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Chair Chat

St. Louis Section Chair- Jim Guglielmo

Welcome to the November issue of the St. Louis AIAA Section newsletter. In case you hadn't noticed, there was no October issue this year, and the November issue will highlight the October events, and provide information for several very interesting programs coming up in November and December.

The month of October was a very busy month for STEM activities, with four outstanding events lead by Jackie Blumer, the St. Louis Section STEM Chair. If you are interested in wind tunnel testing, please consider attending our next two Technical Specialist meetings for a presentation on November 21st and a Boeing Polysonic Wind Tunnel tour December 10th. Our 9th Annual AIAA Members Appreciation Event will take place on December 12th.

With Thanksgiving just around the corner, I will share a little flying/aviation-related turkey trivia. First, I found it interesting that wild turkeys can fly short distances and up into trees, but not domestic turkeys. Second, at least two military aircraft received the unfortunate "Turkey" nickname. The first aircraft was a Grumman TBM-3E Avenger, which was a very capable and durable WWII torpedo bomber. Some reports indicate the Avenger received its nickname from aircrews and escort carrier sailors because of its size and maneuverability in comparison to the F4F Wildcat fighters, and for its somewhat large and awkward appearance. The second aircraft to have references to the "Turkey" moniker was the Grumman F-14 Tomcat. One F-14 pilot cites the lack of power in the earlier models as the reason for the "Turkey" designation, and another reference mentions all of the moving parts, like the flaps on its variable sweep wings, contributing to its "turkey-like" appearance in the approach configuration. Coincidentally, both of these aircraft were designed and built by Grumman. And lest we forget the famous quote by Mr. Carlson after the tragic Thanksgiving Day helicopter turkey-drop event... *"As God is my witness, I thought turkeys could fly!"* (30 October 1978 "Turkeys Away" episode of WKRP in Cincinnati)



Grumman Avenger Photo Courtesy of
Commons.wikipedia.org

I hope you enjoy this month's newsletter. As always, if you have any questions or suggestions for events, please email me at james.j.guglielmo@boeing.com or call 314-452-1271. And if you are interested in either volunteering on the Council or at an event, we welcome your help.

Thanks!

Jim Guglielmo

History in Aviation: October & November

Historian - Colin Thiele



1 October 1986 – The B-1 B Bomber receives Initial Operational Capability. The B-1 is a variable sweep, supersonic heavy bomber for the US Air Force.



4 October 1957 – The first Earth orbiting satellite, Sputnik I, is launched by The Soviet Union.

8 October 1940 – The Royal Air Force creates the first Eagle Squadron, made up of volunteer pilots from the US.

11 October 1910 – Teddy Roosevelt is the first US President to fly. The flight takes place at Kinloch Field in St. Louis, MO, with pilot Archibald Hoxsey at the wheel.

1 November 1954 – The United States Air Force retires its last Boeing B-29 “Superfortress” from service.

6 November 1915 – The first catapult launching of an airplane from a moving ship is made from the USS North Carolina in Pensacola, Florida.

6 November 1945 – The first jet plane to land on an aircraft carrier is a Ryan FR-1 “Fireball” piloted by U.S. Navy Ensign Jake West.

7 November 1910 – The first use of an airplane to carry commercial freight is the Wright Company's airplane that flies from Dayton to Columbus, Ohio carrying ten bolts of silk to the Morehouse-Martens Company.

10 November 1988 – The USAF reveals existence of the Lockheed F-117A “Nighthawk” stealth fighter.

11 November 1956 – The first flight of the world's first supersonic bomber, the Convair B-58 “Hustler.”

12 November 1921 – The first air-to-air refueling is made when American Wesley May steps from the wing of one aircraft to that of another carrying a five-gallon can of gasoline strapped to his back.

30 November 1907 – Glenn Curtiss founds the Curtiss Aeroplane Company. It is the first United States airplane manufacturing company.

November is National Aviation History Month, and is dedicated to exploring, recognizing and celebrating America's great contributions and achievements in the development of aviation. Aviation history refers to the history of development of mechanical flight – from the earliest attempts in kites and gliders to powered heavier-than-air, supersonic and space flights.

STEM Events

Jackie Blumer

AIAA Teacher Institute “Soar into STEM”

Teachers in Madison County IL attended an AIAA Teacher Institute to learn how to “Soar into STEM”. Jackie Blumer, AIAA STL STEM Chair, held a day long conference to give teachers ideas on incorporating STEM into their curriculum. Teachers learned about the difficulties of communicating effectively without talking. They also completed multiple challenges, including designing, building, and testing a lunar lander, load their rocket on a launcher, and stomp on the plastic bottle to launch their rocket high into the air. The kids could also build a rubber band launched rocket out of foam. The kids really enjoyed both crafts and many stayed to make both rockets or came back after their flight. Scholarship applications and information about Educator Associate memberships were also distributed from the AIAA booth.

Thank you to everyone who helped host this event. The kids really enjoyed it!



Educate Full Steam Ahead with the Moon Landing Challenge

Commemorating the 50th anniversary of America’s moon landing and NASA’s renewed focus on returning to the moon, students investigated the challenges and opportunities offered by a moon landing challenge. Mrs. Blumer’s 6th and 7th grade science students from Greenville Jr. High School (Greenville, IL) shared their solutions to challenges in creating a lunar lander, lunar rover, space suit (Barbienaut), rocket and successful heat shield that will all be needed for NASA’s return to the moon.

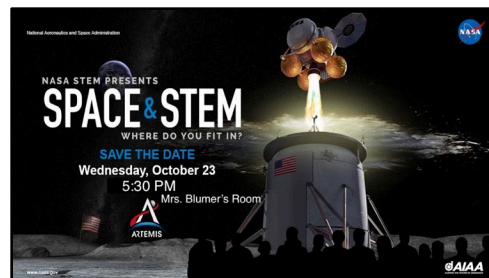


In addition to investigating the moon landing challenge, students also learned from an engineer from the American Institute of Aeronautics and Astronautics. This segment of the program focused on the various careers available in engineering and the importance of teamwork and collaboration in solving an engineering problem.

Full STEAM Ahead with the Moon Landing Challenge, with Jackie Blumer, Science Teacher, Greenville Jr. High School & AIAA-STL STEM Chair, and Alec Herzog, Engineer from Boeing and AIAA-STL Treasurer

Artemis Watch Party

Jr. High students in Greenville, IL were invited to learn more about Artemis during NASA's Artemis Watch Party. Students learned about how they can one day contribute to humankind's exploration of the Red Planet and to find out where THEY fit in to the program.



STEM Corner: Meteor Dynamics

Overview

Asteroids are rocky bodies in our galaxy that are too small to have an atmosphere or be called planets. Tens of thousands of asteroids are gathered in a doughnut-shaped ring called the *Asteroid Belt* between Mars and Jupiter. Asteroids also orbit the sun and sometimes pass very close to earth. If an asteroid passes through our atmosphere, we call that a **meteor**, or a *shooting star*. Meteors leave behind a bright trail of debris created by their high speeds and atmospheric friction. Most meteors disintegrate in or glance off the atmosphere. Some meteors get too hot and explode in the upper atmosphere, like the meteor in Chelyabinsk, Russia in 2013. Some asteroids reach the ground and get a new name – **meteorites**. The largest meteorite found on Earth is the Hoba meteorite in Namibia, Africa that weighs in at nearly 120,000 pounds.

Background

In February of 2013, a small asteroid entered Earth's atmosphere and broke up 32.5 seconds later over Chelyabinsk, Russia. The explosion was seen by many and heard by all of the residents of Chelyabinsk. NASA estimated the meteor to be 17 meters in diameter and have a weight of 11,000 metric tons. The meteor was tracked at 18 kilometers per second and descended down a flight path at a 15° angle with respect to the horizontal. The meteor terminated its journey at an altitude of about 20 kilometers.

Materials

- Download the [“Math Rocks” worksheet](#) from the JPL website
- Download the [“Math Rocks” answer sheet](#) from the JPL website

Procedure

Explore meteor dynamics by having students answer the following questions:

1. What is the straight-line distance the meteor traveled through Earth's atmosphere?
2. Compute the volume of the asteroid, assuming it was nearly spherical.
3. Compute the density of the asteroid. What does this tell you about the physical composition of the asteroid?
4. Is it primarily ice? Rock? Iron?
5. How much energy was released by the event? Give answer in Joules and kilotons.
6. At what altitude did atmospheric entry occur? What layer of the atmosphere is this?

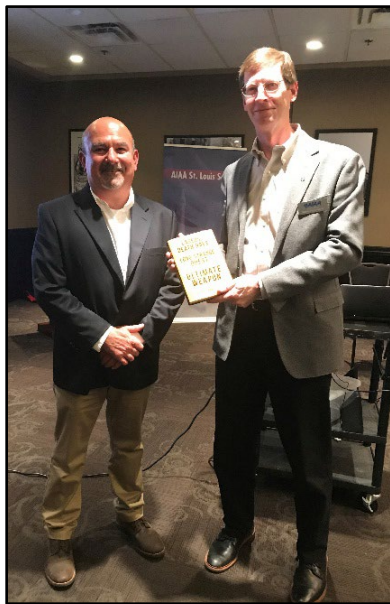
Reference: This page was adapted from the demonstration on the NASA JPL website. See the [NASA JPL website](#) for more information and other ideas for home or classroom science demonstrations.

Public Policy Dinner Meeting

Frank Youkhana

The section's first Distinguished Lecturer event of 2019 took place on the evening of October 17 at Syberg's Meeting Facilities on Dorsett Ave. Dr. James Horkovich travelled from Littleton, CO to present his topic "Changing the Game-Public Policy and Emerging Technologies".

Through examples dealing with the pursuit of High Power Laser and Directed Energy technology, most associated with the "Star Wars" program, he stressed the need for engineers to understand the relationship between technological advances and public policy formulation. In his presentation, he cited numerous examples of past policy predictions to demonstrate that even the best minds don't always have a perfect "crystal ball" and that new technology ideas have to be presented and sold to decision makers in such a manner that constructive plans come forward for the benefit of society. He also stressed the importance of establishing relationships with local politicians at an early stage and maintaining those avenues of communication as they work their way up the political chain.



(L) Mark Kammeyer is presented with the door prize for this event, Lasers, Death Rays, and the Long, Strange Quest for the Ultimate Weapon by Jeff Hecht, a book specifically recommended by Dr. Horkovich.

(R) The Public Policy Chairperson for the St. Louis Section, Frank Youkhana, presents Dr. Horkovich with the section's "Challenge Coin" as a token of appreciation for speaking to its membership.

Technical Specialist Meeting: October

Technical Specialist Chair- John Schaefer

On October 29, Washington University Professor Ramesh Agarwal gave a presentation entitled "Active Wingtip Vortex Cancellation in a Propeller-Driven UAV with Distributed Electric Propulsion." The talk began with an overview of electric propulsion concepts and vehicles, followed by a detailed computational fluid dynamics analysis for a specific configuration. Dr. Agarwal demonstrated that by using large, wingtip-mounted propellers, the wingtip vortices of a vehicle can be partially canceled to yield lower drag and higher lift to drag ratio. The presentation was held at Washington University in St. Louis and was well attended – approximately 25 students and professionals were in the audience. As a reminder to our membership, please RSVP if you plan to attend technical specialist meetings so that St. Louis Section officers can get an accurate count for food.

Join us for our next meeting on November 21, when Mathew Rueger, Boeing Technical Fellow, will present on the topic "A Practical Guide to Wind Tunnel Testing." This talk will be followed by a tour of the Boeing Polysonic Wind Tunnel on December 10, guided by Mark Kammeyer, Boeing Associate Technical Fellow.

Trivia Night Answers!

Nic Moffitt & Bob Dowgwillo

For those of you that participated in the last newsletter's "St. Louis, True or False" trivia, fear not, the answers are below!

Question	Answer
The tower on top of the 22-floor Continental Building in Grand Center was intended to moor airships until the Hindenburg Disaster dashed those plans.	FALSE
Newly renovated Boeing Aviation Fields in Forest Park, home to 4 baseball and 4 softball diamonds, was once a real airfield.	TRUE
There once was an aircraft factory in the University City Loop.	TRUE. Actually, two locations
Lambert airport once was home to both an Air National Guard Base AND a Naval Air Station	TRUE
St Louis hosted the famous Floyd Bennett Balloon Races three times, more than any other city in the world.	TRUE
The F-15 Eagle made its first flight on July 27, 1972 from Lambert Airport.	FALSE, Edwards Air Force Base
During the 1937 St. Louis Air Races, Louise Thaden broke the women's speed record held by Amelia Earhart.	TRUE
In 1965, a twin engine airplane was flown through the Gateway Arch.	FALSE. It was in 1966, soon after the Arch opened.

Aerospace Link of the Month



<https://www.reuters.com/article/us-ups-drones/ups-drone-makes-first-home-prescription-deliveries-for-cvs-idUSKBN1XF2JC>

Drone drug deliveries done!

Upcoming Events

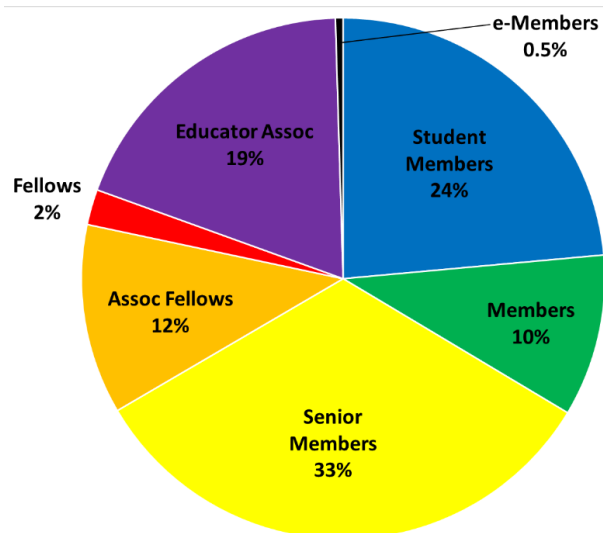
- WashU Chapter AIAA Meeting (NASA Armstrong Flight Research Center Director): November 19th
- Tech Specialist Meeting (Wind Tunnels, Mat Rueger): November 21st
- Technical Specialist Meeting (Boeing Polysonic Wind Tunnel Tour): December 10th
- Dinner Meeting – Member Appreciation & Toys for Tots: December 12th

Membership Report

Nic Moffitt – Membership Chair

The Section membership is up to 637 members. The distribution breaks down as shown in the table below and the pie chart at the right:

Type	Number
Professional	366
Student	150
Educator Associate	121



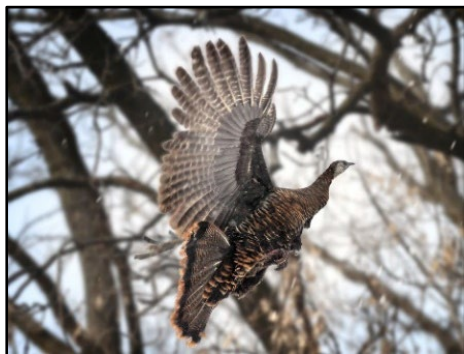
If you want to help someone get connected with AIAA events in St Louis, please pass along a couple of social media groups related to our St. Louis Section. We advertise our events on Facebook through the group “I Fly St Louis” and through the Boeing inSite group “AIAA – St Louis Section”. Both of these groups are free to join and do not require AIAA membership. Please feel free to forward any membership questions to Nic Moffitt.

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."

AIAA St. Louis Section Website

Please see the AIAA St. Louis Section website for more information about upcoming events, announcements, and discussions: <https://engage.aiaa.org/stlouis/home>



Photograph of a Wild Turkey in Flight

Reference:

<https://www.flickr.com/photos/rahimageworks/8571235730/in/photostream/>

AIAA St. Louis Section Council

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STEM	Jackie Blumer	----	jblumer@bccu2.org
Strategic Planning	Larry Brase	314-234-4907	lawrence.o.brase-jr@boeing.com
Webmasters	Thomas Rehmeier Jim Guglielmo	314-232-2986 314-452-1271	thomas.r.rehmeier@boeing.com james.j.guglielmo@boeing.com
Young Professionals	Stephen Clark	314-545-9509	stephen.f.clark3@boeing.com

If you are interested in joining one of the committees, please contact the AIAA St. Louis Section Chair, Jim Guglielmo, or the committee chairperson.



American Institute of Aeronautics and Astronautics

WashU in St. Louis Student Section

Tuesday, November 19, 2019

Whitaker Hall, Room 100

Washington University in St. Louis

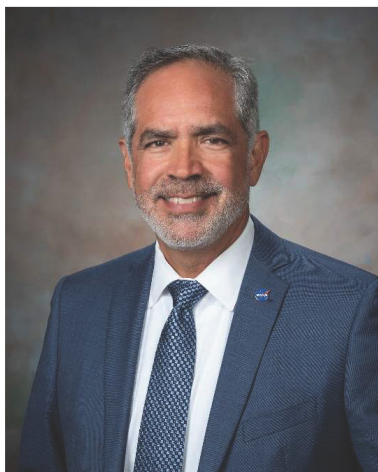
1 Brookings Dr.

St. Louis, MO 63130

Looking to the future:

Upcoming advancements in aerospace engineering

Presented by David D. McBride, Director of NASA's Armstrong Flight Research Center



David McBride is the director of NASA's Armstrong Flight Research Center at Edwards, California, and has been serving since 2009. He oversees all aspects of management, strategy and operations at NASA Armstrong, one of the agency's 10 field centers, and is the agency's lead center for atmospheric flight research, operations, and testing. During McBride's tenure as director, the center achieved full operational capability with the highly modified B-747 Stratospheric Observatory for Infrared Astronomy, completed flight evaluation of the X-48B/C hybrid wing body experimental aircraft, transitioned NASA's Global Hawk unmanned aircraft to science operations and demonstrated the NASA Orion spacecraft's launch abort system.

Director McBride will be speaking on the future of aerospace engineering including the next generation of NASA X-planes, the Artemis program (returning astronauts to the moon's surface by 2024), and the role of government in the age of private space and aircraft flight.

Schedule

4:45 – 5:00 Sign-in / social

5:00 – 6:00 Presentation

6:00 – 6:30 Q/A

Menu

Light refreshments

Ticket Price

Free



RSVP options (pick 1):

- [Google form](#)
- <https://bit.ly/36jbLsO>
- Scan the QR code
- Send an email to s.fang@wustl.edu with your full name and preferred email.

Please submit your reservation by
10 AM Monday, November 18





American Institute of Aeronautics and Astronautics

St. Louis Section

Thursday, November 21, 2019

Boeing Bldg. 100 Briefing Center

6300 James S. McDonnell Blvd

Berkeley, MO 63134

Part 1 of 2:

A Practical Guide to Wind Tunnel Testing

Presented by Mathew L. Rueger – Boeing Technical Fellow



Image credit: NASA Ames Research Center

While there have been rumors of its demise since the late 1980s, wind tunnel testing for the development of aircraft, missiles and other weapons systems is still going strong. Having said that, computational fluid dynamics has made great strides in both accuracy and productivity in recent decades. This presentation will provide an overview of the concept of wind tunnel testing, types of tests conducted by The Boeing Company and the facilities where such tests are conducted. Recent trends in wind tunnel testing will also be discussed, followed by

an open forum discussion of the best use of both CFD and wind tunnels to develop flight vehicles.

Mat Rueger received a Bachelor's and Master's Degree in Aeronautical and Astronautical Engineering in 1986 and 1988, respectively, from The Ohio State University. In 1988 he hired into the Computational Fluid Dynamics group at McDonnell Aircraft Company and was immediately loaned to the wind tunnel organization to work on transonic wall interference correction. He transferred into the Laboratory Organization shortly thereafter, and has been active in both high-speed and low-speed wind tunnel testing since that time. Mr. Rueger has conducted R&D efforts in many areas related to wind tunnel testing, and he holds several patents in the field.

Schedule

5:00 – 5:30 Sign-in / social

5:30 – 6:30 Presentation

6:30 – 7:00 Additional questions or
follow-on conversations

Menu

Sandwiches and
Light refreshments

Ticket Price

Free

Technical content to be
discussed at this event limits
attendance to US-Persons only

Reservation by 10 AM Monday, November 18

Send reservation by email*: stlaiaa@gmail.com

Contact [John Schaefer](#) for questions

* In email, please include name, # tickets, and
non-Boeing employees





American Institute of Aeronautics and Astronautics

St. Louis Section

Tuesday, December 10, 2019

Boeing Bldg. 100 Lobby
 6300 James S. McDonnell Blvd
 Berkeley, MO 63134

Part 2 of 2: **Boeing Polysonic Wind Tunnel Tour**

Guided by Mark Kammeyer – Boeing Associate Technical Fellow



In lieu of our normal presentation format, this month's Technical Specialist event will be a tour of the Boeing Polysonic Wind Tunnel (PSWT). The PSWT is a 4-ft x 4-ft blow-down wind tunnel located near Lambert Airport. Originally built by McDonnell Aircraft Company, it has been in continuous operation since 1959. The "Polysonic" wind tunnel gets its name for the ability to provide test conditions in the subsonic, transonic, supersonic, and

hypersonic flow regimes. Over its 60-year history, the PSWT has played a key role in the development of major programs such as Gemini, F-4, F-15, F-18, Delta Rocket, X-51, and more. This walking tour will describe the facility hardware, tunnel operation, and general test methods.

Dr. Mark Kammeyer is an Associate Technical Fellow with The Boeing Company. As part of the Test & Evaluation organization in St. Louis, Mark supports company wind-tunnel test programs at internal and external facilities. His interests include wind-tunnel data quality and uncertainty analysis, statistical methods, force-measurement instrumentation, and test methods development. Prior to joining Boeing in 1996, Mark worked at the US Navy's Hypervelocity Wind Tunnel. Over his 30-year career Mark has tested in Boeing, NASA, USAF, USN, and international facilities covering the low-speed, transonic, supersonic, and hypersonic flow regimes.

Schedule

5:00 – 5:30 Sign-in / social
 5:30 – 5:45 Travel to PSWT facility
 6:00 – 7:00 Walking tour

Menu

Sandwiches and
 Light refreshments

Ticket Price

Free

Reservation by 10 AM Friday, December 6

Send reservation by email*: stlaiaa@gmail.com

Contact [John Schaefer](#) for questions

* In email, please include name, # tickets, and
 # non-Boeing employees

* Detailed itinerary will be disseminated closer to event

PSWT facility requirements
 limit the attendance for this
 event to US-Persons only





9th AIAA Member Appreciation Event

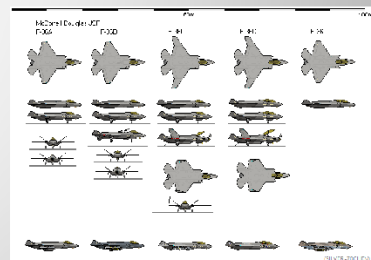
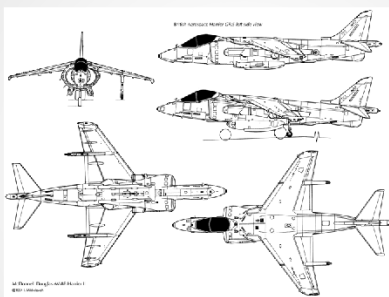
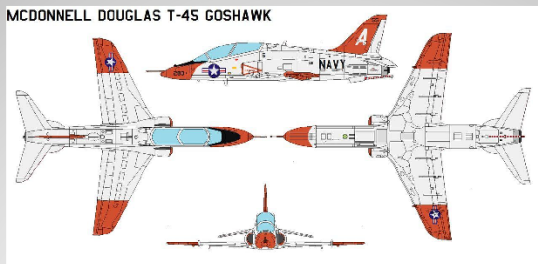
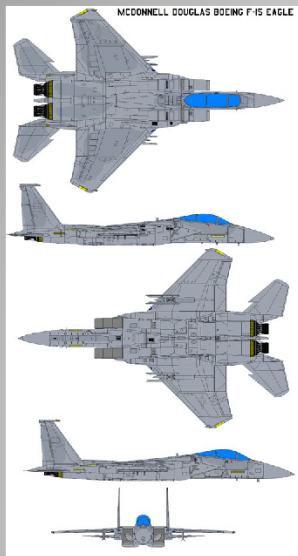
Please join the members of the St Louis Section as we recognize the membership anniversaries of a number of our longtime AIAA colleagues. Come and show your appreciation for these members who have been with AIAA for 25, 30, ...45, and even 60+ years. In addition, we will also be recognizing those members who are 2019 AIAA Fellows and 2020 Associate Fellows in the St. Louis Section.

December 12, 2019

**Special Panel
Presentation:**

'Making Tactical Aircraft – Stories from the Trenches'

**with Retired McDonnell Douglas/ Boeing Engineers,
Moderated by Ray Cosner**



**Please bring an
unwrapped Toy For**



Schedule	Where	Cost
<p>Thursday, December 12, 2019</p> <p>5:01 pm – Social time w/ Open Bar</p> <p>5:49 pm – Buffet Dinner</p> <p>6:51 pm – Member Appreciation Program</p> <p>7:07 pm – Presentation</p> <p>8:29 pm – Adjourn</p> <p><u>Reservation Deadline:</u> 10:53 am on Monday, 9 December 2018</p> <p><u>Reservation Contact:</u> Send reservation by email*: stlaiaa@gmail.com * In email, please include name and # tickets</p>	<p>Orlando's 2050 Dorsett Village Maryland Heights, MO 63043 314-453-9000</p>	<p>\$18 per person</p> <p>Membership is <u>NOT</u> required to attend this event. All are Welcome ☺</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Dinner Menu: Sicilian Roast Beef Italian Chicken Spedini Cavatelli Broccoli Green Beans Amandine Italian Garden Salad Dinner Rolls and Butter Assorted Petite Sweets</p> </div>