

Workshop Report

Summer workshop on High Performance Computing in the Mathematical Sciences
Acadia University, July 9-14

The event was a 6-day workshop with two goals: first, to educate new and potential users on techniques for high performance computing, especially in the mathematical sciences, and second to showcase current research in the area of HPC in the Mathematical Sciences. Over 60 participants attended the event, with about 80% of these coming from universities and research institutes in the Atlantic region.

Operations: Overall the event ran very smoothly. Both the creation of the scientific program and event administration were conducted by faculty and staff at Acadia University. Some faculty had previous experience with organizing workshops, so student funding, reimbursement of travel expenses, scheduling, accommodations, and food services all went well. It was challenging to generate interest and get participants to register, but ultimately we attained our target registration of around 60 participants. Participants were quite satisfied with the event: *“It is a very useful and successful workshop, as a matter of fact, it is the most fruitful one among the workshops I attended.”* – Zeliang Wang graduate student, York University.

Funding: Financial support for the event was provided by a number of funding agencies, including AARMS, ACEnet, MITACS, NSERC (Atlantic Regional Office), and D-Drive. In-kind contributions were also made by Sun Microsystems (who sent Jim Himer, Chief Technologist, HPTC/Grid, to the event), the National Program on Complex Data Structures (who directly supported travel costs for four NPCDS students to attend the event), ACEnet (who sent Ross Dickson to present at the event), and the Acadia Centre for Mathematical Modelling and Computation (ACMMaC) who provided technical staff member Duane Currie who was a co-organizer of the event and presenter. The bulk of funding was used for travel and accommodation expenses for student participants at the event. Additional details are provided in the budget.

For additional information on the event, see the workshop website, at <http://ace.acadiau.ca/math/hpcworkshop2007/>

Attachments:

- Brief financial report
- 1-page summary, previously written for the AARMS newsletter

Expenses	
item	amount
Speaker travel & accommodation	\$4,108.94
Student travel (MUN)	\$3,075.00
Other student travel	\$4,209.64
Student residence accommodation	\$3,372.12
Poster boards	\$146.28
Management fee (Acadia)	\$250.00
Building rental - BBQ	\$90.00
Catering - coffee breaks & mixer	\$3,106.51
Food for BBQ	\$253.55
total	\$18,612.04
Revenue	
MITACS	\$5,000.00
AARMS	\$5,000.00
ACEnet	\$4,108.94
NSERC-Atlantic	\$2,494.76
D-Drive	\$2,008.34
total	\$18,612.04

Note that student travel for the group of MUN is separated out since this claim was processed later. The D-Drive contribution will be put towards the remaining balance on this expense.

Summer Workshop on HPC in the Mathematical Sciences – a summary for AARMS

In July, Acadia's Centre for Mathematical Modelling and Computation (ACMMaC) hosted a 6-day training and research workshop on High Performance Computing in the Mathematical Sciences. Among the over 60 participants were academic researchers, scientists from government labs, and a large number of undergraduate and graduate students from as far away as the University of Victoria. What brought participants together was a desire to learn how high performance computing tools are changing the culture of research in many areas of the mathematical sciences.

Four days of the workshop were dedicated to training, providing detailed information on how to design and implement parallel programs that solve a variety of complex problems in the mathematical sciences. After being introduced to the nuts and bolts of HPC, such as programming MPI and OpenMP, participants were given hands-on experience in implementing these techniques on one of ACEnet's newest cluster machines.

"Core" techniques that occur in a wide variety of mathematical problems, as well as in many applications of mathematics were covered, including linear methods and stochastic simulation. Participants also got a flavour of more exotic HPC topics such as combinatorial group theory, and experienced a wide variety of remote collaboration tools including Access Grid videoconferencing, Wikis, internet telephony, tablet PCs, and online communication using mathematical notation. Videoconference technology enabled presentations from Trent, Dalhousie and Los Alamos National Labs.

The workshop culminated in a two-day research event, covering large-scale weather modelling, statistical methods for the design and analysis of computer experiments, geophysical modelling, and even how the new SONY Playstation 3 processors might be the next significant HPC engines. Student participants gave posters on a rich variety of topics including combinatorial methods in DNA sequencing, seismic profile modelling, and problems in number theory.

This was the inaugural event of the ACEnet Institute for Advanced Computing, which, along with AARMS and MITACS provided significant funding for the event. Additional sponsorship was provided by the NSERC Atlantic Regional Office, D-Drive, NPCDS, and Sun Microsystems.

Additional information about the workshop is available online, at <http://ace.acadiau.ca/math/hpcworkshop2007/>