Workshop II: N-Body Problems in Astrophysics

Monday April 18, 2005

8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*

8:50–9:00 *Welcome and Opening Remarks*

9:00–10:00 **Ben Moore** (University of Zurich)
N-Body simulations in cosmology

10:00–10:30 *Break*

10:30–11:30 **John Dubinski** (University of Toronto)
A Universe in Motion: Testing the Cosmological Paradigm with Galaxy Dynamics

11:30–12:00
TBA

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Wes Petersen** (ETH Zurich, Switzerland)
Numerical Methods for Langevin's Equation in Gravitational Systems

3:00–3:30 *Break*

3:30–4:30 **Jerrold Marsden** (California Institute of Technology)
Transport in Celestial and Molecular Systems

4:30–5:00 **Katrin Heitmann** (Los Alamos National Laboratory)
Robustness of Cosmological Simulations

5:00–7:00 *Wine/Cheese Reception (Hosted by IPAM)*

Tuesday April 19, 2005

12:00 *Algorithms*

8:30–9:00 *Continental Breakfast*

9:00–10:00 **Ben Leimkuhler** (University of Leicester,UK)
Time-Reversible Integrators for the N-Body Problem

10:00–10:30 *Break*

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10:30–11:30 **Joachim Stadel** (University of Zurich)
Timestepping and Parallel Computing in Highly Dynamic N-body Systems

11:30–12:00 **Wayne Hayes** (ICS)
On Simulation Reliability: A Shadowing-Based Timestep Criterion for Collisionless N-Body Simulations

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Walter Dehnen** (University of Leicester,UK)
Force approximation issues: softening and tree codes

3:00–3:30 *Break*

3:30–4:30 **Seppo Mikkola** (University of Turku)
A Comparison of Regularization Methods for few-body interactions

4:30–5:00
TBA

Wednesday April 20, 2005

12:00 *SPH*

8:30–9:00 *Continental Breakfast*

9:00–10:00 **Joseph Monaghan** (Monash University, Australia)
SPH as a Dynamical N-body System

10:00–10:30 *Break*

10:30–11:30 **Andrey Kravtsov** (Center for Cosmological Physics)
Cosmological Simulations with Adaptive Mesh Refinement

11:30–12:00
TBA

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Ralf Klessen** (Astrophysical Institute of Potsdam)
Modeling Star Formation with Smoothed Particle Hydrodynamics

3:00–3:30 *Break*

3:30–4:30 **Matthew Bate** (University of Exeter)
Modelling Stellar Clusters Embedded in Gas

4:30–5:00
TBA

Thursday April 21, 2005

12:00 *Collisional Dynamics*

8:30–9:00 *Continental Breakfast*

9:00–10:00 **Sverre Aarseth** (Cambridge University)
Direct N-Body Implementations

10:00–10:30 *Break*

10:30–11:30 **Simon Portegies-Zwart** (Sterrenkundig Instituut ”Anton Pannekoek”)
The gravitational trillion body problem

11:30–12:00 **Bedros Afeyan** (Polymath Research Inc.)
Denoising Particle-In-Cell Codes Passively and Actively Using Wavelet Techniques: Steps Which May Lead to the Accuracy Found in Discrete Phase Space Grid Vlasov-Poisson Solvers

12:00–2:00 *Lunch (Hosted by IPAM)*

2:00–3:00 **Jun Makino** (University of Tokyo)
Current Status of GRAPE Project

3:00–3:30 *Break*

3:30–4:30 **Rosemary Mardling** (Monash University, Australia)
Gravitational Chemistry

4:30–5:00 **Marc Freitag** (Northwestern University)
The Monte Carlo approach: Fast simulations of collisional self-gravitating systems

Friday April 22, 2005

12:00 *Applications and Analysis*

8:30–9:00 *Continental Breakfast*

9:00–10:00 **Derek Richardson** (University of Maryland)
Collisions in N-body Problems: Techniques and Applications

10:00–10:30 *Break*

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10:30–11:30 **Volker Springel** (Max Planck Institute for Astrophysics)
The universe in a supercomputer: From the first quasars to the large-scale galaxy distribution

11:30–12:00
TBA

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Shane Ross** (University of Southern California)
Astrophysical transport calculations inspired by chemistry

3:00–3:30 *Break*

3:30–4:30 **Piet Hut** (Institute for Advanced Studies, Princeton)
Probing the N-Body Problem for Fun and Profit

4:30–12:00 *Conclusion*