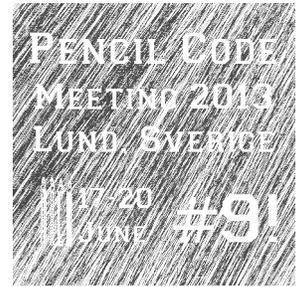


# Program of Pencil Code Meeting 2013



## Monday 17 June:

- 13:30 Welcome (Anders and Michiel)
- 13:50 Distribution of the Pencil Code T-Shirt 2013 + name round
- 14:00 Axel Brandenburg: Pencil Code Meeting Opening Talk
- 15:00 Coffee
- 15:30 Food sign up (for restaurant reservation)
- 15:35 Discussion on how to improve the Pencil Code (led by Anders)
- 16:30 Code technical discussions
- 18:30 Dinner in Lund

## Tuesday 18 June:

- 09:00 Joachim Hein (lunarc): Scalasca profiling
- 10:00 Coffee
- 10:30 Code technical discussions
- 12:30 Sandwich lunch in the meeting room
- 13:30 Short code / science talks (20 min)
  - Boris Dintrans:
  - Colin McNally: Pencil Shorts
  - Daniel Carrera: Simulations of the streaming instability in small particles
  - Illa Rivero Losada:
- 15:00 Coffee + photo time
- 16:00 Code technical discussions
- 17:30 Questions from students
- 18:30 Barbecue in the courtyard

## Wednesday 18 June:

- 09:00 Short code / science talks (20 min)
  - Karl Jansson: Collapse of virialised pebble clumps
  - Sarah Jabbari:
  - Miikka Väisälä: MHD modelling of rotating elephant trunks
- 10:00 Coffee
- 10:30 Short code / science talks (20 min)
  - Michiel Lambrechts: The Rayleigh-Taylor sample in the Pencil Code
  - Anders Johansen: Sink particles in the Pencil Code
- 11:10 Code technical discussions
- 12:30 Lunch at Ideon
- 14:15 Department seminar by Wlad Lyra (see below for abstract)
- 15:00 Coffee
- 15:30 Short code / science talks (20 min)
  - Sven Bingert: Non-Fourier heat conduction and 8th moment approximation or the solar corona model

- Chao-Chin Yang: Artificial diffusivity with fixed Reynolds number & advection by polynomial interpolation
  - Karsten Dittrich: Planetesimal formation in zonal flows
- 16:30 Phillipe Bourdin: Large-scale data analysis and reproducibility in IDL  
17:00 Jeff Oishi: YT visualisation  
18:00 Dinner in Lund

## Thursday 20 June:

- 09:00 Axel Brandenburg: The radiation module  
10:00 Coffee  
10:30 Code technical discussions  
12:00 Wrap up of meeting (Anders and Michiel)  
12:30 Lunch at IDEON (for those that want to)  
13:30 End of organised programme  
(the workshop room remains available for further discussion)

Note:

The 20 minute talks are 15 minutes + 5 minutes for questions at the end.

Abstract for departmental seminar on Wednesday (14:15):

### **Evolution of circumstellar disks and planet formation**

During the first million years of evolution, nascent planetary systems are embedded in dense disk-shaped clouds of gas. These circumstellar disks are home to a myriad of hydrodynamical processes, which bring about turbulence and the emergence of viscous-like behavior, enabling accretion of gas onto the protostar. Meanwhile, micron-size dust grains embedded in the disk are growing through coagulation onto pebbles and rocks. Turbulence has a positive effect on these small solids, concentrating them into transient high pressure regions for long enough to achieve gravitational collapse into km-sized bodies, forming the first planetesimals. Giant storm systems in the disk, similar to Jupiter's Great Red Spot, may exist in quiescent zones of the disk. These are even more prone to collecting solid material, producing the first terrestrial planets and cores of giant planets. Once the planets are formed, gravitational interactions, migration through the disk, and jitter from the turbulent gas define the system's final architecture. Concurrently, high energy photons from the central star slowly evaporate the gas, eventually leaving behind a disk of dust and debris. These debris disks tend to show a variety of non-trivial structures attributed to planetary perturbations and utilized to constrain the properties of the unseen exoplanets. In this talk I will discuss the state of the art and recent advances in the field of planet formation, and provide an alternative explanation for some of the structure seen in debris disks around young stars. Finally, I will discuss pressing problems such as the asymmetries observed in ALMA images of circumstellar disks, and an analytical model that may explain them.