In this issue

- April and May History in Aviation
- STEM Corner
- Aurora Dinner Meeting
- Honors and Awards Banquet
- Zoom into Summer Event

Technical Specialist Meeting: April and May

Technical Specialist Chair- John Schaefer

On April 2, the section was joined by Mark Anderson, who presented some of his work on Design of Experiments (DoE) and Response Surface Modeling. Mark is a principle and general manager of Stat-Ease, Inc. in Minneapolis, MN, and is the author of numerous DoE publications and three textbooks. His presentation was followed by an enthusiastic discussion, and he generously donated copies of two of his textbooks to the AIAA St. Louis Section: “DOE Simplified – Practical Tools for Effective Experimentation” and “RSM Simplified – Optimizing Processes Using Response Surface Methods for Design of Experiments.” Section members interested in borrowing the textbooks should contact John Schaefer (john.a.schaefer3@boeing.com).

On Tuesday, May 14, the section was joined by Aslihan Vuruskan, a PhD Candidate at the Missouri University of Science and Technology. Aslihan presented her work on robust aerodynamic shape optimization, which included several shape deformation techniques and turbulence models for both 2D and 3D applications. Her results indicate that uncertainty quantification using non-intrusive polynomial chaos can be employed to mitigate the transonic drag rise for optimal designs of the RAE 2822 airfoil and NASA Common Research Model wing. Approximately 20 individuals attended the meeting.

Chair Chat

St. Louis Section Chair- Thomas Rehmeier

Fellow AIAA members, it has been a pleasure to serve as the St. Louis Section Chair for the 2018-2019 term. There have been a lot of great advancements in recruitment of new members, a renewed focus on trying new events and STEM outreach, and overall healthy growth of the St. Louis Section. As planning begins for the 2019-2020 term, the council will be working some large scale events and, as always, welcomes any and all support the membership at large can offer. This can be in the form of program ideas, volunteering a few hours of your time, or just help spreading the word about AIAA. As we head into June, it is my pleasure to pass the gavel to Mr. Jim Guglielmo as the incoming chair. My last official duty is to capture all of the hard work and success stories of the section in the form of the annual report for AIAA National award consideration. It is my sincere hope that we will be reporting St. Louis taking home a few recognitions in the fall. Thank you for the support, and please join me in looking forward to the great things to come with Jim at the helm.

Aerospace Link of the Month

With the 50th Anniversary of Apollo 11 so recently, those associated with the early days of the space program are rapidly leaving us. America’s first woman astronaut candidate dead at 88.


Jerrie Cobb, Image Courtesy of Fox News
Making a change?

Are you graduating and moving? Planning to retire soon? Making a career move? If you are leaving the St. Louis Section area, please update your AIAA profile, so you will continue to receive accurate AIAA correspondence.

Go to "My AIAA" http://www.aiaa.org/myAIAA and, upon logging in, go to "My Account" and select "Edit Contact Info."
Meet Aurora Flight Sciences

The students queue with their resumes to meet Aurora's Taylor McVey.

Every table had an Aurora or Boeing representative.

Aurora's Chris Gee engaging the students

Aurora VP Martin Gomez addresses the room.

Alex receives her St. Louis Section Challenge Coin

The New Wing of the Engineers' Club of St. Louis

Alex Mozdzanowska
Meet Aurora Sciences Dinner Meeting
Programs Chair- Bob Dowgwillo

The February dinner meeting at the Engineers’ Club of St. Louis featuring Aurora Flight Sciences was an unqualified success and without doubt one of the Section’s best student engagement events ever.

Visiting from their home office in Manassas, VA, were Martin Gomez, VP, Autonomy for Defense; Aleksandra (Alex) Mozdzanowska, Director, Special Projects & Chief of Staff, and Taylor McVey, Talent Acquisition. In addition, Aurora engineers Christopher Gee, Lead Aerostructures, Laura Gibbs, Structures, and Caleb Boe, Stress, attended locally from their assignment on the Boeing MQ-25.

Joining us from Boeing St. Louis management were Steve Cramm, (BDS), Brandon Wegge (BCA), Rick Martin (BDS), Don Drouin (BR&T) and Robert Funke (BR&T).

Thirty seven students attended from five universities within our Section boundaries: Washington University, St. Louis University – Park’s College, University of Missouri – Columbia, Missouri University of Science & Technology, and Southern Illinois University – Edwardsville. Seven design teams were represented. Six of the teams displayed hardware for their projects, from human powered flight to rockets.

New Council Member Spotlight: STEM Chair-Jackie Blumer

Jackie Blumer is a 20 year veteran teacher at Greenville Jr. High School, where she teaches Earth, Space, and Physical science to 6-7th grade students. Mrs. Blumer has been an Adjunct Instructor at Southern Illinois University in Edwardsville and has taught Title I Reading, 1st, and 4th Grade. She earned both a Bachelors and Masters Degree in Education from SIUE, and has an additional Masters Degree in Administration from Eastern Illinois University. She obtained National Board Certification in 2004.

In 2006, she earned the Outstanding Teacher and Association Leader award by the Illinois Education Association. While general science and self contained elementary education is completely entertaining, space science is her passion. Mrs. Blumer was the Team Lead for the NASA Explorer School Program at Greenville Elementary. She was also a Northrop Grumman Weightless Flight of Discovery Recipient and a NASA Zero-G Recipient.

Mrs. Blumer’s goal is to spark an interest in life-long learning and for students to be confident enough to take risks. She exposes students to many hands-on STEM activities through group work, simulations, interactive lectures, virtual field trips and presentations. Mrs. Blumer’s passion to inspire and engage her students and fellow educators in authentic real-world science is extraordinary.
Overview

When an astronaut moves an object in space, the astronaut has to understand how to move objects and themselves using balanced and unbalanced forces. Newton’s First Law states that unbalanced forces acting on an object will result in that object changing its motion. NASA uses hovercraft to allow engineers, astronauts, and spacecraft to practice interacting with each other in a frictionless environment, like experienced in space. This allows engineers and astronauts to experience how the interaction of external forces between people and objects before the astronaut leaves the Earth or between spacecraft during their design. This activity allows you to make your own hovercraft from a CD or DVD and a balloon.

Materials

- CD or DVD (1 per hovercraft)
- Flip-top or pop-up spout from water bottle (1 per hovercraft)
  
  **Note:** Spouts must always be open, so spouts with a diaphragm activated by squeezing will not work for this activity.
- Round balloon, at least 5-in size (1 per hovercraft)
- Paper
- Smooth tape, like Scotch tape
- Scissors
- Sandpaper
- Low-temperature hot glue gun and glue sticks
- Measuring tape
- Stopwatch or clock with a second hand

Safety

- Dish with cold water
- Eye protection

For **young students**, cut any flip-tops off of the water bottle spouts (Step 1) before giving to students. The teacher or teacher’s aide should operate the hot glue gun.

Keep the **dish of cold water** nearby. If anyone gets hot glue on their fingers, dip fingers in the cold water, which will harden the glue and minimize discomfort.

Procedure

1. Use scissors to cut the flip-top off of the water bottle spout, leaving the nozzle.
2. Use sandpaper to rough the smooth plastic around the small end of the spout. (This is preparation for the next step to help the hot glue create a tight seal.)
3. Put a bead of hot glue along the circumference of the small end of the spout. Allow to dry and harden.

4. Put a head of hot glue around the large end of the spout and immediately press the freshly-glued end over the hole in the CD or DVD, label up. (The spout should completely enclose the hole in the CD or DVD.)

5. After the glue has cooled and hardened, put an additional bead of glue around the base of the spout to create a better seal.

6. Stretch the balloon a couple of times to relax it for inflating.

7. Inflate the balloon and twist the neck to keep the air from escaping.

8. Keep the balloon twisted closed, and stretch the neck of the balloon over the spout, using the hardened glue to hold the balloon in place.

9. Tape paper over the hole in the CD or DVD. Create a hole in the paper to limit the airflow of the hovercraft. (The edges of the hole can protrude up into the water bottle lid but make sure the edges do not create friction by dragging on the ground.)

10. Find the optimal performance (longest duration of hover) from your hovercraft.

**Demonstration**

1. Fill a balloon with air, attach to the hovercraft, and put the hovercraft on a smooth surface. (Keep the balloon pinched off until the hovercraft is on a table or tile floor.)

2. Release the balloon, and push the hovercraft across the surface.

3. Refill the balloon and reset the hovercraft. Release the balloon, but do not add any external force to the hovercraft. (No external force results in no change in motion.)

4. Refill the balloon and reset the hovercraft. Release the balloon and add an initial force to the hovercraft. (Unbalanced external force results in change in motion.)

5. Apply a force to stop the hovercraft before it runs out of air. (Unbalanced external force results in change in motion.)

6. Repeat Step 4 and let the balloon run out of air while moving as far as possible. (The unbalanced external force is created by friction.)

7. Compete your hovercraft against others in your class or family to see whose design performs the best. Use stopwatch and measuring tape to compare.

**Reference:** This page was adapted from the demonstration on the NASA JPL website. See the [NASA JPL website](https://www.jpl.nasa.gov) for more information, videos on how to perform this demonstration, and other ideas for home or classroom science demonstrations. This activity can be incorporated into a lesson about Newton's First Law. The [NASA JPL website](https://www.jpl.nasa.gov) gives a longer description of astronauts, hovercraft, and Newton's First Law.

17 May 1997 – The first flight of the McDonnell Douglas X-36 tailless fighter demonstrator takes place at Dryden Flight Research Center.

20 May 1927 – Charles Lindbergh pilots his “Spirit of St. Louis” across the Atlantic Ocean for the first non-stop flight from New York to Paris.

20 May 1932 – Amelia Earhart completes the first female solo flight across the Atlantic. The flight was from Harbor Grace, Newfoundland to Londonderry, Northern Ireland in a Lockheed Vega.

Membership Report
Nic Moffitt – Membership Chair

The Section membership has recently increased to 639 members. The distribution breaks down as shown in the table below and pie chart:

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Last year the Region V website had a picture of distribution of our membership, as distributed across the region. We replicated their process for the St Louis Section using the zip codes of mailing addresses registered with AIAA.

The distribution of Educator Associates, Professional, and Student members in the St Louis metroplex are shown in the first picture. Groups of members are shown as a circle with the head count as a number. The distribution of the three types is broken out in that circle, like a pie chart. Individuals are shown as a destination pointer with the appropriate color.

Maps on the next page show the distribution of the three groups across the St Louis Section. The boundaries of the Section (by county) are shown for reference.
Have Ideas for Programs?

The St. Louis AIAA council organizes a wide range of events including dinner meetings, technical specialist presentations, outreach events, and other STEM activities. To provide its members with the most stimulating and educational programs, all members are encouraged to propose topics, speakers, or other event ideas they might have to the council. We are always looking for new and fun ideas for programs and events so suggestions are welcome and appreciated! If you have any ideas or would like to become more involved, please contact either our Programs Chair Bob Dowgwillo or Council Chairman, Thomas Rehmeier.

AIAA St. Louis Section Website

Want to stay more up to date with section events, get to know the council or get connected to other local aerospace content? Check out the revamped AIAA website!

https://engage.aiaa.org/stlouis/home
Bob Dowgwillo, Programs Chair, presents the section challenge coin to speaker Dr. Roger Launius as a token of the Section’s appreciation.

Andrea Martinez, Publicity Chair, presents Dominic Guglielmo, son of our Vice Chair Jim Guglielmo, with our first-ever raffle prize: a LEGO Apollo Saturn V.

Jim Guglielmo, Vice-Chair, congratulates his son, Dominic.

Dr. Roger Launius presenting “Why Go to the Moon?” at Syberg’s on Dorsett, Thursday, April 18th.
The St. Louis Section of AIAA hosted its Annual Awards Banquet on Thursday, May 2, at Orlando’s in Maryland Heights. The Annual Awards Banquet highlights the outstanding contributions of individuals and organizations in the aerospace industry across the St. Louis section. This year, the following awards were presented to deserving nominees in the section:

- **Section Service Award**: Nic Moffitt
- **Technical Management Award**: Scott Schwimley
- **Educator Associate Award**: Jackie Blumer
- **Civic Service Award**: Army Aviation Heritage Foundation, Gateway Chapter
- **Young Professional Awards**: Micheal Bass, John Schaefer, and Aslihan Vuruskan

Congratulations to our 2019 award winners! Following the awards ceremony was a presentation on the Challenger Learning Center, located in Ferguson, MO, by the executive director Tasmyn Front. This great event wrapped up the 2018-2019 AIAA year. Look for more exciting events to come in August 2019!
Chelsea Fuller Presenting Technical Management Award to Scott Schwimley

Chelsea Fuller Presenting Educator Associate Award to Jackie Blumer

Chelsea Fuller Presenting Civic Service Award to Army Aviation Heritage Foundation

Stephen Clark Presenting Young Professional Award to Micheal Bass
Stephen Clark Presenting Young Professional Award to John Schaefer

Stephen Clark Presenting Young Professional Award to Aslihan Vuruskan
**New! St. Louis Section Council**

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If you are interested in joining one of the committees, please contact Chair Jim Guglielmo or the committee chairperson.
1ST ANNUAL

ZOOM INTO SUMMER
AVIATION SCHOLARSHIP PICNIC & FAMILY FUN

Who: Everybody is invited!

When: June 29th 10 AM - 1 PM

St. Louis Downtown Airport, West Ramp
Greater Saint Louis Air & Space Museum
2300 Vector Drive, Cahokia, IL

Picnic Lunch Hosted by 99s Women Pilots
*Free Flights for kids (EAA Young Eagles Sponsored)
Hands-on STEM Activities (AIAA Sponsored)
Meet Tuskegee Airmen Inc.
Microsoft Flight Simulators (Civil Air Patrol Sponsored)
Free Museum Tours & Kids Activities
Rivet Demonstration (SWIC Sponsored)

* Register for Young Eagles Flights (guarantee your spot, walk-ins okay)
* Go to: https://youngeaglesday.org?475 & Print your registration form

Text event Questions to Docent Zoe © 847-271-6303