VERMONT EPSCoR NEWSLETTER

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HTTP://www.uvm.edu/~epscor/

I. The Vermont Experimental Program to Stimulate Competitive Research (EPSCoR) Program

Dr. Christopher W. Allen, Vermont EPSCoR Project Director

The Vermont EPSCoR program is a partnership involving federal granting agencies, higher education, the private sector and state government. The core EPSCoR mission is to build a strong, vibrant science and technology infrastructure in Vermont, which will respond to the need for technology-based economic development in the state. Central to this mission is the recognition of the paramount necessity for a strong research university, which can form private sector partnerships and generate the new technologies as well as enhance current ones. The Vermont EPSCoR program is structured to most effectively maintain a balance of focus on infrastructure needs of the science and technology community and the relationship of these needs to economic growth. The connectivity is demonstrated by the fact that the Vermont Technology Council, a group of 23 esteemed Vermont leaders who represent academia, state government and the Vermont business community, serves as the governing board for the EPSCoR program, and that the State Science and Technology Plan developed by the Council in 1994 provides guiding principles for EPSCoR program development.

II. Current Activity in the National Science Foundation (NSF) EPSCoR Program

NSF EPSCoR COOPERATIVE AGREEMENT

The NSF component of the Vermont EPSCoR program is currently in the third year of a three year Cooperative Agreement with the National Science Foundation, with matching funds provided by the University of Vermont and, in part, the state of Vermont. Several new competitive funding opportunities have been initiated through this program, which receives $1,000,000 annually from the NSF. Some of these activities are described below.

GOALI Phase 0

The GOALI (Grant Opportunities for Academic Liaison with Industry) Phase 0 program was created to help researchers prepare for the federal NSF GOALI program by providing modest seed grants to facilitate academic-industrial partnerships and generate initial data.

GRADUATE RESEARCH FELLOWSHIPS

A competition is staged twice a year to provide graduate student support for faculty in order to improve the ability of early career faculty members to successfully compete for federal funding. Awardees are required to submit grant proposals prior to receiving the second year of the fellowship.

TEACHING POSTDOCTORAL FELLOWSHIPS

The competition for this program is announced twice yearly, with the goal of effectively mentoring young faculty, providing an effective teaching experience, and like the Graduate Research Fellowship program, positively impact the research competitiveness of the faculty mentor.

MINIGRANT PROGRAM

Minigrants for the purpose of deferring the costs of "fee for services" centralized facilities at the University of Vermont for early career faculty have been awarded for facilities that include but are not limited to, microscopy, DNA sequencing and A.A. spectroscopy.

EQUIPMENT

In addition to support of laboratory work, research facilities and instrumentation have been put in place with EPSCoR funding. These include cell imaging facility, thin film diffractometer, solid state NMR spectrophotometer, FT-IR spectrometer and Mass Spec Data system, Molecular Ecology Evolution lab, DNA sequencer, electron spin resonance spectrometer.

Four EPSCoR equipment grants have been awarded. One grant will develop a Quantitative Microscopy Facility in the College of Engineering and Mathematics at UVM, and will serve faculty researchers from Mechanical Engineering, Civil Engineering, and Electrical and Computer Engineering. A second grant will fund a Microarray Facility which will help build genome research capability and address biomedical issues as well as many other areas of science included in UVM's research mission. The National Institutes of Environmental Health Sciences and the EPA are both interested in the application of microarray technology for environmental monitoring. Previous equipment grants supported development of the Structural Biology facilities at UVM. A grant for a Thermogravimetric Analysis and Digital Scanning Calorimetry system has been made to the UVM Chemistry Department, and an award to Botany for a digital camera system.

As is the case with much of the other multi-user research instrumentation at UVM, access by private sector scientists and engineers can be (and is) arranged on nominal fee for service basis.

SUMMARY OF FUNDING

The success of EPSCoR-supported researchers in attracting continued federal funding is very impressive. Vermont has received $5.50 for every $1.00 it invested in EPSCoR (5:1 return on investment). The State has provided $2,900,000 to Vermont EPSCoR since 1985 ($300,000 per year 1985-1991 and $200,000 per year 1993-2000). The federal government has provided $16,860,000 to Vermont EPSCoR since 1985.

It should be noted that salaries and wages are by far the largest component of these grants; consequently this is providing employment for Vermonters and injecting a significant amount of money directly into the Vermont economy.

III. EPSCoR PROGRAMS IN OTHER AGENCIES

As a result of the demonstrated success of the national NSF EPSCoR program, Congress has mandated development of EPSCoR programs in seven federal granting agencies. The Vermont EPSCoR program has an active interest in all of the available, relevant funding sources, and currently receives funding from NSF, NIH, NASA, DOE, DoD, EPA and DOC. A major barrier to aggressive development of these additional resources for Vermont is the necessity (requirement) for providing 1:1 matching funds.

OTHER AGENCY AWARDS

EPA EPSCoR

A two-year $464,000 award from the Environmental Protection Agency which began in November, 1999, funds activities that support environmental research infrastructure, as well as a multi-investigator project focused on non-point source pollution and environmental risk assessment. Researchers at UVM work together with the Vermont Agency of Natural Resources.

Department of Energy (DOE) EPSCoR

In July, 2000, Vermont EPSCoR received an award for $650,000 per year for three years from the DOE EPSCoR program. This effort is in the area of Structural Biology and Computational Biology/ Bioinformatics. Dr. Susan Wallace, chairperson of the UVM Department of Microbiology and Molecular Genetics is the principal investigator of this project.

DEPSCoR (Department of Defense EPSCoR)

In February, 2000, four UVM researchers received three-year awards for the DEPSCoR program: Dr. Richard Foote, Department of Mathematics and Statistics; Dr. Christopher Landry, Department of Chemistry, Dr. Walter Varhue, Department of Electrical and Computer Engineering, and Dr. Guoliang Xue, Department of Computer Science. In 2001, the Vermont DEPSCoR awards were received by UVM researchers Dr. Charles Colbourn (Computer Science), and Dr. Kurt Oughstun (Electrical and Computer Engineering).

EPSCoT (Department of Commerce Experimental Program to Stimulate Competitive Technology)

Vermont EPSCoR Project Director Christopher Allen was awarded a grant (11/15/99-5/14/01) for $86,000 from the U.S. Department of Commerce to enhance science and technology-based economic development in Vermont by supporting partnerships to promote a technical liaison program and develop statewide outreach programs to inform entrepreneurs about SBIR opportunities. The Vermont Technology Council, EPSCoR, and the State Agency of Commerce and Community Development work together to further encourage technology transfer activities.

NASA EPSCoR

Dr. William Lakin, UVM Department of Mathematics and Statistics, has a NASA EPSCoR planning grant to develop a full NASA EPSCoR proposal. The proposal

under development will include a new Industrial Partners Initiative which would facilitate interaction between University faculty and Vermont companies in the aerospace/space-related, biomedical, earth science-related and other technological areas of interest to NASA.

NSF EPSCoR Standard Grants

An earlier NSF Standard grant (July, 1997-August, 2000) EPSCoR Standard Grant entitled "Strengthening Vermont Technology Partnerships through Centers of Excellence" brought three projects at UVM from the research level to the point of prototype development and provided interim support for the Technology Transfer office at UVM.

Another successful Standard Grant proposal was submitted in February, 2000, and features "A Multi-disciplinary Research Culture in Environmental Science and Engineering." This grant coordinates multidisciplinary research on Vermont's environment, and focuses on the hydrology, ecotoxicology, microbial ecology and biodiversity of ombrotrophic bogs in Vermont.

NIH IDeA-COBRE

The IDeA (Institutional Development Award) program has created a major new EPSCoR-like initiative called COBRE (Centers of Biomedical Research Excellence). In 2000, University of Vermont's Dr. Charles Irvin received a $2,000,000 COBRE award to study lung biology (with relevance to asthma and other chronic lung conditions). In 2001, Drs. Rodney Parsons and Cynthia Forehand submitted a $1.8 million COBRE proposal to develop a Center of Excellence in Neuroscience.

A new NIH IDeA initiative for a Biomedical Research Infrastructure Network (BRIN), was announced this year; Vermont submitted a proposal for $2,000,000

to develop a BRIN in the area of genetics.

IV. PRIVATE SECTOR RESEARCH

Outreach

With the Vermont Technology Council and the State Economic Development Department, EPSCoR co-sponsors SBIR workshops which feature presenters from the federal agencies involved in the SBIR program. EPSCoR also administers the Phase 0 SBIR program. This Phase 0 grant program funds the initial investigations needed to demonstrate proof of concept to a sufficient degree that the Vermont entrepreneur can submit a competitive federal SBIR Phase I proposal. Vermont EPSCoR created the Phase 0 SBIR program, and the concept has since been adopted on a national level. The $307,000 EPSCoR investment in SBIR Phase 0 since 1992 supported Vermont businesses in their successful quest for over $5,000,000 in federal SBIR grants (16:1 return on investment). The current solicitation increases the individual award potential to $10,000 and has a specific component of three awards for environmentally-related businesses, in addition to the general awards, thanks to the new EPA-EPSCoR grant. Proposals are due in the EPSCoR office on April 16, 2001. Contact Janet Franz at 802-656-7969 for a solicitation.

V. OUTREACH TO VERMONT AND HUMAN RESOURCE DEVELOPMENT

Two EPSCoR programs focus on development of the next generation of Vermont scientists and engineers are part of the Vermont EPSCoR effort

- The **High School Outreach Program**

The High School Outreach Program brings high school science teachers and students into college laboratories during summer vacations to develop school-

based projects, which allow hands-on introduction to science and engineering as it is really done. In order to reach a broader audience of young Vermonters, an annual **Science, Math and Technology Careers Day** is sponsored by the EPSCoR program at UVM. Participants from across the state come to hear presentations on science careers, see the posters created by their peers in the Outreach Summer Research Program, and participate in talks and hands-on demonstrations in over sixteen UVM laboratories. This program attracts 400 high school science students and teachers each year. The 2001 Careers Day will be held at the University of Vermont on **March 20.** Call Gayle Bress at 802-656-0706 for details.

- **Small College Development**

The Small College Development program began in 1986, and supports research at Vermont's small public and private colleges. These grants are awarded on a competitive basis and are designed to enhance on-campus research projects involving undergraduates. This program has funded 97 projects at 9 institutions other than UVM across the state.

VI. NATIONAL PARTNERS

American Association for the Advancement of Science (AAAS) Direct Assistance Program

State EPSCoR programs are able to access AAAS resources for assistance in any issue of central importance to enhancement of the state science and technology infrastructure. Using this opportunity, Vermont EPSCoR hosted environmental consultants in a three day site visit in November, 1998. A successful EPSCoR Standard Grant from the National Science Foundation, as well as the EPA EPSCoR grant, address this particular issue. A recent visit from a team of AAAS experts in the field of Advanced Materials Science provided constructive recommendations which will be taken into consideration as the new proposal to the NSF is developed. (see below)

Annual Conference

The EPSCoR Conference entitled **Internet2 Day**, was held on October 24, 2000 at UVM. Keynote speaker was Dr. Judith Vaitukaitis, Director of the National Center for Research Resources at NIH. Guest presenters from Boston University Northern Crossroads project explained the potential for increased research capability from a regional perspective. UVM's current status and future plans were discussed, and a panel of UVM scientists discussed their vision for how the new technologies will enhance their research. Mary Kratz from Internet2 focused on the project's goals to create a leading edge network capability for the national research community.

VII. FUTURE PLANS

EPSCoR Subcommittee of the Vermont Technology Council

An expanded and reconstituted EPSCoR Subcommittee has been established. Members include the CEO of Verizon, Inc., a senior economic advisor to the Governor, the Secretary of the Vermont Agency of Economic Development, and the Executive Director of the Vermont Technology Council. An expanded role for this subcommittee involves early stage input into proposal preparation, expanded state connectivity and advocacy and program review.

NSF EPSCoR

The next NSF EPSCoR submission is due July 17, 2001. The opportunity exists for increased funding from the current $1,000,000 per year up to a maximum of $3,000,000. This increased opportunity may be accompanied by an increased degree of competitiveness. Consequently, detailed planning is mandatory in order to identify innovative investment opportunities in Science and Technology infrastructure in Vermont which will lead to increased direct Federal R&D funds.