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## SOURCE

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## Colorado State University Engineering Professors Awarded \$1 Million Grant to Design More Robust Computer Systems

**Note to Reporters:** Photos of Professors H.J. Siegel and Tony Maciejewski are available with the news release at <http://www.news.colostate.edu/>.

**FORT COLLINS** - Lighting strikes, floods, and other natural and manmade disasters can mean life or death for people, and they also can devastate computer systems at times when they're most needed.

H.J. Siegel, Tony Maciejewski and Arnold Rosenberg, engineering professors at Colorado State University, have received more than \$1 million from the National Science Foundation to design techniques for building robust and dependable computing and communications systems capable of withstanding major, unexpected disruptions. The CSU team includes graduate and undergraduate students.

The grant money is made possible through the American Recovery and Reinvestment Act of 2009.

"Information systems are often a heterogeneous mix of machines and networks that experience degraded performance due to such problems as machine failures, changes in workload or other uncertainties," said Siegel, Abell Distinguished Professor of Electrical and Computer Engineering and director of the university's Information Science & Technology Center (ISTeC). "The goal is to bring together researchers and practitioners to collectively investigate the problem of robust computing systems."

"Uncertainty is the enemy of a robust computer system, but this grant will help us minimize damaging failures and work to build computer systems that perform well through crises," said Tony Maciejewski, head of the Electrical and Computer Engineering department in Colorado State's College of Engineering. "As computer systems become more integrated with everyday life, it's really important that they continue to perform critical functions even when there's an unpredicted circumstance."

Also collaborating on the grant that is led by CSU are DigitalGlobe, which supplies images to Google Maps and Microsoft Virtual Earth, the National Center for Atmospheric Research, which studies prediction of severe and catastrophic weather, and the University of Colorado at Boulder.

The team will design models and mathematical and algorithmic tools to derive robust resource management schemes as well as to quantify the probability of system failures.

"The robustness concepts being developed have broad applicability, and will significantly contribute to meeting national needs to build and maintain robust information technology infrastructures," said team member Jay Smith at DigitalGlobe.

Siegel and Maciejewski serve as co-directors of the CSU Center for Robustness in Computing Systems, which has been funded by the Colorado Commission on Higher Education Technology Advancement Group, DARPA, and an earlier NSF grant. Siegel's research focuses on distributed computing and communication systems, heterogeneous computing, parallel processing, computer architectures and

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algorithms, and interconnection networks. Maciejewski's research and teaching interests center on the design and analysis of robust systems, including fault-tolerant robotic systems for operation in hazardous or remote environments.

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