

## Workshop II: Computational Challenges in Magnetized Plasma

### Monday April 16, 2012

- 8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:50–9:00 *Welcome and Opening Remarks*
- 9:00–9:10 *Frank Graziani - Workshop Overview*
- 9:10 *Magnetic Reconnection*
- 9:10–10:10 **James Drake** (University of Maryland)  
*An Overview of Magnetic Reconnection and Associated Particle Acceleration*
- 10:20–10:30 *Break*
- 10:30–11:20 **William Daughton** (Los Alamos National Laboratory)  
*Generation and Influence of Turbulence in Collisionless Reconnection*
- 11:30–11:40 *Break*
- 11:40–12:30 **Vyacheslav Lukin** (United States Naval Research Laboratory)  
*Magnetic reconnection in the fluid limit: connecting micro-scales to macroscopic dynamics.*
- 12:40–2:30 *Lunch (on your own)*
- 2:30–3:20 **Michael Shay** (University of Delaware)  
*Magnetic Reconnection Generalized to Turbulent Systems*
- 3:30–4:00 *Break*
- 4:00–4:50 **Seiji Zenitani** (National Astronomical Observatory of Japan)  
*A new measure of the dissipation region in collisionless magnetic reconnection*
- 5:00–6:30 *Poster Session/Wine & Cheese Reception*

### Tuesday April 17, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00 *Multiscale*
- 9:00–10:00 **Steve Jardin** (Princeton Plasma Physics Lab)  
*Multiple timescale calculations of sawteeth and other global macroscopic dynamics of tokamak plasmas*
- 10:10–10:25 *Break*

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- 10:25–11:15 **Michael Barnes** (Massachusetts Institute of Technology)  
*Multiscale Algorithms for Tokamak Turbulence*
- 11:25–11:40 *Break*
- 11:40–12:30 **Greg Hammett** (Princeton Plasma Physics Lab)  
*Advection Algorithms, Anisotropic Diffusion, and Symplectic Iteration*
- 12:40–2:30 *Lunch (on your own)*
- 2:30–3:20 **Giovanni Lapenta** (Katholieke Universiteit Leuven)  
*The challenge of multiphysics: federation or unification?*
- 3:30–4:00 *Break*
- 4:00–4:50 **Tamas Gombosi** (University of Michigan)  
*Multiscale Simulations of Space and HED Plasmas*

### Wednesday April 18, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00 *Multiscale (continued) Plasma-Material Interaction*
- 9:00–9:50 **Jeff Candy** (General Atomics)  
*Capturing electron-scale effects in tokamak turbulence*
- 10:00–10:15 *Break*
- 10:15–11:05 **Luis Chacon** (Oak Ridge National Laboratory)  
*Efficient algorithms for fluid simulation of magnetized plasmas*
- 11:15–11:30 *Break*
- 11:30–12:30 **Brian Wirth** (University of Tennessee)  
*Multiscale Materials Modeling of low-energy He plasma surface interactions with Tungsten*
- 12:40–2:00 *Lunch (on your own)*
- 2:00–2:50 **Jeffrey Brooks** (Purdue University)  
*Normal and Transient Plasma/interactions with Material Surfaces-Issues and Supercomputing Challenges*
- 3:00–3:50 **Predrag Kristic** (University of Tennessee)  
*Bottom-up, integrated theoretical-experimental science for the plasma-material interface*
- 4:00–4:30 *Break*
- 4:30–5:30 *Public Lecture by Ed Moses (Principal Associate Director, National Ignition Facility) Franz Hall, Room 1178*
- 6:00–7:30 *Reception (Location: IPAM Lobby)*

## Thursday April 19, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00 *Wave-Particle Physics*
- 9:00–10:00 **Cynthia Phillips** (Princeton Plasma Physics Lab)  
*Successes and Challenges in Modeling Wave-Plasma Interactions in Magnetically Confined Plasmas*
- 10:10–10:25 *Break*
- 10:25–11:15 **Eduardo D’Azevedo** (Oak Ridge National Laboratory)  
*Numerical Linear Algebra Techniques for Fusion Applications*
- 11:25–11:40 *Break*
- 11:40–12:30 **John Shadid** (Sandia National Laboratories)  
*Scalable Implicit Solution Methods for Multiple-time-scale Multiphysics*
- 12:40–2:30 *Lunch (on your own)*
- 2:30–3:20 **Diego del-Castillo-Negrete** (Oak Ridge National Laboratory)  
*Tensor product decomposition methods for noise reduction, data compression, multi-scale analysis, and projective integration*
- 3:30–4:00 *Break*
- 4:00–4:50 **Eric Sonnendrucker** (Université de Strasbourg I (Louis Pasteur))  
*Semi-Lagrangian gyrokinetic simulations on curvilinear meshes.*

## Friday April 20, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00 *Experimental Review and Workshop Summary*
- 9:00–9:50 **Richard Buttery** (General Atomics)  
*Addressing Experiment Challenges with Computational Physics*
- 10:00–10:15 *Break*
- 10:15–11:05 **Troy Carter** (University of California, Los Angeles (UCLA))  
*Studies of turbulence, transport and flow in the Large Plasma Device; a target for validation of edge turbulence models*
- 11:15–11:30 *Break*
- 11:30–12:20 **Angelos Vourlidas** (Naval Research Laboratory (NRL))  
*A Grand Tour of Recent Observations of Solar and Heliospheric Plasmas: Challenges and Future Directions for Plasma Physics Theories*
- 12:30–2:00 *Lunch (on your own)*
- 2:30–3:20 *Wrap Up Discussion with Frank Graziani and Slava Lukin*

