



# NASA Rhode Island Space Grant

## 2016 Northeast Regional Meeting (NYC)





# Rhode Island Space Grant Consortium

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Brown University Lead (Providence, RI)

Bryant University (Smithfield, RI)

Community College of Rhode Island (Lincoln, RI)

Graduate School of Oceanography (URI, Narragansett Bay, RI)

Providence College (Providence, RI)

Rhode Island College (Providence, RI)

Rhode Island School of Design (Providence, RI)

Museum of Natural History and Cormack Planetarium (Providence, RI)

Roger Williams University (Bristol, RI)

Salve Regina University (Newport, RI)

University of Rhode Island (Kingston, RI)

Wheaton College (Norton, MA)

## **PARTNERS**

Ladd Observatory (Brown)

Northeast Planetary Data Center (Brown)

Krupowicz Planetarium (Middletown, RI)



# Rhode Island Space Grant Programs

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- Fellowships and Scholarships: ~15-20
  - Academic Year
  - Summer awards
- Travel Grants: 6
- Research Seed Grants: ~\$5-\$10K (4)
- Curriculum Development: (2)
- Under-represented programs: 3
- NASA network opportunities



# RISD Course Development

Rhode Island School of Design (RISD)

## Highlights





# RISD Course Development

Rhode Island School of Design (RISD)

## Highlights







# Mars Ascent Vehicle

## *RISD Studio Class Challenge*





# *RISD Studio Class Challenge*

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## Outcomes

### ➤ Student Hiring

- *NASA JSC*: hired 8 students over last 10 years
- *SAIC Industrial Designer: Aberdeen Proving Ground*
- *Interdisciplinary Designer: TEAGUE (Everett, WA)*:  
industrial, technical, and mechanical design groups on a range of projects for Boeing aircraft interiors
- *Engineer: US BioDesign (biomedical textiles)*
- *Exhibit Designer and Visual Information Specialist: Smithsonian Institution in DC*

### ➤ Broader involvement across RISD

- *NASA's Human Exploration Rover Challenge*
- *Textiles Course (NASA JSC collaboration)*
- *Digital Media Course (graduate program)*
- *Research on development of a low-gravity space suit simulator*
- *Research on new flexible space glove*



# Museum of Natural History

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## SG Partnerships:

*Museum of Natural History*

*NASA RI Space Grant*

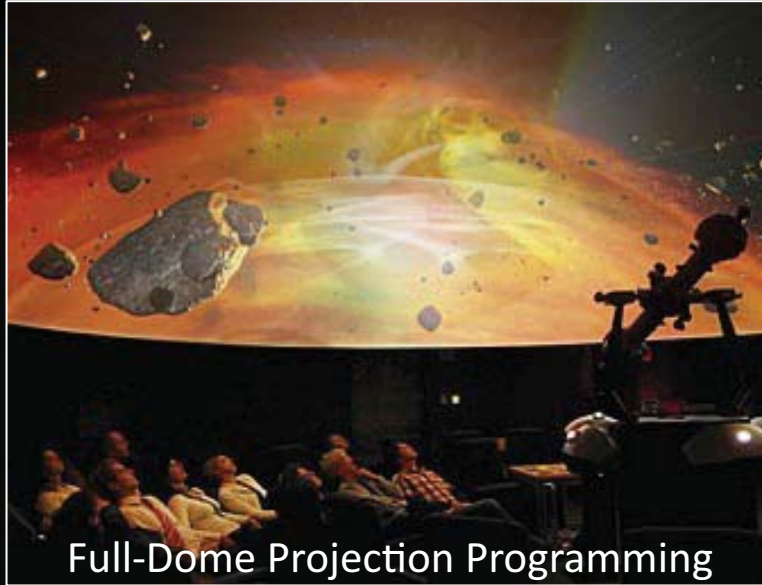
*Northeast Planetary Data Center*

- **Statewide Networking with educators**
  - Krupowicz Planetarium (Middletown, RI)
  - Woonsocket Public Schools
  - Informal educator collaborations (Providence)
- **NASA-themed exhibits and educator workshops**
- **NASA Room**
  - NASA-themed exhibits
  - Developed in conjunction with colleges & universities
  - Focus for educator workshops
  - Over 43,500 visitors and 20 special events





# Museum of Natural History



Full-Dome Projection Programming

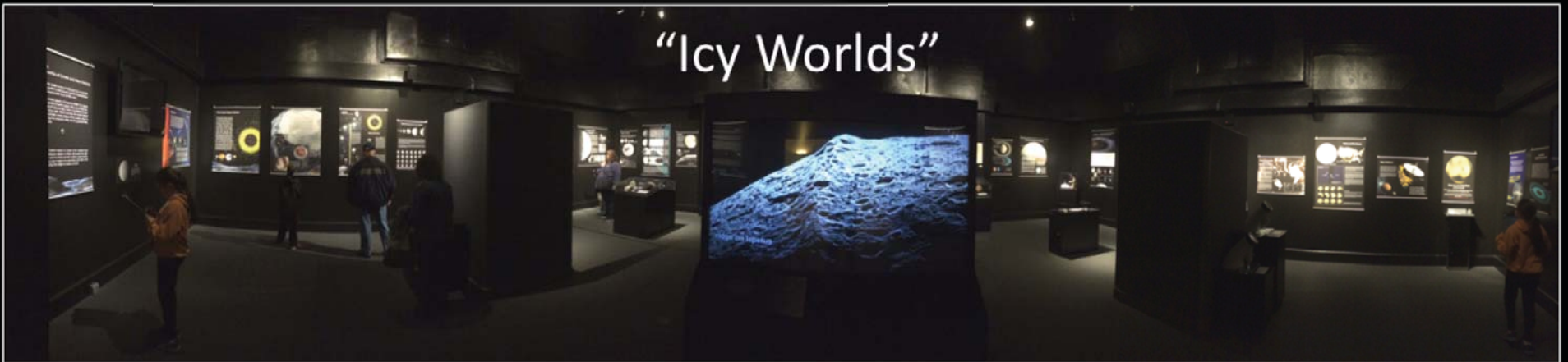
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*Museum of Natural History*

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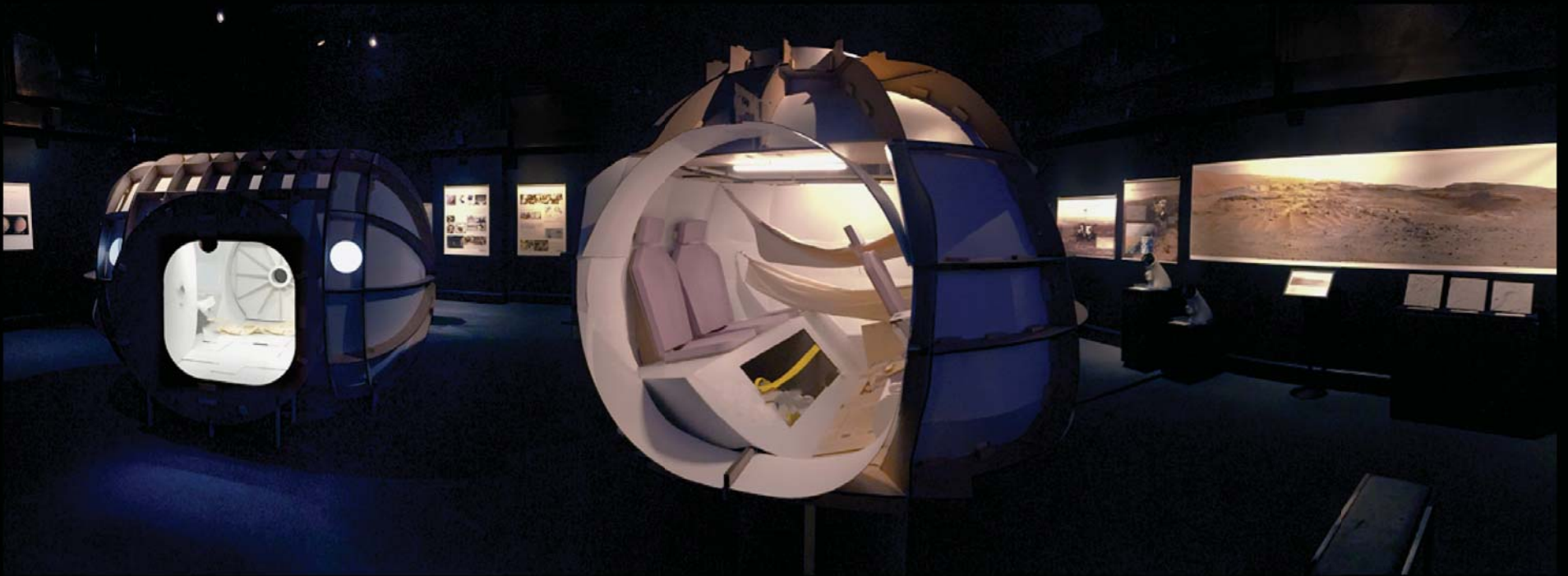
## "Icy Worlds"





Now Showing!

**The Red Planet: *Going to Mars***

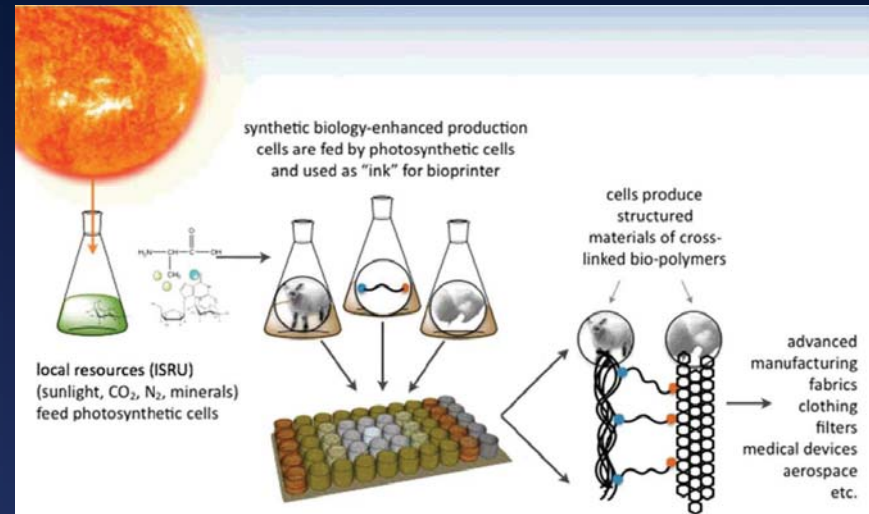
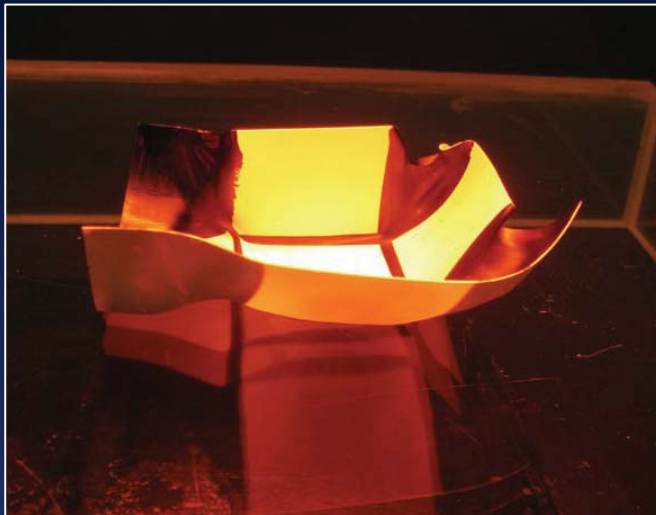




# Brown-Stanford iGEM Project

*The International Genetically Engineered Machines (iGEM) Competition.*

- Joint effort between *NASA Ames, Stanford, and Brown*
- Applies synthetic biology to NASA problems
  - *Bio-Origami*: genetically engineered strains of *E. coli* that can create plastic, which in turn can fold itself into 3D shapes when heated.
  - *Grand Vision*:



Rothschild., L. (2016), Synthetic biology meets bioprinting: Enabling technologies for humans on Mars (and Earth) *Transactions of the Biochemical Society*, Vol. 44 (4), 1158-1164



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  - *Grand Vision*:
- Focuses on different topics each year (student identified)
- Work toward international competition (*iGEM Jamboree, Boston*)
  - Gold medal for the *Best Manufacturing* category
  - Nominated as a finalist in the *Best Composite Part, Best Parts Collection, and Best Poster* categories
- Large outreach effort
- Students participate in *World Maker Faire (NYC)*
- New NASA grant and paper







# Space Horizons Series



## Topical Workshops on Alternative Strategies for Low-cost Missions

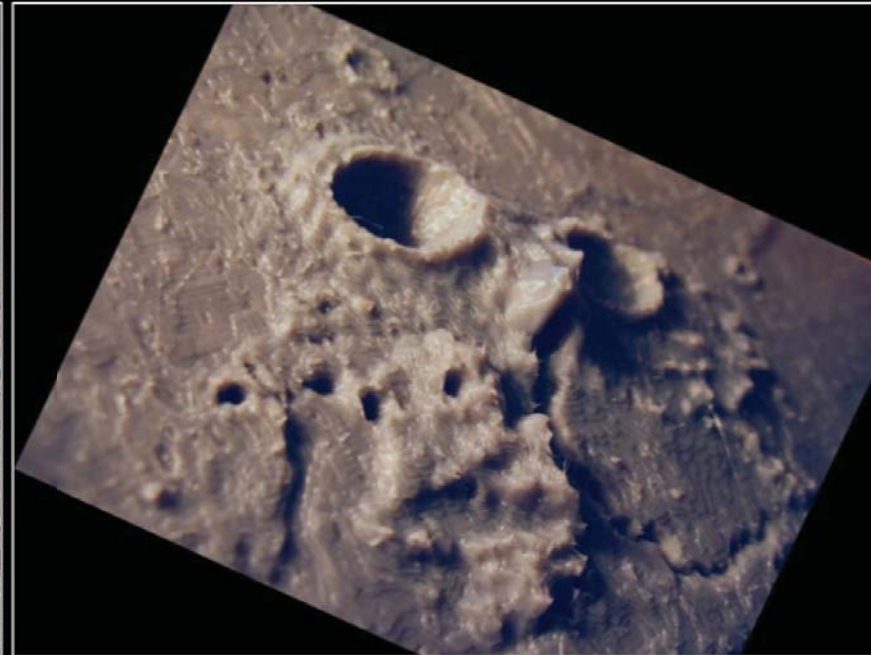
- Every February
- Brown Engineering
- Rick Fleeter
- 8<sup>th</sup> year



# Northeast Planetary Data Center

Brown University

## Large-Format 3D Printing





# Northeast Planetary Data Center

Brown University

## Large-Format 3D Printing



Brown University

NASA

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Director: Professor Peter H. Schultz  
Manager: Peter H. Schultz  
Contact: 401-863-2344  
401-863-2345  
224 Rhodes Hall (at Science Hall)  
Brown University  
Providence, RI 02912

Read us on Facebook

#### 3D Planetary Printing

Welcome to the Northeast Planetary Data Center's 3D Model Repository, part of a network of Regional Planetary Image Facilities. Here we are generating a collection of 3D models of terrestrial and extraterrestrial landscapes, shapes and features as well as models of spacecraft and technology. All are related to the exploration of terrestrial and planetary surfaces derived from a variety of data formats ranging from RADAR to photographs.


All models are in stereolithography (.stl) format and have been tested for printability on a variety of FDM (fused filament-type) and additive resin printers. To download the model, please right click on the image or filename (Windows) or "control" click (Mac) and save it to an appropriate local folder on your machine. These models are offered under the Creative Commons license and are free for non-commercial use. If presenting in a public forum, please credit the Northeast Planetary Data Center, Providence, Rhode Island.

#### Mars

- This is region of Mars  
~8x vertical exaggeration  
Mars1 ThisRegion01v.stl  
16259K
- Westemmost region of Valles Marineris  
~2x vertical exaggeration  
VMAmaris1.stl  
23543K
- Central region of Valles Marineris  
~2x vertical exaggeration  
VMAmaris2.stl  
23400K
- Eastemmost region of Valles Marineris  
~2x vertical exaggeration  
VMAmaris3.stl  
23304K

#### Moon

- Anistarchus region  
3x vertical exaggeration  
Anistarchusregionmoon3x.v.stl  
8340K
- Copernicus crater  
3x vertical exaggeration  
Copernicuscrater3xv.stl  
87125K
- Gassendi crater  
3x vertical exaggeration  
Gassendicrater3xv.stl  
26099K





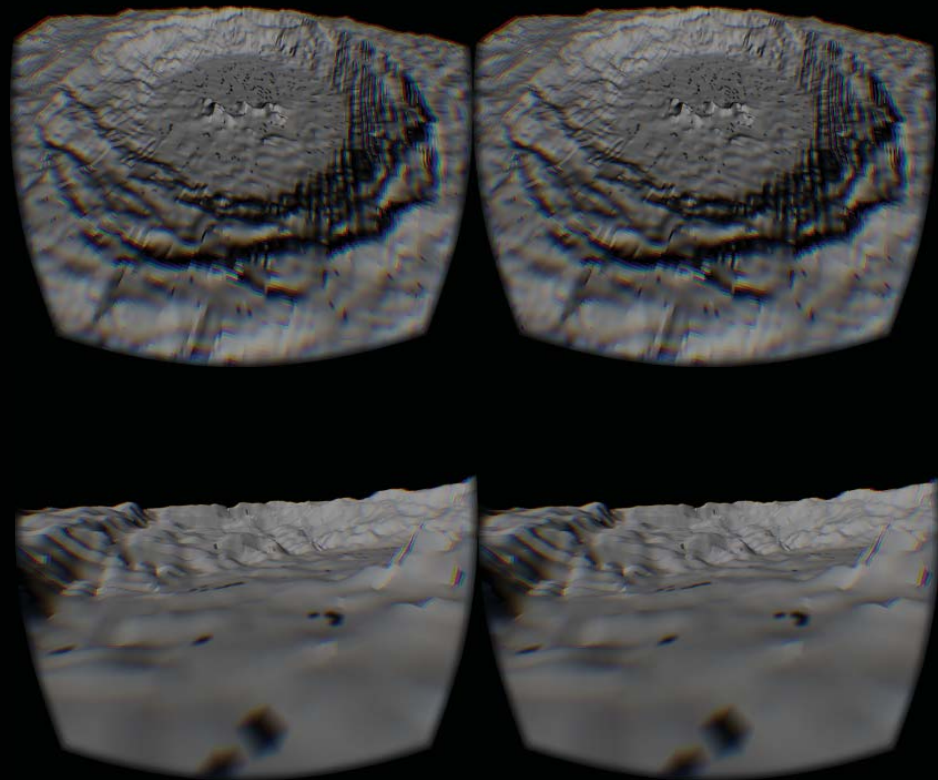


# Northeast Planetary Data Center

Brown University

Seth Horowitz (*NeuroPop*)

## *Virtual Reality and Motion Sickness*







## Distribution

# Distribution of Funds



**Consortium Members:** Brown University (Lead) ★ Bryant University  
★ Community College of Rhode Island ★ Ladd Observatory  
★ NASA Educators Resource Center in RI ★ Northeast Regional Data Center  
★ Providence College ★ Roger Williams Park Natural History Museum and  
Cormack Planetarium ★ Roger Williams University ★ Rhode Island College  
★ Rhode Island School of Design ★ Salve Regina University ★ University of Rhode Island  
★ University of Rhode Island Graduate School of Oceanography ★ Wheaton College