VERMONT EPSCoR NEWSLETTER

Vermont Experimental Program to Stimulate Competitive Research

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Vermont EPSCoR is the Experimental Program to Stimulate Competitive Research, a cooperative effort of federal and state government, the higher education community, and the private sector in Vermont.

EPSCoR AWARD FOR 1999-2002

The National Science Foundation has recently announced the new award to the Vermont EPSCoR program; the 1999 award will total $1 million, which is matched by local private, institutional and state funds. The new 3-year EPSCoR program will feature several new competitive funding opportunities, described below.

FOCUS AREAS FOR THE NEW EPSCoR PROGRAM

The new EPSCoR effort will strengthen activities of the State of Vermont in pursuit of a proactive policy of science and technology development in the context of local needs and opportunities. While the primary focus is on the University of Vermont (UVM), significant outreach components to the private sector and other components of the educational community exist. The areas of emphasis match those identified in the State Plan for Science and Technology. The criteria for selection of the focus areas were potential for contributions to economic development in the state and importance in the future vision of strengths at the University of Vermont. The specific areas of emphasis are:

Advanced Materials: These investigations will focus on areas of current importance such as electronic materials, sensors, porous solids and polymers along with an increased focus on biomaterials.

Biotechnology: Research in this area will focus on areas in biology which in principle can lead to new technologies. These cover the range from modern molecular biology and genetics to measurement technologies related to biological processes.

Environmental Science & Engineering: This component will cover a broad range of activities from groundwater modeling to field based studies. The thrust will be to develop cross departmental and college collaborations in order to advance the strength of environmental based research across the University.

NEW EPSCoR COMPETITIVE FUNDING OPPORTUNITIES

GOALI Phase 0: In order to take advantage of the NSF Grant Opportunities for Academic Liaison with Industry (GOALI) program, we have established a GOALI Phase 0 program. In this initiative, modest one year seed grants will be available for academic-private sector research collaborations designed to form the partnerships and generate initial data which will be the basis of a competitive federal GOALI proposal. This initiative will be appropriate for each of the focus areas and will allow researchers to expand their horizons in terms of viable and significant research opportunities. Awards will be made on a competitive basis for those proposals which best match the following criteria: early career preferred to senior faculty; Vermont-based businesses preferred to out-of-state businesses; potential for success at NSF.

Postdoctoral Competition: A competition for two teaching postdoctoral positions per year will be offered to researchers in the focus areas. Faculty in the focus areas will be given the opportunity to apply for a postdoctoral position for his or her research group. The awards will be made on a competitive basis

for those which best match the following criteria: early career faculty; detailed and effective mentoring plan; nature of teaching assignment; joint research bridging departments or programs. Identification of a postdoctoral candidate from groups underrepresented in science and engineering would also be given priority. The expected outcomes for this initiative will involve both research enhancement in the Vermont focus areas due to the availability of highly trained personnel and a new approach to effectively preparing young scientists and engineers for academic careers.

Graduate Research Fellowships: Graduate Research Fellowships are available on a competitive basis for research groups in the areas of Advanced Materials, Biotechnology, and Environmental Science and Engineering. The support is primarily designed for students who have completed all or nearly all of their formal course work requirements and can devote full time to research.

Minigrant Competition: A hallmark of modern scientific research is the aggressive application of modern instrumentation and technology to complex problems. A minigrant fund has been established in each of the focus areas which will fund services from the numerous centralized "fee for service" instrumentation facilities in Vermont (e.g. DNA sequencing, NMR spectroscopy, the array of modern microscopies, x-ray crystallography, inductively coupled plasma AA). We anticipate that these funds will have the greatest impact on competitiveness when awarded to researchers who are in the early stages of their careers. However, these funds will be available on a limited basis for small Vermont science and technology-based businesses and senior researchers who are temporarily between grants. The inclusion of private sector groups is consistent with EPSCoR's overall goal of building totality of the Vermont science and technology community.

New Equipment Acquisitions: In addition to current instrumentation facilities, EPSCoR will provide funds for acquisition of new instrumentation in the advanced materials

and biotechnology focus areas. The materials scientists as a group have specified the need for equipment funding in the continual upgrading and modernization of the tools required for competitive modern science and engineering. The approach will emphasize multiuser facilities and proposals which carry a significant matching component from another source.

The first round of awards have been made and will be announced in late December.

PROJECT MANAGEMENT

Dr. Christopher W. Allen, professor of Chemistry at UVM will continue as EPSCoR Project Director. Dr. Judith Van Houten, chair of Biology at UVM is Associate Director. The experienced EPSCoR staff will administer the program activities. The University of Vermont is the fiscal agent for EPSCoR. Committees have been established which will review the proposals received in response to the announcements for new funding opportunities.

HIGH SCHOOL OUTREACH

The **EPSCoR High School Outreach Program** was begun in 1994. In that year, four teachers and 10 students were involved in the program designed to provide summer research experiences in college laboratories, learning from college faculty sponsors. There were four faculty sponsors at that time. In 1995, eight teachers and 18 students were involved, requiring eight faculty sponsors, six of whom were in **UVM** labs, one at **Johnson State,** and one at **Lyndon State**. In 1996, nine teams involved eight high school teachers, 16 students, and eight faculty sponsors, six at **UVM**, one at **Bennington College,** and one at **Lyndon State.** In 1997, nine teams were involved, seven at **UVM**, one at **Middlebury College**, and one at **St. Michael's College**. Seventeen students, nine teachers and nine faculty sponsors participated. This year, seven teams involved seven teachers, 15 students and seven faculty sponsors participating in seven teams, five at **UVM,** one at **Middlebury**, and one at **Norwich University**. Over 50% of the

student participants in this program are female. Contact **Maria Timmons**, High School Outreach Coordinator at 802-656-0706 or e-mail **mtimmons@zoo.uvm.edu** for more information about this and the **Science and Technology Careers Day.**

SCIENCE AND TECHNOLOGY CAREERS DAY

The first **S&T Careers Day** was held at **UVM** in May, 1995. About 80 high school students, teachers and parents attended the day of lab tours and posters done by the summer research teams from the **High School Outreach Program**. Ten varied research demonstrations were held. On May 23, 1996, **350** students, teachers and parents attended this expanded event. On **May 21, 1997,** thirty-six University faculty participated through scientific demonstrations and lectures on careers in science. Once again, over 350 students, teachers and parents attended. This year's event drew over 600 students and teachers and required additional closed-circuit TV to accommodate the audience. Contact **Maria Timmons** at 802-656-0706 for information about these programs.

PHASE 0 SBIR

This program serves to introduce local entrepreneurs to the federal **Small Business Innovation Research (SBIR)** program. To date, **Vermont EPSCoR** has made 43 awards of $5,000 each and 4 Incentive Awards of $3,000 contributed by the State of Vermont. At least twelve Phase 0 projects have achieved Phase I funding from the federal SBIR program. Three have received federal Phase II awards. The federal SBIR awards range from $100,000 (Phase I) to $750,000 (Phase II). In 1998, 8 Phase 0 projects were selected for funding at $5,000 each. Awards were received by **MicroStrain, Inc. (Burlington)** for "Novel Fabrication Methods for High Volume, Low Cost MicroCoils;" **Green Mountain Antibodies (Burlington)** for "Antibody Inhibitors of Thrombosis;" **LexiCon Systems, (Sharon)** for "A Preliminary Test of an Object-oriented Computer Conversion System;" **Haematologic Technologies, Inc. (Essex Junction)** for "Development of a Whole

Blood-based Coagulation Screening Assay;" **ENERFEX (Williston)** for "New Membrane Technology to Improve ammonia Refrigeration Systems;" **TREADLE POWER, Inc. (Burlington**) for "New Mobility: Expanding the Potential for Autonomous Mobility for People with disabilities by Utilizing a Reciprocal-motion Drive Cycle;" **TeraComm Research, Inc. (Essex Junction)** for "High Power Pulsed Laser;" **Glowfish, Inc. (Underhill)** for "Optical Memories: Optical Fiber Data Storage."

The 1999 round of competition is in early spring. Call 656-7969 for details.

WWW INFORMATION

You may view our **EPSCoR Home Page** at **http://epscor.uvm.edu** Within our home page you will be able to access our searchable **Environmental and other Researcher Database**, a directory which provides **information on over 1000 researchers** in academia, business and government.

ANNUAL VERMONT EPSCoR CONFERENCE

The Annual Vermont EPSCoR Conference – "**Vermont EPSCoR: Five Years of Progress**" was held on October 6, 1998 at the University of Vermont. The conference featured the four EPSCoR Research Clusters and the Phase 0 SBIR program supported by the National Science Foundation. Forty-seven posters were displayed by EPSCoR-supported researchers. Special guest, **Dr. John Kauer**, gave the keynote talk. Dr. Kauer is **professor of neuroscience and of anatomy and cellular biology at Tufts School of Medicine**. His major research focuses on how information is processed in the brain; specifically on the way the olfactory system recognizes the properties of odors. He is principal investigator on a current project to refine the "artificial nose" to sniff out land mines. His talk

covered the development of basic science of the detection process and process of developing a company from this basic research.

PARTNERSHIP WITH THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS)

The NSF EPSCoR-AAAS Research Competitiveness initiative has allowed the Vermont EPSCoR program to bring nationally recognized consultants to Vermont in a variety of areas central to the EPSCoR mission. Last year we brought in teams to assist in building the UVM Technology Transfer program. This year on November 16-18 we will host a team to look at our efforts in Environmental Science and Engineering with the goal of identifying potential areas of synergistic activities between environmental groups on the UVM campus.

SMALL COLLEGE DEVELOPMENT PROGRAM

The Vermont EPSCoR Small College Development Program has been a long-standing opportunity for faculty at undergraduate colleges in Vermont to pursue summer research. Over the years, eighty-three projects involving faculty and students have been supported at eight different colleges (**Bennington College, Castleton State College, Johnson State College, Lyndon State College, Marlboro College, Middlebury College, Norwich University, and St. Michael's College**). Most projects are within the $3,000 - $6,000 range.

In **1998 awards** were made to the following faculty members:

Valerie Banschbach, Department of Biology at **St. Michael's College** for "Competition in forest ants: The impact of tool use by *Aphaenogaster rudis*;" **Lisa Landino,** Department of Chemistry/Biochemistry, **Middlebury College** for "Detection and Biochemical Consequences of Oxidative Damage to Microtubule Proteins;" **Andrea Lloyd,** Department of Biology, **Middlebury College** for "Long-term forest dynamics in an uncut forest fragment in central Vermont;" **Cynthia**

Moulton, Department of Natural Science, **Castleton State College** for "Plethodon salamander Population Dynamics and Ecological Integrity of Poultney River D.B.;" **David Scharstein,** Department of Math and Computer Science, **Middlebury College** for "The Effects of Imperfect Data on Stereo Algorithms."

A call for proposals for the 1999 Small College Development competition will be available in early spring. ■

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For more information about the EPSCoR program, please e-mail Lilian.Gamache@uvm.edu or call

802-656-7969