Center for Scientific Computation And Mathematical Modeling

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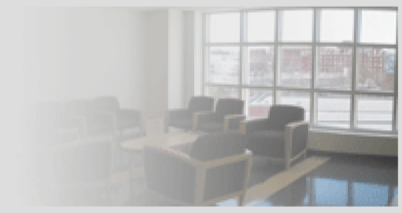

A Workshop on

"Analysis and Numerics for Modeling Semiconductor Devices and Biological Channels"

May 19 – 23, 2003

Organizers: C. Gardner, H. Liu, P. Markowich, and E. Tadmor

Invited Participants

Fabio Chalub
-University of Vienna
Sankar Das Sarma
-University of Maryland
Yasmin Dolak
-Vienna University of Tech
Robert Eisenberg
-Rush Medical Center
Ingenuin Gasser
-Universität Hamburg
Anne Gelb
-Arizona State University
Matthias Gobbert
- University of Maryland
C. David Levermore
-University of Maryland
Hailiang Li
-Osaka University
Jian-Guo Liu
-University of Maryland
Wolfgang Nonner
-University of Miami
Lorenzo Pareschi
-Università di Ferrara
Umberto Ravaioli
-University of Illinois
Giovanni Russo
-Universitàdi Catania
Marco Saraniti
-Illinois Institute of Technology
Sergei Sukharev
-University of Maryland
Ellen Williams
-University of Maryland
Igor Zutic
-University of Maryland

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SCIENTIFIC CONTENT. The last few years have witnessed rapid developments in semiconductor mathematical research including modeling, analysis and numerical simulations of semiconductor device equations, ranging from the Schrödinger equation for the evolution of the electron wave function to the drift-diffusion system for the evolution of the 'electron gas' which is close to a Maxwellian equilibrium. Like semiconductor devices, many proteins and biological systems are also devices in exactly the engineering sense of the word. These devices have a definite function described by an approximate device equation that is valid ONLY when the device is working as designed. Devices have complex internal structure that allows them to have a reasonably robust and simple equation and much of biological research is really an inverse problem to determine the device equation.

The diversity of physical architectures for semiconductor devices and biological ionic channels as well as the mathematical models they are based on has proven to be a fruitful ground for interaction of researchers from different disciplines in physics, biology, engineering, mathematics and scientific computation. We plan to revisit existing intersections and to explore future directions in modeling, analysis and numerics of classical and quantum transport in semiconductor devices, and classical transport in biological ionic channels, and related topics. Focal points include

- Classical & quantum transport in semiconductor devices
- Semi-classical device modeling: hydrodynamic and kinetic models
- Inverse problems in semiconductors and biological systems
- Ionic channels

A limited number of openings are available.
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email: smc03@cscamm.umd.edu

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