Institute for Pure and Applied Mathematics
University of California, Los Angeles presents a program in

Grand Challenge Problems in Computational Astrophysics

Workshop I: Astrophysical Fluid Dynamics

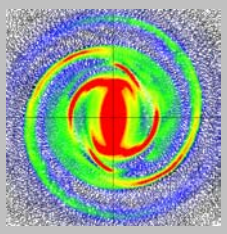
April 4 - 9, 2005

Members of the Organizing Committee include: **Richard Klein,** Chair (UC Berkeley / Lawrence Livermore National Laboratory), **Willy Benz** (University of Bern), **Philip Colella** (Lawrence Berkeley National Laboratory), **James McWilliams** (UCLA**), Joseph Monaghan** (Monash), **Michael Norman** (UCSD), **Robert Rosner** (Univ. of Chicago), **Chi-Wang Shu** (Brown University), **Jim Stone** (Princeton University) and **Marco Velli** (Florence)

Scientific Overview: The unifying theme of this workshop is the computational approach to ***astrophysical fluids***, whether plasmas, neutral clouds, or some mix of the two. Emphasis will be placed on:

1) ***a broad range of astrophysical applications appropriate to each computational technique***
2) ***the methodologies developed for including gravity, magnetic fields, radiation transport, dust, energy sinks and sources, and other physical processes***
3) ***the algorithmic approaches developed to avoid instabilities and unphysical dissipation in the computations.***

Topics will include hydrodynamics, magnetohydrodynamics, multi-phase flows, cosmology, black hole accretion, turbulence, convection, evolution of molecular clouds, disks, current and primordial star formation, supernovae and novae, planet formation as well as the numerous associated computational issues.



Semester Program Schedule:

***Tutorials.* March 8 - 11, 2005**
➢ ***Workshop I: Astrophysical Fluid Dynamics.* April 4 - 9, 2005**
***Workshop II: N-Body Problems in Astrophysics.* April 18 - 22, 2005**
***Workshop III: Relativistic Astrophysics.* May 2 - 6, 2005**
***Workshop IV: Transfer Phenomena.* May 16 - 20, 2005**

Confirmed Speakers:

Matthew Bate (University of Exeter)
Mitchell Begelman (University of Colorado)
Axel Brandenburg (Nordita)
Greg Bryan (Columbia)
Andreas Burkert (University of Munich)
Adam Burrows (University of Arizona)
John Castor (Lawrence Livermore National Laboratory)
Roger Chevalier (University of Virginia)
Philip Colella (Lawrence Berkeley National Laboratory)
Sam Falle (University of Leeds)
Charles Gammie (University of Illinois)
Carl Gardner (Arizona State University)
John Hawley (University of Virginia)
Greg Howes (UCLA)
Alexei Khokhlov (University of Chicago)
Richard Klein (UC Berkeley / Lawrence Livermore National Laboratory)
Philip Marcus (UC Berkeley)
Jose Marti (University of Valencia, Spain)
Chris McKee (UC Berkeley)
Joseph Monaghan (Monash)
Michael Norman (UCSD)
Chi-Wang Shu (Brown University)
Jim Stone (Princeton University)
Juri Toomre (University of Colorado)
Gabor Toth (University of Michigan)
Marco Velli (Florence)
Paul Woodward (Univiversity of Minnesota)

Participation: Financial support for this workshop is available for participants at all academic levels, and recent PhD's, graduate students, and researchers in the early stages of their career are especially encouraged to apply. An online application for support is available at ***http://www.ipam.ucla.edu/programs/pcaws1.*** Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission and we welcome their applications. Applicants who are interested in becoming core participants and participating in the semester program (March 7 – June 10, 2005) should apply at ***http://www.ipam.ucla.edu/programs/pca2005.***

Please visit our website at

http://www.ipam.ucla.edu/programs/pcaws1

or email questions to ***pcaws1@ipam.ucla.edu***

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