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 and the higher education community in Vermont.

EPSCoR AWARD FOR 1997

The National Science Foundation has recently extended the Vermont EPSCoR program; the 1997 award will total $1.488 million, which is matched by local private, institutional and state funds. It is anticipated that continued funding will be possible through 1998 and beyond.

CURRENT EPSCoR RESEARCH

Ongoing research programs feature scientific investigations into four basic areas at the University of Vermont (UVM): Computational Science and Engineering, Evolutionary Ecology, Receptor-mediated Signaling and Biotechnology, and Advanced Materials.

The Computational Science and Engineering (CSEC) group is led by Professor David Dougherty, faculty member in Civil and Environmental Engineering at UVM; Dr. Dougherty is newly appointed this year, succeeding former Cluster Director Dr. George Pinder. Half of the current projects are continuations from the first three years and half are new projects led by new focus faculty, Drs.

Donna Rizzo and George Karatzas, UVM Civil and Environmental Engineering. Several former members of the cluster "graduated" as they received independent funding from other sources. Dr. Charles Colbourn joins the group as a mentor. He is a new senior faculty member in the Computer Science and Electrical Engineering Department at UVM and has come to the University as the inaugural Dorothean Professor of Computer Science. Stuart "Red" Martin, of WCAX Television in Burlington, generously endowed a research professorship in the College of Engineering and Mathematics; the Dorothean Professorship is named in memory of his wife.

CSEC researches computational science and engineering, mostly related to algorithms for solving specific problems. In addition, CSEC develops ideas that facilitate such advancement, including computer interconnection schemes and experimentation with parallel computing environments. The cluster members apply computational methods and mathematical modeling to problems in the environment, biology and computer methodology.

The Receptor-mediated Signaling and Biotechnology cluster currently is led by Dr. Thomas Tritton, UVM Vice Provost and Professor of Pharmacology. Dr. Tritton will leave in June to become President of Haverford College in Pennsylvania. Taking his place as Cluster Director will be Dr. Douglas Johnson, who began his UVM career as one of the first EPSCoR-funded microbiology researchers in the Microbiology and Molecular Genetics Department. Through the addition of several new UVM faculty researchers, this cluster has extended its range. Dr. Jose Madalengoitia is a new Chemistry Department faculty member. Dr. James Posada is in Molecular Physiology and Biophysics. Two new pilot projects will be started, one by Dr. Lily Chen, Cell and Molecular Biology Program, and Dr. Michael Kalafatis, Biochemistry Department. Dr. Lynne Schneider, a new member of the Biology Department, was the recipient of a pilot project award from this cluster, and has graduated to full cluster membership. This research group is focused on the fundamental aspects of cellular function

with specific focus on biological signaling mechanisms and the relationship of these events to the mechanism of action of numerous drugs. This interdisciplinary group draws members from the basic and applied biomedical sciences and biology. Technology transfer from this cluster has led to private sector development. Dr. Mark Brann, a "graduated" member of this group, has started his own company, Receptor Technologies. New laboratories have been established including one in the UVM Department of Biomedical Technology and one at Johnson State College. A state-of-the-art, campus-wide accessible Cell Imaging Facility has been developed.

The Advanced Materials cluster's new multi-disciplinary approach, led by Dr. Walter Varhue, Professor of Electrical Engineering at UVM, has become the research norm for Materials Science at UVM. This is best exemplified by the thin film work centered in the synthesis and characterization work which reaches out to chemistry for molecular precursors, to physics for theoretical understanding and application to sensors, and to mechanical engineering for tool coatings. Major instrument acquisitions by this cluster have resulted in a high quality characterization laboratory being established. New cluster member, Dr. Hongda Chen, Assistant Professor in the UVM Animal and Food Sciences Department, provides a unique opportunity for this group to develop a biomaterials initiative. His research will focus on developing a basic science approach to biomaterials characterization and to develop expertise in chemical modification of biomaterials. Dr. Christopher Landry has joined the cluster as a new faculty member to the UVM Chemistry Department. His research will be concerned with controlling the macroscopic properties of selected organic-inorganic composite materials and the development of thin film precursors.

The Evolutionary Ecology group led by Dr. Joseph Schall, Professor of Biology at UVM, seeks to understand the ways ecological, evolutionary, and historical factors interact to produce patterns in nature. The various subdisciplines that make up evolutionary ecology contribute to solving "real-world" problems as well

as contributing to theoretical science. Members of this cluster are studying various aspects of parasite-host biology. The biodiversity crisis is approached in the research on the genetics of small populations, the distribution and genetics of rare species and the invasions of pest plants into natural communities.

Five members of the very successful Evolutionary Ecology cluster have been funded by the National Science Foundation and the National Institutes of Health for individual research, and the group was awarded the first NSF Graduate Training Grant in Vermont's history.

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 nine high school teachers, 18 students, and nine faculty sponsors, six at UVM, one at Middlebury College, one at Lyndon State, and one at Norwich University. Over 50% of the student participants in this program are female. Upon completion of their experiences in the program, High School participants have expressed such comments as "Out of everything I did in high school, I feel EPSCoR was the most important activity I chose to participate in." (Burlington H.S.) and "I gained laboratory experience that most others won't have until late in their undergraduate careers." (Lyndon Institute). Contact Maria Timmons, High School Outreach Coordinator at 802-656-0706 or e-mail mtimmons@zoo.uvm.ed 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. This year's event will be held at UVM on May 21, 1997. Contact Maria Timmons.

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 28 awards of $5,000 each and 4 Incentive Awards of $3,000 contributed by the State of Vermont. At least seven Phase 0 awardees have gone on to achieve funding from the federal SBIR program. The federal SBIR awards range from $100,000 (Phase I) to $750,000 (Phase II). In 1996, 41 Phase 0 proposals were received; 9 were selected for funding at $5,000 each. The review process requires a wide variety of experts drawn from local scientists, industry, and state government. Phase 0 proposals received in March are currently under review; 1997 awards are expected to be announced in May.

A Vermont SBIR workshop was held at the University of Vermont on November 8, 1996. Ann Eskesen led the "Fall BootCamp 97" which was an SBIR support initiative sponsored by DOD BMDO and set up in collaboration with SBIR support organizations in the six New England States. EPSCoR was identified as the participating SBIR support organization in Vermont. Sessions were described as in-depth, no-frills examinations of all SBIR participating agencies. Information about federal procurement, business development and commercialization of funded projects was provided to the group.

TIBBETTS AWARD

Vermont EPSCoR is a proud recipient of the Tibbetts Award, which was recently created by the Small Business Administration to recognize the most successful individuals/groups involved in national research and development projects under the Small Business Innovation Research grant program. Project Coordinator Janet H. Franz accepted the award on behalf of Vermont EPSCoR from Senator Patrick Leahy.

WWW INFORMATION

You may view our EPSCoR Home Page at http://www.uvm.edu/epscor/ Within our home page you will be able to access our Environmental Database, a directory which provides information on over 900 environmentally-related researchers in academia, business and government.

STATE PLAN: CENTERS OF EXCELLENCE

The State Plan for Science and Technology was updated in November, 1996 as a "Second Anniversary Progress Report." A copy is available through the EPSCoR office. Call 802-656-7969.

We are pleased to welcome Dr. Paul Huyffer back to Vermont in his new role as the Executive Director of the Vermont Technology Council. Dr. Huyffer was the recipient of the first Ph.D. in Organic Chemistry ever granted at UVM (1964). He brings thirty years of experience to his new position; prior positions included Vice President, Science and Technology of the Markem Corporation, and several senior executive positions at Polaroid Corporation. We look forward to new cooperative arrangements between academic and industrial enterprises in Vermont through Dr. Huyffer's efforts.

The Food Science Center, one of the potential Centers of Excellence, hosted a tour of the renovated Carrigan Hall on the University of Vermont campus as part

of the Council's report. Francis G.W. Voigt, President of the New England Culinary Institute, heads the Food Science Center.

The renovation of Carrigan Hall has created an incubator facility for food safety researchers and for small companies seeking sophisticated food-processing or testing equipment on a short-term basis.

The Applied Biotechnology Center of Vermont (ABCV) is led by Dr. Norman Alpert, and has a core group of directors in place; articles of incorporation and a business plan should be available by the new year. Several research-based businesses are targeted for development.

The Partnership of Environmental Technology and Science (POETS) is directed by Dr. Robert Skiff, and focuses on environmentally-based business opportunities. Ventures taking shape in the Burlington Intervale anchored by the McNeil generating plant that could include aqua-culture, and incubator facilities in an Eco-park have been incorporated into a joint proposal to EPA.

U.S. Department of Energy Secretary Hazel O'Leary toured several targeted POETS sites on September 26-27, 1996, and at a breakfast for Vermont political and business leaders, indicated her personal support for the efforts underway

VERMONT MANUFACTURING EXTENSION CENTER (VMEC)

Vermont EPSCoR is delighted that VMEC has received extended funding from the National Institute for Standards and Technology (NIST); NIST also awarded VMEC a new grant to coordinate a network of environmental service providers. We will work together with Director Bob Zider and VMEC field agents in areas that link research and manufacturing.

ARGONNE WORKSHOP

A new EPSCoR initiative is being sponsored by the seven federal agencies that are involved in EPSCoR (Department of Energy, National Science Foundation, NASA, Department of Agriculture, National Institutes of Health, Department of Defense, and the Environmental Protection Agency). A series of federal laboratory-based workshops intended to encourage the formation of additional collaborative partnerships between EPSCoR researchers and the staff at the federal labs will be held in May. Several will be attending from Vermont EPSCoR.

DEPARTMENT OF DEFENSE EPSCoR (DEPSCoR)

In 1996, five DEPSCoR awards were made to UVM researchers:

Deborah A. Lannigan, Department of Pharmacology; David W. Maughan, Department of Molecular Physiology and Biophysics; Kyle Squires, Department of Mechanical Engineering; Guoliang Xue, Department of Electrical Engineering and Computer Science, and Yuanyuan Yang, Department of Electrical Engineering and Computer Science. These scientists were selected from 287 applicants in 19 states. The 1997 competition for DEPSCoR funding was announced in early April.

EPA EPSCoR

A proposal was submitted to the Environmental Protection Agency (EPA) EPSCoR program in March. Dr. Alan McIntosh, School of Natural Resources, UVM is the co-PI and Project Manager on the Strategic Improvement Plan to increase the competitiveness of Vermont researchers while addressing two particular environmental problems: 1) remediation decisions at contaminated groundwater sites and 2) strengthened tools for assessing risk to aquatic ecosystems in agricultural watersheds. The results of the projects would benefit the state in its efforts to protect and manage its surface and groundwater resources. The two research projects are led by Dr. Mary Watzin, School of Natural Resources, UVM, and Dr. George Karatzas, Department of Computer

Science and Environmental Engineering, UVM. In preparing this proposal, we have been in close collaboration with the Vermont Agency of Natural Resources, which has offered several examples of firm support and encouragement for the projects.

VT/ME/NH PROPOSAL TO NSF

In February, three New England States collaborated in the development of an EPSCoR proposal to the National Science Foundation. The proposal requests funds to upgrade the states' networking infrastructure. To support and sustain meritorious research applications requiring high bandwidth and foster thematic collaborations, Maine Science and Technology Foundation, and its partners, the University of Vermont and the University of New Hampshire, have applied for funds to seed connections to the NSF vBNS and participation in the Internet2 project. This is an effort to create a regional network consortium to define, maintain and self-sustain network quality of service and assure scalability for future research needs.

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

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