Summer School
Supercomputing Techniques in Astronomy
19-23 April 2010

Institutions

Heidelberg Universität, Germany
Pontificia Universidad Católica de Chile

Place

Campus San Joaquín, Pontificia Universidad Católica, Santiago, Chile
Avenida Vicuña Mackenna 4860

Introduction

Astronomy is increasingly becoming a computationally intensive field due to the ever larger datasets delivered by observational efforts to map ever larger volumes of the Universe, and also to provide ever finer details of galaxies and their stellar, gas and dust content. As a result there are two computationally demanding, complementary approaches that need to be performed to uncover new findings and interpret them within a cosmological context:

1) The processing of the observational data so that it can be used to answer particular problems of cosmology and galaxy formation. This includes computationally intensive statistical tools to be applied to datasets of hundreds of terabytes or even more. The study of the power spectrum of density fluctuations mapped by the galaxies in the largest survey to date, the Sloan Digital Sky Survey, already requires parallel computing in order to be performed. In the near future several new surveys will demand orders of magnitude increase in the available data and therefore in data processing capabilities.
2) The appropriate construction and interpretation of theoretical models of galaxy formation within a cosmological framework. The simulations involve two general steps. The first one is to include the necessary physics to produce a reliable evolution and required observables; the second is the analysis of outputs which need to be at least as large or detailed as the observational datasets, with information on the underlying properties and complete evolution history across time of galaxies and their components.

Program contents

1) The school (Monday 19 to Wednesday 21 April, 2010)

The school will concentrate on providing basic and advanced tools to perform parallel computing tasks in theoretical and observational astronomy. To do this international experts in different areas will cover the following topics:

General parallel computing techniques: Gavin Pringle (Edinburgh)
Data-base management: Gerard Lemson (MPE and Zürich) TBC
Massively parallel handling of large observational datasets: Robert Lupton (Princeton)

Massively parallel dark-matter numerical simulations: Raúl Angulo (MPA Garching)
Numerical simulations of galaxies: Ralf Klessen (Heidelberg) TBC
SPH and gas simulations: Tom Theuns (Durham University) TBC

The format of the school will consist on lectures and practical problem sessions which the attendees will be able to solve using the computing cluster at Pontificia Universidad Católica.

2) The Workshop (Thursday 22 to Friday 23 April, 2010)

The second part of the meeting will consist on a two-day workshop on the subject of Cosmology and Galaxy Formation from large astronomical datasets and state-of-the-art numerical simulations, with keynote and contributed talks. There will be poster sessions.

Keynote speakers:
Carlos Frenk (Durham University)
Patricia Tissera (IAFE, Buenos Aires)
Scientific organizing committee


Local organizing committee:


Value

The registration fee for the full meeting is us$400. There are limited funds to provide partial support for participants with contributed talks or posters upon request.

Because of limited space the school/workshop will be limited to a total of 70 participants. Also, the number of contributed talks and posters will also be limited and those selected for presentation will be notified by 20 March 2010.

Sponsor

DAAD
Deutscher Akademischer Austausch Dienst
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Registration

To register please cut and paste the following form, and email it to

Carlos Oliva (coliva@astro.puc.cl) with the subject "Supercomputing meeting"

NAME:
INSTITUTION (full address):
POSITION:
REQUEST FOR FINANCIAL SUPPORT:
PRESENTATION TYPE: Contributed talk/Poster/None
PRESENTATION TITLE:
PRESENTATION ABSTRACT:

Deadline

10 March 2010