

Rhode Island Space Grant Consortium
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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 **Rhode Island Space Grant Consortium** is a Program Grant Consortium funded at a level of **\$660,000** for fiscal year 2010.

PROGRAM GOALS: Our program goals and objectives are summarized below. These summaries are abridged for brevity, but full descriptions of our goals can be found in our 2010 Budget Package.

A. OUTCOME 1: *Fellowship/Scholarship, Higher Education, and Research Infrastructure programs*

1.Faculty and Research Support: Our goal was to provide NASA competency-building education and research opportunities for faculty, researchers, and post-doctoral fellows. For the Lead Institution, we proposed to allocate (from NASA) a total of \$2.1K for research support. For our Affiliates, we allocated \$20.2K for Affiliate research support in FY'10, which represented about 18.5% of our Affiliate allocation, consistent with our consortium emphasis on higher education. We anticipated making 5 awards. The Research Review Committee will review proposals on the following criteria (in order): relevance to NASA, merit, potential for broadening Affiliate involvement (new institutions or faculty), and potential for new NASA collaborations. Included in these proposals are travel grants to conferences, NASA Centers, and Visiting Researchers. *Our success was also to be measured by: research papers, conference presentations, and new proposed research grants.*

2.Student Support: Provide NASA competency-building education and research opportunities to develop qualified undergraduate and graduate students who are prepared for employment in STEM disciplines at NASA, industry, and higher education. We proposed the following awards. *Success was to be measured by the quality of the applicant pool, research papers/abstracts, presentations at the annual Symposium, and a short report (or published abstract/paper) at the end of the support period.*

- a. Full-year *RISG Fellowships* at Brown (4) and our Affiliates (2)
- b. *RISG Summer Teaching Fellows* (at least 2)
- c. *RISG Summer Research Scholars* (at least 2)
- d. *Academic Year Outreach Scholars* at Brown (2) and our Affiliates (6)
- e. *RISG Graduate/Undergraduate Travel Grants*
- f. *RISG Undergraduate Research Opportunities*

- g. Joint Industry Partnership (up to 1)
- h. *RISD Internships at NASA Centers* (4)

3. Course Development: Develop NASA-related course resources for integration into STEM disciplines.

a. *RISD Design for Extreme Environments program:* This program was proposed to consist of a six-credit course run in the Department of Industrial Design during the 2010-2011 academic year with internships awarded at the *JSC Habitability Design Center* (HDC).

b. *Brown Capstone Engineering Course:* We proposed to continue supporting classes offered by the Engineering Department at Brown University that emphasize hands-on activities.

4. Student Field Experiences: We proposed to continue a popular undergraduate Spring Field Trip where undergraduates are immersed in field studies while using NASA materials (remote sensing and planetary analogs).

5. Targeted Institution Research and Academic Infrastructure: We proposed to host a program for a faculty member from a Tribal College, which is part of the Nebraska Space Grant Consortium. The program was designed to engage Native American faculty members in culturally relevant STEM-related fields using culturally relevant NASA themes.

B. OUTCOME 2: *Higher Ed programs and Pre-College Programs*

1. Educator Professional Development:

a. *Museum of Natural History (MNH):* Educator workshops were planned at our Affiliate, the *Museum of Natural History*, all tied to the ongoing RISG-co-sponsored exhibits entitled: *Life of Stars: From Nebula to Supernova* and *Alien Worlds: New Discoveries Around Distant Stars*.

b. *Teacher Partnership Program:* Our 75:25 (75% Research to 25% Outreach) Program engages our RISG Fellows and Scholars through partnerships with RI K-12 teachers. They bring their current NASA-focused research into the RI classrooms, thereby providing a context to learning classroom materials.

c. *Brown Summer Academy:* We proposed to support 3 classes for middle and high school students given by RISG Summer Fellows. This also enhances the teaching skills of the graduate students.

2. Curricular Support Resources: Our Affiliates (Museum of Natural History and the Ladd Observatory) and Fellows, and Low-Gravity Program provide resources for students and mentoring through our outreach programs. We proposed to continue sharing research results and experiences with students through class visits, public speaking (e.g., local astronomy clubs), and special seminars.

3. Student Involvement K-12: Most of our involvement is through programs provided by our Affiliate, the Natural History Museum. In addition, our Fellows and Scholars interact with K-12 students. This experience, however, is primarily to provide teachers with STEM materials and to develop tools for informal-education skills that can be used as they become professional researchers.

a. *Gaudet Middle School Planetarium and Cormack Planetarium:* The Director of the Cormack Planetarium proposed to develop new STEM-based programs using resources provided by RISG-sponsored NASA programs.

b. NASA Mission-related Outreach: Fellows and Scholars involved in NASA missions engage K-12 by describing their experiences and the need for academics in order to achieve their dreams of participating in the exploration of other worlds.

C. OUTCOME 3: *General Public and External Relations programs*

1. Resources

a. Life of Stars: From Nebula to Supernova: This exhibit focuses on stars, interstellar matter, galaxies and the Universe. It also includes an emphasis on the importance of studying the cosmos using different filters and colors.

b. Alien Worlds: New Discoveries around Distant Stars: This exhibit offers a look inside the science that is emerging from the discovery of exoplanets, the new ways in which these planets are being found, and a glimpse at what the future may hold in this field.

c. Educator List-serve: Relays current NASA-related news, educational opportunities, and relevant websites to educators.

d. Ladd Observatory Outreach Program: Provides weekly views of current hot topics in astronomy.

2. Professional Development for Informal Education Providers:

a. Fellows and Scholars Teacher Partnerships: This program specifically addresses this outcome by instilling a desire (and responsibility) to provide informal education in the community even after their fellowship ends.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1,2, OR 3): *Provide meaningful highlights (anecdotes) that are directly related to work completed in 2010. Show specificity relative to an Outcome – highlighting student and/or project.*

A. RISD Extreme Environments: The great success of RISD's first entry into NASA's *Great Moonbuggy Race* during the 2009-2010 academic year created tremendous enthusiasm and interest among RISD students to continue the effort. As a result, this year RISG funding allowed students to form a new RISD "Office of Student Life" supported, student-lead "Moonbuggy" club. The club is currently finishing their new competition entry for the 18th annual Moonbuggy Race to be held at the beginning of April 2011. RISG funding and the enthusiastic reception of the new club prompted RISD to offer a new 3-credit class based on the NASA *Great Moonbuggy Race* that included a curricular/co-curricular collaboration with the student club. The course, offered through the industrial Design department, taught 16 students - including industrial design and one freshman student - fabrication skills that would prepare them to contribute to the design and fabrication of a club race vehicle. The students learned fundamentals of steering, suspension powertrain and chassis design, including some of the underlying engineering principles important for creating successful results. Other skills taught during the course included metalworking, brazing, composite fabrication, model-making and rendering. While the club is independent of the course, the co-curricular collaboration resulted in two of the club members who had previously worked on last year's moonbuggy becoming TA's for the course in order to share their knowledge and advise the new students on the intricacies of designing and fabricating a competition vehicle. Even before the end, 8 students (5 female, 3 male) from the course signed up for the club and began assisting with the new vehicle. In addition to those students from the course, the club has an additional 11 students participating on their own time in the creation of the moonbuggy. RISD's efforts have been highlighted statewide through the *Rhode Island Monthly* magazine and television coverage.

B. Desktop Delta-V Workshop: Continuing the Brown Emerging Space Technology workshop series, RISG co-hosted (with Brown) a one-day workshop on February 17, 2011. The workshop was held on the Brown University campus and focused on the topic of small-scale propulsion applied to microspacecraft and the unique near-earth and deep space science missions this emerging technology might enable.

C. Museum of Natural History Programs: RISG-supported programs at the Museum of Natural History have had a significant impact on the community, museum, its staff, and infrastructure improvements. Institutions of higher learning have been drawn back to the museum as a place for family learning, with the “*Space Science Room*” being a focal point.

Museum attendance was up 12.3% and summer planetarium attendance up 18%. There also has been a significant increase in middle and high school groups. Teachers enjoy the more advanced STEM programming and its alignment to state Science Grade-Span Expectations (GSEs). Both the Museum Director (Renée Gamba) and Museum Educator (Dawn Valentim) were selected to be NASA Solar System Ambassadors for two additional years, through 2012, given the work that they do in the “Space Science Room” and in the community. Renée Gamba has been asked to serve on a number of panels and committees (Providence After School Alliance STEM Advisory Team, Providence After School Alliance Experiential Learning Advisory Committee, Middletown School Strategic Planning) with other educators, utilizing expertise gained through programming offered at the Museum (thanks to RISG funding), which continue to increase visibility of the Museum, and in turn RISG. Hence, our partnership with this museum has drawn their personnel into NASA’s programs in meaningful ways, which extend throughout our community.

D. Research Outcome: RI Space Grant provided seed funding for innovative research involving microwave-assisted synthesis of electrode materials for photovoltaic applications. The work carried out addressed three chief objectives: (1) develop a protocol and pulse sequence to allow for microwave heating of conductive ITO substrates within a multimode microwave cavity; (2) complete synthesis of model ITO-silane-coordinating group-metal dye architecture along two parallel paths (built directly on the surface by subsequent reactions versus development of the silane-metal complex via solution phase synthesis and then deposition onto the ITO electrode); (3) carry out microwave Sonogashira coupling reactions on quartz substrates as a control experiment for ITO electrode work, and to finish a complete set of data for publication in the coming year. A patent was received for an invention developed while working on the research.

PROGRAM ACCOMPLISHMENTS: CONNECTION BACK TO CONSORTIUM ANNUAL PERFORMANCE GOALS AND OBJECTIVES

OUTCOME 1

A. Fellowship/Scholarships

Achievements and Progress: *Our target for involvement by under-represented minority students is 18% (the percentage of minority enrollment in our state, 17.2%) and 40% for women. Our projected support for all fellowships and scholarships is \$240.2K, which exceeds the minimum for a Program Grant (\$180K) according to the Budget Calls. All awards were directly related to NASA’s mission and goals. Our primary metrics for our Fellows included the quality of the applicant pool, presentations at the annual symposium, and papers/abstracts. These goals were achieved. We encouraged women and under-represented groups to apply. We came close to meeting our goal of 18% for awards to under-*

represented minority students (14%). We did exceed our goal of 40% for awards to women (50%).

- a. 2010 Summer Fellowships:** We supported 3 Summer Fellows.
- b. 2010-2011 Academic Year Fellowships (Brown):** We awarded 3 fellowships at Brown and 2 to our Affiliates.
- c. 2010-2011 RISG Academic Year Undergraduate Outreach Scholars:** We awarded 1 at Brown and 2 to our Affiliates.
- d. 2010 Summer Undergraduate Research Scholars:** We awarded 3 Summer Scholars.
- e. RISD Internships at NASA Centers:** We awarded 2 RISD Internships.

B. Higher Education

Achievements and Progress:

a. Course Development

- i. RISD Design for Extreme Environments program:** This program changes its design focus each year with focused goals in close collaboration with *NASA-JSC* personnel. The program includes a winter-semester internship at NASA, summer internships, and mentorship by graduate students who have completed the class sequence.
- ii. Brown Capstone Engineering Course:** This year the course was team-taught by the faculty member and visiting investigator and focused on machine design concepts and issues faced by space exploration. Such a course has been beneficial in that it engages students in real-world applications of system engineering applied to space exploration.
- iii. Bryant University Initiative:** *Bryant University* was awarded a new grant to enhance and complement their new graduate and undergraduate programs in Environmental Science. This includes new NASA-related courses and research projects dealing with robotics and remote sensing being incorporated within the programs.

b. RISG Graduate/Undergraduate Travel Grants: Travel grants were awarded to 11 students over the report period and benefitted from integration into NASA Center programs and/or NASA themes.

c. Student Field Experiences: RISG provides support for an annual geology field trip over spring break. Students highlight planetary analogs and illustrate how NASA remote-sensing approaches can be used in the field. 21 students traveled through Arizona and visited Superstition Mountain Range, Tonto National Forest, Grand Canyon, and Meteor Crater.

C. Research Infrastructure

Achievements and Progress:

- a. Affiliate Faculty and Research Support:** One of our goals each year is to enhance broader Affiliate participation in our Research Infrastructure. We met this goal by funding proposals from 5 new faculty members at 3 Affiliates: Bryant University, Roger Williams University, and the University of Rhode Island. We have also been in working on informing some of our less involved affiliates about the opportunities geared towards them.
- b. Lead Institution Faculty and Research Support:** We were able to support two faculty members with crucial seed funding. One was used to explore data actualization

of digital terrain models for enhanced student comprehension. The other was used to develop a computational model for control of biomimetic systems.

OUTCOME 2

Achievements and Progress:

1. Educator Professional Development: 7 NASA-related educator workshops were held over the report period (approximately 122 participants). These included: *From Space Shuttle to Constellation*, *Life of Stars Educator Workshop*, *Life of Stars: Bringing it to Your Classroom*, *Martian Geology: Exploring the Landscape*, *NASA's Great Observatories: A Look Beyond Our Milky Way*, and *More Than Just Rocks: The Terrestrial Planets*. The Museum's Director facilitated a series (5) of STEM-based learning experiences, utilizing NASA resources, for afterschool providers for Providence Middle Schools. One of the content providers for this year's exhibits (Associate Professor Ian Dell'Antonio, Brown University) also participated in this program.

2. Museum of Natural History (MNH): The Museum hosts a variety of STEM-based professional development opportunities each year. These include NASA Lunar and Meteorite Certification workshops, as well as workshops based on, and aligning with, current NASA missions. The Museum also facilitates STEM workshops for local Girl Scout troop leaders and educators from Afterschool Programs, Providence After School Alliance, and homeschool families.

3. Brown Summer Academy: We supported three classes through the Office of Continuing Education for middle and high school students. The classes were: "Astrobiology: the Search for Life in the Universe" taught by Seth Horowitz, "Hello From Mars" taught by John Macaluso, and "Exploring the Planets" taught by Angela Stickle.

4. Student Involvement K-12:

a. Gaudet Middle School Planetarium and Cormack Planetarium: The Gaudet Planetarium has been transformed into a hands-on teaching and enhancement tool for middle school teachers. This includes innovative programming for immersive learning using the Gaudet Middle School Planetarium. A series of educator trainings at Gaudet incorporated NASA Earth and Space Science and Museum resources into part of the science curriculum development.

b. NASA Mission-related Outreach: The exhibits at the Museum of Natural History during this period were both created based on data and insights from the *Cosmic Background Explorer (COBE)*, *Hubble Space Telescope*, and the *Kepler Mission*. Two RISG funded interns worked at the museum during the 2010 summer and aided in facilitating workshops for K-12 students and teachers. The RISG Director also gave a talk on *LCROSS Mission* research results to the *TCI Educator Cooperative Institute's* Educator Science Institute.

OUTCOME 3

Achievements and Progress:

1. Resources: The costs for this effort represent a relatively small fraction of our budgeted dollars; our success represents extensive leveraging in order to stimulate a broader public awareness of NASA-related research in RI.

a. Exhibits: During this reporting period for the two below exhibits there were over 30,000 visitors, 5,140 school children, 273 children in camp/after-school programs, and 138 girls in Girl Scout programs. General museum attendance is up 12.3% and the planetarium attendance is up 18%. Both exhibits were very successful and continued to

enhance the presence of the Museum and RISG in the state, as evidenced by the increase in attendance.

i. “Life of Stars: From Nebula to Supernova” (January 2010 through December 2010). A faculty member (previous minor involvement in RISG) came forward with a plan for a new, homegrown exhibit this year. The exhibit was given guidance from the Museum Director and our Partner, the *Northeast Planetary Data Center*, providing images and design advice.

ii. “Alien Worlds: New Discoveries Around Distant Stars” (February 2011 through January 2012). After the success of the previous exhibit, the same faculty member worked with the Museum to develop another exhibit. This focused on the science that is emerging from the discovery of exoplanets.

b. Programs at the MNH: Our seed money for the *Museum of Natural History and Cormack Planetarium* has had multiplicative effects on support from the city. For example the museum can now count on the VIP openings of RISG supported exhibits to ensure that the city does necessary renovations (previously placed at low priority). The relationship continues to provide the Museum with resources that have allowed an increase in visitor and school group attendance through its NASA programming. The increased visibility in the community also has provided the museum with new opportunities, including strong positioning to petition for additional funding. RISG supported programs at the Museum increase the Museum’s visibility and relevancy in the areas of STEM (Science Technology Engineering Mathematics) education. At a time when the nation’s educational focus is pushing towards an increase in STEM education, the Museum and its partnership with RISG are in the unique position to provide experiential STEM learning experiences to area youth and families.

c. Educator Listserve: Our listserv continues to thrive, with approximately 20 educators added to it this year. This has proven to be an effective mechanism to get information out to the educators in the state.

d. Ladd Observatory Outreach Program: RISG supported a major (and popular) Open House during Halloween. This support enabled broader participation, advertising, and displays related to observing the planets and the universe. This also reinforced the community awareness of the observatory, contrasting the old (Ladd) and the new (NASA).

e. NASA Mission-related Outreach: Talks included: “Secrets from the Shadows: Results from the LCROSS Mission” (August 2010); “Why the Two-Faced Moon?” (August 2010); *EPOXI and Stardust/NEt Mission Encounters* presentation at the Northeast Regional Space Grant Meeting (September 2010).

2. Professional Development for Informal Education Providers

a. Summer Teaching Fellows: We proposed to fund *RISG Teaching Fellowships* as a response to student requests for hands-on teaching experience. This award was made to two graduate students with faculty mentors, developing a one-week NASA-themed class over the summer, for middle school students. The classes were held during the summer of 2010. One class was entitled *Hello From Mars* and the other was entitled *Exploring The Planets*.

b. Development Travel Grants: RISG supported the Museum of Natural History Director attending professional development workshops that content and activities were

integrated into new planetarium programming at the Cormack and Krupowicz Planetaria, exhibits, and programming, including professional development for teachers and informal educators at the Museum of Natural History and Krupowicz Planetarium. Topics included Climate Change (JPL/NASA, Pasadena California), Heliophysics and Astrophysics (NASA Goddard Spaceflight Center, attended with Curator of Education), Astronomy and Astrophysics at Kitt Peak and Mt Lemmon Observatories.

NASA 2010 EDUCATION PRIORITIES

- 1. Authentic, hands-on student experiences in science and engineering disciplines:** All RISG supported Fellows, Scholars, and Interns have hands-on experience in their research projects. For example students interning at NASA Johnson Space Center's Habitability Design Center. The interns learn a variety of engineering principles through hands on experience. RISG also supported a group of students who entered the NASA Great Moonbuggy Challenge, during which they entered and won the engineering focused Best Design Award.
- 2. Engage middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise:** RISG supported teacher workshops at the Museum of Natural History, which were geared towards middle school teachers. A faculty member and his RISG Fellow, who had helped design the past two exhibits held in the Museum's Space Room, frequently taught the workshops.
- 3. Summer opportunities for secondary students on college campuses with the objective of increased enrollment in STEM disciplines or interest in STEM careers:** RISG supports summer Fellows and Scholars, across various campuses, who participate in STEM based summer research. This opportunity is open to students at each of the institutions. The students often use this opportunity to strengthen their skills within their field.
- 4. Environmental Science and Global Climate Change:** RISG Affiliate, Bryant University, has been working on a variety of research topics regarding environmental science and global climate change with support from RISG. Their research ranges from the relationship between climate change and hydrogen to modeling climate systems to the relationship between molecular hydrogen isotope signals and the polar climate change to climate changes during the Neolithic time to earth system sciences and social impact.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- **Longitudinal Tracking:** *Total FY'10 awards = 17 awards (8 female, 9 male); Fellowship/Scholarship = 14 (7 female, 7 male); Higher Education/Research Infrastructure = 3 (1 female, 2 male). Of these students, 1 is continuing in STEM-related career and the rest are continuing in advanced education in NASA-related disciplines.*
- **Course Development:** *Number of new or revised courses targeted at the STEM skills needed by NASA that are developed with NASA support: 3 revised courses were offered over the report period.*
- **Matching Funds:** *Ratio of funds leveraged by NASA funding support: Our ratio of Match-to-NASA is \$0.86 to \$1, when calculating with the full Base and Augmentation awards. The actual amounts are \$566,584 match to the \$480,000 requirement.*
- **Minority-Serving Institutions:** *Summarize interactions: Due to the fact that Rhode Island does not have any Historically Black Colleges or Tribal Colleges we have been finding ways to engage these colleges using our unique strengths. This year we proposed to host a faculty*

member from a Tribal College in Nebraska utilizing Rhode Island's strengths in innovative STEM approaches while gearing it towards culturally relevant needs. Unfortunately the faculty member who was identified left their position and there was not enough time to identify another.

IMPROVEMENTS MADE IN THE PAST YEAR: Succinctly *describe improvements and/or adjustments made last year that demonstrate significant change(s) within the Consortium.* **
The improvements and/or adjustments that brought about change may have been in management, resource allocation, project design, project evaluation, etc. **

A. Management Changes: During FY2010 RISG was able to offer a small amount of funding (no more than \$1.5K) to each Affiliate Coordinator to use at their discretion for conference or research travel. We also created a formal relationship with Krupowicz Planetarium, which is located in the Gaudet Middle School (across the Bay from the MNH). This has allowed us to broaden our outreach efforts and increase the number of teachers and students we impact.

B. Resource allocation adjustments:

1. Low-gravity Opportunity: The Brown Space Club proposal for the Low-gravity Flight Opportunities was not successful this year after very active leadership had graduated.

2. Targeted Institution Academic and Research Infrastructure: The faculty member that was selected to participate in this program had to abruptly leave their position and could no longer attend the program. There was not enough time to identify another participant to be a replacement.

3. RISD Internships at NASA Centers: We had proposed to fund four students to intern at NASA Centers, but only funded two. The other two students were funded by a one-time opportunity.

4. 2010-2011 Academic Year Fellowships: Due to the applicant pool we received this year three instead of four Fellows were funded.

5. Research Support: The funds in the above mentioned programs were reallocated to provide for additional research requested by faculty members. We had planned to make five awards, but this year we were able to make seven.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION: *List the institutions that comprise the consortium; include the name, type of institution, and key characteristics.*

Brown University: Lead institution. This is a private university with a variety of undergraduate and graduate degree programs. Given that the grant is based here it is fairly involved with the grant and providing support.

Bryant University: Private university. Their relatively new programs in Environmental Sciences and Biology have begun to flourish and receive strong institutional support especially as they are learning how RISG can benefit them.

Community College of Rhode Island: Community college. This two-year community college provides opportunities for re-training and a stepping-stone to a four-year institution (including Brown).

Graduate School of Oceanography: *GSO* is part of the state-supported *University of Rhode Island* system (Narragansett Bay campus) exclusively for graduate studies and research on oceanography. They are the *Sea Grant* Lead for the state. Their NASA research includes remote sensing, astrobiology (past *National Astrobiology Institute* Lead), and climate.

Providence College: Four-year liberal arts institution. This past year their Affiliate Representative has received some seed funding from RISG and has started to gain an enhanced understanding of the program.

Rhode Island College: Primary training institution for teachers in the state. It houses the NASA's *Educator Resource Center*.

Rhode Island School of Design: *RISD* is a nationally ranked private college in the arts and design. *RISD* has been a very active of the consortium through innovative curricula linking industrial design classes with NASA centers (JSC, KSC). They will host the RISG Symposium.

Museum of Natural History: *MNH* is funded by the *City of Providence* and is located in historic Roger Williams Park. It contains the *Cormack Planetarium* where NASA-related programming is often featured. This museum has become increasingly important to our program through NASA-themed exhibits and programs (educator workshops). In return, they have created a "Space Science Room" which is reserved for rotating exhibits related to current events, missions, or themes related to NASA.

Roger Williams University: *RWU* is a private institution (MAT, Masters of Public Administration, Architecture, Law, Criminal Justice) with growing programs in environmental and international studies.

Salve Regina University: University offering PhD in the humanities. They offer a number of programs in the STEM fields.

University of Rhode Island: Lead state-supported undergraduate/graduate institution (identified here as "*URI*") and a *Land Grant* institution. *RISG* supports students and faculty in engineering and geology.

Wheaton College: Private liberal arts college with several faculty members who are involved in NASA-related research (studies into the satellites of the outer planets (using Galileo and Cassini data), astronomy, and environmental science.

Other Partners: In addition to our formal Affiliates, *RISG* has active partners including the: **Northeast Planetary Data Center** (*NEPDC* at *Brown*) is funded through NASA's Planetary Geology and Geophysics Program and is an active partner through cooperative programs (exhibits) and access to planetary image data.

Ladd Observatory provides weekly notices on topics related to astronomy as well as lectures and special events.

Krupowicz Planetarium is a planetarium located at one of the schools within the Middletown Public School System and provides an outlet for increased outreach.