

North Dakota Space Grant Consortium

Lead Institution: University of North Dakota

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Affiliate Members: Bismarck State College; Cankdeska Cikana Community College; Dickinson State University; Fort Berthold Community College; Grand Forks Herald; Lake Region State College; Mayville State University; Minot State University; Minot State University—Bottineau; North Dakota State College of Science; North Dakota State University; Sitting Bull College; Representative of American Indian Higher Education in North Dakota; Turtle Mountain Community College; United Tribes Technical College; Valley City State University; and Williston State College.

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 received 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 pipeline, including elementary/secondary and informal education. The North Dakota Space Grant Consortium (NDSGC) is a Capability Enhancement Consortium funded by NASA at a level of \$410,000 for fiscal year 2007 with matching funds from University, industry partners, and other non-federal sources at a level of \$306,000.

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. Since North Dakota has no Space Centers and almost no aerospace industry, Space Grant provides a visible presence for NASA in the state. With that in mind the NDSGC can promote the Mission Directorates while at the same time provide our students with special research opportunities that might be taken for granted in other states. Because of our small population and because of the close ties that we have developed with legislators, the governor and our Congressional delegation, the NDSGC is in a position to be a strong advocate for NASA and its projects.

Program Benefits to North Dakota: North Dakota is rapidly diversifying its economy and investing money to attract research and high technology companies. The NDSGC is an important contributor to the workforce development that is needed for that diversification. Space Grant provides financial incentives, through its scholarship and fellowship programs, for North Dakota students to do NASA-related research. Our

scholarship and fellowship recipients are put in a situation that allows them to contribute to the economic health of the state and/or to the national security of the country. The NDSGC is a major architect of the roadway that encourages students (high school through graduate school) to be involved with science and technology research. One of the successes of the NDSGC is providing opportunities for students at our two year and tribal colleges to be involved in research projects that are typically not available at their respective institutions.

Program Goals: The strategic plan of the NDSGC states that the objectives of our consortium are: to develop NASA-related research infrastructure in the state; enhance higher education programs not just at the two research universities but at the four year colleges, two year colleges and tribal colleges; and continue NASA-relevant K-12 and informal education activities; and improve consortium identify and communication.

Program Accomplishments: The NDSGC awarded 42 fellowships/scholarships in FY 2007. Fifty-five percent of these were awarded to women and 45 percent were awarded to men. The percentages of scholarships given to minority students exceeds the percentage of minorities in the general population. The newest research infrastructure of the NDSGC was the initiation of the Space Grant Internet Telescope Network (SGITN), which is envisioned as a geographically-distributed network of Internet-controlled astronomical observatories that will be available to college students and faculty for astronomical research. In addition several improvements were made to the astronomical infrastructure at the University of North Dakota (UND) Observatory. Post NDX-1 (planetary space suit research continued at UND. The NDX-1 received additional testing in the Utah desert and a recent emphasis has been on the development of a prototype Liquid Cooling Ventilation Garment (LCVG) for the NDX-1. Plans are to begin design, construction and testing of the NDX-2 in FY 2008 using state funds. Space Grant provided funds for the development of a vertical spacecraft simulator that will be used for classroom projects and research. Space Grant also funded the High Altitude Student Project, the Undergraduate Student Launch Initiative, the North Dakota Student Rocket Initiative Project and the BalloonSat Project. Space Grant funded seven faculty summer fellowships and three senior design projects one of which was aeronautics related that has some potential for application within North Dakota. Support was provided for FIRST robotics, a Lego Robotics camp, TARC, the Dark Skies initiative, pre-service workshops and Science Teaching Enhancement Grants for K-12 educators. The Consortium also sponsored a summer robotics workshop for students, teachers and faculty at Fort Berthold Community College. Financial support has also been given to graduate and undergraduate students who attend national competitions or national conferences to present papers. The NDSGC co-sponsored a production of "The Planets" by the Greater Grand Forks Symphony. Our funding was used to support a professional animated film of the Solar System that accompanied the three performances, once of which was given for 2300 area children. Space Grant continues to sponsor "StarDate" on Prairie Public Radio which is a good means of letting a large number of North Dakotans know that Space Grant is alive and well in the state. Site visits were made to half the Space Grant affiliates in 2007; the remaining half will be visited in 2008. This continues the Consortium plans of visiting half of the affiliate colleges every year. An important accomplishment of the

NDSGC has been to receive a substantial appropriation from both the 2005 and 2007 state legislative sessions. Space Grant is currently included in the budget to be considered in the 2009 Legislative session.

Student Accomplishments: According to the longitudinal tracking records of the significant research fellowships awarded by North Dakota Space Grant in the past three years, all recipients are still on the STEM pathway, either as an undergraduate student or advancing to the masters or Ph.D. level or graduating and finding STEM employment. One of our fellowship recipients received his B.S. in mechanical engineering this spring. During the past two years he worked on the Liquid Cooling Ventilation Garment for the NDX-1 spacesuit and on the vertical spacecraft simulator. During that time he presented papers at two professional, national conferences regarding his research. He will spend the summer at the NASA Academy at Marshall Space Flight Center. In the fall he will go to University of Southern California where he has been accepted into its Master's/Ph.D program. He stopped by the Space Grant offices to say "thank you" and "good-bye." With a big grin on his face he said, "I am so pleased at the good things that have happened to me as an undergraduate and I am so excited about the good things that are ahead of me." Space Grant is responsible for those good things. Not just the good things that have and will happen for him but for almost every one of our fellowship recipients.