

# INNOVATIONS IN FLIGHT



2015

Wisconsin Space Grant Consortium and  
Experimental Aircraft Association Present:

## The Twenty-Fifth Annual WISCONSIN SPACE CONFERENCE

EAA AirVenture Museum  
Oshkosh, Wisconsin

Friday, August 14, 2015

# WSGC Presentation Schedule

August 14, 2015

7:30-8:15am      **Registration & Continental Breakfast**      **(Lobby & Founders Wing)**

8:15-8:30am      **Welcome & Introductions**      **(Founders Wing)**

**Christine Thompson:** Program Manager, WSGC; Carthage College

**Kevin Crosby:** Director, WSGC; Dean, Division of Natural and Social Sciences, Carthage College

**Mike LeDocq:** Chair, WSGC Advisory Council; Natural Science Department Head and Physics Instructor, Western Technical College

## **Session 1: Plenary Speaker**      **(Founders Wing)**

8:30-9:15am      **Moderator: Bret Steffen,** Director of Education, EAA

**John Monnet:** President and Founder, Sonex Aircraft LLC

## **Session 2: NASA Partnerships**      **(Founders Wing)**

**Moderator: William Dirienzo,** WSGC Advisory Council; Department of Computer Science, Engineering, Physics, and Astronomy, UW-Sheboygan

9:15-9:30am      **HUNCH: Matt Heer,** *NAVi3: Stabilizing and Controlling a GoPro Camera with Gyroscopes in Microgravity*; Physics & Engineering; Teacher, Platteville High School

9:30-9:45am      **USIP: Tessa Rundle, Kevin LeCaptain, Benjamin Tillema,** *Microgravity Propellant Gauging Using Experimental Modal Analysis*; Physics; Undergraduates, Carthage College

9:45-10:00am      **X-HAB: Nicole Przybyla,** *Design of Carbon-fiber/FDM Spacecraft Structural Fabrication System (SSFS)*; Engineering & Applied Sciences; Undergraduate, UW-Milwaukee

10:00-10:15am      **Senior Design: Justin Collins, Stephen Skibinski,** *Thermal Energy Management on Enceladus*; Mechanical Engineering; Undergraduates, Milwaukee School of Engineering

10:15-10:20am      **FNL Video: Chris Thompson,** Carthage College

## Session 3A: Student Research

(Vetti)

**Moderator: Lindsay McHenry**, WSGC Associate Director, Undergraduate Scholarships and Graduate Fellowships; Associate Professor of Geosciences, UW-Milwaukee

10:30-10:45am **Stephanie Bradshaw**, *Thunderstorm Electrification*; Physics & Astronomy; Undergraduate, Carthage College

10:45-11:00am **Christopher Christopherson**, *Observing Nebulosities*; Physics & Astronomy; Undergraduate, UW-Oshkosh

11:00-11:15am **Jordan Zimmerman**, *Riveting Hammer Vibration and Nerve Damage*; Biomedical Engineering & Cell Biology; Undergraduate, Marquette University/Medical College of Wisconsin

11:15-11:30am **Sarah Martens** – *Star Forming Rates and HI Gas Content in Galaxy Groups*; Astronomy & Physics; Undergraduate, UW-Madison

11:30-11:45am **Trent Cybela**, *Developments in Fire Suppression on Orbit*, Mechanical Engineering; Undergraduate, UW-Platteville

11:45-12:00am **Aaron Olson**, *Recent Progress in Lunar Helium-3 Extraction Research*; Engineering Physics; Graduate, UW-Madison

## Session 3B: K-12 General Outreach

(Batten)

**Moderator: Karen Broitzman**, WSGC Associate Director, Aerospace Outreach; Aviation Education Program Manager, Wisconsin Department of Transportation

10:30-10:45am **Barbara Bielec**, *Wild Weather! & Biotechnology: Basics* – BTC Institute Outreach; K-12; Program Director, BTC Institute

10:45-11:00am **Susan Kelly**, *NASA Astronaut at Middle School 2016 Summer Science Camps at UW-La Crosse*; Mathematics; Professor, UW-La Crosse

11:00-11:15am **John Heasley**, *Driftless Dark Skies: STEM Careers for Rural Students*; Environmental Education; Space Science Educator, Kickapoo Valley Reserve

11:15-11:30am **Chris Janssen**, *Space Simulator Engaging Youth for Leadership and Engineering Skills*; Planetarium; Director, Wausau School Planetarium

11:30-11:45am **Thomas Consi**, Learning Spacecraft Engineering with Underwater Vehicles; Freshwater Sciences; Assistant Professor, UW-Milwaukee

## Lunch

(Founders Wing)

11:45-12:45pm **Lunch**

11:45-12:45pm **Individual Awardee Photos**

## Session 4: Academic and Industry Research

(Founders Wing)

**Moderator: Gubbi Sudhakaran**, WSGC Associate Director, Research Infrastructure; Chair of Physics Department, UW-La Crosse

12:45-1:00pm **Seth King**, *Effects of Gamma Irradiation on ZnO*; Physics; Associate Professor, UW-La Crosse

1:00-1:15pm **Robert Benjamin**, *Variable Stars of the Galactic Disk*; Physics; Professor, UW-Milwaukee

1:15-1:30pm **Brian Kragh, Rachel Post, Nathaniel Lee, Stephen Janke**, *Exploring Drone Capabilities for Academic Research*; Natural Science Division; Undergraduates, Carthage College

1:30-1:45pm **Taviare Hawkins**, *Microtubule Mechanics in the Presence of Lattice Defects*; Physics; Assistant Professor, UW-La Crosse

1:45-2:00pm **Todd Treichel**, *Astronaut Crew LED Lighting & Human Factor Effects*; Senior Systems Engineer, Orbital Technologies Corporation

2:00-2:15pm **Eric Compas**, *Investigating the Use of Low-Cost UAVs for Low-Altitude, High-Temporal Resolution Aerial Photography for Natural Resource Research and Teaching*; Geography, Geology, and Environmental Science; Assistant Professor, UW-Whitewater

2:15-2:30pm **Lindsay McHenry**, *Developing Impact Cratering Labs for an Online Introductory Planetary Geology Course*; Geosciences; Associate Professor, UW-Milwaukee

2:30-2:45pm **Robert Ragan**, *Predicting Equilibria in 1-d Collisionless Gravitational Systems*; Physics; Professor, UW-La Crosse

## Session 5: Networking & Poster Session

(Fergus Plaza)

2:45-3:45pm

**Poster Session; Refreshments in Hallway**

**3:30pm - Group Photo in Eagle**

**Moderator: Michael LeDocq**

**Ryan Manske**, *Using Radio Frequencies to Spatially Track ID Tags*; Natural Sciences; Science Teacher, East Troy High School

**Evan Dowling**, *Can Dark Matter Halos Change Shape?*; Physics; Undergraduate, UW-La Crosse

**Zachary Dercks, Matthew Arnoldussen**, *Asteroid Attachment*; Mechanical Engineering; Undergraduates, Milwaukee School of Engineering

**Andrew Eagon**, *The Circulation of Ionized Gas on the Milky Way*; Astronomy; Undergraduate, UW-Whitewater

**RockSat-C Team: Amelia Gear, Tessa Rundle, Jordan Rice, Justin Barhite**: *Normal Field Instability of Ferrofluid in Microgravity*; Physics; Undergraduates, Carthage College

**Collegiate Rocket Launch: Second Place – Engineering Division – Team Badger Ballistic**; Undergraduate Student, University of Wisconsin-Madison  
Represented by Lucas Jewell

**2015 Elijah High Altitude Balloon Program Launch Team:**

Alana Tirimacco; Mechanical Engineering, MSOE

Jordan Petrie; Mechanical Engineering, MSOE

Danny Ochoa; Mechanical Engineering, MSOE

Jadee Kellogg; Physics, Ripon College

**Henri LeMieux** – *Massive Stellar Content of the Cygnus Superbubble*; Physics and Astronomy; Undergraduate, UW-Oshkosh

**Stephen Dornbos** – *Early Life on Land: Evaluating the Biogenicity of Mesoproterozoic Fluvial-Lacustrine Stromatolites*; Geosciences; Associate Professor, UW-Milwaukee

**Geoffrey Ament** – NASA Internship; Engineering Physics; Undergraduate, UW-Platteville



## Session 6: WSGC Team Projects

(Founders Wing)

**Moderator: Bill Farrow**, WSGC Associate Director, Student Satellite Initiatives;  
Assistant Professor, Milwaukee School of Engineering

3:45-4:00pm

**Collegiate Rocket Launch: First Place – Non-Engineering Division – Team Red Hawk Rocketry**; Undergraduate Students, Ripon College

Jadee Kellogg  
Akash Sen  
Paul Ninneman  
James Ihrcke

4:00-4:15pm

**Collegiate Rocket Launch: First Place – Engineering Division – Team Whoosh Generator**; Undergraduate Student, Milwaukee School of Engineering

Represented by Eric Johnson

4:15-4:30pm

**Midwest High-Powered Rocket Launch: Third Place – Engineering Division – Team Pioneer Rocketry**; Undergraduate Student, UW-Platteville

Represented by Jake Ellenberger

4:30-4:45pm

**Elijah Balloon Payload Team**; Mechanical Engineering  
Benjamin Jensen, Milwaukee School of Engineering  
Kai Swanson, Milwaukee School of Engineering  
Taylor Davitz, Milwaukee School of Engineering  
Woodrow Walker, Milwaukee School of Engineering  
Nate Klassen, UW-Whitewater  
Scott Frazier, UW-Milwaukee

4:45-5:00pm

**Tethered Aerostat Program**; NASA STEM Persistence Grant  
Amy Jozwiak, College of Menominee Nation  
Marilyn Madosh, College of Menominee Nation  
Larry Madden, College of Menominee Nation  
Jesse Banick, UW-Fox Valley  
Kathryn Lentz, UW-Fox Valley  
Jeshanah Zolkowski, UW-Fox Valley  
Travis Haugstad, Western Technical College  
Joel Nielsen, Western Technical College

# Awards Ceremony

(Founders Wing)

5:00-5:25pm

## **Award Presentation**

Chris Thompson – EmCee  
Kevin Crosby – Award Presenter  
Mike LeDocq – Award Presenter

## **Student Programs – Presenters**

Lindsay McHenry – Undergraduate Scholarship  
Gubbi Sudhakran – Undergraduate Research  
William Farrow – Student Satellite Programs  
Dan Hawk – Tethered Aerostat Program  
Robert Morrow – Aerospace Internships  
Lindsay McHenry – Graduate & Professional Programs

## **Non-Student Programs – Presenters**

Karen Broitzman – Aerospace Outreach Program  
Nicole Wiessinger/Michael LeDocq – Special Initiatives Program  
Gubbi Sudhakran – Research Infrastructure Program  
Michael LeDocq – Higher Education Incentives  
Robert Morrow – Aerospace Industry Program

5:25pm

## **Closing Remarks – Kevin Crosby**

# WSGC Evening Schedule

August 14 2015

- |        |                                                                                                                                                                                                                                                                                                    |                        |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 5:30pm | <b>Reception</b>                                                                                                                                                                                                                                                                                   | <b>(The Voyager)</b>   |
| 6:30pm | <b>Welcome – Chris Thompson</b>                                                                                                                                                                                                                                                                    | <b>(Founders Wing)</b> |
| 7:30pm | <b>Plenary Speaker:</b>                                                                                                                                                                                                                                                                            |                        |
|        | <b>Introductions: Kevin Crosby</b>                                                                                                                                                                                                                                                                 |                        |
|        | <b>Dr. R. Aileen Yingst; <i>Innovations in Spaceflight: Three Years with Curiosity on Mars</i>, Senior Scientist, Planetary Science Institute; Participating Scientist, Mars Exploration Rover Mission; Deputy Principal Investigator, Mars Handlens Imager instrument on Mars rover Curiosity</b> |                        |
| 8:20pm | <b>Closing Remarks – Kevin Crosby</b>                                                                                                                                                                                                                                                              |                        |



# WSGC Workshop Schedule

August 15, 2015

9:00-9:10am	<b>Welcome and Introductions</b>	<b>(Vetti)</b>
	<b>Dan Choffnes</b> , Carthage College, Workshop Leader <b>William Farrow</b> , Milwaukee School of Engineering <b>Aaron Olson</b> , UW-Madison <b>Madeline Klothe</b> , UW-Madison	
9:10-9:20am	<b>Dan Choffnes: <i>Overview of Workshop Themes</i></b>	
9:20-9:30am	<b>Dan Choffnes: <i>Intentionality and Serendipity in the Careers of Scientists and Engineers</i></b>	
9:30-9:45am	<b>Bill Farrow: <i>Developing and Articulating Career Goals</i></b>	
9:45-9:55am	<b>Aaron Olson: <i>Career Path and Advice</i></b>	
9:55-10:05am	<b>Morning Break</b>	
10:05-10:15am	<b>Making Connections</b> <ul style="list-style-type: none"><li>- Networking with Academic Faculty &amp; Staff</li><li>- Reaching out to WSGC Institutional Representatives</li><li>- Courting Potential Internship Sponsors &amp; Graduate Supervisors</li></ul>	
10:15-10:45am	<b>The Statement of Purpose</b> <ul style="list-style-type: none"><li>- Role of Personal Statement/Declaration of Goals in Career (Scholarships, Graduate School)</li><li>- Common Myths about the Personal Statement</li><li>- Mock Review of Sample Personal Statements</li></ul>	
10:45-10:55am	<b>Maddie Kothe: <i>Career Path &amp; Advice</i></b>	
10:55-11:00am	<b>Wrap Up and Conclude</b>	

## MORNING KEYNOTE SPEAKER | JOHN MONNETT

President and Founder, Sonex Aircraft LLC

We are honored to have John Monnett, Founder and President of Sonex Aircraft LLC, as our Event Keynote Speaker. John, a multi-thousand hour private pilot with both glider and float plane ratings and an A&P Mechanic, has many de-signs to his credit including the Sonerai sport aircraft series, Monerai sailplane, Moni motorglider, Monex racer, along with numerous other homebuilt aircraft. John has over 40 years of homebuilt aircraft and restoration experience along with extensive engine development and testing experience. John was inducted into the EAA Homebuilder's Hall of Fame in 2001 and his designs are on display in the Udvar-Hazy National Air & Space Museum and the EAA AirVenture Museum



## **EVENING KEYNOTE SPEAKER | Dr. R. Aileen Yingst**

Dr. R. Aileen Yingst is a Senior Scientist at the Planetary Science Institute, a research institution headquartered in Tucson, AZ. She is a Participating Scientist on the Mars Exploration Rover Mission and Deputy Principal Investigator for the Mars Handlens Imager instrument on the Mars Science Laboratory rover Curiosity. Other missions that Dr. Yingst has worked on include Dawn at Vesta, Mars Pathfinder, Mars Polar Lander, and Galileo. Dr. Yingst also served as Director of the Wisconsin Space Grant Consortium for 14 years.



Dr. Yingst received her AB from Dartmouth College in Physics and Astronomy, and her M.Sc. and Ph.D. in Geological Sciences from Brown University.

## STUDENT PROGRAMS

### **Undergraduate Research (UGR)**

**Dr. Laurel Salton Clark Memorial Graduate &**

**Professional Fellowship (LSC)**

**WSGC Graduate & Professional Research**

**Fellowship (GPP)**

Application Deadline: February 1, 2016

Award Announcement: April 1, 2016

### **Undergraduate Scholarship**

*Two-year Academic Institutions*

Application Deadline: September 30, 2015

Award Announcement: December 1, 2015

### **Industry Internship Program (IIP)**

Application Opportunity: February 1 – 26, 2016

Award Announcements: Determined by Industry Partners

## TEAM PROGRAMS

### **Collegiate Rocket Launch (CRL)**

*Notice of Intent (NOI) to compete due:*

Application Deadline: September 30, 2015

Selection Announcement: October 9, 2015

Launch Competition: April 23, 2016 (TBC)

### **High-Altitude Balloon Program - Elijah**

*Launch Internship (EBL)*

Work period April 1, 2016 – May 15, 2017

*Payload Internship (EBP)*

Work period May 15, 2016 – August 15, 2016

Application Deadline: February 26, 2016

Award Announcements: April 15, 2016

### **Tethered Aerostat Program**

Western Technical College, UW-Fox Valley, College of Menominee Nation

*Lead Student Internship, Affiliate Student Internship*

Work Period September 19, 2015 – September 18, 2016

Application Deadline: September 30, 2015

Award Announcements: October 30, 2015

## ACADEMIC & INDUSTRY PROGRAMS

### **Aerospace Outreach Program (AOP)**

**Special Initiatives Program (SIP)**

Application Deadline: October 16, 2015

Award Announcements: December 7, 2015

### **Higher Education Incentives (HEI)**

**Research Infrastructure Program (RIP)**

Application Deadline: December 10, 2015

Award Announcements: March 1, 2016

### **Industry Internship Program (IIP)**

Application Deadline: November 16, 2015

Award Announcements: February 1, 2016