



Quantum Leap

The Newsletter of the Department of
Physics and Astronomy
University of South Carolina

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Advanced Solutions Group

and Complex Problems Group

Physics Partnerships Formed through Interdisciplinary Teaching, Research, and Service

Through numerous interdisciplinary efforts, Professor Joseph Johnson continues to build partnerships among physics and other departments and to serve the community through cooperative projects with federal, state, and local government. His efforts join his specialties in theoretical physics with mathematical and computational sciences, information technology, and other disciplines, while paying heed to needs in the public sector.

On Jan. 1, 2002, Professor Johnson added a research fellow to his interdisciplinary research team, the Complex Problems Group (CPG), through a competitive award sponsored by the U.S. Department of Defense. John Lane, who received his Ph.D. in mathematics from the University of South Carolina in 2001, joins the team for study and research using his mathematical and computational science skills. Working with CPG Research Professor Vladimir Gudkov, Lane is using his expertise in wavelet analysis

to help develop and refine algorithms to monitor network parameters and to develop optimized models to detect network intrusions. The project, funded by the Defense Advanced Research Projects Agency (DARPA), seeks to develop methods to protect critical information networks.

Professor Johnson's interdisciplinary research efforts led to a third activity in teaching and service beginning in January 2002. He sponsored a topics course that provided one of the first cross-disciplinary studies of terrorism. Titled "Counterterrorism: A Multidisciplinary Analysis," the class featured 26 lectures by experts from USC faculty, public agencies, and the private sector. Highlights included lectures on definitions of terrorism by Honors College Dean Peter Sederberg, contemporary historical perspectives by distinguished History Professor Dan Carter, nuclear concerns by Savannah River Site experts, cybersecurity by Computer Science Chair and Information Technology Institute Director Duncan Buell, and the state law enforcement role by State Law Enforcement Divi-

sion (SLED) Chief Robert Stewart. The course has been a successful interdisciplinary effort that boosts the physics department's teaching and service contributions to the University, state government, and the community.

On April 1, 2002, Professor Johnson began directing a yearlong grant for the Internet Victim Information System (IVIS) designed by his interdisciplinary technology team, the Advanced Solutions Group (ASG). Operational in South Carolina since 1998, IVIS combines modern technologies including relational databases, Web interfaces, and telephony to provide information services to victims of crime. The continued award allows ASG to add new features to IVIS and to deploy it throughout South Carolina. The grant brings \$495,000 to the Department of Physics and Astronomy from the U.S. Department of Justice through the S.C. Department of Public Safety, with state matching funds provided by the S.C. Supreme Court.

