



21<sup>ST</sup> ANNUAL  
**FELLOWSHIP SYMPOSIUM**  
UTAH NASA SPACE GRANT CONSORTIUM  
12 MAY 2015



held at

THE LEONARDO EVENT CENTER & AUDITORIUM (3<sup>RD</sup> FLOOR)

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- 12:00 p.m. **Lunch** – combined with Annual Meeting participants, tour of Leonardo museum  
12:45-1:15 p.m. **Registration** – sign in and pick up materials  
1:15 p.m. **Welcome and Introductions – Dr. Joseph Orr, Space Grant Director**  
*All participants meet in Leonardo Auditorium and then will break into dual sessions for presentations starting at 1:30 p.m.*

**Session I**      **Session Chair: Dr. Victor Hasfurther, Dixie State University**  
**Leonardo Auditorium**

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- 1:30 p.m.      **Zhenchao Yang** (Karl Warnick), *Brigham Young University*  
High Efficiency Planar Arrays and Array Feeds for Satellite Communications
- 1:42 p.m.      **Kimberly Stevens** (Brian Iverson), *Brigham Young University*  
Two-Phase Flow Pressure Drop in Superhydrophobic Channels
- 1:54 p.m.      **Mike Fogarty** (Joseph Orr), *University of Utah*  
Simple Ventilation Device for Procedural Sedation, Difficult Intubation in the OR, and Transport
- 2:06 p.m.      **Leda Sox** (Vincent Wickwar), *Utah State University*  
Early Rayleigh-Scatter Lidar Temperature Measurements from the Lower Thermosphere
- 2:18 p.m.      **Ryan Lundgreen** (Dan Maynes), *Brigham Young University*  
Cavitation Instabilities in Inducers that Employ a Stability Control Device
- 2:30 p.m.      **Poster Session & Break**

**Session III**      **Session Chair: Dr. Lara Brewer, University of Utah**  
**Leonardo Auditorium**

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- 3:00 p.m.      **Alexandra Ahern** (Jani Radebaugh), *Brigham Young University*  
Lineations and Structural Mapping of IO's Paterae and Mountains: Implications for Internal Stresses
- 3:12 p.m.      **Jonathan Pugmire** (Mike Taylor), *Utah State University*  
Mesospheric Dynamics and Temperature Variance Studies Using Satellite and Ground-Based Instruments
- 3:24 p.m.      **David Coats** (William Christensen), *Brigham Young University*  
Analyzing Sea-Level Change on the East Coast with Spatiotemporally Correlated Data
- 3:36 p.m.      **Sean Ermer** (Joseph Orr), *University of Utah*  
Detecting Adverse Respiratory Events: A Comparison of the Effectiveness of Modern Respiratory Sensors
- 3:48 p.m.      **Blaine Harker** (Kent Gee), *Brigham Young University*  
Phased-Array Measurements of Full-Scale High Amplitude Jet Noise

**Sessions I/III and II/IV will be dual sessions:**  
*Sessions I & III held in Leonardo Auditorium*  
*Session II & IV held in Leonardo Event Center*

## Session II    Session Chair: Dr. Shad Roundy, University of Utah

### Leonardo Event Center

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- 1:30 p.m.    **Paula Johnson** (Steven Charles), *Brigham Young University*  
Low-Cost, Quantitative Motor Assessment
- 1:42 p.m.    **David Christensen** (Shad Roundy), *University of Utah*  
Ultrasonic Power Transfer for Biological Implants
- 1:54 p.m.    **Michelle Pyle** (Ryan Davidson), *Utah State University*  
Design Analysis and BNG Driver Simulation for a CubeSat Time-of-Flight Mass Spectrometer
- 2:06 p.m.    **Allison Lee** (Julie Crockett), *Brigham Young University*  
An Experimental Study of Internal Wave Generation through Evanescent Regions
- 2:18 p.m.    **Kristen Wilding** (Brad Bundy), *Brigham Young University*  
Rational Engineering of Protein Stability for Potential Application as Detectors in NASA Space Missions
- 2:30 p.m.    **Poster Session & Break**

## Session IV    Session Chair: Dr. Joseph Orr, University of Utah

### Leonardo Event Center

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- 3:00 p.m.    **Andrew Davidson** (Steven Charles), *Brigham Young University*  
Compliant Robots for Next-Generation Human-Robot Interaction
- 3:12 p.m.    **Sean Walker** (Stephen Whitmore), *Utah State University*  
Development of a Power Efficient, Restartable, "Green" Propellant Thruster for Small Spacecraft and Satellites
- 3:24 p.m.    **Matthew Duffield** (Timothy McLain), *Brigham Young University*  
Automatic Dependent Surveillance-Broadcast for Sense and Avoid on Small Unmanned Aircraft
- 3:36 p.m.    **Rydge Mulford** (Brian Iverson), *Brigham Young University*  
Dynamic Control of Radiative Surface Properties with Origami-Inspired Design
- 3:48 p.m.    **Dallin Swiss** (Mark Colton), *Brigham Young University*  
A Compliant Haptic Pantograph: Springback Force Considerations

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**Poster Session** *Auditorium Lobby of Leonardo Museum, 2:30 – 3:00 p.m.*

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**Crystal-Lynn Bartier, Zachary Gibson, John Blakeslee, Hyejeon Cho, Hyun-chul Lee** (Joseph Jensen), *Utah Valley University*  
The Surface Brightness Fluctuation Distance to the Coma Cluster

**Margaret Chao** (Joseph Orr & Lara Brewer), *University of Utah*  
Identifying Changes in Ventilation Leading to Oxygen Desaturation during Procedural Sedation

**Edgar Chavez & So Mi Yoo** (Bonnie Baxter), *Westminster College*  
Exploration of Life in Halite

**Johnathon Gay and Stuart Johnson** (Kim Nielsen), *Utah Valley University*  
Establishing a Student-Driven High Altitude Research Program at UVU

**Zachary Gibson, Hyun-chul Lee, John Blakeslee** (Joseph Jensen), *Utah Valley University*  
Probing Stellar Populations in the Virgo and Fornax Clusters with Infrared Surface Brightness Fluctuations

**Macklin Johnson** (Sam Tobler), *Dixie State University*  
Resistivity Measurements on Gold and Gallium Thin Films

**Garrett Milton** (Sam Tobler), *Dixie State University*  
Gold and Gallium Nanoparticle Growth on Silicon (100)

**Betty Rozum**, *Utah State University Library*  
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**Jessica Zollinger** (Jan Sojka), *Utah State University*  
High Altitude Payload for CUBESAT Aeroboom Development (HAPCAD)