

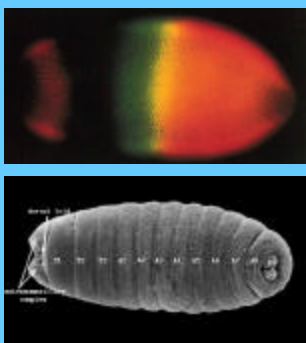


Institute for Pure and Applied Mathematics
University of California, Los Angeles presents

Cells and Materials: At the Interface between Mathematics, Biology and Engineering

March 13 - June 16, 2006

Members of the Organizing Committee include **Tom Chou** (UCLA, Biomathematics), **Trachette Jackson** (U. of Michigan, Mathematics), **Mark Lewis** (U. of Utah, Mathematics), **John Lowengrub** (UCI, Mathematics), **Stanley Osher** (IPAM & UCLA, Mathematics), **Bill Tawil** (Baxter Biosciences, BioSurgery), and **Ben Wu** (UCLA, Material Sciences and Engineering and Biomedical Engineering)



Background and Motivation:

"The most exciting science in the 21st century is likely to evolve among, not within, traditional disciplines" (Sung et al. 2003, Science 301:1485). Bioengineering programs have transformed from training of engineers to work in hospitals in the 60's and 70's, to training of principal investigators about scientific problems in medicine and biology. This transition has paralleled unprecedented advances in the medical sciences, basic sciences, and engineering, and created unique educational and research opportunities. Driven initially by intellectual pursuit of solutions to medical problems, the field of bioengineering has emerged internationally as an established discipline integrating engineering and analytical tools with principles in the medical and life sciences. Tissue engineering requires mathematical approaches ranging from reaction-diffusion equations to percolation models. Membrane protein structure determination involves methods as diverse as mean field theory, Monte Carlo processes and inverse problems.

This program aims at providing an environment for researchers to explore new applications of mathematics in a variety of the bioengineering fields. Our hope is that modern mathematical techniques and ideas can be brought to bear on fundamental problems in bioengineering and biomaterials research, much as they have impacted materials science and engineering. Specifically, the program will offer an opportunity for participants to: learn about various sub-disciplines of bioengineering; gain perspective by engaging in extended discussions with mathematicians, physical scientists, physicians, life scientists, and engineers; and develop new collaborations. To achieve these objectives, the Cells and Materials program will feature tutorials, workshops, social activities, and a culminating workshop at Lake Arrowhead.

Program Schedule:

Tutorials March 14 - 17, 2006.

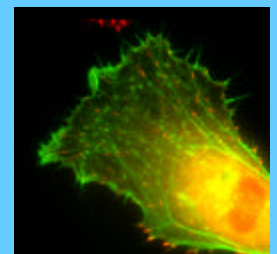
Workshop I: Membrane Protein Science and Engineering. March 27 - 31, 2006.

Workshop II: Microfluidic Flow in Nature. April 18 - 22, 2006.

Workshop III: Angiogenesis, NeoVascularization and Morphogenesis. May 8 - 12, 2006.

Workshop IV: Systems Biology and Molecular Modeling. May 22 - 26, 2006.

Culminating Retreat at Lake Arrowhead. June 11 - 16, 2006.



Participation:

This program will involve a community of senior and junior researchers. The intent is for long-term participants to have an opportunity to learn from the perspectives of many different fields -mathematics, science and engineering--and to meet a diverse group of people and have an opportunity to form new collaborations.

Full and partial support for long-term participants is available, and those interested are encouraged to fill out an online application at <http://www.ipam.ucla.edu/programs/cm2006>. Support for individual workshops will also be available, and may be applied for through the online application for each workshop. We are especially interested in applicants who are interested in becoming core participants and participating in the entire program (March 13 - June 16, 2006), but give consideration to applications for shorter periods. Funding for participants is available at all academic levels, though recent PhD's, graduate students, and researchers in the early stages of their career are especially encouraged to apply. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission and we welcome their applications.

<http://www.ipam.ucla.edu/programs/cm2006>

or email questions to cm2006@ipam.ucla.edu

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