

Multiscale Processes in Fusion Plasmas

Monday January 10, 2005

- 8:30–9:15 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:15–10:00 **Bob Lin** (University of California at Berkeley)
Magnetic Reconnection in Solar Flares, the Earth's Magnetosphere, and the Solar Wind
- 10:00–10:30 **James Drake** (University of Maryland)
Multiscale issues in modeling magnetic reconnection.
- 10:30–11:00 *Coffee Break*
- 11:00–12:00 **Bjorn Engquist** (University of Texas)
Numerical multiscale techniques for fusion
- 12:00–1:30 *Lunch (on your own)*
- 1:30–2:30 **Russel Caflisch** (UCLA)
A Hybrid Method for Kinetic Theory
- 2:30–3:00 **Steve Jardin** (Princeton University)
High-Accuracy, Implicit Solution of the Extended-MHD Equations using High-Continuity Finite Elements
- 3:00–3:15 *Break*
- 3:15–3:45 **Masaki Yamada** (Princeton University)
Laboratory Studies of the Physics of Two-Fluids MHD for Magnetic Reconnection
- 3:45–4:15 **Tamas Gombosi** (University of Michigan)
This talk describes the high performance plasma simulation framework developed at the University of Michigan and discusses its application for fusion plasmas.
- 4:15–4:30 *Break*
- 4:30–5:00 **Paolo Ricci** (Dartmouth University)
GS2 Simulations of Turbulence in Closed
- 5:00–5:30 *Panel Discussion*
- 5:30–12:00 *Wine/Cheese Reception (Hosted by IPAM)*



Tuesday January 11, 2005

- 8:30–9:15 *Continental Breakfast*
- 9:15–10:00 **Warren Mori** (UCLA)
Modeling Plasma based Acceleration using particlee Techiques
- 10:00–10:30 **John Cary** (University of Colorado)
Optical injection through collisions of laser pulses
- 10:30–11:00 *Coffee Break*
- 11:00–11:30 **Thomas Antonsen** (University of Maryland)
Quasi-Static Modeling of Particle -Field Interactions
- 11:30–12:00 **Thomas C. Katsouleas** (University of Southern California)
- 12:00–2:00 *Lunch (on your own)*
- 2:00–2:30 **Chengkun Hung** (UCLA)
- 2:30–3:00 **Viktor Decyk** (UCLA)
Parallelization of the UPIC Framework
- 3:00–3:45 *Break*
- 3:45–4:30 **Phillip Colella** (Lawrence Berkeley National Laboratory)
- 4:30–5:00 **Luis Silva** (UTL)
Photon Kinetics for Laser Plasma Interactions

Wednesday January 12, 2005

- 8:30–9:15 *Continental Breakfast*
- 9:15–10:00 **William Dorland** (University of Maryland)
Multiscale extension of gyrokinetics
- 10:00–10:45 **Greg Hammett** (Princeton University)
T.B.A.
- 10:45–11:00 *Coffee Break*
- 11:00–12:00 **Tom Hou** (California Institute of Technology)
Multiscale Computation of Fluid Flows
- 12:00–1:30 *Lunch (on your own)*
- 1:30–2:30 **Jan Hesthaven** (Brown University)
Towards High-Order Unstructured Grid Particle-In-Cell Methods for
- 2:30–3:00 **Ron Cohen** (Lawrence Livermore National Laboratory)
RIC: Relaxed Iteration Method for Coupling Disparate Scales
- 3:00–3:15 *Break*
- 3:15–3:45 **Alan Glasser** (Los Alamos National Laboratory)
Adaptive Grid Generation for Magnetically Confined Plasmas
- 3:45–4:15 **Ronald Waltz** (General Atomics)
Gyrokinetic Simulations and Multiscale Processes
- 4:15–4:30 *Break*
- 4:30–5:00 **Zhihong Lin** (University of California at Irvine)
Gyrokinetic particle simulation of plasma turbulence.
- 5:00–5:30 **Charlson Kim** (University of Wisconsin, Madison)
Applying Finite Elements to Stiff Magnetohydrodynamics
- 5:30–12:00 *Panel Discussion*

Thursday January 13, 2005

- 8:30–9:30 *Continental Breakfast*
- 9:30–10:30 **Jean Claude Adam** (Ecole Polytechnique, France)
High performance parallel Particle in Cell codes for laser plasma interaction
- 10:30–11:00 *Break*
- 11:00–11:25 **Marie Farge** (Ecole Normale Supérieure, France)
Extraction of Coherent Structures in Turbulent Flows using Orthogonal Wavelets
- 11:25–11:50 **Kai Schneider** (Université de Provence, Marseille)
An adaptive multiresolution method for parabolic PDEs
- 11:50–12:20 **Alex Friedman** (Lawrence Livermore National Laboratory)
Implicit multiscale PIC and related topics
- 12:20–2:00 *Lunch (on your own)*
- 2:00–2:30 **Jean-Luc Vay** (Lawrence Berkeley National Laboratory)
Application of Adaptive Mesh Refinement to Particle-In-Cell simulations
- 2:30–3:30 **Brian Albright** (Los Alamos National Laboratory)
Multi-scale simulation of laser acceleration of ions for fast ignition ICF
- 3:30–3:45 *Break*
- 3:45–4:15 **Bedros Afeyan** (Polymath Research Inc.)
Multiresolution Analysis Techniques for Vlasov Codes and PIC Simulations
- 5:15–5:45 **Cheng Chin Wu** (UCLA)
Shock waves in MHD and Related Systems

Friday January 14, 2005

- 8:30–9:15 *Continental Breakfast*
- 9:15–10:00 **Francois Waelbroeck** (University of Texas)
Natural velocity of magnetic islands
- 10:00–10:30 **Howard Wilson** (Culham Science Center)
Modelling the Neoclassical Tearing Mode
- 10:30–11:00 *Break*

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- 11:00–12:00 **Kun Xu** (Hong Kong University of Science and Technology)
Gas-kinetic BGK Schemes for Nonequilibrium Flows
- 12:00–1:30 *Lunch (on your own)*
- 1:30–2:00 **Charlson Kim** (University of Wisconsin, Madison)
Applying Finite Elements to Stiff Magnetohydrodynamics
- 2:00–2:30 **Dalton Schnack** (SAIC)
Effective Algorithms for Temporally Stiff Magneto-Fluid Problems

