

AIAA Greater Huntsville Section

Next-Gen Technical Symposium 2019

By Patrick Dees

The AIAA Greater Huntsville Section Council proudly presents the 4th annual Next Gen Technical Symposium! Composed of half-day short courses, presentation sessions, keynote speakers, a Hypersonics panel discussion, a Speed Mentoring Session, a Soft-Skills Workshop, and two evening socials, the event brought together over 100 of the area's technical leaders and innovators. In the lead up to the main event several fundraising and signal-boosting events were also organized: [dinner at Farm Burger](#), [Nerd Trivia at Blue Pants Brewery](#), [Paint Night at Spirited Art](#), and finally [Brews to Benefit at Straight to Ale](#).



Attendees at the UAV Short Course creating a map of a UAH building

The event kicked off with two 4 (four) hour Short Courses hosted by UAH in the Von Braun Research Hall. In the morning, Casey Calamaio led 12 attendees (7 Student, 5 Professional Members) through the process of utilizing data gathered by an Unmanned Aerial Vehicle (UAV) into a three-dimensional map of the area through which it had flown. Attendees were each given an opportunity to fly the drone around Material Science Building, UAH, while collecting data on the shape of the building. Attendees then returned to the classroom to each receive a copy of the

data collected and use open source software to generate a detailed three-dimensional map of the building. In the afternoon, Jay Langley, head of the Artificial Intelligence and Machine Learning (AI&ML) group at Urban Engine's CoWorking Night, led 24 attendees (10 Student, 14 Professional) in an Introduction to AI&ML Short Course. During the session he covered the history of the field, a hands-on introduction including manipulating data, creating a neural network, applying deep learning techniques, and finally ending with a discussion of current hot topics in the field such as data bias and ethics. Almost all attendees of the earlier UAV Short Course stayed through lunch for the AI&ML Short Course, and after-action reviews have been greatly positive!



Dr. Barnhart walking through the crowd on Monday morning of the Next Gen Symposium

At the start of the main event on Monday, after registration attendees were treated to an Opening Keynote delivered by Dr. Deborah Barnhart, CEO and Executive Director of the U.S. Space and Rocket Center. Eschewing the stage, Dr. Barnhart walked through the crowd of attendees speaking to her theme of “Back to Our Future”, showcasing Huntsville’s integral role in the creation and success of NASA and the Apollo Program.

After Dr. Barnhart’s Keynote the first Technical Sessions began, starting with parallel sessions on Artificial Intelligence & Machine Learning (3 presentations), Cyber Engineering (2 presentations), and Session 1 of Transportation and Propulsion Architectures (5 presentations).



Attendees Grace Spotswood and Malik Thompson giving their presentations in the Transportation and Propulsion Architectures Technical Session

Following the initial Technical Sessions was the lunch break, with a Keynote from Don Farr, Senior Technical Fellow with The Boeing Company. Mr. Farr spoke of Boeing’s Digital Transformation, moving from the traditional disconnected document-based approach to Systems Engineering to the modern integrated Model-Based Systems Engineering (MBSE). Topic highlights were the development of the “Digital Twin” to mirror the traditional Systems Engineering “V” and how it relates to MBSE.



Don Farr speaking to the Monday Lunch crowd on Model-Based Engineering

Following lunch was a soft-skills development workshop given by Kristin Scroggin of [genWHY Communications](#) on “Giving Better Feedback”. The feedback we received was overwhelmingly positive! Ms. Scroggin has a whole host of different topics to speak to, we couldn’t recommend her enough!



Ms. Scroggin delivering a workshop on “Giving Better Feedback”

After the Workshop Phil Bording, Research Professor at AAMU, led a session titled “Shoebox STEM Projects”. This session had the attendees up on their feet putting together demonstrations of multiple STEM concepts utilizing readily available materials, such as an oversized Newton’s Cradle, magnetic properties of different materials, and how the different folds of a paper airplane affect its aerodynamics.

The final session of the day was a very well attended Panel Discussion on Hypersonic Vehicles. Several tickets were purchased only to attend this panel. Leading the panel was Dr. Ragini Acharya, Director of Hypersonics at CFD Research Corporation. Joining her was Dr. Brian Landrum, Associate Professor of Mechanical & Aerospace Engineering at UAH, Brad Hopping, Chief Engineer with the Boeing Company, and John Schmisser, Professor at UT Knoxville. The Panelists had much to say on the topic, and the audience was highly engaged with questions and comments, to the point that discussion had to move outside the venue once closing time of the venue had been reached.



Hypersonics Panel led by Dr. Ragini Acharya

The end of day social kicked off at Innerspace Brewing that night with roughly 30 attendees participating. It gave the Symposium Committee a great chance to take a breath, reconnect, and chat with the attendees to find out what they liked and didn't like about the first day of the event.



Symposium Committee and Attendees mingling at Innerapace Brewing

Starting off Day 2 of the Symposium was a Keynote speech by Mr. Dan Roark, Co-Founder and CEO of Torch Technologies, with the tagline “It’s Just the Right Thing To Do”, speaking of the history and founding of Torch.



Mr. Bill Roark receiving a Section Coin from Symposium Chair Patrick Dees

Following the morning keynote were parallel technical sessions on Space Exploration & Environments (4 presentations) and Modeling & Simulation (6 presentations).



Symposium Committee Member Brittani Searcy Presenting in the Space Exploration & Environments Session

One of the highlights of these sessions was Symposium Sponsor Teledyne-Brown Engineering presenting on and demonstrating their Multi-Purpose Glovebox for Lunar Gateway. The prototype glovebox was displayed in the room for attendees to check out and practice performing a few tasks just like astronauts would at the Lunar Gateway.



Paul Galloway, Senior Systems Engineer with Teledyne-Brown Engineering, presenting on the Multi-Purpose Glovebox for Lunar Gateway



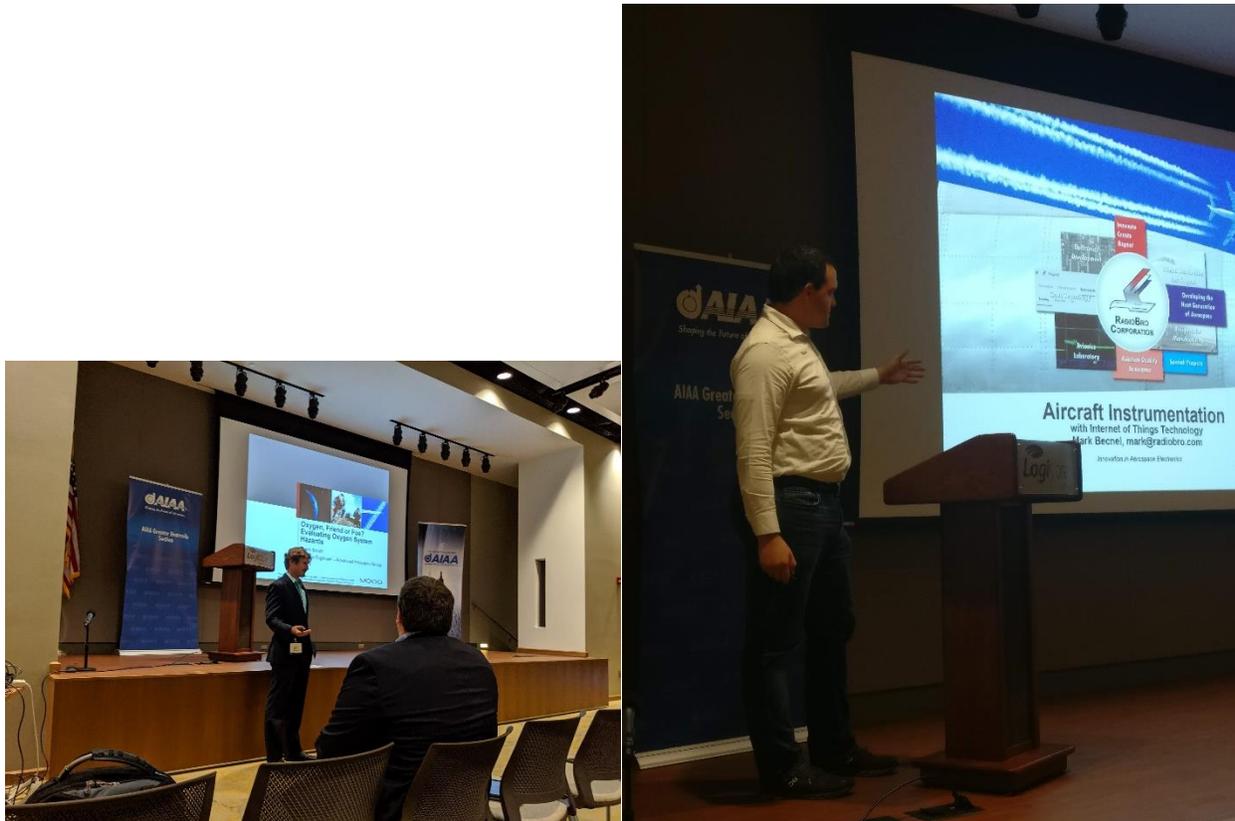
Demonstration of the Multi-Purpose Glovebox for Lunar Gateway

Following up morning sessions was a lunch Keynote by Dr. Michelle Christensen of Blue Origin, with her topic of “Autosequence Start: A Career in Rocket Engine Testing”.



Dr. Michelle Christensen receiving a Section Coin from Symposium Chair Patrick Dees

After lunch, technical sessions resumed with Materials, Structures, and Dynamics (5 presentations) and a continuation of Propulsion & Transportation Architectures (4 presentations).



Attendees Kevin Smith and Mark Becnel presenting on their work in the final afternoon session

Finishing out the day was a Speed Mentoring session, which we have held for several years. During this event attendees got a chance to have an informal discussion with some fantastic Mentors such as Mr. Stephen Crow, Director of Mechanical Engineering at ULA, Mark Rogers, NASA MSFC, Dan Dumbacher, AIAA Executive Director, and Dr. Michelle Christensen, Senior Manager of Engine Testing with Blue Origin. Feedback from both Mentors and Mentees was very positive.



Mark Rogers, NASA MSFC, speaking with several Attendees



Stephen Crow, ULA, speaking with several Attendees



Dr. Christensen, Blue Origin, speaking with several Attendees

To finish out the event, all attendees were invited to the opening reception of the Von Braun Symposium held at UAH. This allowed the Next Gen attendees to rub elbows with the policy makers who shape the engineering work in the country. In addition, the top three presenters of the Next Gen Symposium were invited to present at the Von Braun Symposium. Those winners were:

- First Place: Robert Hetterich
- Second Place: Matthew Hitt (AIAA Professional Member)
- Third Place: David Noever (AIAA Professional Member)

Overall, the event was a great success. 12 tickets were sold for the UAV Short Course, 24 tickets for the AI short course, with many students purchasing both. 26 1-Day tickets and 54 2-Day tickets were purchased, for a total of 80. Of those attendees, 18 were Students. Of the remainder, 24 different companies and government organizations were represented.

The 2019 AIAA Next Gen Technical Symposium could not have occurred without our fantastic sponsors and partners. A big thank you to Teledyne-Brown Engineering, Aerojet Rocketdyne, LogiCore, Jacobs SEG, Moog, PeopleTec, the National Space Club, RadioBro, and UAH for helping make our event so great! We had a great group of local technical leaders come out to watch and judge our technical sessions, thank you for your time and energy! Especially thank

you to Dan Dumbacher, AIAA Executive Director for taking the time to come by our event while in town. We would not have made it through the days without amazing food and drink from Kathleen's Catering, thank you so much Chris and your team! Finally, no event comes together all on its own. The organizing committee made up of GHS Professional Members put in long hours bringing all the elements to produce a top-tier event. Thank you to the Committee!

- Patrick Dees (Chair)
- Brittani Searcy (Vice-Chair, Sponsorships)
- Amanda Banks (Marketing)
- Mark Becnel (Sponsor, Material Support)
- Alex Byers (Venue, Day-Of Support)
- Beth Champion (Graphic Design)
- Christopher Dale (Schedule, Fundraising)
- Nishanth Goli (YP Director Oversight)
- Michelle Knox (Fundraising)
- Josh Sharpe (Website)
- Tamara Statham (Social Media)
- Jacob Szczudlak (Panel & Speed Mentoring)



From left to right: Dan Dumbacher, Alan Lowrey, Brittani Searcy, Kurt Polzin, Jacob Szczudlak, Dylan Stapp, Alex Byers, Patrick Dees, Mark Becnel



From left to right: Mark Becnel, Alex Byers, Patrick Dees, Nishanth Goli, Jacob Szczudlak, Brittani Searcy, Tamara Statham

Further details of the 2019 event, and updates about the 2020 event are available on our [website](#).

Please be sure to [reach out](#) if you have any questions or comments. Hope to see you next year!