



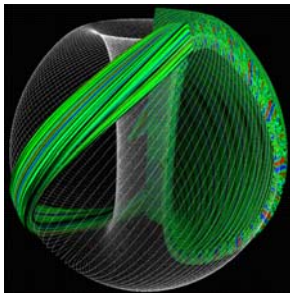
Institute for Pure and Applied Mathematics
University of California, Los Angeles
and The Center for Multiscale Plasma Dynamics

present a program in

Multiscale Processes in Fusion Plasmas
January 10-14, 2005

Members of the organizing committee include **Steven Cowley**, Chair (UCLA, Physics), **William Dorland** (Maryland, Physics), **James Drake** (Maryland, Physics), **Bjorn Engquist** (Texas, Mathematics), **Alan Glasser** (LANL, Fusion Theory), **Eliezer Hameiri** (Courant, Mathematics), **Yannis Kevrekidis** (Princeton, Applied Mathematics/Chemical Engineering), **Bruce Langdon** (Lawrence Livermore, Laser Fusion), **Warren Mori** (UCLA, Physics/Engineering), **Carl Sovinec** (Wisconsin, Engineering Physics) and **William Tang** (Princeton University, Plasma Physics Laboratory)

Scientific Overview:



To achieve fusion in a magnetically confined plasma, it is necessary to hold a plasma of tens of meters cubed in a stable configuration for many seconds. Inside this plasma are physical processes on a vast range of space and time scales. Theoretical analysis of these problems has mainly focused on a single relevant space and time scale for each physical process. For example, in the last decade the fusion community has made remarkable progress on calculating the small scale anisotropic kinetic turbulence that leads to the loss of heat from magnetically confined plasmas. It has become clear, however, that this single scale approach is inappropriate for key phenomena and that the interaction of disparate scales is nontrivial. A similar situation has arisen in inertial confinement fusion and in the relativistic interaction of beams and lasers with plasmas. In these high energy density (HED) plasmas the time scales range from the femtosecond laser period to the nanosecond plasma evolution time.

dialogue between the plasma science and applied mathematics communities. The key issues of multiscale plasma dynamics will be presented. New methods in multiscale analysis and their application to plasmas will also be discussed.

Meeting Organization - Scientific Topics

The meeting will be organized around five physical phenomena in plasmas - one per day. Each morning will start with a pedagogical review of the phenomena, the scales involved, the physical approximations and the equations to be solved. This will be followed by a series of talks on current approaches and recent progress. Each afternoon will begin with talks from applied mathematicians on techniques developed to solve similar problems. The afternoons will conclude with open discussions.

- **Day 1: January 10, 2005.** Reconnection, Sawteeth and Kinetic Modeling
- **Day 2: January 11, 2005.** Methods in Relativistic Laser and Beam Plasma Interaction
- **Day 3: January 12, 2005.** Multiscale Turbulent Transport in Magnetic Confinement
- **Day 4: January 13, 2005.** Long Time-scale Laser Plasma Interaction for Direct Drive, Indirect Drive and Fast Ignition Fusion
- **Day 5: January 14, 2005.** Slow Island Growth in Tokamaks

Confirmed Speakers:

Jean Claude Adam (Ecole Polytechnique, France)
Russel Caflisch (UCLA)
James Drake (Maryland)
Roger Evan
Eliezer Hameiri (Courant)
Tom Hou (Caltech)
Dave Levermore (U. Maryland)
Zhihong Lin (UC Irvine)
Barrett Rogers (Dartmouth)
William Tang (Princeton)
Howard Wilson (Culham Science Center)
Kun Xu (Hong Kong)
Alan Glasser (LNLA)

Thomas Antonsen (University of Maryland)
Phillip Colella (Berkeley, LBL)
Bjorn Engquist (Texas)
Tamas Gombosi (University of Michigan)
Jan Hesthaven (Brown University)
Steve Jardin (Princeton)
Bob Lin (Berkeley)
Scott Parker (University of Colorado)
Dalton Schnack (SAIC)
Frank Waelbroeck (University of Texas)
Cheng Chin Wu (UCLA)
Masaki Yamada (Princeton)

Participation:

The program is open to the entire mathematical and scientific communities. Please visit our website for more information, including an online registration form and an application for support at: <http://www.ipam.ucla.edu/programs/fus2005>. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission and we welcome their applications.

Please visit our website at
<http://www.ipam.ucla.edu/programs/fus2005>
or email questions to fus2005@ipam.ucla.edu

IPAM is an NSF funded Institute