

Workshop III: Mathematical and Computer Science Approaches to High Energy Density Physics

Monday May 7, 2012

- 8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:50–9:00 *Frank Graziani: Opening Remarks*
- 9:00–9:50 **Frederico Fiuza** (Instituto Superior Tecnico)
Multi-scale particle-in-cell simulations of high energy density scenarios
- 10:00–10:15 *Break*
- 10:15–11:05 **Felix Parra** (Massachusetts Institute of Technology)
- 11:15–11:30 *Break*
- 11:30–12:20 **Andris Dimits** (Lawrence Livermore National Laboratory)
Higher-Order and Multi-Level Time Integration of Stochastic Differential Equations and Application to Coulomb Collisions
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Jesus Ramos** (Massachusetts Institute of Technology)
Fluid and drift-kinetic theory for macroscopic plasma dynamics at low collisionality
- 3:30–4:00 *Break*
- 4:00–4:50 **CS Chang** (Princeton Plasma Physics Lab)
Challenges in the extreme-scale first-principles simulation of tokamak plasma
- 5:00–6:30 *Reception and Poster Session (Hosted by IPAM)*

Tuesday May 8, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00–9:50 **Luis Chacon** (Oak Ridge National Laboratory)
Fully implicit particle-in-cell algorithms for kinetic simulation of plasmas
- 10:00–10:15 *Break*
- 10:15–11:05 **Matt Hopkins** (Sandia National Laboratories)
Building Blocks for 3D Vacuum Arc Discharge
- 11:15–11:30 *Break*

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- 11:30–12:20 **Andreas Kemp** (Lawrence Livermore National Laboratory)
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Amitava Bhattacharjee** (University of New Hampshire)
Magnetic Reconnection in High-Energy-Density Laser-Produced Plasmas
- 3:30–4:00 *Break*
- 4:00–4:50 **Irene Gamba** (University of Texas at Austin)
Recent numerical and analytical issues for Vlasov-Boltzmann-Maxwell systems

Wednesday May 9, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00–9:50 **Phil Colella** (Lawrence Berkeley Laboratory)
- 10:00–10:15 *Break*
- 10:15–11:05 **Ammar Hakim** (Princeton Plasma Physics Lab)
Advanced Algorithms for Multi-Moment Fluid and Kinetic Simulations of Plasmas
- 11:15–11:30 *Break*
- 11:30–12:20 **Warren Mori** (University of California, Los Angeles (UCLA))
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Manuel Torrilhon** (RWTH Aachen)
Moment Equations for Plasmas: Some Results and More Challenges
- 3:30–4:00 *Break*
- 4:00–4:50 **Stanislav Boldyrev** (University of Wisconsin-Madison)
Theory and simulations of magnetohydrodynamic turbulence at large and small scales

Thursday May 10, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00–9:50 **Andrew Christlieb** (Michigan State University)
An Asymptotically Preserving Implicit Maxwell Solvers
- 10:00–10:15 *Break*

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- 10:15–11:05 **James Rossmann** (University of Wisconsin-Madison)
- 11:15–11:30 *Break*
- 11:30–12:20 **Bei Wang** (Princeton University)
A Particle-in-Cell Method with Adaptive Phase-Space Remapping for Kinetic Plasmas
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Ahmed Ratnani** (Association EURATOM - Commissariat à l'Énergie Atomique (CEA), Centre d'Études Nucléaires de Cadarache (CEN))
- 3:30–4:00 *Break*
- 4:00–4:50 **Maria Kuznetsova** (NASA)

Friday May 11, 2012

- 8:00–9:00 *Continental Breakfast*
- 9:00–9:50 **Uri Shumlak** (University of Washington)
The Multi-Fluid Plasma Model: Derivation, Context, and Computational Solution
- 10:00–10:15 *Break*
- 10:15–11:05 **Matt Bettencourt** (Sandia National Laboratories)
- 11:15–11:30 *Break*
- 11:30–12:20 **Andrea Bertozzi** (University of California, Los Angeles (UCLA))
Surface tension models for complex fluids
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Clinton Groth** (University of Toronto)
- 3:30–4:00 *Break*
- 4:00–4:50 *Wrap up discussion*

