



# 2017 NIAC Symposium



September 25-27, 2017 – Denver, CO

## Monday, September

- 8:30 **Welcome & Overview** *Jason Derleth, NIAC Program Executive*
- 9:00 **Keynote Address** *Prof. Brian Argrow, University of Colorado, Boulder*
- 10:00 Break**
- 10:20 *Jay McMahon, University of Colorado, Boulder, Dismantling Rubble Pile Asteroids with Area-of-Effect Soft-bots*
- 10:45 *Benjamin Goldman, Global Aerospace Corporation, Pluto Hop, Skip, and Jump*
- 11:10 *Jason Gruber, IMMSG Laboratories, Inc., Turbolift*
- 11:35 *John Brophy, NASA JPL, A Breakthrough Propulsion Architecture for Interstellar Precursor Missions*
- 12:00 Lunch**
- 1:30 *POSTER SESSION*
- 2:30 *Gary Hughes, California Polytechnic State University, Remote Laser Evaporative Molecular Absorption Spectroscopy Sensor System*
- 2:55 *Ratnakumar Bugga, NASA JPL, Venus Interior Probe Using In-situ Power and Propulsion*
- 3:20 *Joel Sercel, TransAstra Corporation, Optical Mining of Asteroids, Moons, and Planets to Enable Sustainable Human Exploration and Space Industrialization*
- 3:45 Break**
- 4:05 *David Kirtley, MSNW, LLC, Magnetoshell Aerocapture for Manned Missions and Planetary Deep Space Orbiters*
- 4:30 *Philip Lubin, University of California, Santa Barbara, Directed Energy for Interstellar Study*
- 4:55 *Robert Youngquist, NASA KSC, Cryogenic Selective Surfaces*
- 5:20 **Adjourn**
- Fellows' Free Evening:** *Fellows are free to collaborate informally to make broader connections*



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## Tuesday, September 26

- 8:30 **NIAC Plans and Announcements** *Ronald Turner, NIAC Senior Science Advisor*
- 9:00 **Keynote Address** *Sascha Paladino, Creator and Executive Producer, Miles from Tomorrowland, Disney TV*
- 10:00 Break**
- 10:20 *Adam Arkin, University of California, Berkeley, A Synthetic Biology Architecture to Detoxify and Enrich Mars Soil for Agriculture*
- 10:45 *Raymond Sedwick, University of Maryland, College Park, Continuous Electrode Inertial Electrostatic Confinement Fusion*
- 11:10 *Michael LaPointe, NASA MSFC, Gradient Field Imploding Liner Fusion Propulsion System*
- 11:35 *Kevin Kempton, NASA LRC, Phobos L1 Operational Tether Experiment (PHLOTE)*
- 12:00 Lunch**
- 1:30 **POSTER SESSION**
- 2:30 *Siegfried Janson, The Aerospace Corporation, Brane Craft Phase II*
- 2:55 *Stephanie Thomas, Princeton Satellite Systems, Inc., Fusion-Enabled Pluto Orbiter and Lander*
- 3:20 *Jonathan Sauder, NASA JPL, Automaton Rover for Extreme Environments (AREE)*
- 3:45 Break**
- 4:05 *Melville Ulmer, Northwestern University, Further Development of Aperture: A Precise Extremely Large Reflective Telescope Using Re-configurable Elements*
- 4:30 *Joshua Rovey, University of Missouri, Rolla Experimental Demonstration and System Analysis for Plasmonic Force Propulsion*
- 4:55 *William Engblom, Embry-Riddle Aeronautical University, Flight Demonstration of Novel Atmospheric Satellite Concept*
- 5:20 Adjourn**
- 7:00 Fellows' Reception in Poster Session Room**



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## Wednesday, September 27

8:30 **Welcome/NIAC Q&A** *Kathy Reilly, NIAC Strategic Partnerships Manager and NIAC Staff*

9:00 **Keynote Address** *Ariel Waldman, Founder, Spacehack.org, NIAC External Council Member*

### 10:00 Break

10:20 *Robert Youngquist, NASA KSC, Solar Surfing*

10:45 *Nan Yu, NASA JPL, A direct probe of dark energy interactions with a solar system laboratory*

11:10 *Heidi Fearn, Space Studies Institute, Mach Effects for In Space Propulsion: Interstellar Mission*

11:35 *Slava Turyshev, NASA JPL, Direct Multipixel Imaging and Spectroscopy of an Exoplanet with a Solar Gravity Lens Mission*

### 12:00 Lunch

1:30 *Panel Discussion: "Life After NIAC" Session*

2:30 *Joel Sercel, TransAstra Corporation, Sutter: Breakthrough Telescope Innovation for Asteroid Survey Missions to Start a Gold Rush in Space*

2:55 *John Lewis, Deep Space Industries, Inc., Massively Expanded NEA Accessibility via Microwave-Sintered Aerobrakes*

3:20 *John-Paul Clarke, Georgia Institute of Technology, Evacuated Airship for Mars Missions*

### 3:45 Break

4:05 *Chris Mann, Nanohmics, Inc., Stellar Echo Imaging of Exoplanets*

4:30 *Robert Skelton, Texas A&M University, Tensegrity Approaches to In-Space Construction of a 1g Growable Habitat*

4:55 *John Bradford, Spaceworks Engineering, Inc., Advancing Torpor Inducing Transfer Habitats for Human Stasis to Mars*

### 5:20 Adjourn



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## ABOUT NIAC:

The NASA Innovative Advanced Concepts (NIAC) Program supports early studies of visionary concepts that could one day “change the possible” in space and aeronautics. NIAC studies develop and assess revolutionary, yet credible, aerospace architecture, mission, and system concepts. They aim to enable far-term capabilities, and spawn exciting innovations to radically improve aerospace exploration, science, and operations.

NIAC also contributes to the Nation's leadership in key research and technology areas, and fosters outreach, education, and economic benefits. Part of the Space Technology Mission Directorate, NIAC is the most open-ended and far-reaching program in NASA.

## 2016 NIAC SYMPOSIUM SPEAKERS:



**Keynote Address: Day 1**

**Brian Argrow**

**Professor, Dept. of Aerospace Engineering Sciences  
University of Colorado, Boulder**

Brian Argrow is a professor in the Department of Aerospace Engineering Sciences and the Director of Integrated Remote & In-Situ Sensing Systems Initiative (IRISS) at the University of Colorado, Boulder. His research involves work with Unmanned Aircraft Systems (UAS); computational, experimental, and analytical aero-gas dynamics.



**Keynote Address: Day 2**

**Sascha Paladino**

**Disney TV**

**Creator and Executive Producer, MILES FROM TOMORROWLAND**

Sascha Paladino is a four-time Emmy-nominated television writer and producer, and an award-winning film director. He is the creator and executive producer of “Miles From Tomorrowland,” an animated intergalactic adventure series currently airing on Disney Junior and around the world, as well as its offshoot, “Mission Force One.” “Miles From Tomorrowland” incorporates space science facts into its stories and has screened at NASA’s Kennedy Space Center, Johnson Space Center, Ames Research Center, and independent science centers around the country.

Sascha has been a writer, head writer, and producer for many children's programs, including "Doc McStuffins," "Henry Hugglemonster," "Ni Hao, Kai-lan," "Wonder Pets," and "Blue's Clues." Sascha has written and developed projects and pilots for companies including Nickelodeon, Disney, The Jim Henson Company, MTV, Scholastic, and the BBC.

Sascha is also a film director. His documentary feature, "Throw Down Your Heart," is about the American banjo virtuoso Béla Fleck's journey to Africa to explore the roots of the banjo, and explores the use of music as a means of cross-cultural communication. The film won many honors, including the Audience Award at the South by Southwest Film Festival, and is distributed on DVD by New Video/Docurama.

Sascha's projects aim to make complex ideas accessible, stimulate dialogue between cultures, inspire kids to explore the arts and sciences, encourage everyone to tell their own stories, and make people laugh.



**Keynote Address: Day 3**  
**Ariel Waldman**  
**Founder, Spacehack.org**  
**NIAC External Council Member**

Ariel Waldman is on a mission to make science and space exploration disruptively accessible. She is the co-author of a congressionally-requested National Academy of Sciences report on the future of human spaceflight and the author of the book, *What's It Like in Space?: Stories from Astronauts Who've Been There*. Ariel is the founder of Spacehack.org, a directory of ways for anyone to participate in space exploration, and the global director of Science Hack Day, a grassroots endeavor to prototype things with science that is now in over 25 countries. In 2013, Ariel received an honor from the White House for being a Champion of Change in citizen science.