

December 2019

Holiday Potluck!

Join your local AIAA Cape Canaveral Section this weekend (Dec 7) for a family-friendly, fun, and food-filled evening at our Holiday Potluck!



This will be a fun, informal opportunity for our members to get to know each other, strengthen relationships and networks, share accomplishments and reflections from 2019, and celebrate the holiday season. Whether you've been to every one of our events or are brand new to the area, we would love to have you join us! All section members invited - bring your friends, families, games, and a favorite holiday dish to celebrate the holiday season!

The potluck will be generously hosted by our Vice Chair, Rachel Mocini, at her home- so please join us in thanking her for her hospitality!

You can sign up for the potluck here:
www.PerfectPotluck.com/GYCR9269

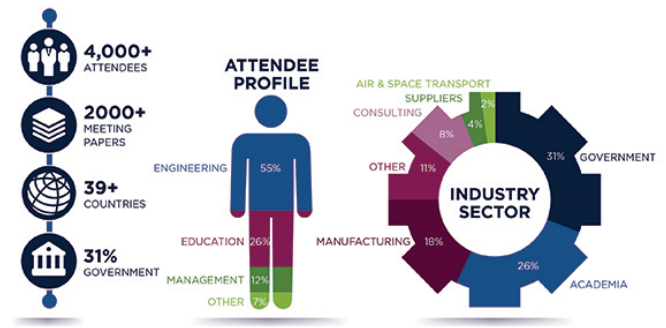
We will also have an optional White Elephant gift exchange with a maximum price of \$10 for anyone interested participating! 🎁

Recommended attire is casual, with a holiday flair! Ugly sweaters welcome.



SciTech Forum in Orlando

The 2020 [AIAA Science and Technology Forum and Exposition](#) is coming to our area January 6-10, 2020 at the Hyatt Regency Orlando. [Registration is now open](#). This event is an outstanding networking opportunity for Aerospace professionals and is expected to draw over 5,000 participants from around the globe. More than 2,500 technical presentations will be given as well as 13 short courses and workshops on diverse topics such as sonic boom prediction, hypersonics development, digital engineering, missile guidance, space standards and architecture, and more. The Exposition Hall includes more than 50 organizations including some of the top names in Aerospace (see the full list [here](#)).



Council Member Spotlight



My name is David Fleming, and I am an Associate Professor of Aerospace Engineering at Florida Tech. I have been an AIAA member for 33 years, having first joined while I was an undergraduate student at MIT (at that time, as one of the perks of joining new members were taken up in a small plane by one of the faculty who

demonstrated stalls and other aerodynamic phenomena –a great introduction to AIAA). I am currently Cape Canaveral Section Secretary, but in the past have served on many positions on the council including two stretches as Section Chair.

Since joining the faculty of Florida Tech in 1996, I have served as Faculty Adviser for the Florida Tech Student Branch of AIAA. This has been one of the most interesting (you learn a *lot* driving a van load of undergraduate students across the southeastern US each year for the AIAA Region 2 Student Conference) and rewarding parts of my career. Now that I have been at Florida Tech for more than 20 years, it is exciting to know that students that I've helped educate are working all over the world at places like SpaceX, Boeing, Gulfstream, Northrop Grumman, Piper, and more. I am currently serving as Program Chair for Aerospace Engineering as part of Florida Tech's Department of Aerospace, Physics and Space Sciences.

My primary research area is in composite structures. One of my current graduate students, Teddy Sedalor, will be presenting a paper "Predicting Hydrodynamic RAM Damage in Bonded Composite Tanks Using Progressive Damage Failure Analysis" at SciTech in January. This paper deals with the problem of protecting airplane fuel tanks against ballistic threats. One specialization that I have worked on over the years is structural crashworthiness, *i.e.* making sure vehicle structures are designed to protect occupants in the event of a crash. My co-author, Dr. Karen Jackson from NASA Langley Research Center, and I

recently submitted a draft book manuscript on this topic. Keep your eyes on the best seller list. AIAA has been a great way for a naturally introverted person such as myself to get out and meet like-minded people in the community and to stay involved with the young professionals that keep our profession moving forward.



Local Universities Participating in SciTech

Embry-Riddle Aeronautical University in Daytona Beach and Florida Institute of Technology in Melbourne are strongly participating in January's SciTech Forum. 35 Technical Papers at the Forum are authored or co-authored by representatives of these universities and 10 sessions are chaired or co-chaired by ERAU and FIT personnel. A full list of these technical papers is included at the end of this newsletter.

AIAA Cape Canaveral is on Social Media and we want to hear from you! Find us @capeaiaa

Take a minute to follow the AIAA Cape Canaveral Section on Facebook, Instagram, and Twitter at username @capeaiaa, or find us on Engage at engage.aiaa.org/capecanaveral/home

We want to hear from our members! Tell us what you think. Do you have a question you need answered? Do you need a guest speaker and/or volunteers for your event? Use these tools to ask your fellow section members for their help!

2019 - 2020 Cape Canaveral Section Council Members

Chair	Elizabeth Balga
Vice Chair	Rachel Mocini
Secretary	David Fleming
Treasurer	Matthew Zuk
Programs	Dennis Dali
Education	Naveen Sri Uddanti
Honors & Awards	Razvan Rusovici
Communications	Jacob Shiver
STEM K-12	Melissa Sleeper
Public Policy	Holly Petrucci
Career and Workforce Development	Dhuree Seth
Young Professional	Ashley Scharfenberg

Vacant Positions

The Executive Council currently has two vacancies – Membership Chair and Technical Officer – and we are looking for motivated, hard-working members to fill those positions for the rest of the 2019-2020 term!

Not ready to chair a committee? Consider supporting an existing committee chair – Programs, Education, Honors & Awards, Communications, STEM K-12, Public Policy, Career & Workforce Development, Young Professional – to help plan and execute events, initiatives, and more.

If interested, please contact Section Chair Elizabeth Balga at aiaacanaveral@gmail.com.



Announcements

Daily Launch

Want to receive a daily email summary from AIAA about all the latest aerospace news from Newspapers, TV, Radio and Journals? Sign Up for The AIAA Daily Launch. For member access to the AIAA Daily Launch, please log in to www.aiaa.org/MyAIAA, navigate to "Access Publications & Materials" and select "Daily Launch." The AIAA Daily Launch, distributed to AIAA members each weekday morning, is a digest of the most important aerospace news selected from thousands of sources by the editors of Bulletin Media.

AIAA Career Center

AIAA is pleased to provide members with a [Career Center](#), with extensive lists of resumes and available positions. A powerful and user-friendly search tool allows you to find the ideal job or candidate.



Special Spotlight: AIAA SciTech Technical Papers and Session Chair/Co-Chair Representatives from Section Universities

The following is a list of papers authored or co-authored by representatives of Embry-Riddle Aeronautical University and Florida Institute of Technology, universities found in the Cape Canaveral Section, at the upcoming AIAA SciTech Forum.

Technical Papers:

“Time-Harmonic 2D and 3D Gust-Airfoil Interactions: Comparison of Numerical Predictions with Analytical Models” Marina Kazarina, Vladimir Golubev, Embry-Riddle Aeronautical University, Daytona Beach 9:30am - 10:00am, Mon, Jan 06

“Arkadiko: A lunar space station mission proposal for the development of deep space exploration,” Christopher Watson, Embry-Riddle Aeronautical University, Daytona Beach, et al., 11:00am - 11:30am, Mon, Jan 06

“Geostationary Satellite Constellation Tracking and Identification Using Normalized Cross Correlation,” David Zuehlke, Troy Henderson, Embry-Riddle Aeronautical University, Daytona Beach, 11:00am - 11:30am, Mon, Jan 06

“Suborbital Payload Testing Aboard Level 3 Rocket Research Platform,” Nikita Amberkar, Vijay Vishal Duraisamy, Melisa Mastroliberti, Michelle Munasinghe, Gabriel Maupin, Pedro Llanos, Sathya Gangadharan, Embry-Riddle Aeronautical University, Daytona Beach 11:30am - 12:00pm, Mon, Jan 06

“Transparent Heating Films using Functionalized Carbon Nanomaterials,” Mounisha Ganesan, Daewon Kim, Virginie Rollin, Foram Madiyar, Embry-Riddle Aeronautical University, Daytona Beach, 11:30am - 12:00pm, Mon, Jan 06

“A review of aeroacoustics of supersonic jets interacting with solid surfaces,” Sam Salehian, Reda Mankbadi, Embry-Riddle Aeronautical University, Daytona Beach 12:00pm - 12:30pm, Mon, Jan 06

“Tracking Reference Orbits Around Asteroids with Unknown Gravitational Parameters Using a Nonlinear Adaptive Controller,” Madhur Tiwari, Richard Prazenica, Troy Henderson, Embry-Riddle Aeronautical University, Daytona Beach 12:00pm - 12:30pm, Mon, Jan 06

“High-Fidelity Simulations of Upstream Turbulence Effects on Wake Evolution,” Marina Kazarina, Petr Kazarin, Vladimir Golubev, Embry-Riddle Aeronautical University, Daytona Beach 3:00pm - 3:30pm, Mon, Jan 06

“Design and Prototyping of an Aviation Big Data Repository,” Ravi Thota, Gurvir Bawa, Richard Stansbury, Embry-Riddle Aeronautical University, Daytona Beach 3:30pm - 4:00pm, Mon, Jan 06

“In-situ Measurement of Resin Shrinkage with Respect to Degree of Cure,” Samarth Motagi, Sirish Namilae, Thomas Freeman, Sandra Boetcher, Embry-Riddle Aeronautical University, Daytona Beach 9:30am - 10:00am, Tue, Jan 07

“UAS Model Identification and Simulation to Support In-Flight Testing of Discrete Adaptive Fault-Tolerant Control Laws,” Mansi Bakori, Hever Moncayo, Embry-Riddle Aeronautical University, Daytona Beach 10:30am - 11:00am, Tue, Jan 07

“Unsteady Behavior of Wall Bounded Harbor Seal Whisker Inspired Pin Geometries,” Anish Prasad, Mark Ricklick, Embry-Riddle Aeronautical University, Daytona Beach, 10:30am - 11:00am, Tue, Jan 07

“The Effects of Turbulence-Kinetics Interactions on Reducing Chemical Mechanisms,” Scott Martin, Embry-Riddle Aeronautical University, Daytona Beach, 11:00am - 11:30am, Tue, Jan 07

“Effect of Cylinder vortex shedding on downstream Impinging Jet Oscillation through Wake Interaction,” Karthik Krishna, Mark Ricklick, Embry-Riddle Aeronautical University, Daytona Beach 11:30am - 12:00pm, Tue, Jan 07

“Numerical Simulation of an Axial-Staged Combustor at High Pressure,” Bernhard Stiehl¹, Tyler Worthington¹, Andre Woodard¹, Kareem Ahmed¹, Carlos Velez², Scott Martin³
¹University of Central Florida, ²General Electric Company, ³Embry-Riddle Aeronautical University, Daytona Beach 12:00pm - 12:30pm, Tue, Jan 07

“Predicting Hydrodynamic RAM Damage in Bonded Composite Tanks Using Progressive Damage Failure Analysis” Teddy Sedalor, David Fleming, Florida Institute of Technology 2:30pm - 3:00pm, Tue, Jan 07

“Shape Sensitivity for High-speed Flows with Shocks,” Mandar Kulkarni, Embry-Riddle Aeronautical University, Daytona Beach, 4:00pm - 4:30pm, Tue, Jan 07

“Simulation-Based and Formal Verification of Domain-Specific Language Model,” Bharvi Chhaya, Shafagh Jafer, Embry-Riddle Aeronautical University, Daytona Beach, 4:00pm - 4:30pm, Tue, Jan 07

“Adaptive Control Design Using the Udwadia-Kalaba Formulation for Hovering Over an Asteroid with Unknown Gravitational Parameters,” Wesley Stackhouse, Morad Nazari, Troy Henderson, Richard Prazenica, Embry-Riddle Aeronautical University, Daytona Beach, 4:30pm - 5:00pm, Tue, Jan 07

“Vision Based Relative Navigation for Close-Formation Flight Missions,” Ashok Sarath Chandra Reddy Irigireddy, Hever Moncayo, Karina Rivera Lopez, Embry-Riddle Aeronautical University, Daytona Beach, 5:00pm - 5:30pm, Tue, Jan 07

“Ground-Based Passive Attitude Determination Through Photometric Data,” Zachary Henry¹, Bogdan Udrea², Graham Fox¹, Shadi Naderi³, Thomas Swindle³, Cody Shaw⁴
¹Embry-Riddle Aeronautical University, Daytona

Beach, ²VisSidus Technologies, Inc., ³Air Force Research Laboratory, ⁴University of Hawaii, Manoa, 10:00am - 10:30am, Wed, Jan 08

“A First-Principle Power and Energy Model for eVTOL Vehicles,” Emils Senkans, Max Skuhersky, Markus Wilde, and Brian Kish, ¹Florida Institute of Technology 11:00am - 11:30am Wed, Jan 08

“Numerical Investigation of Scaling Effects on a Ramjet-Powered Projectile,” Arjun Vedam, William Engblom, Embry-Riddle Aeronautical University, Daytona Beach, Florida 2:30pm - 3:00pm, Wed, Jan 08

“Investigation of Pressure Effects on Reacting Jet in Vitiated Crossflow,” Michelle Otero¹, Tommy Genova¹, Jonathan Reyes¹, Kareem Ahmed¹, Scott Martin², Carlos Velez³
¹University of Central Florida ²Embry-Riddle Aeronautical University, Daytona Beach, ³General Electric Company, Schenectady, 3:00pm - 3:30pm, Wed, Jan 08

“High-Pressure Reacting Characteristics of Axial Stage Combustion,” Tommy Genova^{*1}, Michelle Otero¹, Jonathan Reyes¹, Kareem Ahmed¹, Scott Martin², Carlos Velez³
¹University of Central Florida, ²Embry-Riddle Aeronautical University, Daytona Beach, ³General Electric Company, Niskayuna 3:30pm - 4:00pm, Wed, Jan 08

“Towards Efficient 2-DOF LCO Control Using a Closed-loop Nonlinear Active Flow Control Technique,” William MacKunis^{*1}, Vladimir Golubev¹, Krishna Bhavithavya Kidambi¹, Reda Mankbadi¹, Oksana Stalnov²
¹Embry-Riddle Aeronautical University, Daytona Beach, ²Technion--Israel Institute of Technology, Haifa, Israel, 4:00pm - 4:30pm, Wed, Jan 08

“Hybrid Immunized Swarm Optimization Concept for Resilient Coordinated Missions,” Diana Festa, Hever Moncayo, Embry-Riddle Aeronautical University, Daytona Beach, 4:30pm - 5:00pm, Wed, Jan 08

“Autonomous Autorotation of Tilt Rotor Aircraft Using Nonlinear Model Predictive Control,” Elias Wilson, Richard Prazenica, Embry-Riddle Aeronautical University, Daytona Beach, 5:00pm - 5:30pm, Wed, Jan 08

“Simulations of Broadband Noise of a Small UAV Propeller,” Reda Mankbadi, Samuel Afari, Vladimir Golubev, Embry-Riddle Aeronautical University, Daytona Beach 9:30am - 10:00am, Thu, Jan 09

“Using Small Unmanned Aircraft Systems for Remote Sensing and Data Collection: Aerospace Education and Service Learning,” Nickolas Macchiarella, Kevin Adkins, Ryan Wallace, Embry-Riddle Aeronautical University, Daytona Beach 3:00pm - 3:30pm, Thu, Jan 09

“Kinematic and Dynamic Spacecraft Maneuver Simulators for Verification and Validation of Space Robotic Systems,” Markus Wilde, Stephen Kwok Choon, Marcello Romano, Florida Institute of Technology 3:30pm - 4:00pm, Thu, Jan 09

“Towards the development of sCO₂ Combustors: Damköhler Number Based Path Flux Analysis for Chemical Kinetic Mechanism Reduction,” Raghu Veera Manikantachari Kancherla², Scott Martin¹, Jose Bobren², Subith Vasu²; ¹Embry-Riddle Aeronautical University, Daytona Beach, ²University of Central Florida, 9:30am - 10:00am, Fri, Jan 10

“Design and Testing of a Field Gradient System to Control a Hybrid Magneto-Active SLOSH Control System,” Manikandan Vairamani¹, Kevin Crosby², Pedro Llanos¹, Sathya Gangadharan¹
¹Embry-Riddle Aeronautical University, Daytona Beach, ²Carthage College, Pleasant Prairie, Wisconsin, 12:00pm - 12:30pm, Fri, Jan 10

“Shape Optimization for Energy Harvesting Applications,” Suyash Lahoti, Mandar Kulkarni, Embry-Riddle Aeronautical University, Daytona Beach 2:30pm - 3:00pm, Fri, Jan 10

“Towards Efficient 2-DOF LCO Control Using a Closed-loop Nonlinear Active Flow Control Technique,” William MacKunis¹, Vladimir Golubev¹, Krishna Bhavithavya Kidambi¹, Reda Mankbadi¹, Oksana Stalnov²; ¹Embry-Riddle Aeronautical University, Daytona Beach; ²Technion--Israel Institute of Technology, Haifa, Israel 4:00pm - 4:30pm, Wed, Jan 08