



# FREQUENT FLYER

American Institute of Aeronautics and Astronautics  
Northern Ohio Section

Newsletter - March 2019

## Young Astronaut Day Celebrates the 50<sup>th</sup> Anniversary of the Apollo Moon Landing

The 26<sup>th</sup> Annual Young Astronaut Day (YAD) outreach event was held at the NASA Glenn Research Center (GRC) on November 3, 2018. The event was held in the MIC Building where 340 students and 150 teachers/parents were in attendance. The students (grades 1–12) competed in various hands-on STEM challenges meant to simulate the tasks performed by NASA engineers. This year, students participated in the following activities: Don't Lose Your Marbles, Planetary Rovers, Rocket Launch Challenge, Asteroid Capture, Titan Submarine, Powered and Pumped up: Solar Concentrator, and Mars Rover and Landing System. In addition, the students participated in CANstruction®, a community service activity led by volunteers from NASA and Onyx Creative, in which 2,160 cans of food were used to create a pixel wall of the NASA 60<sup>th</sup> Anniversary logo and a model of an Apollo Lunar Lander in celebration of the 50<sup>th</sup> Anniversary of the Apollo Moon Landing. The model and pixel wall remained on display at NASA for a week and the canned food was subsequently donated to the Cleveland Foodbank.

Grant Slusser, Chief Training Officer at Johnson Space Center, spoke about what it takes to train astronauts for various missions during the keynote address. YAD is made possible

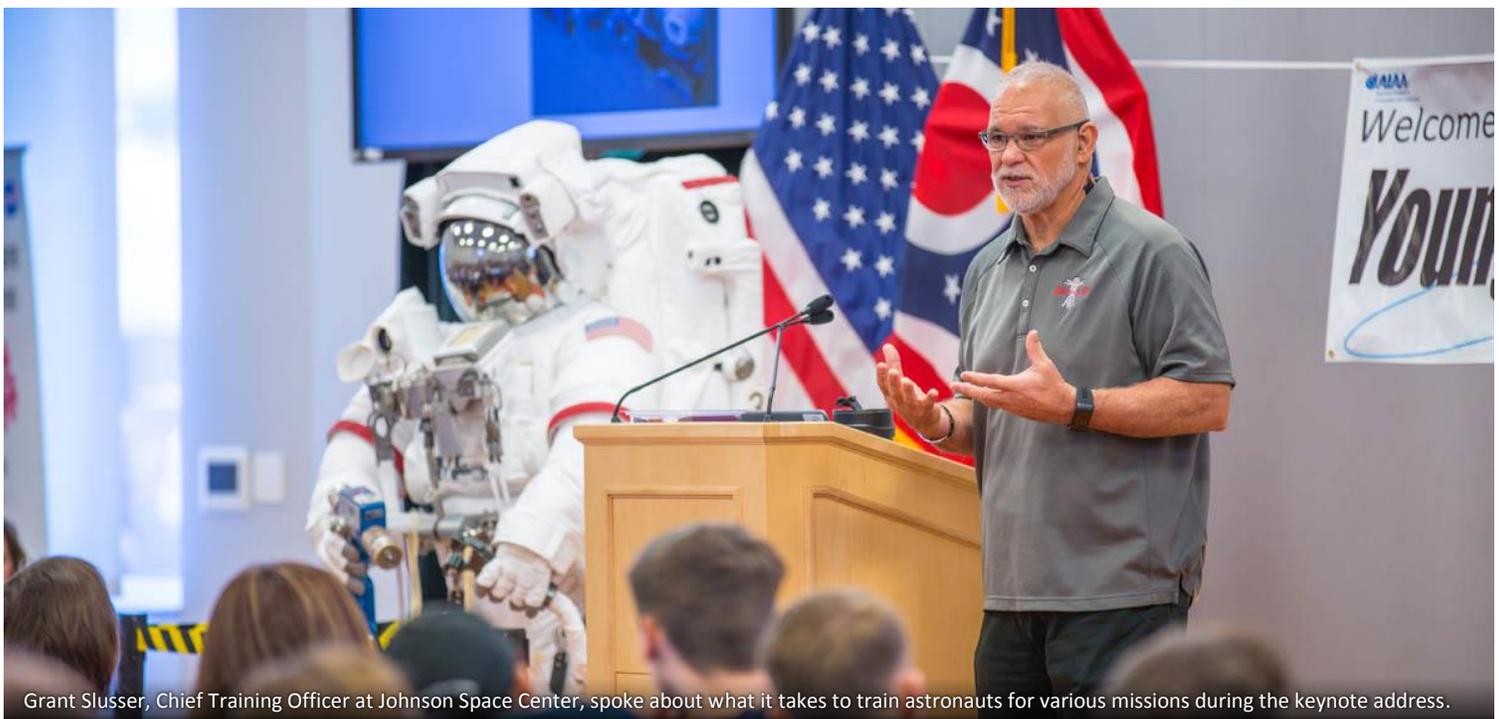


CANstruction model of Apollo Lander and NASA 60<sup>th</sup> Anniversary logo.

through the grass roots efforts of 65 volunteers from NASA GRC, the Cleveland State University AIAA student chapter, and several AIAA members. This year's event was sponsored by the NASA Exploration Systems Project Office, AIAA Northern Ohio Section (NOS), and the TFOME Contractor Team of HX5-Sierra, Jacobs, and MSM Group. Additional photos may be found on the AIAA NOS Facebook page:

[Young Astronaut Day 2018 - Photo Album](#)

*(Text: Ashlie Flegel, Photos: Edmond Wong)*



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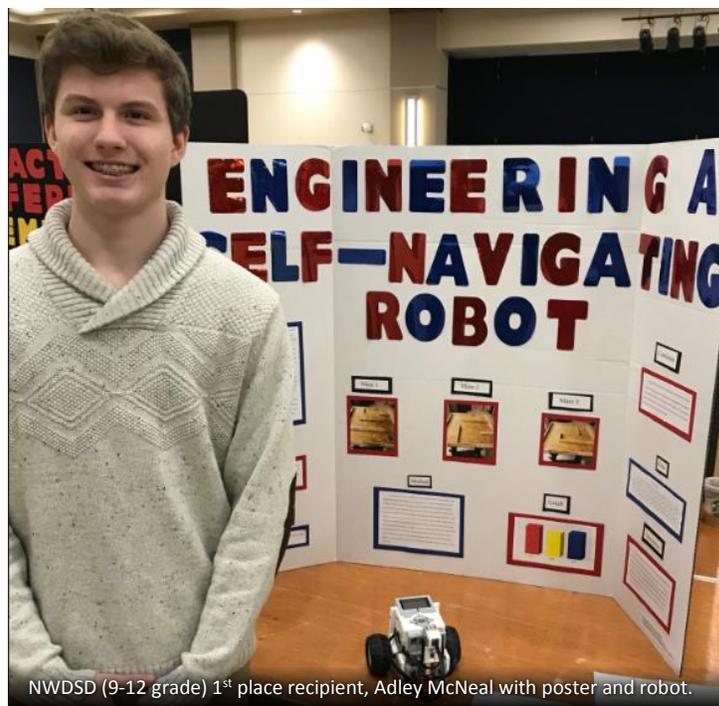


### Northern Ohio Section Judged and Sponsored Special Awards for Area Science Fairs

In March 2019, the AIAA NOS continued its support of the Northern Ohio regional science fairs. Each year NOS offers \$400 in prizes for aerospace-related projects, which are judged by volunteer members of the section.

The Northwest District Science Day (NWSDS) science fair was held at the University of Toledo student union on Saturday March 2. Jonathan Kratz and Aaron Hensley of the NASA Glenn Research Center (GRC) were onhand to judge the projects. Students were grouped into two categories, 5<sup>th</sup> – 8<sup>th</sup> grade, and 9<sup>th</sup> – 12<sup>th</sup> grade, with over 140 total science projects on display. AIAA NOS judges evaluated a number of these science projects broadly related to aerospace engineering and associated sciences. One 1<sup>st</sup> place and two 2<sup>nd</sup> place prizes were awarded in each category for a total of six prizes.

Many students put together impressive projects and exhibited a great deal of knowledge and passion toward their



NWSDS (9-12 grade) 1<sup>st</sup> place recipient, Adley McNeal with poster and robot.



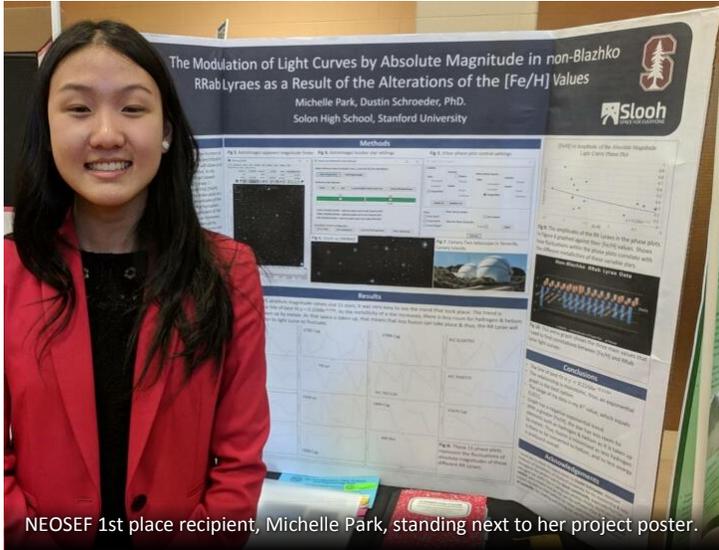
NWSDS (5-8 grade) 1<sup>st</sup> place recipient, Travis Burnard, with his project poster.

project topic. Particular worthy of highlighting was: Adley McNeal’s (Grade 11) assembly, programming, and testing of a self-navigating robot with a vision toward potential application to autonomous exploration and mining on Mars; Travis Burnard’s (Grade 7) analysis of strength and deflection in 3D printed parts when considering different infill patterns and their density; and Nipun Jayatissa’s (Grade 12) design and testing of a novel biosensor for detecting heart disease.

The Northeastern Ohio Science and Engineering Fair (NEOSEF) took place at Cleveland State University on March 12. There were over 450 projects in a wide range of categories covering grades 7–12. The judges were given time to look at the displays and down-select, then interviewed around 15 students to select two 1<sup>st</sup> place winners and four runners up. The judges were Jonathan Kratz (NASA GRC), Jonathan Litt (NASA GRC), Al Juhasz (NASA GRC), Yu Hin Hau (NASA GRC), and David Sagerser (Retired NASA GRC).

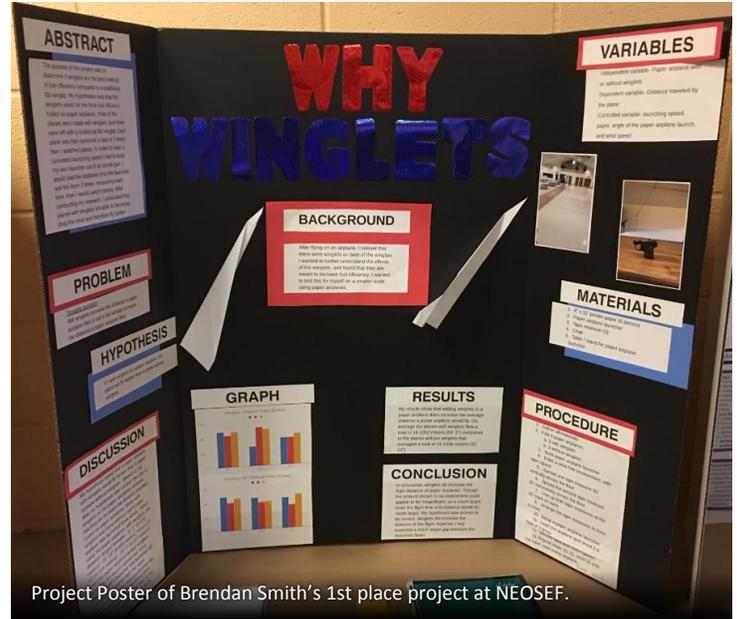
#### Northwest District Science Day (NWSDS) Prize Winners

Prize	Name	School	Project
1 <sup>st</sup> place, \$50	Adley McNeal, 11 <sup>th</sup> Grade	Hilltop High School	Engineering a Self-Navigating Robot
1 <sup>st</sup> place, \$50	Travis Burnard, 7 <sup>th</sup> Grade	Lial Catholic School	The Effect of Infill Patterns on the Deflection of 3D Printed Objects
2 <sup>nd</sup> place, \$25	Nipun Jayatissa, 12 <sup>th</sup> Grade	Maumee Valley Country Day School	Feasibility of Designing a Novel Biosensor for Detecting Heart Disease
2 <sup>nd</sup> place, \$25	Mazen Hinch & Hussein Muhammad, 6 <sup>th</sup> Grade	Toledo Islamic Academy	The Homemade Food Battery
2 <sup>nd</sup> place, \$25	Danna Maalood, 6 <sup>th</sup> Grade	Toledo Islamic Academy	The Effect of Flame Retardants on Flammability and Burning Rate of Cotton
2 <sup>nd</sup> place, \$25	Nash Kuney, 12 <sup>th</sup> Grade	Hilltop High School	3D Printed Part Strength with Orientation & Layer Height



NEOSEF 1st place recipient, Michelle Park, standing next to her project poster.

It was apparent that the students put a great deal of work into their projects. Several of the students displayed a high level of interest and enthusiasm that was accompanied by their extensive knowledge about their project topic. Particularly worthy of highlighting was: Michelle Park's analysis of the modulation of the light curves of stars as a result of their Fe/H



Project Poster of Brendan Smith's 1st place project at NEOSEF.

values; Brendan Smith's carefully thought out, sound, and resourceful approach to evaluating the impact of winglets on aircraft range and efficiency; Antonio Linek's showcase of work and knowledge concerning the use of a vacuum to create a propulsive force; and Jaden Stainforth's engineering of a track and vehicle for testing a maglev system with application to aircraft take-off.

Overall the judges found the experience to be rewarding. Jonathan Kratz commented, "it was good to see the enthusiasm of the students, their interest in engineering and the sciences, and their vision for improving the lives of others, and it was gratifying for me to have the opportunity to encourage them in that pursuit." Judging is a great way to give back to the community, re-juvenate your passion for STEM, encourage the next generation of engineers and scientists, and who knows, you might learn something, too!

*(Text and photos: Jonathan Kratz)*



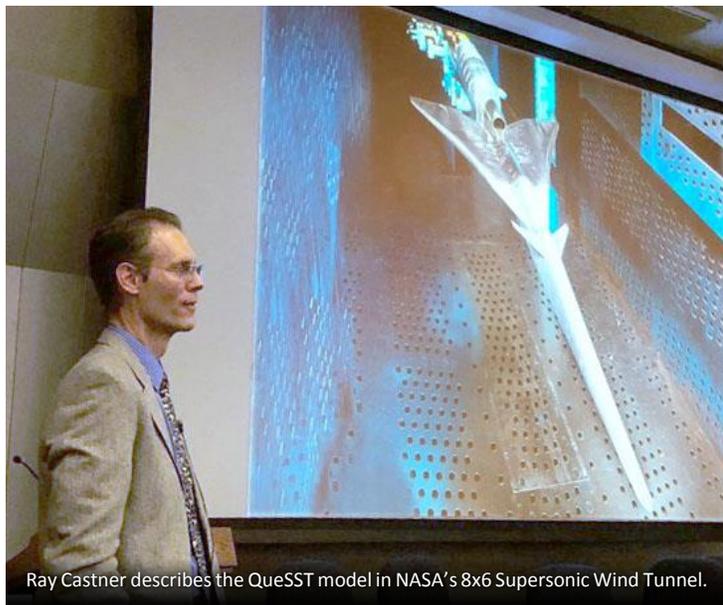
NEOSEF projects, students, and judges at the Cleveland State University recreation center.

**Northeastern Ohio Science and Engineering Fair (NEOSEF) Prize Winners**

Prize	Name	School	Project
1 <sup>st</sup> place, \$50	Michelle Park, 9 <sup>th</sup> -10 <sup>th</sup> Grade	Solon High	The Modulation of Light Curves by Absolute Magnitude in non-Blazhko RRab Lyraes as a Result of the Alterations of the [Fe/H] Values
1 <sup>st</sup> place, \$50	Brendan Smith, 7 <sup>th</sup> -8 <sup>th</sup> Grade	St. Mary of the Falls	Why Winglets?
2 <sup>nd</sup> place, \$25	Antonio Linek, 11 <sup>th</sup> -12 <sup>th</sup> Grade	West Geauga High	Vacuum Propulsion
2 <sup>nd</sup> place, \$25	Jaden Stainforth, 7 <sup>th</sup> -8 <sup>th</sup> Grade	Birchwood School	Maglev Technology for Aircraft Liftoff
2 <sup>nd</sup> place, \$25	George Gonet, 7 <sup>th</sup> -8 <sup>th</sup> Grade	St. Albert the Great School	Drones in Drafts
2 <sup>nd</sup> place, \$25	Nicholas Dunmire, 7 <sup>th</sup> -8 <sup>th</sup> Grade	SS Robert and William School	Make the Wind Work for You

### Distinguished Lecture: Ray Castner on Supersonic Flight Research at NASA

On November 14, nearly 30 members of AIAA Northern Ohio Section were treated to a lecture by the NASA Propulsion Team Lead for the Low Boom Flight Demonstration Project. Mr. Ray Castner is an Aerospace Engineer in the Inlets and Nozzles Branch at the NASA Glenn Research Center and has been an active member of AIAA and served on the AIAA Ground Test Technical Committee (GTTC) for over 10 years.



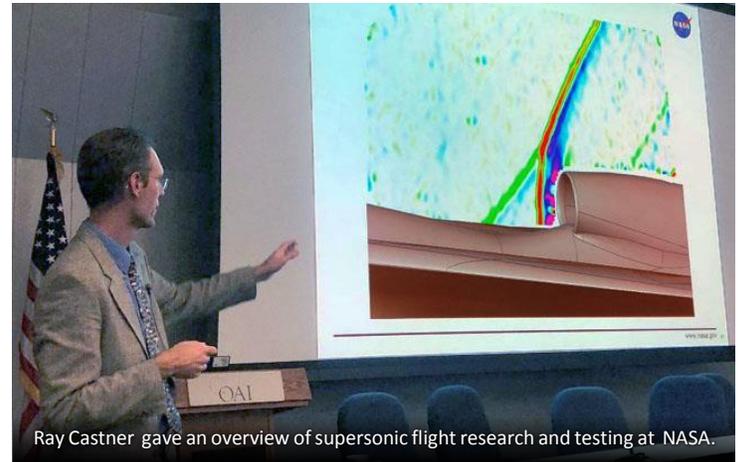
Ray Castner describes the QueSST model in NASA's 8x6 Supersonic Wind Tunnel.

Mr. Castner gave an overview of a key element of NASA Aeronautics research, supersonic flight. He then focused on the Quiet Supersonic Technology (QueSST) vehicle, which is being developed to provide key data for future quiet supersonic flight over land. The lecture also covered a description of the sonic boom problem, the plans for research data collection on the test vehicle, the history of NASA's 8x6 Supersonic Wind Tunnel, the QueSST wind tunnel model installation, key test results, and a behind-the-scenes glimpse of a large wind tunnel test at one of NASA's historical facilities.

Ray Castner started at NASA Glenn in 1990 as a test engineer where he worked to reduce jet noise in the Aero-Acoustic Propulsion Lab, and collected performance data on jet engines in the Propulsion Systems Lab.

Following his well-received lecture lasting nearly an hour, the attentive audience peppered the speaker with a variety of questions, from those addressing the QueSST vehicle to in-depth wind tunnel data questions from former test engineers. It was a very engaging and enjoyable lecture!

(Text: Jim Gilland, Photos: Christie Pastor-Barsi)



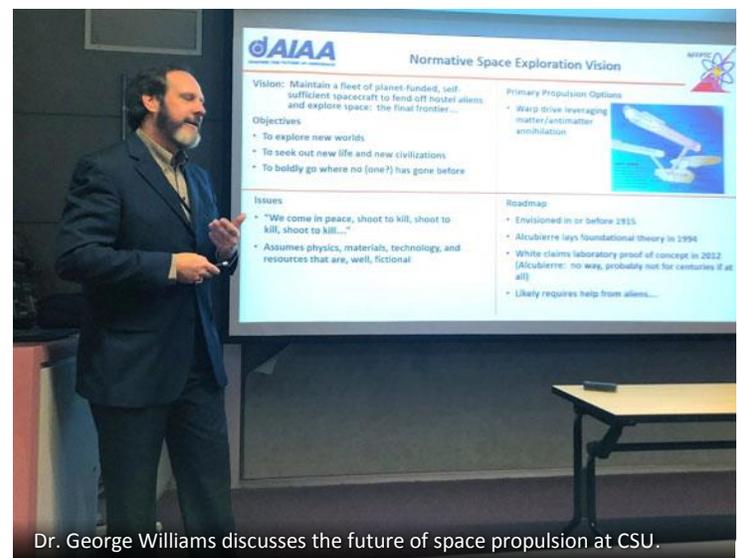
Ray Castner gave an overview of supersonic flight research and testing at NASA.

### CSU Chapter Hosts George Williams Talk

On October 25<sup>th</sup>, 2018, Cleveland State University's Student Chapter of AIAA hosted a lunch-and-learn with NASA Senior Scientist, George Williams, Ph.D, on *The Future of Space Propulsion*. Dr. Williams, an Associate Fellow of AIAA and expert in spacecraft propulsion, piqued the curiosity of the group of students, as together they explored the reality of some more radical mission support studies for advanced propulsion systems. The presentation touched on the development of both plasma and chemical propulsion systems, and entertained the possible utilization of these types of propulsion for future deep-space exploration.

"Dr. William's take on the advancement of astronomical engineering was eye-opening, and really got our gears turning!" Dan Londrico, Mechanical Engineering Student.

(Text and photo: Maggie Kolovich)



Dr. George Williams discusses the future of space propulsion at CSU.

## Youngstown State University Chapter Hosts Talk on Elements of Solid Propulsion

The AIAA student chapter at Youngstown State University hosted Mr. Jim Rade, engineering consultant at Northrop Grumman Innovation Systems (formerly Orbital ATK), as its 2018 fall-semester technical speaker.

Student members had the opportunity to hear about Mr. Rade's career journey as he shared personal highlights of his engineering projects, including work on the STAR 48BV upper-stage rocket motor used during NASA's recent Parker Solar Probe mission. Mr. Rade also spoke with the students about his role in the program that provided the gas generators used by the airbag landing system for NASA's Mars Exploration Rovers (Spirit and Opportunity) in 2004.

The YSU students benefited from hearing how an undergraduate degree in chemistry propelled Mr. Rade to the U.S. Navy Nuclear Power School and a subsequent career in spacecraft propulsion.

*(Text and photo: Kevin Disotell)*



(Left to right) Kyle Williams (AIAA-YSU Treasurer), speaker Jim Rade, and Matthew Lawson (AIAA-YSU Chair).

## AIAA Membership Grades

The distinction gained with membership advancement bolsters a member's status and reputation in the aerospace community. Visit the AIAA Honors page to learn how to submit a nomination:

<https://www.aiaa.org/Honors/>

- **Student Member** – Dues extremely low for high school, undergraduate, and graduate students.
- **e-Member** – It's a FREE one-year membership for aerospace professionals new to AIAA that offers access to AIAA's electronic resources! AIAA e-Members are professionals who hold a science or engineering degree, or qualifications through professional experience in aeronautics or astronautics, and are new to the Institute, having never been a student or professional member in the past.
- **Member** – AIAA Members hold a science or engineering degree, or professional qualifications through professional experience in aeronautics, or astronautics. Any student who is a member of AIAA in good standing at the time of graduation may transition to professional membership at a substantial discount for the first three years.
- **Senior Member** – Individuals who have demonstrated a successful professional practice in the arts, sciences, or technology of aeronautics or astronautics for the equivalent of at least eight years, or who have at least eight years of continuous professional membership in AIAA. Senior Member applicants, or nominators, shall furnish two (2) references, both of whom shall be Senior Member or higher.
- **Associate Fellow** – Individuals who have accomplished or been in charge of important engineering or scientific work, or who have done original work of outstanding merit, or who have otherwise made outstanding contributions to the arts, sciences, or technology of aeronautics or astronautics. To be selected as an Associate Fellow an individual must be an AIAA Senior Member in good standing, with at least twelve years professional experience, and be recommended by a minimum of three current Associate Fellows or higher. Associate Fellows may be nominated by any member in good standing. Self-nominations are not permitted, and the nominator cannot also act as a reference.
- **Fellow** – Individuals of distinction in aeronautics or astronautics who have made notable valuable contributions to the arts, sciences, or technology of aeronautics or astronautics. Nominees must be an Associate Fellow. Four AIAA members in good standing are required to act as references. One reference must be a Fellow or Honorary Fellow, a member of the AIAA Council of Directors or Institute Board of Trustees, Section Chairperson, Technical Committee or Program Committee Chairperson. Self nominations are not permitted.
- **Honorary Fellow** – Individuals of eminence in aeronautics or astronautics distinguished by long and highly contributive careers in the arts, sciences, or technology of aeronautics or astronautics. Nominees must be a Fellow. Five AIAA member references are required. The names of not more than 4 nominees deemed the most worthy of the Honorary Fellow honor shall be recommended to the Board for election each year.

## Upcoming Events

### Donations Needed for CANstruction™ Charity Event

April 4<sup>th</sup>, 2019

South Park Mall – Strongsville, Ohio

The Northern Ohio Section of the American Institute of Aeronautics and Astronautics has assembled a team of engineers to participate in this year's CANstruction™ competition. This competition is a way to help make a difference for hungry families across Northeast Ohio, and we are looking for sponsors to help our team.

What is CANstruction™? It is a competition between teams of architects, engineers, and other professionals to produce the most creative sculptures out of cans of food. Awards are given in various categories ("Best use of labels", "Best meal", etc.). After the competition, all the canned food is donated to the Cleveland and Akron food banks. This year's competition theme is "Heroes and Villains." The images show last year's sculpture and a sneak peek of the concept for this year's creation.

CANstruction™ Cleveland 2019 will take on place April 4<sup>th</sup>, 2019 at South Park Mall in Strongsville, Ohio. The sculptures will be on display through April 15<sup>th</sup>. Our team is eager to build, but we need your support to purchase the cans and other materials. Any donation would be helpful and greatly appreciated. If your company is willing to donate, would you be able to support us with a donation of \$250? As a donor, your name will be displayed alongside our structure at South Park Mall. This is not only a great way to get your business'



name in front of mall patrons, but also a way to make an impact on our community by helping to feed the hungry in the Cleveland and Akron areas.

Corporate or individual donations of any amount can be easily made using PayPal. To learn more about the event and to make an online donation via PayPal, please visit:

<https://aianos.org/canstruction>

If you have any questions, please contact John Wolter at [jwolter0@gmail.com](mailto:jwolter0@gmail.com) or 216-337-1384.

Thank you for your consideration.

*The AIAA-NOS CANstruction™ Team:*

*John Wolter, Mike Borghi, Rula Coroneos, Dan Gotti, Stefanie Hirt, Henry Korth, Lexi Lee, Logan Micham, Taylor Pember, Manan Vyas, and Linda Yoon*



## Upcoming Events

### AIAA Region III Student Conference

April 5-6, 2019

Cleveland State University – Cleveland, Ohio

The American Institute of Aeronautics and Astronautics (AIAA) sponsors student conferences in each AIAA Region as a means to encourage students in aerospace-related fields to discuss research, exchange knowledge, and generate interest in the field of aerospace engineering.

This year, the AIAA Student Chapter at Cleveland State University will be hosting the 2019 AIAA Region III Student Conference on April 5<sup>th</sup> and 6<sup>th</sup>. Student AIAA members from Wisconsin, Illinois, Indiana, Kentucky, Ohio, and Michigan, are encouraged to join CSU-AIAA in their pursuit to ignite and celebrate aerospace ingenuity! Students may register for the conference through [aiaa.org](http://aiaa.org) and are encouraged to attend regardless of a paper submission!

The conference's three categories are Undergraduate, Masters, and Undergraduate Team. Each category has three prizes that are funded by the AIAA Foundation:

- First place: \$500 and a trip to the AIAA SciTech Forum in January, for one author
- Second Place: \$300
- Third Place: \$250

In addition to the monetary prizes, conference attendees will have the opportunity to tour several facilities at NASA Glenn Research Center and will also learn about higher education opportunities available at GRC. Moreover, NASA GRC Deputy Director, Dr. Marla Perez-Davis, will be delivering a keynote presentation to conference attendees on NASA's core competencies, in relation to the importance of aerospace awareness, and how organizations like AIAA are vital to the aerospace industry!

#### Important Dates to remember:

- Papers Due: March 17, 2019, 11:59 pm Eastern Time Zone, USA
- Registration Deadline: March 17, 2019, 11:59 pm Eastern Time Zone, USA
- Registration Cancellation Deadline: March 24, 2019, 11:59 pm Eastern Time Zone, USA
- Conference Dates: April 5-6, 2019

Questions? Contact the AIAA staff representative, Rachel Dowdy ([racheld@aiaa.org](mailto:racheld@aiaa.org)), or CSU AIAA representative, Maggie Kolovich ([maggiokolovich@gmail.com](mailto:maggiokolovich@gmail.com))



The 2019 AIAA Region III Student Conference will be held at Cleveland State University in Cleveland, Ohio.

## Upcoming Events

### AIAA NOS Lunch Time Lecture Series

#### “Electric Propulsion Design and Options”

Dr. James Gilland  
Ohio Aerospace Institute (OAI)

**Tuesday, March 26, 2019**

Noon to 1 pm

Ohio Aerospace Institute, The President’s Room  
22800 Cedar Point Road, Cleveland, OH 44142

Electric Propulsion, using electricity to accelerate propellants for thrust, has always offered high propellant efficiency (specific impulse), which is necessary for extremely demanding missions. However, the trade-off is always that the need for power supplies to travel with the rocket slows the acceleration, requiring long operating times, and in some cases, long trip times. The obvious answer is always, "use more power", but IS that the answer? The talk will go over the trades involved in using high power electric propulsion, the thruster concepts espoused for this application such as magnetoplasmadynamic thrusters and the VASIMR conception, and the status of the systems.

Dr. Gilland is a Senior Scientist and Research Team Manager for the Ohio Aerospace Institute in Brook Park, Ohio. He has over 30 years of experience in electric propulsion research, mission analysis, and system design, ranging in power from 300 W to 300 MW, from solar to nuclear fission to nuclear fusion. He is also a past Fellow of the NASA Innovative Advanced Concepts program, and currently works on the NASA Gateway SEP thruster concept as well as the NextSTEP 100 kW thruster program.

*Attendance is free and reservations are not required. Bring your lunch!*

Contact Al Juhasz, [albert.j.juhasz@nasa.gov](mailto:albert.j.juhasz@nasa.gov), with any questions.

### AIAA Northern Ohio Section Night at the Ballpark

**Friday, July 19, 2019**

7:10 pm  
Progressive Field

Come watch your Cleveland Indians take on the Kansas City Royals. We have a block of 40 seats in Section 309. You’ll get a great view of the field, scoreboard and the post-game fireworks!

In addition to the Fireworks display, this game will feature many other great promotions including:

- “Pre-Game in the District”
- Sugardale Dollar Dog Night
- Bottle Opener Sunglasses
- “Block Party”

Tickets will go on sale soon. Stay tuned!



## Northern Ohio Section Officers and Council Members

## Officers

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