

VERMONT EPSCoR NEWSLETTER

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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 serves as the governing board for the EPSCoR program and that the State Science and Technology Plan developed by the Council 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 second 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.

Two EPSCoR equipment grants have recently 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.

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.

OTHER AGENCY AWARDS

EPA EPSCoR

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

Department of Energy (DOE) EPSCoR

Vermont EPSCoR has recently been notified of 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. The average award for the national DEPSCoR program is \$296,000.

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

Vermont EPSCoR Project Director Christopher Allen has been awarded a one-year grant (11/15/99-11/14/00) for \$86,000 from the U.S. Department of Commerce will 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 will be working 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.

PRIVATE SECTOR RESEARCH

The Vermont EPSCoR organization has evolved into the reference center for all activities related to the Small Business Innovation Research program (SBIR). EPSCoR sponsors SBIR workshops with presenters from the federal agencies involved in the SBIR program. EPSCoR also administers the Phase 0 SBIR

program. This 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. Vermont EPSCoR earned the 1996 Tibbetts Award from the U.S. Small Business Administration in recognition of their contributions to the national program. The \$234,000 EPSCoR investment in SBIR Phase 0 since 1992 supported Vermont businesses in their successful quest for \$4,000,000 in federal SBIR grants (17:1 return on investment). The current solicitation increases the individual award potential to \$7,500 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.

OUTREACH TO VERMONT AND HUMAN RESOURCE DEVELOPMENT

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

- 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 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 has grown to 700 participants in 1999. Science/Math/Technology Careers Day will be held **May 23, 2000**. Call Gayle Bress at 802-656-0706 for details.
- The EPSCoR **Small College Development** program 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 since 1987.

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. The resulting site visit report verified that "the university is nationally competitive in a number of environmental research areas and is capable of achieving nationally competitive status in others." The report cited several challenges to be overcome, including the coordination of existing programs. A February, 2000 EPSCoR Standard Grant proposal to the National Science Foundation, as well as the EPA EPSCoR grant, address this particular issue.

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. A major barrier to aggressive development of these additional resources for Vermont is the necessity (requirement) for providing 1:1 matching funds.

Proposals Submitted

NSF EPSCoR Standard Grants

The current (July, 1997-August, 2000) EPSCoR Standard Grant entitled "Strengthening Vermont Technology Partnerships through Centers of Excellence" was designed to bring three projects at UVM from the research level to the point of prototype development. It also provided interim support for the Technology Transfer office at UVM.

Another Standard Grant was submitted in February, 2000. This grant would develop "A Multi-disciplinary Research Culture in Environmental Science and Engineering" at UVM, and would support a position of Environmental Coordinator in addition to multidisciplinary research on Vermont's environment

NIH IDeA-COBRE

The IDeA (Institutional Development Award) program has announced a major new EPSCoR-like initiative called COBRE (Centers of Biomedical Research Excellence). This year Vermont has submitted one proposal in the basic area (neurobiology) and one with a more clinical direction in lung biology (with relevance to asthma and other chronic lung conditions). Increased funding for the IDeA program is proposed for FY 2001. A successful proposal could result in an award of \$1.5M per year for five years.

IV. FUTURE PLANS

EPSCoR Subcommittee of the Vermont Technology Council

An expanded and reconstituted EPSCoR Subcommittee is in the process of being established. An expanded role for this subcommittee involving early stage input into proposal preparation, expanded state connectivity and advocacy and program review is under consideration.

NSF EPSCoR

The next NSF EPSCoR submission is due July, 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.

A proposal for a \$75,000 supplement to the current Cooperative Agreement in order to provide expert assistance (consultants) is in preparation.

NIH IDeA-COBRE

Current pending legislation would increase the Federal investment in this program. Ongoing work with the Vermont Congressional delegation to develop support is continuing. If the reauthorization is successful, a partnership of Vermont EPSCoR, the University of Vermont and the UVM College of Medicine will focus on maximizing opportunities for success in this area.

Outreach

Plans for implementation of the SBIR outreach program supported by the EPSCoT grant are under development. Short term (workshops) and long term (electronic sites) solutions are planned. This program will be a partnership between Vermont EPSCoR, the Vermont Technology Council, and the State of Vermont Agency of Commerce and Community Development.