiotic Bacteria, Lactic Acid and Lactate Dehydrogenase by Fermentation with *Lactobacillus Acidophilus*
Robert P. Chambers
Haodi Dong

Effect of Carbon Sources on Propionic Acid Fermentation by *Propionibacterium Acidipropionici*
Supaporn Suwannakham
Shang-Tian Yang

Hydrodynamic Study of Gas Recirculation Aerobic Bioreactors Using Radio Active Particle Tracking and Gamma Ray Tomography
Rajneesh Varma
Muthanna Al-Dahhan

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

Stochastic Grey-Box Modelling of Industrial Fermentation
Jan K. Rasmussen
Henrik Madsen
Sten Bay Jørgensen

Computer-Assisted Optimization of Hplc Separation for Simultaneous Quantification of Substrates and Products in Microbial Fermentation
Yandi Dharmadi
Ramon Gonzalez

Towards the Commercial Production of Pharmaceutical Proteins Using Cell-Free Systems
Michael C. Jewett
Kara A. Calhoun
James R. Swartz

Influence of Moderate Electric Field Frequency on the Growth Kinetics of *Lactobacillus Acidophilus*
Laleh Loghavi
Sudhir K. Sastry
Ahmed E. Yousef

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
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 Cunierie
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. Gonzáles 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  
Musheda 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 β1 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  
Chenghaim 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
Thrombogenic Protein Microarrays for in Vitro Coagulation Studies under Flow
Uzoma M. Okorie
Scott L. Diamond

Tocopherols and Cehcs Modulate Platelet Thrombus Formation
Durga Prasanthi Sarvepalli
Kenneth Hensley
Matthias Ulli Nollert

Cryopreservation of Human Platelets with a Trehalose-Based Formula
Ying Nie
Juan J. de Pablo
Sean P. Palecek

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

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

Preventing Hepatocyte Steatosis by Co-Culture with Adipocytes during Plasma Exposure
Deepak Nagrath
Vanessa Lopez
Francois Berthiaume
Martin Yarmush

Morphological and Functional Responses of Hepatocytes Cultured on Glycosaminoglycan-Chitosan Membranes
Therese Bou-Aki
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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 Movnbte Catalyst for Propane Oxidation and Ammoxidation
Salil R. Bhatt
Neelakandan Chandrasekaran
Vadim V. Guliants

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 Hzsm-5 and Ga/Hzsm-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
Srirorn 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
Srirorn Jongpatiwut
Thirasak Rirksomboon
Somchai Osuwan
Daniel E. Resasco

491g  N-Octane Aromatization over Pt Supported on Small Crystal of Kl Zeolite
Supak Trakarmroek
Srirorn 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 Veser

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 CH4/O2: High Temperature Rate Constants for CH4 + O2-> CH3 + HO2
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. Doskoci
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 Cumaranatunge
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
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
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

DNA Sequencing by Hybridization with Errors Via Integer Programming
YoungJung Chang
Nick Sahinidis

Sporulation Regulons and Their Prediction in Clostridia
Carlos J. Paredes
Keith V. Alsaker
Eleftherios T. Papoutsakis

An Integer Optimization Framework for Selecting Informative Genes
James Wu
Ioannis (Yannis) P. Androulakis

Development of a Mechanistic Model for Sugar-Utilization Regulatory Systems
Ryan Peacock
Jiangfeng Zhu
Jacqueline V. Shanks
Ramon Gonzalez
Ka-Yiu San

Inferring Pathways That Confer a Cellular Phenotype by Integrating Gene Expression and Metabolic Profiles
Zheng Li
Shireesh Srivastava
Xuerui Yang
Christina Chan

Chemogenomic Analysis of Signaling Pathways for Reactive Nitrogen Oxide Species in Escherichia Coli
Laura R. Jarboe
Daniel Hyduke
Linh My Tran
James C. Liao

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

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 Pricl
  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 Nnrtis
  Sabrina Pricl
  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. Sliozberg
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
A Domain Decomposition Based Parallel Monte Carlo Simulation Scheme for Simulations of Very Large Systems
Joydeep Mukherjee
Stephanie L. Teich-McGoldrick
Sharon C. Glotzer

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

Phase Transitions and Criticality in Small Nanoscale Systems
Alexander V. Neimark
A. Vishnyakov

Finite-Size Scaling Monte Carlo Simulations of Tricritical Behavior
Gerassimos Orkoulas

Thermodynamics of Symmetric Dimers: Lattice Dft Predictions and Simulations
Yiming Chen
G.L. Aranovich
M.D. Donohue

Development and Application of Mayer Sampling Methods for the Evaluation of Cluster Integrals
Andrew J. Schultz
David A. Kofke

Studying Thermophysical Properties with Molecular Dynamics
Jared T. Fern
David J. Keffer
William V. Steele

Determination of Interfacial Tension in Binary Mixtures Using Transition-Matrix Monte Carlo
Vincent K. Shen
Jeffrey R. Errington

Modeling CO₂ Solubility in Ionic Liquids Using Semi-Grand Ensemble Hybrid Monte Carlo
Haizhong Zhang
Edward J. Maginn

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
Athanassios Z. Panagiotopoulos

**456e** Atomic Molecular Dynamical Modeling of a Large Protein Complex: Stf-Fvila
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
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
A Bioinformatics Approach to the Analysis of Combinatorial Transcriptional Regulation
Sarita Nair
Praveen Chakravarthula
Rajanikanth Vadigepalli

A Network Decomposition Framework for Integration of Knowledge on Regulatory Networks in Biological Systems
Yandi Dharmadi
Ramon Gonzalez

Distance-Dependent Force Field Using a High Resolution Decoy Set
Rohit Rajgaria
Scott R. McAllister
Christodoulos A. Floudas

Determination of Metabolically Distinct Cellular Physiologies Using Metabolic Rate Screening
R. Robert Balcarcel

New Approaches for Enabling Temporal Expression Profiling Analysis
Eric Yang
Joseph Vitolo
Charles Roth
Ioannis (Yannis) P. Androulakis

Transcriptional Profiling of Engineered Skin: the Role of Air-Liquid Interface on Epidermal Development and Stratification
Piyush Koria
Stelios T. Andreadis

Crystal Packing Simulations - the Impact of Torsion Angles on Polymorph Formations
Paul H. Young
Howard Y. Ando

Many-Scale Molecular Modeling of Pet/Pen Blends
Maurizio Fermeglia
Marco Ferrone
Paolo Cosoli
Stefano Piccarolo
Giuseppe Mensitieri
Sabrina Pricl

Multiscale Modelling of Sibs and Sulfonated Sibs Copolymers
Jan Andzelm
James Sloan
Eugene Napadensky
Steven McKnight
David Rigby

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. Mann

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. Norskov
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. Biddy
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

      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 Si_{1-x}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 Tmdls: 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

612f Molecular Dynamics Study of Water Vapor Adsorption into Ordered Mesoporous Silica
Katsuhiko Shirono
Hirofumi Daiguji

612g Theory and Computer Simulation of Adsorption in Templated Molecular Recognition Materials
Lev Sarkisov
Paul R. Van Tassel

612h Anomalous Swelling of Thin Films with CO2
Xiaochu Wang
Isaac C. Sanchez