



MGHPCC Awards \$500,000 in Second Round of Seed Grants for Collaborative Research in Array of Scientific Disciplines

HOLYOKE, Massachusetts, Jan. 15, 2013 – The Massachusetts Green High Performance Computing Center (MGHPCC) today announced \$500,000 in seed grants to six multi-university teams to support cross-institutional research among MGHPCC members.

The MGHPCC, which opened in November, is intended to promote research collaboration among the participating universities – Boston University, Harvard University, the Massachusetts Institute of Technology, Northeastern University and the University of Massachusetts – through high-performance computing, a pillar of major scientific research today. The seed grant program is intended to accelerate the MGHPCC’s mission of computational collaboration.

This year’s seed grant program was supported by the five universities and the Center for Integration of Medicine and Innovative Technology (CIMIT), a non-profit consortium of Boston’s leading teaching hospitals and universities that fosters interdisciplinary collaboration among world-class experts in translational research, medicine, science and engineering, in concert with industry, foundations and government, to rapidly improve patient care.

This is the second round of seed grants awarded by the MGHPCC Consortium, and it brings the total amount of awards to \$1.1 million.

“This year’s projects reflect a continued commitment of the five MGHPCC universities to collaborate in creative ways on cutting-edge scientific problems of importance to the Commonwealth – in strategic areas such as the life sciences, climate change and big data,” said Tom Chmura, president of the MGHPCC and vice president for economic development at UMass.

The six winners were chosen from a field of 26 applications by a committee of researchers from each of the participating universities: Dave Kaeli of Northeastern, the chairman, David Coker of BU, Scott Bradner of Harvard, Chris Hill of MIT and Jim Kurose of UMass. The grant amounts ranged from \$52,000 to \$131,000. The request for proposals sought “novel collaborative research activities addressing significant and challenging problems at the forefront of high-performance technical computing. Proposals also had to include a strategy for follow-on research that would attract external funding.

“This year’s awards span basic astrophysics research, computer systems innovation and real time clinical application and highlight the richness of the region as a world leading center of gravity for academic discovery,” said Hill. “In addition to the great research, also notable this year was sponsorship participation from John Collins and colleagues at the CIMIT organization, which reflects a real increase in interest in applied computationally intensive research at major regional hospitals.”

The funded projects are:

- The CaterPillar Project: Exploring the Dark Matter Substructure of Milky Way Galaxies. Anna Frebel and Edmund Bertschinger of MIT and Lars Hernquist of Harvard will run multiple N-body problems to uncover the physical processes and details of the Milky Way to both confirm assembly history and better understand general galaxy behavior.

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- Designing Cloud and Big Data Platforms for Scientific and HPC Applications. Orran Krieger of BU, Peter Desnoyers of Northeastern, Manuel Garber of UMass Worcester and Prashant Shenoy of UMass Amherst will explore how today's cloud and Big Data platforms can be better tailored to handle Big Data while investigating ways to re-architect data intensive applications to exploit Big Data processing methods and cloud platforms.
- Strength and Fracture Mechanisms of Hierarchical Biological Materials. Alain Karma of Northeastern and Markus Buehler of MIT will explore the fundamental mechanisms that control the strength of biological materials, and create a platform for the biomimetic (literally nature mimicking) design of nanostructured composite engineering materials for technological applications and in the medical industry.
- Computational Identification of Outcome-Associated DNA Alterations in Neuroblastoma. Stefano Monti of BU and Roberto Chiarlie of Harvard will develop high-throughput sequencing techniques to identify novel DNA markers to inform treatment of Neuroblastoma, one of the most common tumor-causing cancers in children.
- Genome-Scale Characterization of Chromosomal Aberrations Using Parallelizable Compression Algorithms. Dan Simovici, Nurit Haspel and David Weisman of UMass Boston and Jennifer Rosen of BU will develop new data compression techniques for large-scale data mining of next-generation DNA sequencing data to speed-up detection of large chromosomal aberrations that lead to cancer.
- Automated Segmentation of Vessel Network Structures in Large Image Stack Sets. Deniz Erdogmus of Northeastern, Jeff Lichtman of Harvard and David Boas of Harvard and Massachusetts General Hospital will develop an open high-performance image analysis software package to analyze automatically or interactively a large imagery database for quantitative modeling and statistical analysis. The software will help neuroscientists understand the complex behavior of neuronal circuits, and how they evolve during synaptic competition.

About the Massachusetts Green High Performance Computing Center

The Massachusetts Green High Performance Computing Center (MGHPCC) is a ground-breaking collaboration of five of the state's most research-intensive universities, state government and private industry — the most significant collaboration among government, industry and public and private universities in the history of the Commonwealth, and the first facility in the nation of its kind. The 90,000-square-foot computing facility in Holyoke, Massachusetts, opened in November 2012. Funding was provided by the five member universities - Boston University, Harvard University, the Massachusetts Institute of Technology, Northeastern University and the University of Massachusetts -- the Commonwealth of Massachusetts, Cisco, EMC, and the Federal New Markets Tax Credit program. The member universities will fund the ongoing operation of the MGHPCC. For more information on the Massachusetts High Performance Computing Center, visit <http://www.mghpcc.org/>.

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