

Vermont Space Grant Consortium

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Affiliate Members:

St. Michael's College, Colchester, VT

Norwich University, Norwich, VT

Vermont Technical College, Randolph Vermont

Aviation Technology Center, Burlington Technical Center, Burlington, VT

Vermont State Mathematics Coalition

Fairbanks Museum, Fairbanks, VT

MicroStrain, Colchester, VT

Triangle Metal Fabrication, Milton, VT

Program Description:

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Vermont Consortium is a Capability Enhancement Consortium funded at a level of \$410,000 for fiscal year 2007.

Program Relevance to NASA:

Space Grant consortia build human capital and research expertise to support NASA programs and missions, expand NASA's expertise and educational networks, and bring knowledge and awareness of space to a broad range of constituents in every state. Vermont Space Grant helps "prime" the human resources pipeline by offering scholarships and fellowships to talented undergraduate and graduate students at Vermont institutions of higher education who are preparing for careers in science, technology, engineering, and mathematical areas relevant to NASA's mission. Vermont Space Grant also promotes the development of Vermont's research infrastructure by awarding a variety of research grants to academic researchers developing a broad range of projects that are aligned with new and continuing NASA research priorities. Outreach efforts, including collaborations with the office of Vermont's Lieutenant Governor and the Vermont Civilian Aviation interests, increase statewide appreciation for NASA's activities and mission.

Program Benefits to the State:

The Vermont State Science and Technology Plan, developed for the state by the Vermont Technology Council and revised in 2006, envisions that within ten years, Vermont will be nationally recognized for its ability to create, grow, and retain innovation-focused, technology-enabled businesses. It notes that state's economic future will depend on how it positions itself to continue to build a knowledge-based, innovation-driven economy. Specifically noted are breakthroughs in biomedical research, environmental technologies, and information technology, combined with emerging interdisciplinary sectors such as complex systems. The academic research projects and research infrastructure enhancement activities supported by Vermont Space Grant fully support the state plan. Indeed, in recognition of the role Vermont Space Grant plays in the state, we were invited to participate in the 2006 revision of the state plan.

Program Goals:

The Vermont Space Grant Consortium (VSGC) is dedicated to encouraging students at all levels to take more mathematics and science courses and to consider careers in science, technology, engineering, and mathematics (STEM) areas. Through its activities, the VSGC connects Vermont citizens to NASA and contributes to the development of the scientific and technical workforce that will be needed by NASA, its contractors, and the nation to remain competitive in the future. As a Capability Enhancement Consortium, the VSGC emphasizes programs in Higher Education and seeks to increase Vermont's research infrastructure in areas that are NASA priorities. In all of its programs, the VSGC promotes diversity by actively encouraging the participation of women, members of underrepresented groups, and persons with disabilities.

Program Accomplishments:

As a Capability Enhancement Consortium, a priority aim of the VSGC is increasing Vermont's Research Infrastructure in areas aligned with new and continuing NASA research priorities. The primary program used by the VSGC to promote the development of Vermont's research infrastructure is our yearly Faculty Research Grant Competition. Five faculty research projects were supported during the 2007 fiscal year. The first of these involved a VSGC-funded Small-Scale Grant awarded to Prof. Scott Stevens of the Division of Information Technology & Sciences at the Champlain College to study the effects of microgravity on intracranial pressure dynamics. A second Small-Scale Grant was awarded to Prof. Jun Yu of the Department of Mathematics at the University of Vermont (UVM) for research involving analysis of remotely-sensed NASA data sets to explore correlations between polar sea ice concentration and climate change. Three Research Minigrants providing seed funding for projects were also awarded to Profs. Jeff Frolik of Electrical Engineering and Beverly Wemple of Geography at UVM, Prof. Mandar Dewoolkar of Civil Engineering at UVM and Prof. Christopher Danforth of Mathematics at UVM.

It is an indication of the accomplishments of VSGC programs that Vermont's Governor James Douglas personally attended our 2007 Awards Night to represent the State of Vermont. In his remarks, Gov. Douglas showed that he was fully aware of the broad range of VSGC programs and the impact they have on the State. Also attending this

ceremony was Ms. Martha Hanson, Chief of Staff to Brian Dubie, Vermont's Lieutenant Governor and the current National Chair of the Aerospace States Association, and Ms. Margaret Gendron, a member of Senator Patrick Leahy's staff who specializes in educational issues.

Student Accomplishments:

Each year, VSGC scholarships are responsible for successful student outcomes. For example, Charles Morin was first awarded a Vermont Space Grant Undergraduate Scholarship in 2003 as a freshman Mechanical Engineering major at UVM. On the basis of exceptional academic performance and glowing reference letters, Mr. Morin's applications for continued VSGC merit-based undergraduate scholarship funding were approved from 2004 to 2007. Mr. Morin joined the VSGC-sponsored UVM MoonCat Team in 2003 and was a rider in NASA's Great Moon Buggy Race from 2003 to 2005. In 2006, he applied for and was offered a student summer internship at NASA Goddard and was awarded a VSGC special undergraduate scholarship that allowed him to accept this summer internship and have the benefit of this outstanding opportunity. Mr. Morin graduated with his baccalaureate degree in 2007. He is now employed by the Department of Defense as a Mechanical Engineer on US Army projects. His job responsibilities include working on design as well as overseeing different stages in production and testing. A second highly positive outcome of student participation in a progression of VSGC-supported programs involves Philip Lindermann. During all four years of his undergraduate studies in Mechanical Engineering at the University of Vermont, Mr. Lindermann was Team Leader of the UVM Moon Cat Team. In his last two years, he was also a VSGC Undergraduate Scholar and an advisor to the Vermont Baha Vehicle Team. After graduation in 2005, Mr. Lindermann accepted an engineering position at Triangle Metal Fabrication in Milton, VT. This company, which is internationally known for its fabrication of complex metal parts, is a VSGC affiliate and has been heavily involved in the construction of the UVM MoonCat vehicles through donations of materials, the use of its facilities, and a sharing of its expertise. At Triangle, Mr. Lindermann's work was highly praised and he was given training in quality assurance engineering. He also continued to be associated with the UVM MoonCat Team as a mentor and advisor. The General Dynamics Corporation recruited Mr. Lindermann as an Associate Quality Assurance Engineer in 2007. He currently divides his time between projects at General Dynamics facilities in Vermont and Maryland. At the graduate level, examples of student success as a result of VSGC support include Dr. Franco Fedele, who joined the NASA workforce at the Goddard Earth Sciences & Technology Center (GEST) at NASA Goddard, where he worked with Dr. Ronald Errico on techniques to reduce the errors associated with models used in weather forecasting. Other recent examples of success include Dr. Hania Mahassen and Dr. Scott Stevens, who currently have faculty appointments and are helping to train the next generation of STEM students.