MICHIGAN STATE
U N I V E R S I T Y

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To: Campus Community

From: J. Ian Gray, Vice President for Research and Graduate Studies

Subject: Computing infrastructure

Last month I wrote in general about how supporting research infrastructure helps shape the future of research at MSU and promised that I would follow up with reports about some specific research infrastructure advances. Computing resources are among the most used, with scholarship in all disciplines moving toward technology-centered, computation-intensive, discovery-based multidisciplinary collaborations.

Before computers, scientific scholarship relied on theory and experiments. As computing power became available, the physical sciences and engineering began developing a third approach: cyber-enabled scholarship. Early cyber-enabled research used high-performance computing systems to solve the complex equations that underlie physical, chemical, and biological processes. These computing tools enabled large-scale simulations and visualizations of systems.

Now life and social sciences, communication arts, and humanities also rely heavily on computation science to advance knowledge in their fields. And with continuing advances in computer hardware and software, even more researchers will turn to these tools and use them more extensively for analysis of large databases that encompass data, images, sounds, and video. Research on such large and complex areas of knowledge would be prohibitively time consuming without the power of large and complex computing systems.

To help meet this computing need, MSU established the High Performance Computing Center (HPCC) in 2004 with Research Excellence Funds (REF). Early in 2008, David Gift, vice provost for libraries, computing, and technology (LCT), and I established the Visioning Committee for Cyber-Enabled Discovery to develop a strategic plan to advance computational science at MSU. The committee, with members from across campus, surveyed MSU chairs and directors, held a fact-finding workshop, and invited other experts at MSU to share their vision for cyber-enabled discovery on campus. The result: creation of the Institute for Cyber-Enabled Research (iCER).

ICER initially supports five existing research thrust areas that are important to MSU's research portfolio. They are
- Climate and Environmental Modeling
- Computational Biology
- Materials, Nanoscience, Energy
- Computational Chemistry and Physics
- Inverse and Multiscaled Modeling

The institute has a core group of affiliated faculty from these areas, selected because of their use of advanced computing in research that is externally funded or has the potential for external funding.

ICER is an ambitious project, but we have to think boldly if MSU is to enhance competitiveness in research that requires extensive computing power. Our faculty are prepared to push the boundaries of knowledge, but they need the tools iCER helps provide.

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