

Workshop I: Astrophysical Fluid Dynamics

Monday April 4, 2005

- 8:00–12:00 *Methodology*
- 8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:50–9:00 *Welcome and Opening Remarks*
- 9:00–10:00 **John Castor** (Lawrence Livermore National Laboratory)
The Radiation Transport Conundrum in Radiation Hydrodynamics.
- 10:00–10:30 *Break*
- 10:30–11:30 **Phillip Colella** (Lawrence Berkeley National Laboratory)
- 11:30–12:30 **Joseph Monaghan** (Monash University, Australia)
SPH Lagrangians and consistent gravity smoothing
- 12:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Adam Burrows** (University of Arizona)
Multi-Dimensional Simulations and Physics of Core-Collapse Supernova Explosions
- 3:00–3:30 *Break*
- 3:30–4:30 **Markus Wetzstein** (Ludwig-Maximilian-University, Munich)
VINE - a new N-body / SPH code
- 4:30–5:30 *Panel Discussion*
- 5:30–7:00 *Wine Reception and Poster Session*

Tuesday April 5, 2005

- 8:00–12:00 *Methodolgy Cont; Cosmology; Clusters*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Greg Howes** (UCLA)
Gradient Particle Magnetohydrodynamics and Adaptive Particle Refinement
- 10:00–10:30 *Break*

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- 10:30–11:30 **Jose Marti** (University of Valencia, Spain)
Numerical Relativistic Hydrodynamics and Magnetohydrodynamics, and Extragalactic Jets
- 11:30–12:30 **Michael Norman** (University of California at San Diego)
Cosmological Fluid Dynamics with Adaptive Mesh Refinement
- 12:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Greg Bryan** (Columbia University)
Simulating the First Stars in the Universe
- 3:00–3:30 *Break*
- 3:30–4:30 **Mitchell Begelman** (University of Colorado)
Simulations of the Intracluster Medium
- 4:30–5:30 *Panel Discussion*

Wednesday April 6, 2005

- 8:00–12:00 *AGN; Disks; Black Holes; Dynamos*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **John Hawley** (University of Virginia)
General Relativistic Magnetohydrodynamic Simulations of Black Hole Accretion Disks
- 10:00–10:30
- 10:30–11:30 **Charles Gammie** (University of Illinois)
Relativistic Plasmas Near Black Holes: General Relativistic MHD and Force-Free Electrodynamics.
- 11:30–12:30 **Axel Brandenburg** (Nordita)
Dynamo action in shear flow turbulence
- 12:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Juri Toomre** (University of Colorado)
Magnetic Dynamo Action in the Solar Convection Zone
- 3:00–3:30 *Break*
- 3:30–4:30 **Friedrich Busse** (University of Bayreuth)
Prandtl number dependence of convection driven dynamos in rotating spherical fluid shells
- 4:30–5:30 *Panel Discussion*

Thursday April 7, 2005

- 8:00–12:00 *Star Formation; Disk Fragmentation; Cores*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Chris McKee** (University of California at Berkeley)
STAR FORMATION: PROBLEMS AND PROSPECTS
- 10:00–10:30 *Break*
- 10:30–11:30 **Matthew Bate** (University of Exeter)
Star Formation, Fragmentation, and Protoplanets in Discs
- 11:30–12:00 **Paolo Padoan** (University of California at San Diego)
Molecular Core Formation in Turbulent Clouds
- 12:00–12:30 **Robert Fisher** (Lawrence Livermore National Laboratory)
The Formation of Brown Dwarfs : A Comparison of SPH and AMR Disk Fragmentation
- 12:30–2:00 *Lunch (hosted by IPAM)*
- 2:00–3:00 **Richard Klein** (University of California at Berkeley/Lawrence Livermore National Laboratory)
Recent Advances in the Formation of Low Mass and High Mass Stars from Turbulent Cloud Cores Using Adaptive Mesh Refinement
- 3:00–3:30 *Break*
- 3:30–4:30 **Sam Falle** (University of Leeds)
Computational Problems in Star Forming Regions
- 4:30–5:30 *Panel Discussion*

Friday April 8, 2005

- 8:00–12:00 *Disks; Turbulence; Supernovae*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Paul Woodward** (University of Minnesota)
Towards an Improved Numerical Treatment of Turbulence in Astrophysical Flows
- 10:00–10:30 *Break*

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- 10:30–11:30 **Jim Stone** (Princeton University)
Studies of the MRI with a New Godunov Scheme for MHD
- 11:30–12:30 **Marco Velli** (University of Florence)
MHD turbulence in the Solar Corona and the Solar Wind
- 12:30–2:00 *Lunch (on your own)*
- 2:00–3:00 **Philip Marcus** (University of California at Berkeley)
Numerical Simulations of 3D Vortices in Highly-Stratified, Rotating, Shearing Protoplanetary Disks
- 3:00–3:30 *Break*
- 3:30–4:30 **Roger Chevalier** (University of Virginia)
Instabilities in the Aftermath of Core Collapse Supernovae
- 4:30–5:30 *Panel Discussion*

Saturday April 9, 2005

- 8:00–12:00 *Supernovae; Weno Schemes; Space Weather*
- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Chi-Wang Shu** (Brown University)
High Order Weighted Essentially Non-Oscillatory (WENO) Schemes and Their Application in Cosmological Simulations
- 10:00–10:30 *Break*
- 10:30–11:30 **Gabor Toth** (University of Michigan)
The Grand Challenge of Space Weather Prediction
- 11:30–12:00 **Alexei Poludnenko** (University of Chicago)
Fluid Flows with High Degree of Expansion and Contraction
- 12:00–1:30 *Lunch (on your own)*
- 1:30–2:30 *Panel Discussion*
- 2:30–12:00 *Conclusion*

