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Cc: Webteam
Subject: News release: Chemistry Dept wins award

SCSU awarded \$325,000 by National Science Foundation

ST. CLOUD, Minn. – The St. Cloud State University Chemistry Department has received two grants totaling more than **\$325,000** from the National Science Foundation through its Major Research Instrumentation (MRI) program. The program encourages U.S. academic institutions to integrate research and education in science, mathematics, and engineering by providing funds for state-of-the-art research instrumentation.

"Using the new equipment in research and **classroom** activities will keep SCSU faculty and students on top of modern chemical instrumentation and help prepare students for industry **and/or** graduate school," said Michael Dvorak, Assistant Professor of Chemistry. More than 30 chemistry students participate in faculty-student collaborative research projects each semester.

Professors Michael Jeannot, Lakshmaiah Sreerama, Mohammad Mahroof-Tahir, Donald Neu, and Nathan Winter received \$157,750 to purchase a matrix-assisted laser **desorption/ionization** (MALDI) mass spectrometer, which gives **information** about the size and structure of large molecules such as proteins, DNA, and synthetic polymers (plastics, adhesives, etc.).

According to Jeannot, SCSU faculty and students will use the MALDI instrument for research in many areas of chemistry. For example, investigators will work to improve the quantitative capabilities of **MALDI** so that it can identify concentrations of molecules. "Concentrations of proteins **in blood** or tissue samples can give information about diseases," said Jeannot. **Researchers** will also produce laser materials, and study conductive polymers that may be used in solar cells and transistors.

In addition, the mass spectrometer will be used for analyses related to drug resistance and protein modification in cancer cells. "MALDI will help us understand the mechanisms of drug resistance in breast cancer patients," said Sreerama. "This will lead to the development of more effective anti-tumor drugs."

Professors Dvorak, Daniel Gregory, Jeannot, and Sreerama received \$167,900 to acquire a Varian Eclipse spectrofluorimeter and develop two add-on hardware modules to expand the Eclipse's power and technical versatility. During the next 9 to 12 **months**, SCSU faculty and students will produce these **modules** in collaboration with Dakota Technologies Inc. (DTI), a leader in development of novel, pulsed laser instrumentation for environmental and health related research.

"SCSU will clearly benefit, Varian will benefit by development of instrumentation for their

Eclipse, and DTI will win by commercialization of the modules," said Dvorak.

At SCSU, the Eclipse and new hardware modules will be used to study three chemistry areas. One area relates to detecting environmental pollutants in soil and water samples. "Contaminants may be associated with fuel leaks and spills, pesticide and herbicide run-off, or food spoilage," noted Dvorak. A second area, according to Dr. Sreerama, is assessing foods, nutritional **supplements**, and pharmaceuticals for their ability to detoxify or toxify chemicals that may prevent or cause cancer. The third area involves investigating the interaction of ultraviolet light with organic compounds. "The Eclipse will allow us to study photochemical reactions on a very short time scale — one billionth of a **second**," stated Dr. Gregory. "This will enable us to develop a more complete picture of a compound's reactivity."

In addition to SCSU faculty and students, the equipment will benefit others in the region. Scientists at the College of St. **Benedict** and Saint John's University have already expressed interest in using the **MALDI** mass spectrometer to pursue their research. Local high school teachers who participate in the SCSU Chemistry Department's summer workshops will update their skills and knowledge through hands-on experience with the new instrumentation. And chemistry classes from local high schools are frequently invited to conduct experiments in the Chemistry Department's laboratories.

A 1999 NSF grant and the University's willingness to contribute \$46,750 in matching funds were influential in the Chemistry Department receiving the two MRI awards in 2002. Although the MRI competition is not yet complete, NSF predicts that 2002 award statistics will be similar to those from 2001, when **non-Ph.D.** granting institutions, like SCSU, received 170 grants totaling about

\$25 million.

The Department of Chemistry at SCSU consists of 13 **faculty** members, two laboratory services specialists, and an office manager. Its undergraduate program is approved by the American Chemical Society.

SCSU is the second largest public university in Minnesota with about 15,600 students and 175 majors, minors and pre-professional programs.

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Note: For photos, contact mproell@stcloudstate.edu.
The SCSU word mark is available at <http://www.StCloudState.edu/~ucomm/>.