

Computational Cosmology

3 – 7 December 2018 @Oort

The Computational Cosmology workshop was a successful event with much positive feedback from the participants. The workshop gathered some of the top experts in the field of computational cosmology and galaxy formation to discuss on-going projects and challenges, exchange ideas and plan future projects in this field. The workshop covered a relatively wide range of related topics from simulations of the large scale structure in the Universe to modeling the small scale processes involved in galaxy formation, as well as alternatives to the standard model of cosmology.

The necessity of pushing simulations to higher resolution by improved modeling of the unresolved processes (“sub-grid physics”) in galaxy formation, as well as to larger volumes for interpreting cosmological surveys, were recurrent themes. Dedicated groups of participants in this workshop are set to work on better modelling of the interstellar medium and radiation transport. In addition there are on-going efforts to develop better and faster algorithms in order to push the simulations to the next level in terms of size and resolution. These research goals are crucial for moving forward in understanding the nature of dark matter through studying galaxy formation, as well as interpreting the results of large cosmological surveys that will become available in the next decade.

There were a total of 70 participants with a balance between senior and junior researchers. All but 4 participants were present for the entire week. The program left plenty of time for interaction. There were 17 plenary talks where leaders of different projects reported on the state of the on-going efforts and plans. There were another 40 talks mostly given by students and postdocs on their most recent work, each lasting 15 minutes including questions. Great successes were the “hack sessions” and “working groups”. Hack sessions included hands-on demonstrations of useful software, while working groups aimed for detailed discussions on specific projects. We received very positive feedback about this format.

Overall, the meeting achieved its goal by bringing the attendants up-to-date about the progress of different projects within European computational cosmology, building new collaborations, defining new projects, and making junior participants familiar with useful tools for their research.

The facilities and office space provided by the Lorentz Center were greatly appreciated by everyone. The workshop was run smoothly because of the friendly help from Aimée Reinards Tara Seeger.

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