

# Activities of the Theory and Computation Committee

## Members

David Clarke (outgoing)	2000-2003	Saint Mary's University	dclarke@ap.stmarys.ca
Martin Duncan (outgoing)	2000-2003	Queen's University	duncan@astro.queensu.ca
David Schade	2002-2005	NRC, CADC	David.Schade@nrc.ca
Robert Thacker (Chair)	2002-2005	McMaster University	thacker@physics.mcmaster.ca

Over the past two years the activities of the Theory and Computation committee have become increasingly focused on issues relating to High Performance Computing (HPC). The influx of funding for HPC facilities in Canada, provided via the Canadian Foundation for Innovation (CFI), has helped to partially address the desperate short fall of HPC facilities identified in the LRPP. Across the country, astronomers and astrophysicists play a key role in almost all the regional HPC facilities that have been funded by the CFI.

The committee website ([http://coho.physics.mcmaster.ca/astro\\_comp](http://coho.physics.mcmaster.ca/astro_comp)) continues to be updated by Rob Thacker, and will be moved to the CASCA server at Queen's in the near future. The semi-annual review of Canada's position on the Top 500 list of supercomputers is proving to be a useful historical resource, and was used in the writing of the LRP mid-term review (MTR) of HPC. In the future the website could be expanded to include the names of individuals and institutions directly involved in astronomical research that is reliant upon HPC.

Members of the committee played an active role in the LRP MTR. With the aid of former Chair David Clarke, a short report on the status of HPC in Canada was prepared for the MTR panel (Thacker, Schade and Ue-Li Pen were invited to give presentations at the meeting). A key theme in the report was that since the original LRPP document was written HPC has moved forward considerably and is now a common theme in both theory and observation. The next generation of observatories will require supercomputers not only to analyze data, but even in some cases to be able to operate. All members of the committee agreed that while the recommendations in the original LRP report had been met, due to the influx of funding from the CFI, the playing field has moved so far that it is now extremely important we adopt a new recommendation: a national HPC facility dedicated to astronomy. As a result of the discussion provoked, a further short report examining the impact of HPC on recent research, future scientific milestones, and questions of sustainability, was prepared for the MTR panel. We are pleased to report that this recommendation was adopted in the early release MTR summary.

Although no face-to-face meetings have occurred in the last two years, the committee has been able to function effectively through email. Over the next year we expect to become more active. Following the adoption of the national facility recommendation, the Theory and Computation Committee will formalize a number of key issues including; location, architecture, principle investigators, and the role of the NRC within such a proposal. We plan to distribute a questionnaire at the upcoming CASCA meeting to determine the needs and aspirations of as wide a catchment of researchers as possible.

Outside of astronomy, the C3.ca organization continues to develop an national Long Range Plan for HPC (<http://www.c3.ca/LRP/index.htm>). Members of the committee are taking an actively role in this process, primarily by contributing comment on draft proposals. Hugh Couchman is a member of the authors panel currently working on the LRP document, and has kept the committee abreast of developments.

With the departure of Clarke and Duncan, Ue-Li Pen (Toronto) and Joseph Hahn (Saint Mary's) have been appointed as new committee members. Joseph Hahn is nominated to speak on behalf of the committee in the absence of the Chair.