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Cyberinfrastructure tools improve remote use of scientific instrum

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Ohio's academic and industrial researchers now can share some of the sta valuable and expensive scientific instruments via the Internet, thanks to cyberinfrastructure tools developed by engineers and researchers at the O Supercomputer Center.

OSC's remote instrumentation cyberinfrastructure provides a trio of servic portals to provide access to multiple researchers; robust networking to pr fast and efficient transmission of data; and mass storage ro allow data arc and subsequent retrieval.

"Our goal is to foster research and training activities that can drastically sl the innovation process in fields such as materials modeling and cancer res said Prasad Calyam, Ph.D. a senior systems developer at OSC. "Such a se also improves user convenience, significantly reduces costs, and, ultimate decreases duplication of instrumentation investments."

By creating Web portals that integrate with OSC's Remote Instrumentatio Collaboration Environment (RICE) software, the Center can support multi-session presence, user control management, live video feeds between Ohi and collaboration tools such as Voice over IP and chat.

"The RICE software allows researchers to control the microscope in real tir (remote operation) as they examine a sample, or it can restrict remote us just viewing the sample's images and communicating with the operator (r observation)," Calyam said. "Meanwhile, the Web portals link to the softw improve ease of remote access."

Recently, Miami University Professor Michael Kennedy, Ph.D., has partnere OSC to "cyber-enable" the university's powerful 850-megahertz nuclear m resonance (NMR) spectrometer, the first of its kind in North America.

"While my Miami colleagues, students and I are fortunate to have this am; sophisticated instrument available for our vital research projects, it's also important to make this unique NMR resource available for remote instructi operation to my more distant research and teaching associates," said Keni Ohio Eminent Scholar in structural biology.

Remote instrumentation sessions require significant network bandwidth. Fortunately, network issues at Ohio's universities are relatively minor beca their connections to OSCnet, the nation's leading statewide, fiber-optic nei dedicated to education, research, and economic competitiveness.



The Ohio Board of Regents funded this research to gain a greater return on investments in extraordinary instruments such as electron microscopes, nuclear magnetic resonance spectrometers, Raman spectrometers, and ion accelerators at Ohio universities. Electron microscopes, for example, can cost a university \$450,000 to \$4 million to purchase and require yet more funding for operation and maintenance.



"These scientific instruments represent a valuable collaborative asset in themselves and can fuel the development of new products and technological innovations as well as to expand the frontiers of knowledge," said Stanley C. Ahalt, executive director of the Ohio Supercomputer Center.



Calyam will be presenting a research paper on OSC's remote instrumentation capabilities at the IEEE e-Science 2008 conference this December in India. This presentation is in addition to two demonstrations this fall: the unveiling of a prototype during the Fall 2008 Internet2 Member Meeting held in October in Orleans, and a more advanced demonstration that will be part of OSC's exhibit during SC08, the premier international conference on high performance computing, networking and storage. This year SC08 is Nov. 17-21 in Austin, Texas.



www.top500.org

More information about OSC's remote instrumentation projects and its participation in SC08 can be found at [its Web site](#).

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