

## **291ab Vibronics: Novel Moletronics System Operating in Terahertz**

*Yuefei Ma, Liuming Yan, and Jorge M. Seminario*

One of the key issues for today's microelectronics as it scales down is power dissipation. Molecular device are proposed to substitute present electronic device. However, it may not be the right solution if it still uses the charge-current approach, i.e., the data is transmitted through the device using electron current variations, which may still lead to the problem of energy dissipation. Here we propose to use molecular vibrational states to transmit data through molecules. Our molecular dynamics (MD) simulation demonstrates that a signal can be encoded and modulate the vibrational state at one site of the molecule, and the propagation of the vibrational movement allows the vibrational signal be detected at the other site of the molecule. Thus the molecule can be used as a single signal processing unit. Digital signal processing techniques are used to encode and decode the signals from molecular vibrational states.