

7th Heidelberg Astronomy Summer School:

Computational Astrophysics: Physical Foundations & Numerical Techniques

September 10th - 14th, 2012

organized by the

*International Max Planck Research School (IMPRS) for
Astronomy and Cosmic Physics at the University of Heidelberg*

Invited Lecturers: **Dominique Aubert** (Strasbourg): *Modern Trends*
Walter Dehnen (Leicester): *N-body simulations*
Cornelis Dullemond (Heidelberg): *Radiation transfer*
Daniel Price (Monash): *Particle-based hydrodynamics*
Romain Teyssier (Saclay, Zurich): *Mesh-based techniques*

Location: Max Planck conference center (“Max-Planck-Haus”),
Gerhard-Hauptmann-Str. 36, 69120 Heidelberg, Germany

School program (as of Sept. 2nd, 2012):

Monday, September 10th, 2012

08:30 - 13:30 Registration
09:30 - 10:00 *Welcome address (IMPRS speaker, Fendt)*
10:00 - 11:00 *Introduction (Springel, Klessen)*
11:00 - 11:30 Coffee break
11:30 - 12:30 *Particle-based hydrodynamics I (Daniel Price)*
12:30 - 14:30 Lunch
14:30 - 15:30 *N-body simulations I (Walter Dehnen)*
15:30 - 16:00 Coffee break
16:00 - 17:00 *Particle-based hydrodynamics II (Daniel Price)*
17:00 – 18:00 **Exercises: *Particle-based hydrodynamics* (Daniel Price)**

Tuesday, September 11th, 2012

09:00 - 10:00 **Exercises: *Particle-based hydrodynamics* (Daniel Price)**
10:00 - 11:00 *Conservation laws (Romain Teyssier)*
11:00 - 11:30 Coffee break
11:30 – 12:30 *The Godunov scheme (Romain Teyssier)*
12:30 - 14:30 Lunch
14:30 - 15:30 *N-body simulations II (Walter Dehnen)*

15:30 - 16:00 Coffee break

16:00 - 17:30 *Exercises: Mesh-based hydrodynamics* (Romain Teyssier)

17:30 - 22:00 BBQ / dinner at the ARI institute park

Wednesday, September 12th, 2012

09:00 - 10:00 *Particle-based hydrodynamics III* (Daniel Price)

10:00 - 11:00 *N-body simulations III* (Walter Dehnen)

11:00 - 11:30 Coffee break

11:30 - 12:30 *Adaptive mesh refinement* (Romain Teyssier)

12:30 - 13:30 Lunch

14:00 - 18:00 Excursion: Boat trip on the Neckar River

Thursday, September 13th, 2012

09:00 - 10:00 *Radiation transfer I* (Cornelis Dullemond)

10:00 - 11:00 *Special topic: BGK Boltzmann* (Fabian Heitsch)

10:30 - 11:00 Coffee break

11:30 - 12:30 *Radiation transfer II* (Cornelis Dullemond)

12:30 - 14:30 Lunch

14:30 - 15:30 *Modern trends I* (Dominique Aubert)

15:30 - 16:00 Coffee break

16:00 - 17:00 *Special topic: Reactive flows* (Simon Glover)

17:00 - 18:00 *Radiation transfer III* (Cornelis Dullemond)

18:00 - 19:00 *Exercises: Radiation transfer (Dullemond)*

20:00 - 23:00 Pub evening

Friday, September 14th, 2012

09:00 - 10:00 *Modern trends II* (Dominique Aubert)

10:00 - 11:00 *Exercises: Radiation transfer (Dullemond)*

11:00 - 11:30 Coffee break

11:30 - 12:30 *Radiation transfer IV* (Cornelis Dullemond)

12:30 - 14:30 Lunch

14:30 - 15:30 *Special topic: A practical overview of visualization techniques* (Christoph Garth)

15:30 - 16:30 *Modern trends III* (Dominique Aubert)

16:30 - 17:30 *Special topic: Unstructured and moving meshes* (Volker Springel)

17:30 - 18:00 Farewell & departure