

San Diego Supercomputer Center Director to Speak at ACM Event in China

SDSC's Berman to Focus on Managing the 'Digital Data Deluge'

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Fran Berman, director of the San Diego Supercomputer Center at the University of California, San Diego, will visit China later this month, where she will speak about the challenges of managing the exponentially increasing amount of digital information, and how a coordinated cyberinfrastructure will accelerate solutions to societal challenges, such as predicting the effects of large-scale earthquakes.

"Applications such as earthquake simulation involve analysis of tremendous amounts of data, enabled by modern computational and data cyberinfrastructure," said Berman, who is scheduled to participate in the Association for Computing Machinery's Distinguished Speakers Program to be held in China April 20-24. "Accurate prediction of the effects of seismic activity can help in identifying areas in which the greatest damage can occur, as might have been helpful in advance of the recent tragedy in Italy. Data-intensive research can also help vet strategies for effective disaster response through more realistic 'what if' scenarios."

Other presenters at the ACM Distinguished Speakers Panel later this month include Tracy Camp, professor in the department of math and computer sciences at the Colorado School of Mines in Golden, Colo.; and Justine Cassell, director of the Center for Technology and Social Behavior at Northwestern University, in Evanston, Ill. Speakers will address communities at the following universities: Tsinghua University (Beijing) on April 20; Huazhong University of Science and Technology (Wuhan) on April 22; and South China University of Technology (Guangzhou) on April 24.

Berman will highlight the challenges of building and deploying effective cyberinfrastructure to enable cutting edge research and education and manage the expanding deluge of digital data. "Many of our most challenging research applications such as simulating earthquakes, understanding the impact of global warming, and developing personalized strategies for promoting health and treating disease, involve massive amounts of digital data," said Berman. "Driving solutions for these critical challenges is the need to access, manage, use, store, and preserve this data effectively, efficiently, and economically."

The data deluge is a critical problem for the Information Age: Current estimates are that in 2006, 161 exabytes (10¹⁸ bytes) were generated by cell phones, computers, digital cameras, sensors, satellites, scientific instruments, and other sources, according to industry figures from International Data Corporation (IDC), a global provider of information technology intelligence based in Framingham, Mass. In just two short years from now, that amount will be *10 times the size* it was in 2006, and almost half of this expanded universe will be without a permanent home as the amount of digital information outstrips storage space, the study notes. In 2007, the exponentially growing global amount of digitally based information outpaced the global amount of storage for the first time ever.

"By 2023, the amount of bytes digital data will exceed Avogadro's number, and the 'grand challenge' we all face is how to manage this digital deluge," said Berman. "There's no question that today's digital data, which virtually drives every area of research, education, commerce, and entertainment, has transformed the way we work and live. But key questions remain as to how we can mobilize this deluge: What will we preserve, and

who will decide what's worth saving? How will we preserve it? And who will pay for this preservation on an economically sustained basis?"

Berman, an ACM Fellow who also is a professor in UC San Diego's Department of Computer Science and Engineering, and first holder of the High Performance Computing Endowed Chair in the Jacobs School of Engineering at UC San Diego, currently co-chairs the Blue Ribbon Task Force on Sustainable Digital Preservation and Access, launched by the National Science Foundation in late 2007 to explore and ultimately present a range of economic models, components, and actionable recommendations for sustainable preservation and access of digital data in the public interest. Commissioned for two years, the task force in January published an interim report outlining economic issues and systemic challenges associated with digital preservation, and will issue its final report in late 2009. Berman co-chairs the task force with OCLC economist Brian Lavoie.

"As a society, we have only begun to address this challenge at a scale concomitant with the deluge of data available to us and its importance in the modern world," she said. In an article published in the December 2008 issue of *Communications of the ACM*, the association's monthly magazine, Berman highlighted the "deluge of data" brought on by the Information Age. Her ACM article closes with a set of "Top 10" guidelines for data stewardship. The ACM's Distinguished Speakers Panel series invites speakers from academia, industry, and government to give presentations to various ACM chapters, members and the greater IT community in a variety of venues and formats. The program offers live talks at student or professional chapter gatherings, and guest speakers at other events or conferences. As the world's largest educational and scientific computing society, ACM is focusing on China, as well as India and Europe, with programs that engage the research, academic, and professional computing communities which are growing rapidly in these regions.

About SDSC As an organized research unit of UC San Diego, the San Diego Supercomputer Center is a national leader in creating and providing cyberinfrastructure for data-intensive research. Cyberinfrastructure refers to an accessible and integrated network of computer-based resources and expertise, focused on accelerating scientific inquiry and discovery. SDSC is a founding member of the national TeraGrid, the nation's largest open scientific discovery infrastructure.

About ACM ACM, the Association for Computing Machinery, is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

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