

# NASA South Dakota Space Grant Consortium

## Strategic Plan



South Dakota Space Grant Consortium  
Headquarters Office  
501 E. Saint Joseph Street  
Rapid City, SD 57701  
<http://sd.spacegrant.org>  
(605) 394-1975

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## Table of Contents

SDSGC Vision, Mission, Values.....	2
Consortium Management.....	3
NASA Internships, Fellowships and Scholarships.....	5
Research Infrastructure.....	5
Higher Education.....	6
Diversity of Participants.....	7
Workforce Development.....	8
Evaluation and Longitudinal Tracking.....	8
Minority Serving Institutions.....	9
Precollege Education.....	10
Public Service.....	11

## **NASA South Dakota Space Grant Program**

### **Vision**

The vision of the South Dakota Space Grant Consortium (SDSGC) is to expand opportunities for all South Dakotans through education, research, and public service in the fields of aerospace, earth science, and supporting STEM disciplines.

### **Mission**

As the link between NASA and the citizens of South Dakota, SDSGC's mission is to instill the spirit of exploration and discovery in students and educators and in the general public, with a special focus on the fields of science, technology, engineering, and mathematics (STEM) that are essential for the development of the nation's workforce.

### **Values**

The NASA South Dakota Space Grant Consortium is committed to excellence in student and faculty research and to promoting STEM education and expanding projects across the state of South Dakota. We specifically seek to include women, Native Americans, and other underrepresented groups in all of the programs and activities supported by the SDSGC.

## A. Consortium Management

These goals and objectives guide the SD Space Grant Consortium in implementing effective STEM education, research and work experience programs while meeting the criteria set forth by the NASA Space Grant Program Office.

**Goal:** *Ensure quality and fairness in all Consortium programs and alignment with the needs of NASA, the affiliate organizations, and the state of South Dakota.*

**Objective A.1:** Strengthen relationships with NASA Centers, NASA Mission Directorates, the national Space Grant network, and the NASA EPSCoR Program.

**Strategy A.1.1:** Maintain and expand relationships with NASA Centers and Mission Directorates through faculty visits and student internships.

**Strategy A.1.2:** Play an active role in the national Space Grant Network.

**Strategy A.1.3:** Provide effective coordination between the state Space Grant and NASA EPSCoR programs.

**Objective A.2:** Represent the diverse interests and resources of the Consortium affiliates.

**Strategy A.2.1:** Maintain effective communication with industry and Consortium affiliates through teleconferences, scheduled meetings, electronic communications, and affiliate surveys.

**Objective A.3:** Ensure Consortium programs are aligned with state priorities.

**Strategy A.3.1:** Provide annual briefing and assessment of needs to representatives of state government on Consortium activities.

**Strategy A.3.2:** Maintain state government representative(s) participation on Management Team.

**Objective A.4:** Foster interaction between the Consortium and industries involved in aerospace and related technologies.

**Strategy A.4.1:** Maintain industry representative(s) participation on Management Team.

**Objective A.5:** Serve as an effective link between the public and NASA in the state.

**Strategy A.5.1:** Serve as a clearinghouse for information on opportunities from NASA and other agencies that support STEM-related research and education, especially in areas of aerospace and earth science.

**Objective A.6:** Pursue opportunities to increase the resources available to the Consortium to broaden participation within the state, to collaborate with other state Consortia in areas of mutual interest and capability, and to assure long-term sustainability.

**Strategy A.6.1:** Identify opportunities to increase funding and matching funds for the state program.

**Strategy A.6.2:** Coordinate submission of proposals to NASA and other agencies on projects in STEM research and education.

**Objective A.7:** Monitor diversity in all Consortium programs and activities.

**Strategy A.7.1:** Emphasize diversity in selection of participating organizations, programs, NASA Internships and Fellowships (NIF), faculty awards, and future Management Team members.

**Objective A.8:** Monitor the quality and effectiveness of the state program.

**Strategy A.8.1:** Maintain the services of an external program evaluator to provide assessment of the Consortium's strategic plan, activities, and outcomes, and to assist in establishing a long-term strategy for continuing evaluation.

**Strategy A.8.2:** Institute long-term evaluation procedures that are consistent with the recommendations of the program evaluator, the Consortium's logic model and strategic plan, and available resources.

**Strategy A.8.3:** Perform annual reviews of the strategic plan and issue annual updates, if deemed necessary.

**Objective A.9:** Provide timely reporting and responses to NASA Headquarters regarding Consortium operations and finances.

**Strategy A.9.1:** Collect program data throughout year necessary for reporting criteria and begin reports when NASA first calls for them.

**Objective A.10:** Promote and share NASA and SDSGC sponsored activities

**Strategy A.10.1:** Utilize social media and press releases to provide information about SDSGC opportunities, programs and activities.

## **B. NIF, Research and Higher Education**

These goals and objectives contribute to the development of the local and national STEM workforce in disciplines needed to achieve NASA's Strategic Goals. These programmatic elements aim to **attract, educate and retain STEM students** through a progression of significant and authentic educational opportunities provided to undergraduate/graduate students and faculty. It is expected these experiences will lead to **employment** in a STEM field.

**Goal:** *Provide internships and fellowships, that enhance educational and research opportunities to students from diverse backgrounds who are pursuing degrees in fields of science, technology, engineering, and mathematics (STEM) that align with NASA's priorities and those of SDSGC affiliates.*

### **B.1. Consortium Programs: NASA Internships and Fellowships (NIF)**

**Objective B.1.1:** Competitively award NASA internships and fellowships to provide students with mission-driven authentic learning experiences and research opportunities with NASA's people, work and facilities, EROS, and aerospace industries.

**Strategy B.1.1.1:** Promote and conduct an annual call for NIF applications to all of the Consortium's higher education affiliates.

**Strategy B.1.1.2:** Ensure the fair distribution of NIF funding to students at affiliates and institutional members each year, with emphasis on maintaining or increasing participation of women, persons with disabilities and members of minority groups, with a focus on Native Americans and Tribal College affiliates.

### **B.2. Consortium Programs Research Infrastructure**

**Goal:** *Improve research programs and capabilities of Consortium affiliates with an emphasis on the fields of aerospace, earth science, and supporting STEM disciplines.*

**Objective B.2.1:** Increase the number of research proposals submitted by SDSGC institutions in fields aligned with NASA's priorities.

**Strategy B.2.1.2:** Coordinate the development of research proposals among faculty at affiliate institutions, especially proposals involving multiple disciplines and institutions.

**Objective B.2.2:** Support new and developing research, especially multidisciplinary and collaborative projects, in fields aligned with NASA's priorities.

**Strategy B.2.2.1:** Provide competitively awarded seed grants.

**Objective B.2.3:** Build research collaborations within and outside the state and with NASA.

**Strategy B.2.3.1:** Coordinate SDSGC research programs with the state's NASA EPSCoR program and other NASA research programs with similar objectives.

**Strategy B.2.3.2:** Develop mutually beneficial research collaborations with NASA Centers, Mission Directorates, EROS and aerospace industry.

**Strategy B.2.3.3:** Facilitate research partnerships among the state's academic institutions and state and federal government agencies.

**Objective B.2.4:** Foster research groups and engineering design teams that contribute to NASA's work by integrating education, research, and development.

**Strategy B.2.4.1:** Provide funding to college research and design teams who participate in mission driven competitions and challenges.

**Strategy B.2.4.2:** Provide seed grants for meritorious research development.

### **B.3. Consortium Programs: Higher Education**

**Goal:** *Build interdisciplinary programs related to NASA's Mission Directorates at the state's institutions of higher education and support related programs that serve to strengthen STEM education in South Dakota.*

**Objective B.3.1:** Disseminate aerospace and earth science resources to the higher education community in South Dakota

**Strategy B.3.1.1:** Promote student funding opportunities, NASA educational resources and successful education programs, data, imagery, and general curriculum development.

**Strategy B.3.1.2:** Distribute announcements of opportunities for education and curriculum enhancement in NASA-related fields to faculty at affiliate institutions.

**Strategy B.3.1.3:** Award competitive grants for course development or workshops that make powerful connections to NASA's mission and work.

**Objective B.3.2:** Enhance faculty and undergraduate/graduate student development in STEM leadership and research skills.

**Strategy B.3.2.1:** Utilize planning visits, internships, and co-ops/NASA Pathways Program at NASA Centers and EROS.

**Strategy B.3.2.2:** Promote NASA leadership and educational opportunities made available through NASA Academy, USIP, NSTRE, NESSE and other NASA programs that integrate training with interdisciplinary research.

**Objective B.3.3:** Establish and maintain linkages between SDSGC, higher education and external stakeholders.

**Strategy B.3.3.1:** Facilitate collaborations with the South Dakota Board of Regents, Governor's Research Centers, and new Ph.D. programs related to NASA's mission.

**Strategy B.3.3.1:** Facilitate educational partnerships between the state's academic institutions and private industry.

## **C. Diversity, Workforce Development, Evaluation and Minority Serving Institutions**

These goals and objectives ensure that across all programs supported by the SD Space Grant Consortium there is 1) diversity in the participants; 2) strengthening of the capacity of minority serving institutions to provide STEM opportunities; 3) development of the STEM workforce; and 4) program evaluation and longitudinal tracking.

### **C.1. National Program Emphases Diversity of Participants**

**Goal:** *Empower minority groups (emphasis Native Americans), women and persons with disabilities (collectively referred to as “underrepresented groups” henceforth) with the knowledge and tools they need to pursue a career in STEM.*

**Objective C.1.1:** Ensure a fair distribution of funding for internships and fellowships to members of underrepresented groups.

**Strategy C.1.1.1:** Utilize intensive marketing techniques to encourage members of underrepresented groups to apply for funding.

**Strategy C.1.1.2:** Increase and nurture personal contacts to grow the network and relationships with appropriate tribal college representatives to ensure applications from qualified Native American students at tribal college affiliates.

**Objective C.1.2** Increase the participation of members of underrepresented groups in statewide research programs.

**Strategy C.1.2.1:** Assist in the placement of students from underrepresented groups in projects that provide hands-on research or design experience.

**Objective C.1.3:** Increase the participation of members of underrepresented groups in all aspects of SDSGC’s higher education program.

**Strategy C.1.3.1:** Target specifically underrepresented groups when promoting higher education related programs.

**Strategy C.1.3.2:** Expand participation and support of aerospace, earth science, and supporting STEM disciplines workshops, training, and related projects at tribal colleges.

**Objective C.1.4:** Facilitate the entry of members of underrepresented groups into STEM careers.

**Strategy C.1.4.1:** Support programs that inform, inspire, and motivate students from underrepresented groups about educational and career opportunities in the fields of aerospace, earth science, and supporting STEM disciplines.

**Objective C.1.5:** Increase the participation of members of underrepresented groups in pre-college programs.

**Strategy C.1.5.1:** Target specifically underrepresented groups when promoting, developing and facilitating pre-college programs.



## **C.2. National Program Emphases Workforce Development**

**Goal:** *Provide students a pathway to careers that will contribute to a highly-trained and diverse workforce for NASA and expand South Dakota's and the nation's research and development capacity.*

**Objective C.2.1:** Encourage students to enter the NASA pipeline and the STEM workforce.

**Strategy C.2.1.1:** Award fellowships and internships based on students' demonstrated interest in entering a NASA career or the STEM workforce.

**Objective C.2.2:** Facilitate authentic research experiences at NASA Centers to SDSGC student fellows.

**Strategy C.2.2.1:** Include information in all NIF announcements on how students apply to NASA internships and co-ops/NASA Pathways.

**Strategy C.2.2.2:** Provide NASA Center Personnel Officers and University Affairs Officers with information on SDSGC student fellows.

**Objective C.2.3:** Increase industry participation in the SDSGC student programs through internships and job placement.

**Strategy C.2.3.1:** Provide SDSGC industry affiliates and other aerospace industry contacts with information on SDSGC student fellows to promote internships or job placement.

## **C.3. National Program Emphases Evaluation and Longitudinal Tracking (Learning Agenda)**

**Goal:** *Evaluate the short-term and long-term impact of SDSGC programs in relation to their goals and objectives.*

**Objective C.3.1:** Document, measure and assess the impact of the internship and fellowship programs.

**Strategy C.3.1.1:** Administer surveys of students' knowledge and attitudes about the Consortium, their internship or fellowship experiences, NASA and STEM careers.

**Strategy C.3.1.2:** Longitudinally track students who received significant fellowship assistance (defined as over \$1,000 in a single award) from SDSGC through first employment or beginning of advanced degrees.

**Objective C.3.2:** Document, measure and assess the impact of faculty research and curriculum development and travel assistance awards.

**Strategy C.3.2.1:** Develop and implement an electronic reporting tool for gathering consistent data from faculty on funded activities and the impact of the activities.

**Objective C.3.3:** Document, measure, and assess the impact of the research infrastructure programs.

**Strategy C.3.3.1:** Develop and administer surveys of faculty and students involved in research infrastructure activities to assess their knowledge and attitudes about the Consortium, NASA research interests and STEM careers.

**Objective C.3.4:** Document, measure, and assess the impact of the higher education programs in conjunction with its implementation of an overall evaluation strategy.

**Strategy C.3.4.1:** Develop and administer surveys for faculty and students to assess their knowledge and attitudes about the Consortium, NASA, and STEM careers.

**Objective C.3.5:** Document, measure and assess the impact of the programs targeting pre-college students, pre-service/in-service educators and the general public.

**Strategy C.3.5.1:** Develop and administer surveys for participants in these programs to assess their knowledge and attitudes about the Consortium, NASA, and STEM careers.

#### **C.4. National Program Emphases Minority Serving Institutions**

**Goal:** *Ensure that Minority Serving Institutions in South Dakota, which are exclusively tribal colleges and universities, are represented in the planning and implementation of all Consortium programs.*

**Objective C.4.1:** Active participation of tribal colleges in the administration of SDSGC programs.

**Strategy C.4.1.1:** Seek representation from tribal college faculty and staff on the Management Team.

**Objective C.4.2:** Strengthen the capacity of tribal colleges to conduct STEM research.

**Strategy C.4.2.1:** Distribute NASA, SDSGC, and SD NASA EPSCoR research and education opportunities to SDSGC contacts at tribal colleges.

**Strategy C.4.2.2:** Facilitate collaborative STEM research between tribal colleges, SDSGC institutions, NASA and/or STEM related industries.

**Objective C.4.3:** Strengthen the capacity of tribal colleges to prepare their students for the STEM workforce.

**Strategy C.4.3.1.:** Provide assistance to tribal college students and advisors in developing competitive proposals for NASA and STEM related industry internships and fellowships.

**Strategy C.4.3.2:** Encourage and provide assistance to tribal college students and advisors to participate in mission driven competitions and challenges.

**Strategy C.4.3.3:** Provide guidance and assistance to programs that help tribal college students make a successful transition to pursue advanced undergraduate and graduate STEM programs at other SDSGC affiliates.

## **D. Youth, Educators and Public Service**

These goals and objectives aim to 1) Create unique opportunities for South Dakota students to contribute to NASA's work in exploration and discovery; 2) Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA's people, content and facilities; and 3) Strengthen understanding by enabling South Dakotans to connect with NASA's mission and work.

### **D.1. Pre-college Students, Formal and Informal Educators**

**Goal:** *Increase South Dakota pre-college student and educator awareness and understanding of, and access to, authentic STEM experiences, NASA's mission, work and people, and career opportunities in aerospace, earth science, and supporting STEM disciplines.*

**Objective D.1.2:** Inspire and support formal and informal STEM student participation in mission-driven competitions and challenges.

**Strategy D.1.2.1:** Communicate, encourage and participate in preparation of grant proposals/funding opportunities to NASA or other organizations that support pre-college STEM education.

**Strategy D.1.2.2:** Promote and connect organizations with resources to develop and/or strengthen STEM education programs.

**Strategy D.1.2.3:** Provide support for partnerships that create opportunities for students to participate in mission driven competitions and challenges.

**Objective D.1.3:** Strengthen the capacity of pre-service, formal and informal educators to effectively incorporate NASA STEM engagement resources and content into the curriculum and programs.

**Strategy D.1.3.1:** Provide evidenced-based professional development that is mission-driven and aligned with national and state education standards.

**Strategy D.1.3.2:** Fund educator participation in research experiences, NASA competitions and challenges and the development of authentic STEM experiences.

**Objective D.1.4:** Increase the capacity of youth programs to provide authentic STEM experiences that make powerful connections to NASA's mission and work.

**Strategy:** Increase student access to direct and virtual experiences with NASA's people and work.

**Strategy D.1.4.1:** Engage students in experiences that expose them to STEM careers.

**Strategy D.1.4.2:** Facilitate public and private partnerships to sponsor pre-college authentic STEM experiences that make powerful connections to NASA's mission and work.

**Strategy D.1.4.2:** Provide guidance and resources to those organizations that participate in mission-driven competitions and challenges.

## D.2. Public Service

**Goal: Strengthen public understanding of NASA’s mission and work** *by complementing community efforts in STEM education and inspiring citizens of diverse backgrounds through the excitement of scientific exploration and discovery.*

**Objective D.2.1:** Engage the public in the excitement of NASA missions and activities of scientific discovery across the state.

**Strategy D.2.1.1:** Utilize social media to connect the public to NASA’s mission, work and mission driven competitions and challenges.

**Strategy D.2.1.2:** Provide presentations that connect the public to NASA’s mission work and mission driven competitions and challenges and NASA sponsored research that is occurring in South Dakota.

**Strategy D.2.1.3:** Sponsor *StarDate* on South Dakota Public Radio.

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Note: The most current version of SDSGC’s “*Roles & Responsibilities of Members*” document can be found online at:

<http://sdspacegrant.sdsmt.edu/RolesandResponsibilities7-22-05.pdf>