

AeroGRAM

A newsletter for alumni & friends of the School of Aeronautics & Astronautics

Covering the 2009-2010 academic year

- Darryl Davis – Distinguished Engineering Alumni
- 2009 Outstanding Engineer Awards

Purdue in Space



STS-1
Launched
April 12,
1981



SPACE SHUTTLE *First to Last*



STS-134
Final planned
mission

AAE Headlines	2
Purdue University's Connection with Space Continues.....	3
Space Shuttle - First to Last	4
Prominent Alumni donate papers... 6	6
Head of NASA Space Operations Honored With National Space Trophy.....	6
AAE alumni wins Boeing Engineering Flightglobal Achievement Award	7
Commander of the 434th Air Refueling Wing	7
Development Updates	8
Walker "Mahurin" Mahurin dies at 91	10
News About You	12
Orion PA-1 Launch Abort System Makes Rocket History.....	16
Honorary Industry Professor - Dr. Allen S. Novick.....	17
William F. Moses Jnr inducted into the Purdue University Reserve Officers Training Corps Hall of Fame	17
Gary Payton Retires as Deputy Under Secretary of the Air Force	18
Darryl W. Davis - Distinguished Engineering Alumni 2009	19
AAE Ranked in the <i>U.S. News</i> & <i>World Report's</i> Top 10	20
Save the Dates!	21
'Purdue's Place in Space: From the Midwest to the Moon'	23
Hayden Krueger Recognized for Contributions to Human Space Flight	23
Outstanding Aerospace Engineers Award	24
Purdue Space Day	29
Faculty News	30
New aluminum-water rocket propellant promising for future space missions	31
AIAA Best Paper	34
Professor Emeritus George Palmer honored as the Designer of the Wind Tunnel	35
Boeing/AFOSR Mach 6 Quiet Tunnel	39
Congratulations to the Graduates ...	40
Student Awards	42
SEDS Spring Space Forum 2010 ..	44
Student Leadership Council	45
Zonta International 2010	46
AIAA Regional Student Conference .	47
Keep in Touch	48

From Professor Tom I-P. Shih - AAE Headlines Fall 2010

It is a real honor and pleasure to serve at Purdue's School of Aeronautics and Astronautics. My first year at Purdue has been wonderfully exciting in working with our students, alumni, faculty, and staff who are so enthusiastic, so energetic, and so constant and dedicated in their efforts to achieve excellence in all that they do. In this letter, I share some of the happenings.

Our School's faculty continues to work on exciting and cutting-edge research that has meaning and impact for our nation's aerospace enterprise and work with passion to provide the best possible education to our students. Also, our faculty continues to broaden and enhance opportunities for our students to engage in hands-on design-build-test/fly projects in aeronautics and in astronautics. Support from alumni and friends are instrumental in enabling these opportunities, and we are extremely grateful.

2009-10 saw our School's undergraduate enrollment increase by 8.8% to 567 and the graduate enrollment increase by 22.3% to 335. This year's graduate enrollment is our School's largest ever. The demand for our students continues to be strong when they graduate, while the increased enrollment brings with it demand for co-op and internship opportunities.

We are delighted and proud that Mark Polansky, BSAAE'78, MSAAE'78 commanded the Endeavour shuttle crew STS-127 on the 29th mission to the International Space Station. This is Mark's third shuttle mission, and during this mission, Mark and fellow Purdue alumnus, David Wolf, celebrated the 40th anniversary of the Apollo 11 mission and fellow Purdue AAE graduate, Neil Armstrong, as the first person to step on the moon. Other highlights of the year include the celebration of our 11th Outstanding Aerospace Engineer Awards Banquet, and the college naming Darryl W. Davis, BSAAE'78 and President of Boeing's Phantom Works, as a Distinguished Engineering Alumnus.

We welcome three new members to the Industrial Advisory Council: Col (Ret) Mark Brown, BSAAE'73; Gary Payton, MSAAE'72; and Dr. Richard Rivir, BSAE'60. With the support of Dean Leah Jamieson, our school formed a Steering Advisory Council to help our school as well as our college address critical needs in our nation's aerospace enterprise. Our school and our college thank both the IAC and the SAC for their vision, guidance, and support.

On faculty news, we congratulate three faculty members who were promoted: Dr. Daniel DeLaurentis and Dr. Inseok Hwang were promoted to Associate Professor with tenure, and Dr. Barrett Caldwell, who serves as Director of the Indiana Space Grant Consortium with a courtesy appointment in our school, was promoted to full professor. We are pleased to welcome two new faculty members during fall of 2009: Dr. Vikas Tomar whose research is in materials for aerospace, energy, and medicine, and Dr. Dengfeng Sun whose research is in air traffic flow management, dynamic airspace configuration, and studies for the Next Generation Air Transportation System (NextGen). We are also pleased to welcome Dr. Allen S. Novick - BSAE'65, MSAE'67, PhD'72, DEA'06, OAE'06, and recently retired vice president from Rolls-Royce - who joined us as an Honorary Industry Professor and two faculty members who joined our school "by courtesy" appointments: Dr. Jay Melosh and Dr. Robert Lucht.

On a sad note, First Lt. Joel C. Gentz - BSAAE'07; a combat rescue officer, trained in special-forces operations and an EMT/paramedic - died at the age of 25 in Afghanistan while on a rescue mission. Also, Professor Emeritus John "Bob" Osborne who served on our faculty from 1957 to 1990 passed on. However, we will remember Professor Osborn through the legacy of his significant research contributions in rocket propulsion, including the Space Shuttle main engine, and as a wonderful educator who touched many students.

We want to welcome our alumni and friends back to campus so that we could show you up-close the educational opportunities that your support has provided to our students. Having you back on campus also gives us a chance to say thank you for your support and, more importantly, connect you with our present students so that you too can know why we make educating Purdue Aeronautical and Astronautical Engineers our life's work.

We strive to make Purdue's AAE live up to the standards that you remember so well. Thanks again for your part in making Purdue so exciting.

Hail Purdue

Tom Shih
Professor and Head



Purdue University's Connection with Space Continues



STS-127 **Mark Polansky** **and David Wolf**

(Top) Astronaut Mark Polansky, STS-127 commander, works on the flight deck of Space Shuttle Endeavour during flight day 14 activities.

(Bottom) Astronaut Dave Wolf, STS-127 mission specialist, is just about ready to participate in Endeavour's third space walk of a scheduled five overall for this flight.

Purdue University's connection with space continued with alumnus Commander Mark L. Polansky BSAAE'78; MSAAE'78 and Mission Specialist Dr. David A. Wolf BSEE'78 serving as crew on STS-127. Polansky was the second astronaut to "Tweet" from space. He posted Twitter updates as he prepared for the mission, tweeting as *astro_127*.

STS-127 launched on July 15, 2009 and was the twenty-third flight of Space Shuttle *Endeavour*. The primary purpose of the mission was to deliver and install the final two components of the Japanese Experiment Module: the Exposed Facility (JEM EF), and the Exposed Section of the Experiment Logistics Module (ELM-ES). Expedition 19 doubled the size of the resident crew on the complex, expanding it to six people.

During their mission, the NASA crew celebrated the 40th anniversary of the Apollo 11 mission. Neil Armstrong was a strong inspiration to them both while they were at Purdue and their goal was to similarly inspire students at Purdue.

As part of an Apollo 11 celebration in Washington, D.C., Wolf and Polansky donned Purdue ball caps and appeared in front of a Purdue backdrop for a brief talk that was broadcast to the audience. See photo above. The 16-day, 6.5 million mile mission returned on July 31, 2009.

They both say that coming from Purdue is like having an unfair advantage. While the two lived in the same dormitory - Cary Quad - they didn't plan to one day be in space together.

In 2001 Polansky, first flew as a shuttle pilot and commanded a mission in 2006. He is a former Air Force pilot. Wolf, a physician, began working at NASA in 1983 on medical equipment for space travel. He became an astronaut in 1990 and NASA Inventor of the Year in 1992. David Wolf will be the VIP guest astronaut for Purdue Space Day on October 30, 2010.

Purdue in Space

SPACE SHUTTLE

First to Last

The Shuttle program was formally launched on January 5th, 1972 when NASA announced it would proceed with the development of a reusable Space Shuttle System. The first flight - Columbia - took place on April 12th 1981, the 20th anniversary of Yuri Gagarin's space-flight. Many Purdue astronaut alumni have served on Shuttle missions - missions made possible by thousands of Purdue engineers who have played a major part in the success of the STS program.

"First to Last" web page
www.engineering.purdue.edu/AAE
(under the "Announcement" section)

1972

NASA announced the launch of the Shuttle Program

In early spring, a YouTube video was sent by **Joe Cassady BSAAE'81; MSAAE'83** to Prof. Stephen Heister, it shows Purdue Aerospace Engineers at the launch of STS-1 in 1981. It features **Eric Ohmit BSAAE'81** at 1:50. This YouTube video is available to watch on the AAE Facebook page. We then asked to hear from anyone with any type of connection with the STS missions. Via both the AAE Facebook page and email, we were delighted to receive stories from alumni whose lives were impacted by both the Space travel in general and the Shuttle program in particular.

The stories are very detailed and we have just included the highlights here. As we want to share them, we have set up a "**First to Last**" web page on the School of Aeronautics and Astronautics web site and encourage you to read them all under the Announcement section on the front page of the AAE web site. <https://engineering.purdue.edu/AAE> front page of the AAE web site. <https://engineering.purdue.edu/AAE>.

The final Space Shuttle Mission, STS-134 is slated to launch February 2011 (at time of print) with Andrew J. Feustel as Mission Specialist. It is a fitting tribute to the thousands of Purdue engineers for a Purdue alumnus astronaut to be part of this historic mission.

Mark Craig BSAA'71; OAE'00; DEA'02; had many amazing experiences while working on the Space Shuttle. He was one of two co-ops lucky enough to be included when Dr. Max Faget who was Director of Engineering at the Manned Spacecraft Center in Houston and NASA's chief engineer on the Mercury, Gemini, and Apollo capsules, convened a "Skunkworks" in May 1969. He used a sketch (on the AAE web site) to explain his concept for a re-usable space shuttle and convey its scale. Mark gained access to state-of-the-art tools and data that was very useful in his Purdue senior design project - a reusable shuttle. Future astronaut **Charlie Walker BSAAE'71** was also on that design team.

Following the landing of STS-1, severe damage to several re-entry heat shield thermal protection tiles was discovered.



1981

First Flight Columbia



2011

Last Flight Endeavour



To investigate and eliminate sources of this damage, the shuttle program created a debris assessment team that Mark was selected to lead. The team quickly saw that an inspection of the fueled launch vehicle before liftoff was mandatory; and to that end Red Team launch inspection was formed. His full story is on the web site.

Jack Rumble BSAAE'95 future career was set while he watched the live coverage of STS-1- Columbia land with the rest of his second grade class. This historic mission inspired him to be an astronaut and learn as much about space as possible. He read books, subscribed to magazines and attended Space Camp in Huntsville, AL a total of six times. He stayed with rockets as an ICBM Launch Officer within Air Force Space Command and Jack is now a Systems Engineer with Lockheed Martin working on upgrades to the ICBM force but he still has his eye on space travel.

Astronaut **John Blaha MSAAE'66** flew in the Space Shuttle a total of five times in the 1980's and 1990's and he salutes the engineers, scientists, and technical management who designed and built the world's only reusable spaceship. It is enthralling to read John Blaha's firsthand account of life on STS-33 Discovery, and his time on the Russian Space Station MIR which launched on STS-79 Atlantis and returned four months later on STS-81 Atlantis.

Barry Power BSAAE'78 says he has been fortunate to have spent over twenty years working on the Space Shuttle program which included sixteen Space Shuttle missions. Some of these missions included the deployment of the planetary spacecraft Magellan and Galileo and the launch of the Chandra X-ray telescope. One of his favorites was working on STS-54 which featured his Purdue AAE classmate, **Greg Harbaugh BSAAE'78**, as Mission Specialist and spacewalker.

Although **Mark Sleppy BSAAE'85** never had the opportunity to work on the Space Shuttle program he was inspired like many before him by the Apollo program and of dreaming to be an astronaut. As a child, he built and flew from scratch a scale model of the Shuttle and as a sophomore at Purdue he got up at 4:00am to watch the STS-1 launch of Columbia on April 12, 1981. He also had the great opportunity to see Endeavour during a tour of the facility at Palmdale, CA.

Greg Wood BSAAE'92 worked as a Launch Safety Officer at the 45th Space Wing at Patrick Airforce Base and Cape Canaveral Air Station from 2006-2007. He was involved in public safety and disaster response planning for all launches from the Eastern Range, including STS-115, STS-116, STS-117 and STS-118. His childhood dream came true when he was able to go inside one of the orbiters while it was undergoing launch preparations on SLC 39A. Although most of his Air Force career has been spent in the space launch area, he considers the highlight have the chance to play even a small role in the Space Shuttle program.

Ray Bigonnesse BSAAE'94 started work at Johnson Space Center as soon as he graduated from Purdue. It was just a few weeks before STS-71 and he was a Safety guy for three years before moving on to Mission Operations. He has been a flight controller since 1998, and specializes in orbital rendezvous and docking and has enjoyed the experience of supporting the various spacecraft visited, Hubble, Mir and the International Space Station. Ray had the sad task to lead search and recovery teams in East Texas following the Columbia accident in 2003. It was Ray's group who designed the Rbar Pitch Maneuver, the "flip" that the Shuttle does before docking to allow the tile on its belly to be inspected.

Tim Carnahan BSAAE'83 is the Lead Structural Analyst for the Express Logistics Carrier (ELC) and continues working to get the last pieces of the International Space Station ready. He has worked at NASA Goddard Space Flight Center for 30 years, and has only recently managed to see Shuttle launches STS-121 and STS-129. The final two missions will go into orbit as currently planned on STS-133 due for launch Fall, 2010 and STS-134, due for lift off in February 2011 (at time of print) - making the ISS complete.

Michael Snyder BSAAE'96 is Orbiter OMS/RCS and Fuel Cell/PRSD Subsystem Area Manager for USA Space Systems Engineering and provided testimony to the Subcommittee on Science and Space Committee on Commerce, Science, and Transportation for the U.S. Senate on February 2010. He discussed the "Challenges and Opportunities of the Proposed FY 2011 Budget for NASA." Mike has worked on the Space Shuttle for the past 13 years and has always wanted to be part of the space program. His testimony in February was prompted by his concern that those in the industry should be able to "pass the torch onto the follow-on program but as time progresses, it looked more like we are simply extinguishing it."

Many of our alumni mentioned the impact the Challenger accident on January 28th 1986. Like countless others, they were stunned and could not believe what they were hearing. Once again, on February 1, 2003, the world was shocked and saddened when Columbia and her crew were lost.

You can view the Purdue School of Aeronautics and Astronautics Facebook page at the link on the right of the web page, or become a Fan and add your story under the "Discussions" page.

**Go Boilers!
Go Purdue Aerospace Engineers!**

Prominent Alumni donate papers to Purdue University



Purdue alumni, **Janice Voss** and **Roy Bridges Jr.** have donated personal papers to the Purdue Libraries Division of Archives and Special Collections. The papers join those of astronaut alumni Neil Armstrong and Eugene Cernan.

Voss graduated from Purdue in 1975. She was selected as an astronaut candidate by NASA in 1990 and is a veteran of five space flights, STS-57 (1993) STS-63 (1995), STS-83 (1997), STS-94 (1997) and STS-99 (2000).

Voss currently serves as Payloads Lead of the Astronaut Office Station Branch. She had previously been science director from 2004-07 for NASA's Kepler Space Observatory, launched to discover Earthlike planets orbiting other stars.

Bridges earned a master's degree in astronautics from Purdue in 1966. He was selected as an astronaut candidate in 1980 and was the pilot aboard STS-51F *Challenger* in 1985. The journey was the first pallet-only Spacelab mission and the first to operate the Spacelab Instrument Pointing System. It carried 13 major experiments.

Bridges is a retired U.S. Air Force major general. He served from August 2003 to October 2005 as director of NASA's Langley Research Center in Hampton, Va., and before that was director of NASA's John F. Kennedy Space Center for more than six years. He also was commander of the Air Force Flight Test Center, Edwards Air Force Base, Calif.; for the Eastern Space and Missile Center, Patrick Air

Force Base, Fla.; and for the 412th Test wing at Edwards. He has received numerous honors, including most recently NASA's Outstanding Leadership Medal and the Presidential Meritorious Award.

He is currently an executive with Northrop Grumman Technical Services and received an honorary doctorate from Purdue in 2001.

The addition of the papers from Voss and Bridges will expand a rich and growing collection in Purdue Libraries' Division of Archives and Special Collections. The George Palmer Putnam Collection of Amelia Earhart Papers - the world's largest compilation of papers, memorabilia and artifacts related to the late aviator - along with papers from 1930 graduate and aviation pioneer Ralph Johnson, also are housed there.



Head of NASA Space Operations Honored With National Space Trophy

NASA Associate Administrator for Space Operations **William H. (Bill) Gerstenmaier, BSAAE'77; OAE'03; DEA'07**, was selected in January to receive the 2010 National Space Trophy. The award is the highest honor bestowed by the Rotary National Award for Space Achievement (RNASA) Foundation. Each year, the foundation presents the trophy to an outstanding American who has made major contributions to our nation's space program. Previous awardees include former NASA Administrator Dan Goldin; NASA astronaut Neil Armstrong; Apollo 11 Flight Director Gene Kranz and President George H.W. Bush.

Since 2005, Gerstenmaier has been responsible for overseeing the International Space Station and Space Shuttle programs, space communications and space launch vehicles. Gerstenmaier was formally recognized at a RNASA gala on April 30. The seven-foot, 500-pound lead crystal trophy is on display at the Johnson Space Center in Houston.

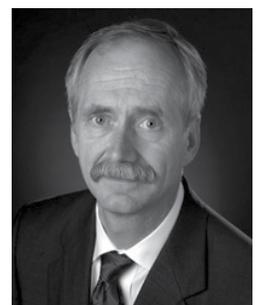


Image provided by NASA



AAE alumni wins Boeing Engineering *Flightglobal Achievement Award*



Michael Grant BSAE'05 has been named joint-winner in the 2010 Boeing Engineering Student of the Year - part of the Flightglobal Achievement Awards. After graduating from Purdue, he moved to Georgia Tech in Atlanta, where for his Masters Research, he developed a new methodology for robotic exploration of Mars using pinpoint landing technology.

In 2007, while working on his masters, Grant participated in NASA's High Mass Martian Landing design competition, winning first place with his team for their design, Heavy MEDL.

Grant hopes to complete his doctorate in 2011, for which he is looking at rapid trajectory optimization and hypersonic aerodynamics and the way they can be applied to the design of slender, high performance entry vehicles. As he puts it in simple terms: "It's about taking something going very fast and landing it slowly and safely by getting rid of a lot of energy on the way."

Since his time at Purdue, Grant has been a "NASA coop," spending his summers working at many of the agency's facilities, including the Johnson Space Center's flight design and dynamics division in Houston and the Langley Research Center in Virginia.

In his entry for the Engineering Student of the Year award - which was judged by a panel of former senior Boeing engineers - his supervisor, Dr Robert Braun, professor of space technology and director of the Space Systems Design Laboratory, describes Grant as an "extremely intelligent and enterprising young man with tremendous potential." Braun continues: "Across his research efforts, Michael has demonstrated exceptional initiative, maturity, creativity and dependability. His strengths include a strong understanding of the fundamentals of aerospace engineering, a significant desire to produce results of benefit to society while learning in the process, and a tremendous interest in new research challenges."

"Across his research efforts, Michael has demonstrated exceptional initiative, maturity, creativity and dependability."



Commander of the 434th Air Refueling Wing

Col. William "Tim" Cahoon BSAE'77 was named 434th Air Refueling Wing Commander at Grissom Air Reserve Base in June 2010.

Cahoon attended Purdue University through an ROTC Air Force scholarship and graduated with a degree in aeronautical engineering in 1977. He almost immediately entered active duty and has spent the past 33 years in the military, moving 14 times before his recent return to Lafayette.

As wing commander of the base, he has to ensure the base run smoothly and meets operational missions'. This also included making sure the base is properly equipped, and they are prepared and ready to deploy if needed.

Grissom Air Reserve Base owns 16 KC-135s, which are 15-year-old airliners that are very well maintained and are converted to tankers. The base offers in-flight refueling for other airplanes, which allows them to fly farther without stopping for fuel. It also allows airplanes to stay airborne in a given area for a longer time. Often this helps aircrafts that are patrolling a high-threat area. The pilots go through a very thorough training process, and they are continued to be trained throughout their careers.

Cahoon considers that it is an honor and a thrill to get back home to Indiana and to continue to serve. He and his wife Vicky have two adult children and seven grandchildren.



Development Updates

Your financial support leaves a lasting impact on Purdue and the School of Aeronautics and Astronautics. These gifts help us to achieve our mission in preparing students to be leaders in the aerospace field.

Our annual Donor Honor Roll covers the period July 1, 2009 – June 30, 2010 and lists our alumni, friends and corporate donors who have given generously of their financial resources to support the School of Aeronautics and Astronautics. Many thanks for your investment in us.

The Donor Honor Roll is published on the Alumni page of the School Web site at <https://engineering.purdue.edu/AAE>.

Thank you for your support!

Preparing for a beautiful Purdue AAE fall!

Here in AAE Development we have geared up for another Academic year, planning fall travel for Dr. Shih and myself, preparing for the fall **Boeing Distinguished Lecture** and the **Charles Rolls and Henry Royce Lecture**, and helping with plans for the upcoming **Industrial Advisory Council meeting, Outstanding Aerospace Awards, Alumni Weekend, President's Council Weekend, Homecoming** and **Purdue Space Day**.

Dr. Shih and I had a wonderful time at the Houston Alumni Association Event in June and we both enjoyed meeting many Houston area alumni. By the time you receive this magazine we will also have met many of the Los Angeles area alumni at an August reception in the area. Dr. Shih and I have travelled to see as many of you as possible this summer and we have been impressed with the many distinguished alumni who have welcomed our visits. We will continue to try and visit as many of you as possible in the coming months and we look forward to meeting you. We have been awed by the facility tours you have given us and appreciate being able to see what our amazing alumni have accomplished in their careers.

If you plan to come back to campus this fall, please let us know so that we may meet with you and give you a tour of Armstrong, or our other wonderful lab facilities. We welcome your visits back to campus. Hail Purdue!

You can reach me at (765) 494-9124
or by e-mail at dklassen@purdue.edu.

Go Boilers,

Diane Klassen
Director of Development
School of Aeronautics & Astronautics



Purdue Strategic Plan:

Sustaining New Synergies



The cradle of astronauts and quarterbacks. The home of Nobel laureates, Pulitzer Prize winners, National Medal of Technology laureates, and World Food Prize recipients. The place where countless scientific and technical advances have been cultivated over the last two centuries.

This is Purdue University, where more than 74,000 students and 19,000 faculty and staff from more than 126 countries converge each day to foster learning and move discoveries into the marketplace.

In 2008, we launched our strategic plan, *New Synergies*, to help Purdue take its place among the great universities of the 21st century. Now, as we enter into this critical time of need for support, we are aligning our development initiatives with the three major goals of *New Synergies*. Through our strategic plan, Purdue University is striving to launch tomorrow's leaders, promote discovery with delivery, and meet global challenges. Please join us in our mission to transform the world through educational opportunity.

Sustaining New Synergies: Funding Priorities for the School of Aeronautics & Astronautics

- **\$250,000 increase in AAE General Fund donations** (annual giving to the School of Aeronautics & Astronautics). These funds are used to give the students unique learning opportunities and enrich their learning experience. They also fund lab equipment needs and student competitions.
- **20 additional Endowed Scholarships** and contributions to the AAE General Scholarship Fund through Annual Giving.
- **2 Additional Endowed Graduate Fellowships** and contributions to the AAE General Fellowship Fund through Annual Giving.
- **2 Additional Endowed Professorships** to recruit and retain top professors for AAE.

NEIL ARMSTRONG HALL OF ENGINEERING

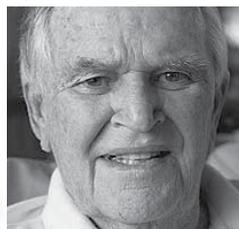
Access & Success Campaign Update:

Purdue's Access and Success student scholarship and program campaign is progressing on pace. At the end of Fiscal 2010, \$128.2 million had been raised toward a goal of \$304 million by 2014. This means that with 42 percent of the reporting period completed, Purdue is at 42 percent of the goal. Since its inception in 2007, the Access and Success Campaign has provided a total of \$109.3 million for student support and \$18.9 million for special programming efforts.

**AAE Alum,
Walker
"Mahurin"
Mahurin,
ace WWII
Fighter Pilot,
dies at 91**



“A Hero in our Midst”



The School of Aeronautics and Astronautics was very sad to hear of the passing of **Walker "Bud" Mahurin BSAE'49; OAE'99** on May 11 at age 91. Mahurin was a hero in the fullest sense of the word and had many accomplishments during his active serves in both WWII and the Korean War.

Mahurin was the Army Air Forces' first double ace in Europe during World War II and was known as a very courageous, skilled and tenacious fighter pilot and was the only Air Force pilot to shoot down enemy aircraft in the European and the Pacific theater of operations and in Korea.

Mahurin enlisted in the Army Air Forces as an aviation cadet in September 1941 and was assigned to the 8th Air Forces' 56th Fighter Group based in England to fly a P-47 Thunderbolt. He scored his first aerial victories in August 1943 by shooting down two German fighters while escorting B-17 bombers. By October 1943, Mahurin had become an ace - signifying that he had downed five enemy aircraft.

In November 1943, Mahurin became the first American pilot in the European Theater of Operations to have shot down 10 enemy planes. He also became first recipient of the Silver Star in the famous 56th Fighter Group, the "Wolf Pack," led by Col. Hubert A. "Hub" Zenke.

On March 27, 1944, he shared credit for downing a German bomber, but had to bail out of his heavily damaged plane over France and met up with members of the French Resistance who took care of him until he was airlifted out by the British Royal Air Force. Due to his knowledge of the French Resistance, he was not allowed to return to combat in Europe, but embarked for combat in the Pacific Theater in January 1944.

Later that year, he became commander of the 3rd Fighter Squadron, part of the 3rd Air Commando Group, in the Philippines. Flying a P-51 Mustang, he scored his only aerial

victory in the Pacific in January 1945. Mahurin, who eventually was shot down by ground fire and spent hours in a life raft before being rescued, ended the war with 20.75 aerial victories. (The fraction indicates he shared the victories with other pilots).

On return to the U.S., Mahurin worked at the Pentagon and then returned to Purdue University where he earned a degree in aeronautical engineering. At the start of the Korean War, he was serving in the Office of the Secretary of the Air Force but Mahurin wanted to get back to air combat and he got a temporary tour of duty when he flew an F-86 Sabre jet with the 51st Fighter Interceptor Wing and scored 3.5 aerial victories before he was hit by ground fire in May 1952. He crash-landed and spent 16 months as a prisoner of war, during which he endured torture and brainwashing.

He was the highest-ranking Air Force serviceman to be captured at the time, and condemned as a war criminal, but was freed on the last day of the prisoner-of-war exchange program and returned to the U.S.

After the war, he remained active in the Air Force and helped the Air Force, his willingness to discuss brainwashing techniques and physiological pressure applied to American POW's, greatly aided the content of survival courses. Leaving active duty in 1956, Mahurin entered the aerospace industry and joined the Air Force Reserves, subsequently retiring as a Colonel.

The School of Aeronautics & Astronautics honored Mahurin in 1999 as "Outstanding Aerospace Engineer" and he returned to Purdue University later that same year as one of the schools "Old Masters," a program that gets the almost graduates ready for the new world of business.

In 2003, Mahurin's long time friend and fellow alum Marine Corp Captain Richard "Dick" Freeman BSAE'50, nominated Mahurin for the USAA Magazine "Heroes in Our Midst Contest" where Mahurin took runner-up place. At that time, Dick summed up all Mahurin's achievements by saying "Mahurin is an outstanding example of what a hero should be and I'm proud to call him my best friend."

Most recently, in May 2007 celebrating the 60th anniversary of the Air Force, the organizers was looking for the greatest hero in the history of the Air Force, and they could not have found a bigger hero than Mahurin. He took part as an honorary marshal in the National Memorial Day Parade in Washington D.C. where the parade drew more than 150,000 spectators. His autobiography, "Honest John: The Autobiography of Walker M. Mahurin," was published by G.P. Putnam's Sons in 1962. Mahurin was buried with full military honors at Arlington National Cemetery.

Awards

The Distinguished Service Cross; Silver Star; Seven Distinguished Flying Crosses; The Purple Heart; Seven Air Medals; The British Distinguished Flying Cross; French *Croix de Guerre*; Belgian *Croix de Guerre*



First Lieutenant Joel Christopher Gentz, BSAAE'07, killed in action

(July 9, 1984 - June 9, 2010)

First Lieutenant Joel C. Gentz BSAAE'07 was killed in action near Forward Operating Base Jackson, Afghanistan on June 9, 2010. Insurgents attacked the U.S. Air Force HH-60 Pave Hawk rescue helicopter which was responding to a NATO medical evacuation in the Sangin district of Helmund province. Three other airmen also died and three others were injured. Joel was a Combat Rescue Officer assigned to the 58th Rescue Squadron, Nellis Air Force Base, NV, and had more than 50 hours of combat time. He was commanding a small team of pararescue personnel in enemy territory and also advises battle staff units in recovery operations.

The Combat Rescue officer training is some of the toughest training offered by the Department of Defense and Joel was trained in Special Forces operations and as an EMT/paramedic. He had completed the Army Airborne School, dive school, Air Force survival school and completed a rotation at a trauma hospital.

In 2005, Joel was chosen to be part of Iron Key, a senior honorary service organization in which students work anonymously each year on a service project that would benefit Purdue. He both enjoyed and excelled in class and had excellent grades throughout his Purdue career. Joel was very active with numerous student and local organizations and was a member of Phi Delta Theta Fraternity.



Originally wanting to be an astronaut, Joel found his desire to serve was stronger and the career as a USAF Combat Rescue Officer would fulfill that desire and would give him the opportunity to help America's military behind the front lines. He ultimately wanted to teach and he believed that Purdue engineering paved the way for this wish. During his time at Purdue, he learned the value of teamwork, leadership, and organizational skills and always received compliments on his resourcefulness, organization, and competence.

Joel met his wife Kathryn (née Sullivan) BS'07 School of Management, at Purdue. Joel served with the most elite Special Forces our country has in supporting Operation Enduring Freedom and is a true hero who made the ultimate sacrifice. He will be missed by all who knew him.

Robert E. Bateman, Corporate Vice President Retired ~ The Boeing Company

BSAE'46; DEA'74; HDR'92; OAE'99 1923-2010



Robert E. Bateman (BSAE'46) died on March 23, 2010, he was 84. He graduated with a bachelor's degree

in aeronautical engineering in 1946 and joined the Boeing Company as an aerodynamicist. During the next 42 years he held a variety of management assignments including senior engineering representative at Strategic Air Command Headquarters, manager of Advanced Space Systems, general manager of the Turbine Division, 747 program executive, and general manager of the Systems Division. He initiated Boeing's hydrofoil systems and was vice president/general manager of Boeing Marine Systems.

Dr. Bateman retired in 1988 as corporate vice president for governmental and international affairs and was responsible for managing and coordinating the governmental affairs of the Boeing Company at the international, national, state, and local levels.

Among his many honors and awards, he received from the Secretary of the Navy the Meritorious Public Service Award in 1968 and the Distinguished Public Service Award in 1972. He was awarded Distinguished Engineering Alumnus (DEA) from Purdue in 1974 and an Honorary Doctorate (HDR) in 1992. He was a Purdue Old Master in 1988 and received the Purdue Engineering Alumni Association President's Lifetime Award in 1998, the Outstanding Aerospace Engineers Award (OAE) in 1999 and the Order of the Griffin which is one of Purdue's highest honors in 2005. Dr. Bateman was also an Associate Fellow of AIAA.

Dr. Bateman met his wife of 61 years, the former Sarah Elizabeth Hayes, at Purdue whom he would walk to class. They have two children, Lucy Ray of London and Paul Bateman of Mill Creek, five grandchildren and two great-grandchildren. He was preceded in death by son Robert "Reb" Bateman.

Dr. Bateman maintained a lifelong attachment to Purdue making annual visits to speak with engineering students. He was among the group of alumni that helped to secure a \$0.5m gift from Boeing to develop the Boeing/AFOSR Mach-6 Quiet Tunnel. The gift arrived during 1994-1999, and helped Prof. Steven Schneider to secure several million dollars in government funding to build, develop and operate the facility. It first achieved high Reynolds number quiet flow in 2006, and is presently the only hypersonic tunnel in the world with low noise levels comparable to flight.

Measurements in the tunnel have affected the design of the DARPA HTV-2 gliding reentry vehicle and the Boeing X-51A scramjet-powered missile. In many ways, the student-operated tunnel is a memorial to the long-term vision for U.S. aerospace shared by Dr. Bateman and other sponsors. (See article on page 39).

Class Notes

Charles R. Reid (BSAE'49) Carmel, IN, joined Merrill, Lynch, Pierce, Fenner, and Smith as vice president of global wealth management.

Dr. Marty Ferman (BSAE'57) Professor Emeritus Parks College, Saint Louis University, has presented a new paper on "A New Concept for a Four Cylindrical Engine" which was included in the Bulgarian Journal of Machine Design, Book 3, published in February 2010. ISSN 0861-9727. He received a 2nd U.S. patent in 2008. The engine block is cylindrical with the pistons traveling up and down parallel to the long axis of the cylinder.

Dr. Gerald Johnson (BSAE'62) Emeritus Abell Professor of Engineering, Colorado State University, is the representative of American Association of Engineering Societies to the World Federation of Engineering Organizations. Dr. Johnson is a Member of Committee on Education & Training and on the Committee on Capacity Building.

Dr. William Lee (MSAE'62) has retired from teaching and is now a Life Coach with Navigators of Canada, Vancouver. He and his wife have four children and twelve grandchildren.

Mark Schlegel (BSESc.'68; MSAE'69) has been inducted into The Society of Experimental Test Pilots (SETP) to the highest grade of "Fellow." See article on page 13.

Richard Covey (MSAAE'69) has retired from his position as President and CEO for United Space Alliance, on March 26, 2010. See article below.

Martin Dixon (BSAAE'70) has retired from Pratt & Whitney after over 39 years of service.

Michael Corso (BSAAE'71) Fort Myers, FL, is a member of the School of Aeronautics and Astronautics Industrial Advisory Council and has been included in the 2010 Florida Trend's Legal Elite.

C. Bruce Harmon (MSAAE'71) Colorado Springs, CO, was promoted to Dean of Doctoral Computer Science at the Colorado Technical University Institute for Advanced Studies. He will remain the Dean of Engineering and Computer Science.



William F. Krieger (E'72, MS AAE'74, PhD AAE'77) Yuma, AZ, left his career designing offshore oil rigs to attend seminary school and is now the priest at St. Paul's Episcopal Church.

Col. (Ret.) Mark N. Brown (BSAAE'73) is Vice President of MCR Federal LLC. Beavercreek, OH.

Jack Cox (BSAAE'73; MSAAE'73) Coastal and Port Engineering Manager with HDR Engineering and a Distinguished Lecturer and Program Associate at the University of Wisconsin School Of Professional Development curricula in Docks and Marinas. Recently appointed Vice Chairman of the Recreational Boating Commission to the Permanent International Association of Navigation Congresses He is the author of Breakwaters, Entrances and Basins Chapter of the ASCE Manual for Marian Design. He is also Senior Diplomat in Coastal Engineering.

Charles W. Haupt Jr. (BSAAE'75) Centennial, CO, is now the United Launch Alliance booster strength manager. He oversees the metallic booster structure for both the Atlas and Delta launch vehicle for ULA.

Edward Bielski (BSAAE'74, MS M'76) Winter Park, FL, has been appointed as finance director of Nangwik Services in Jacksonville, FL.

Lt. Gen. John Hudson (MSAAE'74, DEA'03) retired from the US Air Force on October 1, 2009. See article on page 13.

James Livingston (BSAAE'78) has joined PE Systems, Inc. Dayton, OH. as a Senior Engineer providing weapon systems information protection engineering support to the Air Force Aeronautical Systems Center, Engineering Directorate at Wright-Patterson AFB.

Tim Trowbridge (BSAAE'80) retired as Department Manager, Northrop Grumman Corporation in February 2010.

Joel R. Jung (BSAAE'81) was named Chief Financial officer at AgraQuest Inc. in March 2010. He was previously CFO of Celera Corporation where he led the finance and information technology groups in the spinoff of Celera from Applera Corporation.

Jeffrey King (BSAAE'85) is Sales Manager for American Chemet, Deerfield, IL.

Richard Covey (MSAAE'69, OAE'99)



Richard Covey retired from his position as President and CEO for United Space Alliance, on March 26, 2010. Covey has had a distinguished career spanning more than 40 years as an Air Force fighter pilot, NASA astronaut and a highly respected space industry executive.

Covey joined USA in 2006 as Chief Operating Officer after serving as President of Boeing Service Company in Colorado Springs, Colorado. He became USA's President and CEO in September 2007. From 2003 to 2005, Covey provided critical leadership as co-chairman of the Return-to-Flight Task Group conducting an independent assessment of NASA's response to the Columbia Accident Investigation Board recommendations. For this, he was awarded the NASA Distinguished Public Service Medal.

A former NASA astronaut, Covey piloted STS 51-I, a spacecraft repair mission in 1985 and STS- 26, the first flight of Discovery after the Challenger accident in 1988. He then commanded STS-38, a classified Department of Defense mission in 1990, and the flight of Endeavour on STS-61 in 1993 to service and repair the Hubble Space Telescope.

Prior to joining NASA, Covey served in the US Air Force as a test force director, test pilot and operational fighter pilot. His honors include two Defense Distinguished Service Medals, the NASA Distinguished Service Medal and five Distinguished Flying Crosses, including four received during the 339 combat missions he flew over Southeast Asia.

We have been delighted with the response to the Online Update Alumni Records page on the Aeronautics and Astronautics website. The web page to update your records can be found at:

<https://engineering.purdue.edu/AAE/Alumni/Update/AlumniRecords>

Wayne Tygert (BSAAE'85) has been promoted to Chief Engineer, Boeing Commercial Airlines Loads and Dynamics Organization. Wayne previously served for two years as the Senior Manager for Airplane Design Integration & Analysis on the 787 Program. He is the youngest engineer to be appointed a manager in BCA L&D 12 years ago at the age of 34 and is also the youngest Chief Engineer in BCA L&D. The top three positions in BCA L&D are all held by Boilermakers with **Lee Favour (BSAAE'84)** and **Jeff Bland (BSAAE'78)** as Senior Managers.

Elliott Keen (BSAAE'86) Senior Engineer, Continental Automotive Systems, Auburn Hill, MI, Elliott completed an MBA from Ashford University and graduated in September 2009.

Bob Leckinger (BSAAE'86) President FAFCO Inc. Chico, CA. which is the oldest and largest solar thermal manufacturing company in the U.S. that manufacture solar water heaters, solar pool heaters, and thermal energy storage tanks. Bob earned his MBA from Santa Clara University in 1992 and completed a CPIM from APICS in 2000. Bob and his wife Kelly have been married for 26 years.

James R. Miller (BSAAE'86) is Vice President, Worldwide Operations, Google, Inc.

Jamie Renna (BSAAE'86) has been named Vice President, Engineering Safety, Test & Evaluation for Sikorsky Aircraft. See article on page 14.

Holly Hulse (BSAAE'87) is General Manager, Wire Asia, for Bekaert Management Company, Shangri, China.

Ken Baird (BSAAE'88) Vice President, Corporate Integration, Millennium Engineering & Integration. The company is focused on ballistic missile defense, satellite engineering, launch vehicles, safety and mission assurance.

Gregory McNew (BSAAE'88) Senior Development Education Student in USAF at the Massachusetts Institute of Technology pursuing a Masters of Engineering and Management – System Design and Management as part of the Air Force's Senior Development Education program.

John Murphy (BSAAE'89) has been named Chief Engineer for 787 Propulsion Systems, the Boeing Company, Everett, WA. John is responsible for technical content and execution for both the Rolls Royce Trent 1000 and GENex engines for the Boeing 787.

AAE Alumni Inducted as "Fellow" into Test Pilot Society

Mark Schlegel (BSESc.'68 MSAE'69) has been inducted into the Fellow Class of 2009 of The Society of Experimental Test Pilots (SETP). Mark is a Senior Engineering Test Pilot at the Bombardier Flight Test Center in Wichita KS. He has been a pilot for 43 years and has logged over 12,000 flight hours, including over 6,000 hours in experimental flight test.

Induction into SETP and named as a Fellow shows Mark as the epitome of excellence in flight-test accomplishment and has exhibited the qualities and experience of what all Test Pilots aspire to.

SETP was formed in 1955 and it is the premier international organization for Test Pilots worldwide, fostering safety and education through symposia, publications, and its foundations.

There are more than 2000 Test Pilot members of SETP, in more than 30 countries.



Lt. Gen, John Hudson (MSAE'74, DEA'03)



Lt. Gen John (Jack) Hudson retired from the US Air Force on October 1, 2009 after 36 years of active duty. He was awarded the 2009 Heritage Award by the Air Force Association Wright Memorial Chapter 212 in Sept. 2009. This award recognizes the Air Force individual who has left a positive significant impact on the military aerospace community at Wright Paterson Air Force Base.

On 21 December, he started a new position at the National Museum of the USAF at Wright-Patterson AFB as the deputy director. 2010 will be a big year for the National Museum with the 68th anniversary of the Doolittle Raid on Japan, the opening of many new exhibits in support of the 60th anniversary of the onset of the Korean War, the annual USAF Marathon.

Lt. Gen John Hudson was presented with the College of Engineering Distinguished Engineering Alumni Award in 2003 for his outstanding service to the defense of the United States, particularly as director of the Joint Strike Fighter Program.

Terry Murphy (BSAAE'80, OAE'04)



Terry Murphy set up ARTiCA (Advanced Rocket Technologies in Commercial Applications) in March 2010. It is a consulting company that will be evaluating

technologies and business plans across the entire sustainable energy and water infrastructure.

The mission at ARTiCA will be to help all the stakeholders; investors, entrepreneurs and government agencies identify and bridge the gap from demonstration to full scale commercialization.

NEWS ABOUT *you*

Matt Feaster (BSAAE'91) is with the United States Air Force at Hill AFB.

Brad Till (BSAAE'91) Regional Director, Product Marketing, Boeing Commercial Airplanes, Seattle.

CDR Phillip Hall (BSAAE'92) is an officer in the NOAA Commissioned Corps. He is on a detail to NASA Dryden Flight Research Center as Deputy Project Manager for the NASA Global Hawk Project. This is the first operation of the Global Hawk for civilian earth science. CDR Hall was qualified as pilot for the Global Hawk in November, 2009. He is the first pilot to be qualified to fly in a non-military Global Hawk program.

Greg Wood (BSAAE'92) Deputy Chief Engineer, Minuteman III ICBM, US Air Force.

Jamie Renna (BSAAE'86)



Renna is a member of the AAE Industrial Advisory Council has been named Vice President, Engineering Safety,

Test & Evaluation for Sikorsky Aircraft. This is a newly established position and consolidates engineering safety and test functions under one leader. Jamie also serves as Deputy Chair of the Product Safety Board (PSB) for all Sikorsky programs.

Since joining Sikorsky Aircraft in 1987, Jamie has held positions of increasing responsibility in the Test Engineering organization and later in the Design Engineering organization as Chief of Rotors Design.

His most recent assignment was Director of Dynamic Systems Engineering where he was responsible for providing technical leadership for all design, process, and materials engineering for rotor hubs, rotor blades and transmissions.

His engineering responsibility covered the entire lifecycle of these critical components, from development through production and support. Jamie also served as Integrated Product Team leader for the ongoing S92 main gearbox product improvement initiative.

Dr. Amy Foster (BSAAE'93) Asst Prof at the University of Central Florida has written a book on the history of women's integration into NASA's astronaut corps which is under contract with The Johns Hopkins University press. It is due out this year.

Brett Hoffstadt (BSAAE'93) Project Engineer, CV-22 Technology & Test, The Boeing Company is also the Boeing Technical Program Manager with the Center for Rotocraft Innovation, the industry partner of the National Rotocraft Technology Center. Is also the Chairperson for the AIAA Great Philadelphia Section for the 09-10 term. Brett and his wife Rita have a daughter Maya (6) and a son Max (3).

Dr. Peter Lai (MSAAE'93) Engineering Specialist with The Aerospace Corporation Conference Technical Chair for the 19th AAS/AIAA Space Flight Mechanics Meeting in Savannah, GA in Feb 2009 and will serve as Conference Chair for the 21st AAS/AIAA conference.

Jason Bowman (BSAAE'94) is at the Air Force Research Laboratory, Dayton, OH and has been involved for the last two years in system engineering and development planning for MQ-X, an eventual follow-on to the MQ-9 Reaper. Prior to this, he was involved in the DARPA Morphing Aircraft Structures program.

Dr. Scott Hucker (PhD'94) Manufacturing Engineering Manager at General Motors.

Artagnan Ayala (BSAAE'95) President and CEO of Profit Force Consulting Group LLC.

John Oppelt (BSAAE'97) Mechanical Engineer at Spar-Tek, Portland.

Birk Billingsley (AAE'00, MSE'03) Bloomington, IN, started his own business in designer neckwear in Indiana. www.billingsleyties.com, sales@billingsleyties.com.

Dr. Brandon Owens (BSAAE'03) Flight Dynamics Analyst in the Space Sciences Laboratory at the University of California, Berkeley. He has completed his PhD in Engineering Systems at the Massachusetts Institute of Technology.

Kyle Ryan (BSAAE'03) Boeing Commercial Airplane Opportunities for New Engineers (ONE) Technical Skill Development Lead. ONE is a career development program offering Boeing engineers the opportunity to lead

projects outside of their own work assignment in order to gain experience while also benefiting the Boeing engineering community as a whole. There are six early career engineer Integration Team members who work closely with an advisory board of executive leaders in BCA. Kyle has been involved with the program since October 2008.

Mark Ward (MSAAE'03) Engineering Team Lead for Sikorsky Aircraft Corporation is a former Sikorsky Helicopter Test Pilot, selected for position as engineering team leader on S-70B helicopter (H-60 SeaHawk international variant).

Colleen Rainbolt (BSAAE'05) Regional Marketing Director - Passenger Satisfaction & Revenue, The Boeing Company, Seattle.

Aaron Mayne (BSAAE'06) is engineer for The Boeing Company Integrated Defense Systems, St. Louis, MO.

Kyle Ryan (BSAAE'07) Experimental Hardware Design, The Boeing Company, Seattle. Technical Skills Development Lead for Boeing Opportunities for New Engineers (ONE) which is an organization to provide special company funded projects and opportunities for early career engineers to develop their skills and experience in areas outside their normal work statement. Projects aim to enable hands-on, close collaboration and knowledge sharing between experienced and younger engineers while preparing future leaders at the Boeing Company.

Daniel Uffelman (MSAAE'08) Systems Engineer for Northrop Grumman, Colorado Springs.

Dawn Moessner (MSAAE'08) Mission Design Analyst at Johns Hopkins Applied Physics Laboratory.

Alethea Rucker (MSAAE'08) is Performance and Flying Qualities Engineer for the U.S. Air Force, Edwards AFB, CA.

Stephan Shurn (BSAAE'08) is 1Lt-C-130 Navigator, U.S. Air Force, Dyess AFB, TX.

Kelly (Walsh) Dixon (MSAAE'09) Engineering Leadership Development Program at Lockheed Martin and is now on the second rotation in Palmdale, CA at the Lockheed Martin Skunk Works (Advanced Development Projects) Kelly was married on January 2, 2010 in San Antonio, TX.

AEROGRAM PUBLICATION

Many people prefer receiving their newsletters electronically. With that in mind, and to be conscious of the need to preserve our environment and to keep costs down, we are going to offer our readers that option. We have no immediate plan to discontinue publishing the print version of the AeroGram, but we do plan offering it electronically and it will continue to be posted on our website.

Please contact us at aae-alumni@ecn.purdue.edu so that we can add you to our electronic mailing list. You can be assured that this mailing list is private and will not be released to a third party. Thank you for helping us think Green.

Amanda Schmidt (MSAAE'09) Propulsion Systems Engineer for Qualis Corporation, Huntsville, AL.

Deepak Thirumurthy (MSAAE'10) Mechanical Engineering Associate Rolls-Royce North America.

Births

Alex Fleck (BSAAE'02) and **Kacie Burton (BSAAE'01)**, Lexington Park, MD, welcomed the birth of their daughter on June 9, 2009.

Allison V. (Lambeth) Parlee (BSAAE'02, BSSCI'02, MSAAE'04) and her husband Matthew Parlee BSSCI'03, MSSCI'04 welcomed Alexandra Victoria, on June 18, 2009. She weighed 7lbs 14oz and was 21" long.

Doctoral student **Josh Dustin** and his wife Tifani welcomed Moira Elizabeth Dustin on August 4th 2009; she was 8lbs and 20" long.

Doctoral student **Randy Smith** and his wife Terri welcomed their son Emmett Samuel Smith on August 11th 2009. He was 8lbs 2oz and 21" long. Big brother is Eli.

Michael J. Mattox (BSAAE'90) Newburgh, IN, and his wife Cynthia welcomed the birth of their son, Adam Joseph, on September 29, 2009.

Doctoral student **Jonathan Goodsell** and his wife Mille welcomed their baby girl - Brighten.

Cody and Lori Short welcomed Grayson James Short on June 14, Grayson was 8lb 3oz and 20 inches long. Big brother is Jack.

Alethea Rucker MSAAE'08 and family welcomed Ayden Duval Rucker on February 2, 2010.



Matt and Jill Churchfield welcomes Glory Lucia Aurelia on June 2, 2010. She weighed 7lb 5oz.

Tied the Knot

Elizabeth M. (Newsome) Morrison (BSAAE'03, MSAAE'05) and Kenneth Morrison were married on October 10, 2009 in Huntsville, AL.



Jared M. Kesling (BSAAE'05) and Mindy Lyddon were married on May 16, 2009 Cedar Rapids, IA.

Benjamin C. Jamison (BSAAE'07) and Emily M. (Hilycord) Jamison (MS NRS'07) was married on September 5, 2009 in Covington, KY.

Sarah E. Lindsey (BSAAE'10) and **Matthew Baldwin (BSAAE'10)** were married on May 29, 2010.

In Memoriam

Janet Ailsa Sweet, wife of AAE graduate and Professor Emeritus Arnold Sweet, Dec 19, 2009
Delores Merkle, wife of Professor Charles Merkle Reilly Professor of Engineering, March 12, 2010

Rolf N. Irgens (BSAE'45) Brookfield, WI, Dec. 16

John G. Peine Sr. (BSAE'45) Princeton, IA, June 6, 2009

Stuart L. Treon (BSAE'45) Sunnyvale, CA, Jan. 12, 2010

He is survived by his wife, Marilyn

Stanley L. Plush (BSAE'46) Glasco, KS, Sept. 26, 2009

James Berkel Sterling (BSAE'46) Montesano, WA, Dec. 18, 2009

John C. Ford (BSAE'47) Columbus, OH, May 18

He is survived by his wife, Marilyn (LA'48)

Richard L. Neal (BSAE'47) Londonderry, NH, June 7, 2009

LeMoyné E. Farnsworth (BSAE'47) Racine, WI, June 13, 2009

He is survived by his wife, Margaret

Col. James E. Trask (BSAE'47) Williamsburg, VA, July 12, 2009

John C. Ford (BSAE'47) Columbus, OH, May 18, 2009

He is survived by his wife, Marilyn (LA'48)

Roland C. Sutton (BSAE'47) Saint George, UT, Nov. 17

George H. Christena (BSAE'48) Riverside, CA, May 18, 2009

J. Rosemary (Jones) Reid (MA LA'79) Carmel, IN, Dec. 27, 2009

She is survived by her husband, Charles (BSAE'49)

James N. Scott (BSAE'48) Indianapolis, IN, Mar. 18, 2009

Thomas D. Boyle (BSAE'49) Algonquin, IL, Oct. 8, 2009

Walker "Bud" Mahurin BSAE'49 May 11, 2010 (see article on page 10)

D. Gene Clark (BSAE'50) Chatsworth, CA, July 2, 2009

James P. Jones (BSAE'50) Fort Wayne, IN, June 12, 2009

Charles J. Yaber (BSAT'50) Jan 10, 2009, (See below)

Berkley E. Adams (BSAE'51) Orange City, FL, Dec. 22

Henry E. Covert Jr. (BSAE'52) Saint Louis, MO, Sept. 2, 2009

Charles E. Jack (BSAE'52) New Port Richey, FL, Mar. 6, 2009

William D. McKaig (BSAE'52) Harbor City, CA, May 16, 2009

Yasuhiro Kuroda, (MSAE'53) Tokyo, Japan, Jan. 13, 2009

J. William Small (BSAE'53) Cincinnati, OH, Apr. 26, 2009

C. Zelman Kamien (BSAE'55, MS E'56, PhD ME'60) Chelmsford, MA, July 27, 2009

George S. Fowler (BSAE'56) Mammoth Lakes, CA, Apr. 1, 2009

William Charles Blue (BSAE'58) Granger, IN, Feb. 12, 2009

He is survived by his wife, Judith

William D. Rickard (BSAE'59) Clarence, NY, June 16, 2009

Daniel T. Rich (BSAE'59) Phoenix, AZ, Apr. 30, 2009

Herman E. Tarnow (BSAE'59) Dumfries, VA, May 5, 2009

Rosemary M. (White) Mitchell (CFS'60) Chesterfield, MO, Feb. 11

She is survived by her husband, Gary (BSAE'60)

Paul C. Lam (BSAAE'69) Akron, OH, May 24, 2009

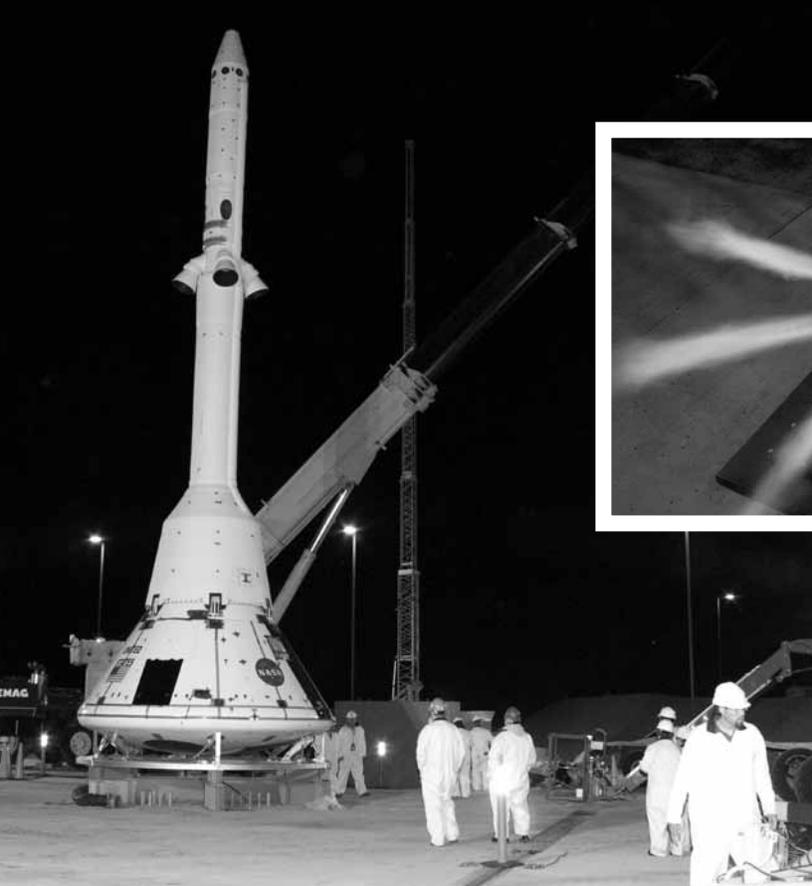
Richard J. Richardson (BSAAE'69) Glenview, IL, Sept. 10

Walter S. Davis III (MSAAE'72) Brookfield, WI, Dec. 13

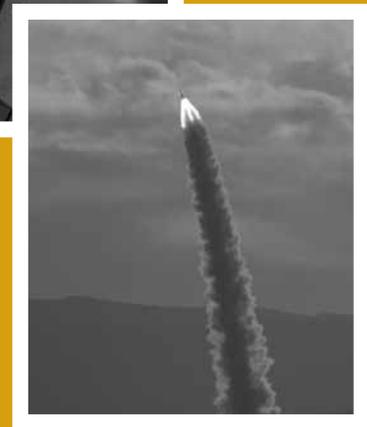
Celso A. Barcelos (BSAAE'77) Nashua, NH, Mar. 18

Craig A. Powell (BSAAE'88) Zionsville, IN, Aug. 23, 2009

Charles J. Yaber (BSAT'50) passed away January 10, 2009, one day after his 85th birthday. He was born in Jeffersonville, IN and followed his two brothers to Purdue after completing his time in the navy. During his time at Purdue, he played trumpet in the Purdue Symphonic Orchestra under "Spots" Emrick and also in the Purdue Marching Band. He loved the horn and began taking lessons and playing at age 10. He and Claire, his wife of 52 ½ years, raised five daughters who all completed college. He worked 21 years with General Electric Company and 16 years with Westinghouse Electric Company in Baltimore. He returned to Purdue twice for Alumni week and played with the Marching Band. He continued to play with bands in the Washington/Baltimore area until 3 years before he passed away.



The second successful full scale ACM development test on March 17, 2010



(Left) The Orion LAS undergoes preparations before the PA-1 launch

(Right) PA-1 flies on the morning of May 6 controlled by the ACM

NASA website photos

Orion PA-1 Launch Abort System Makes Rocket History

by David McGrath BSAAE'83; MSAAE'84 ACM Chief Engineer

At precisely 7:00am Mountain Time on May 6, the Orion launch abort system (LAS) roared to life and flawlessly flew at the U.S. Army's White Sands Missile Range (WSMR) in New Mexico. The integrated flight test of the Orion capsule, the LAS, and the capsule recovery system was the first step in closing the U.S. human spaceflight gap left by the retirement of the Space Shuttle this year. The LAS enables the crew to escape under any launch vehicle failure from the launch pad through Mach 8 at 280,000 feet. Unlike the Apollo program which used a fixed impulse solid pitch motor and a canard for vehicle control, the Orion LAS uses an active attitude control motor (ACM) to provide pitch and yaw control. The application of the ACM and the other state-of-the-art propulsion capabilities in the abort and jettison motors allow the most complete envelope for successful astronaut aborts of any system currently in use or from the past.

The unique first for the ACM is that it is a fully controllable solid motor providing as much as 7,000 pounds of thrust in any direction for the first seven seconds and 2,500 pounds of thrust for the next twenty seconds. Controlling the ACM is a single fault tolerant power, control, and actuation system driven by software which provides the commands for the thrust level and direction while at the same time controlling motor pressure. The ACM is a 32 inch diameter motor that stands about 5 feet tall with eight proportional valves around the circumference, each producing over 4,100 pounds of thrust. Each valve has the power of a Shuttle OMS engine in the size of a coffee can. The ACM represents a revolutionary capability that had to be invented on a schedule for the Orion program. Two full scale tests demonstrated the ACM performance prior to flight on top of other component development tests.

The PA-1 flight was instrumented with 692 sensors to provide the nationwide team of engineers and scientists with useful data for future human spaceflight systems in the areas of launch abort environments, crew capsule environments and system performance, parachute systems, and ground operations. Whether Orion fully survives as a program under the President's new space plan remains to be seen but the LAS technologies demonstrated in PA-1 can be used for any capsule system developed commercially or by NASA.

The entire Orion team worked for over four years to make the flight a reality. Purdue alumni had key roles throughout the Orion and ACM program. From the top level Orion program manager, **Mark S. Geyer (BSAAE'82, MSAAE'84)**, and chief engineer, **Julie A. Kramer-White (BSAAE'90)**, to the ACM program chief engineer, **David McGrath (BSAAE'83, MSAAE'84)**. ACM systems engineers – **Jonathan W. Katz (BSAAE'91, MSAAE'93)**, **Breanne K. Wooten (BSAAE'07)** and **Adam F. Naramore (BSAAE'06)**, and ACM program manager – **Bruce E. Archambeau (BSAAE'94)**.

Dozens of other Purdue grads supported other parts of the program from the NASA centers and contractors – Lockheed Martin, Orbital, and others.

As we look forward to the continuation of the human spaceflight program in the U.S. and exploration of our solar system, May 6, 2010 will go down as a date to remember for the first flight of a human rated, controllable solid propulsion system – and Purdue was there!

Hail Purdue!

More information and videos of the recent static tests are available at the following ATK site:
http://www.atk.com/Customer_Solutions_MissionSystems/cs_ms_sp_acm.asp.

Additional information and videos on the Constellation program are available at the following NASA site:
http://www.nasa.gov/mission_pages/constellation/orion/index.html.

Honorary Industry Professor

Dr. Allen S. Novick

BSAE'65; MSAE'67; PhD'72; DEA'06; OAE'06



The School of Aeronautics and Astronautics is pleased to welcome Dr. Allen S. Novick as Honorary Industry Professor. This position is intended for a renowned Aerospace Industry individual to principally function in a support and guidance position for the School's strategic and development activities.

Dr. Novick most recently served as Vice-President Marketing Intelligence & Support, Rolls Royce Corporation until his retirement in 2009. He joined the Allison Division of General Motors (now Rolls-Royce) in 1972 after receiving his bachelor, master, and doctorate degrees in Aeronautical Engineering from Purdue University.

He progressed through many noteworthy challenging assignments and promotions including engineering research and technology, preliminary design, advanced engine development, program management, business development, commercial business, customer operations, supply chain management and marketing intelligence. Novick was also responsible for leading Allison Division into the commercial aircraft engine business. Also, he was leader and co-founder, with Professor John Sullivan, of the Indiana Advanced Aerospace Manufacturing Alliance.

Novick has been the recipient of many prestigious awards in his career. In 2006, Purdue University honored Novick with the Distinguished Engineering Alumni Award and the School of Aeronautics and Astronautics honored him with the Outstanding Aerospace Engineer Award. He has also received many honors and awards from the aerospace industry.

Dr. Novick has authored numerous publications involving numerical analyses, unsteady flow, combustor design, gear system technology, advanced engines and recipient of the American Society of Mechanical Engineers Best Paper of the Year Award.

The School of Aeronautics and Astronautics Head, faculty and staff look forward to working with Dr. Novick in matters relevant to an industry perspective regarding the future direction of the aeronautical and astronautical engineering profession, economic development and alumni development. Dr. Novick's expertise and commitment to the aerospace industry will help further the Mission of the School of Aeronautics and Astronautics to new heights.

AAESAC Professor Pizza

Aeronautical and Astronautical Engineering Student Advisory Council (AAESAC) hosts **Professor Pizza**, a series of lunchtime lectures/talks to engage current students in a relaxed atmosphere with faculty or other visitors to campus.

AAESAC, with the assistance of **Prof. Steven Collicott**, hosted **Lt. Dan Radocaj BSAAE'99, MSAAE'01** on September 4, 2009.

Known by his peers as "Butters" a reference to his resemblance from the character from South Park; Radocaj was a 1998 Vomit Comet flier while at Purdue. He has recently graduated from the Navy Test Pilot School. He shared his life as a test pilot, how he had gotten there and listed out a very impressive list of the many types of planes he had flown. He was then on hand to talk to students and answer questions about test piloting, carrier flying and much more.



Col (Ret.) William F. Moses Jnr inducted into the Purdue University Reserve Officers Training Corps Hall of Fame

Col. (Ret.) William F. Moses Jnr (Air Transportation 1952) was inducted into Purdue University Reserve Officers Training Corps Hall of Fame on April 17. Col Moses was commissioned into the Air Force after graduation. He attended Air Force pilot training and earned navigator and bombardier

ratings. He began flying the B-52, which was America's newest bomber, during the Cold War.

During the 1962 Cuban Missile Crisis, Moses flew a B-52 "show-of-force" mission that proved to be crucial in resolving the 16-day crisis. Moses was assigned in 1970 as the 744th Bomb Squadron Commander at Beale Air Force Base, Calif., before being deployed to serve in the Vietnam War as a squadron commander.

He flew reconnaissance missions over South Vietnam, Laos and the South China Sea, and he was awarded the

Distinguished Flying Cross for flying classified and hazardous missions. Moses was then assigned to Strategic Air Command headquarters in Nebraska and later served as wing commander at Andersen Air Force Base in Guam.

After his retirement in 1982, Moses founded the Purdue Club of the Midlands, an organization that grew to more than 400 members throughout eastern Nebraska and western Iowa, and he served as club president for 18 years. He performed more than 2,000 hours of volunteer work at the Strategic Air & Space Museum and has spent the last 10 years as a weekly volunteer at a military hospital outside Omaha.

The Purdue ROTC Hall of Fame was established in 1974 to honor graduates who exhibit the leadership, integrity, moral courage and self-discipline that the ROTC program seeks to develop.



Gary Payton MSAAE'72, OAE'99 Retires as Deputy Under Secretary of the Air Force for Space Programs

After many rewarding years of working space programs, both in uniform and in civil service, Purdue astronaut alumnus Gary E Payton, MSAAE'72, OAE'99, retired from Federal service on 31 July.

He graduated from pilot training at Craig Air Force Base, Alabama, in 1973, and became an instructor pilot there. He has accumulated 1,080 hours in T-37, T-38 and T-39 aircraft.

Payton was selected for the U.S.A.F. Manned Space Flight Engineer Program in February 1980, and in January 1985, served on STS-51C, Discovery as payload specialist.

This was the first dedicated Space Shuttle Department of Defense mission and the classified payload was successfully deployed and boosted into its operating orbit. At the conclusion of the mission, Payton had traveled over 1.2 million miles in 48 Earth orbits, and logged more than 73 hours in space.

He retired from the Air Force in the rank of colonel after more than 23 years of service, with his last duty in the Strategic Defense Initiative Organization. He was instrumental in the initiation and of the Midcourse Sensor Experiment, the Lightweight Exo-Atmospheric Projectile, Delta-183, Talon Shield, Clementine and the DC-X launch vehicle technology project.

Payton has also served as NASA's Deputy Associate Administrator for Space Transportation Technology where he initiated, planned and led the Reusable Launch Vehicle technology demonstration program, which included the X-33, X-34, X-37 and DC-XA flight test projects. His responsibilities included program formulation, budget preparation and program advocacy with Congress, the White House, the Department of Defense and the media. For two years he was the Senior Vice President of Engineering and Operations for ORBIMAGE, a leading global provider of Earth imagery products and services.

Payton also served as the Deputy for Advanced Systems in the Missile Defense Agency. There he led the MDA technology program to enhance ballistic missile defense sensor, weapon and battle management capabilities.

Purdue is extremely privileged and proud to have Gary Payton as an alumnus, and we are honored to include him as a member of the School of Aeronautics and Astronautics Industrial Advisory Council. Purdue is very grateful for the Gary & Sue Payton Scholarship which continues to help out-of-state students earn their engineering degree from the School of Aeronautics and. It is this kind of philanthropy that makes Gary and Sue Payton exceptional people.



Alumni Bill Holder Library

Bill Holder (BSAE'60) has donated a library to the School of Aeronautics and Astronautics. Following graduation from Purdue, he worked as a Systems Engineer with Boeing on both the Bomarc and Saturn V moon rocket programs. He also spent three years with the U.S. Army as an Air Defense Guided Missile Officer.

In 1964, he started what was to be a three-decade career in aerospace technical intelligence at Wright Patterson AFB, Ohio. During that time, he was involved with National Intelligence Estimates (NIE's) and presented national-level briefings to high-ranking government, military, and industry officials.

Following retirement, Bill turned to freelance writing covering aerospace, racing, and automotive subjects and has written and published over fifty books. At least two dozen books are on aerospace subjects including a series of books on military aircraft systems. During that period, he was also a consultant for Northrop Grumman Corp.

Find us on Facebook

The School of Aeronautics and Astronautics started a Facebook page in December 2009 and we invite you to join us using this popular social networking tool.

You do not need to join Facebook to view the page, just follow the link on the AAE web page <https://engineering.purdue.edu/AAE>.

We aim to keep alumni, faculty, students, staff and friends of AAE up-to-date on all our happenings!



Find us on
Facebook



***Pictured is
Mr. Davis with
Professor Emeritus
George Palmer
and head of school
Professor Tom Shih.***

Distinguished Engineering Alumni 2010

In recognition of his technical and managerial leadership in the military aerospace industry, Darryl E. Davis has been awarded the 2010 Distinguished Engineering Award (DEA). The DEA Award is presented to engineering alumni/ae who has distinguished themselves in any field of endeavor that reflects favorably on Purdue University, the engineering profession, or society in general.

Watching Neil Armstrong's history making first steps on the moon was only one of the reasons Darryl Davis chose aeronautical and astronautical engineering. From an early age, he was avidly interested in anything that flew, wanting to know how it worked. Following graduation, Davis worked for McDonnell Douglas's propulsion department. McDonnell Douglas merged with The Boeing Company in 1997 and after holding several positions of increasing responsibility in both McDonnell Douglas and Boeing, Davis took his current position as president of Phantom Works for Boeing Defense, Space and Security. He leads an organization of approximately 2,400 employees in five major business elements: Advanced Boeing Military Aircraft (ABMA), Advanced Network & Space Systems (ANSS), Advanced Global Services & Support (AGS&S), Advanced Modeling & Simulation (AMS), and Strategic Development & Experimentation (SD&E).

JOHN B. HAYHURST BSAE'69; DEA'89; HDR'98; OAE'99

John & Linda Hayhurst are philanthropists of the highest order and have a 31 year history of giving unrestricted funds to the School of Aeronautics and Astronautics.

In 2009, they learned about the Presidential and Trustees Scholarship Endowment Challenge Match and decided that this program would be helpful in focusing their giving while leveraging the value of their gifts.

They established the **John & Linda Hayhurst Scholarship in Aeronautics and Astronautics** in fall 2009 in support of the University's

Trustees & Presidential Scholarships and their hope is that with time, the endowment will provide financial assistance to promising undergraduate engineering students who can be employed in the U.S. aerospace industry.

Hayhurst joined Boeing in 1969 as a customer support engineer and held positions of increasing responsibilities related to commercial airplanes until his final position as president of Air Traffic Management and a member of the Boeing Executive Council and senior vice president of Boeing. He retired in April 2004 after an illustrious 33-year career which can only be described as exceptional and marked with so many distinguished accomplishments.

When Hayhurst first came to Purdue, he originally wanted to major in chemical engineering. The Space Race, however, was well and truly underway and he saw the

aerospace industry as having great growth potential and thought the space program would be a fun and challenging place to work. Like many long-time Boeing people,

he saw the spirit of adventure with airplanes and switched majors to aeronautical engineering and earned his degree from the School of Aeronautics and Astronautics in 1969.

Hayhurst was awarded the Distinguished Engineer Alumni Award in 1989 and an Honorary Doctorate in Engineering in 1998 by the College of Engineering and the Outstanding Aerospace Engineer Award from the School

of Aeronautics and Astronautics at Purdue University. He is a Fellow of the Royal Aeronautical Society.

The Hayhurst's philanthropy extends to other areas and he is a trustee and former chair of the Board of Trustees of the Puget Sound Blood Center and is a member of the Aeronautics and Space Engineering Board of the National Academies.

A native of West Virginia, in addition to the bachelor's degree in aeronautical engineering from Purdue University, he received a master's degree in business administration from the University of Washington in 1971. They live in the Seattle area and have two adult children Anne and Thomas. Purdue is extremely privileged and proud to have Dr. Hayhurst as an alumnus.



Linda & John Hayhurst

AAE Ranked in the U.S. News & World Report's Top 10 for 2011



U.S. News & World Report has released this year's national rankings of best engineering graduate programs.

The School of Aeronautics and Astronautics' ranking this year is at #6. Purdue University's College of Engineering overall ranking is at #13 this year, tied with UC San Diego.

This year's discipline rankings once again have all of our programs in the top 25, with eight in the top 15, five in the top 10 and two in the top 5.

The rankings reflect the collective efforts of everyone in the School of Aeronautics and Astronautics and our thanks for our consistent high rankings is extended to our students, faculty, staff, alumni, and friends for this excellent ranking.

Staff Recognitions

President Córdoba and Provost Randy Woodson recognized AAE staff members Terri Moore and Madeline Chadwell at a luncheon on January 28 at the Purdue Ballrooms. Terri received recognition for 30 years of service and Madeline for 15 years.



**Madeline Chadwell
and Terri Moore**

SAVE THE DATES!

August 23	Fall Classes start
September 7	William E. Boeing Distinguished Lecture Fowler Hall with Dr. Charles Bolden, NASA Administrator
September 18	Band Day and Family Day - Purdue vs. Ball State
September 23-25	PAA Alumni weekend
October 3-9	Purdue Green Week
October 15	Industrial Advisory Council Meeting
October 16	Homecoming Purdue vs. Minnesota
October 21	Charles Rolls and Henry Royce Memorial Lecture 4:00pm - 5:00pm, Fowler Hall Mr. Preston Henne Sr. Vice President Programs, Engineering and Test Gulfstream Aerospace Corporation and Vice President General Dynamics Corporation
October 30	Purdue Space Day for grades 3-8 with Astronaut alumni Dr. David Wolf
November 5	Outstanding Aerospace Engineer Award
November 12	President's Council Weekend

Steering Advisory Council

With the support of Dean Leah Jamieson, the newly formed Steering Advisory Council (SAC) had their inaugural meeting on January 25-26, 2010. SAC member Doug Bowers started the two-day series of meetings with a Colloquium, where he presented **Science and Technology for the U.S. Air Force**. The School of Aeronautics and Astronautics are grateful to the 2009-2010 members of the SAC for their time and expertise.

Mr. Douglas Bowers (BSAAE'72) Director, Propulsion Directorate, United States Air Force, Research Laboratory

Mr. Darryl W. Davis (BSAAE'78) President, Phantom Works, Boeing Integrated Defense Systems, *Boeing Company*

Mr. William H. Gerstenmaier (BSAAE'77) Associate Administrator, Space Operation Mission Directorate, *NASA*

Mr. Thomas L. Maxwell (BSAAE'69) General Manager, Military Systems and Design Integration, *GE Aircraft Engines*

Mr. Lee E. Rhyant (Purdue friend, U of Indiana alumnus) Executive Vice President and General Manager, *Lockheed Martin Aeronautics Company*

Dr. Munir Sindir (Purdue friend, Ph.D., U of Florida alumnus) Director, Engineering Technical Disciplines, Pratt & Whitney Rocketdyne, *United Technologies Corporation*

Dr. Matt Szolwinski (BSAAE'93, MSAAE'95, PhD.'98) Manager, GENx Systems Engineering, *GE Aviation*

Mr. Tom Vice (Purdue friend) Corporate VP and President of Technical Services, *Northrop Grumman Corporation*

Mr. Dennis E. Warner (BSAAE'73, MSME'76) President & CEO Rolls-Royce North American Inc. Aero Engine Controls, North America

Purdue Houston Alumni Association Event

The Purdue Alumni Club of Houston hosted a Happy Hour and Networking event on June 22, 2010. Head of school, Dr. Tom Shih, was visiting the area and was able to attend this informal event.

Dr. Shih provided some info on the School of Aeronautics and Astronautics and was available to answer questions.

Astronaut alumni, Loren Shriver, MSAAE'68, Janice Voss, BSES'75 and David Wolf, BSEE'78 showed their support.

Additionally, AAE students working on the NASA Reduced Gravity Student Flight program led by Professor Steven Collicott were also able to attend.



(L-R) Diane Klassen, Director of Development, Loren Shriver, Janice Voss, David Wolf, Tom Shih, Professor and Head, School of Aeronautics and Astronautics

David Wolf with Tom Shih and AAE students from the Zero G mission

Hayden Krueger BSAAE'88 Recognized for Contributions to Human Space Flight



Hayden Krueger (2nd from left) receives his award.

Hayden Krueger (BSAAE'88), SAIC deputy department manager, of the Quality and Flight Equipment Department of SAIC's Safety and Mission Assurance Support Services Contract, was recognized as a NASA Johnson Space Center Space Flight Awareness Honoree during an event at Kennedy Space Center on May 12.

The Space Flight Awareness Honoree award is one of the highest awards presented to NASA and industry, and is presented to employees for their dedication to quality work and flight safety. Krueger provided outstanding leadership in support of NASA's Extravehicular Activity, Space Shuttle Program, and International Space Station Program. He served in multiple areas of responsibility in the Safety and Mission Assurance community giving him over 20 years experience in aerospace engineering and technical management.

The extended Krueger families are true Boilermakers and the following is a shortened family tree of two interlinked families with Purdue connections.

Krueger family

Father Harold A. Krueger, ME'65 - Sister Dianne Kruger Castongia MA
Son Hayden Krueger BSAAE'88
Son Bryan J. Krueger, BS Biology '90
Daughter in law Jacquelyn Graham Krueger, Ag Science '90
Daughter Renee Krueger Sier, BA Communications '92
Nephew Jon Castongia, BSMGMT'89

Sier Family

Son in law Monte J. Sier, (Renee's husband) BA Russian '89,
BS Wildlife Science '89
Monte's father, Duane Sier, Pharmacy,'59
Monte's grandfather, Joseph Sier, Pharmacy '31
Monte's brother, John Sier, ME'92
Monte's uncle, James Sier, Pharmacy,'67, whose three son's
also have Purdue diplomas.

'Purdue's Place in Space: From the Midwest to the Moon' goes online

An exhibit featuring mementos, artifacts and personal papers from Neil Armstrong, Eugene Cernan and other Purdue University astronaut alumni has gone digital.

Debuting on the 40th anniversary of Neil Armstrong's first steps on the moon, the exhibit chronicles Purdue University's role in aviation history and space exploration.

Purdue Libraries' Archives and Special Collections, with help from Lockheed Martin, has placed digital images and information online at www.lib.purdue.edu/moon from its entire 136-item exhibit of "**Purdue's Place in Space: From the Midwest to the Moon**" that had been on display. As the display closed on October 30th, the online version is now able to be shared to view the historic documents and photographs that illustrate Purdue's rich aviation history with people around the world, regardless of time or place.

In addition to Armstrong and Cernan, the exhibit includes items from Roy Bridges Jr., Roger Chaffee, Virgil Gus Grissom, Jerry Ross, Janice Voss and Donald Williams. Sections also include the aviation histories of Lafayette and Purdue, which was the nation's first university to offer college credit for flight training.

Some of the many treasures in the exhibit include flight logs and handwritten notes from astronauts, artifacts carried into space, yearbook photographs of the astronauts, and even Neil Armstrong's homework from his days as a student at Purdue.



Neil Armstrong and Eugene Cernan during their time working with NASA

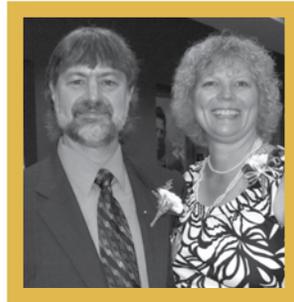
The Purdue University designation Outstanding Aerospace Engineer recognizes the professional contributions of graduates from the School of Aeronautics & Astronautics and thanks them for the recognition that their success brings to Purdue and the School. Criteria for the Award state that recipients must have demonstrated excellence in industry, academia, governmental service, or other endeavors that reflect the value of an aerospace engineering degree. This celebration gives us a very special opportunity to have our students interact with the best possible role models.

Outstanding AEROSPACE ENGINEER AWARDS

PURDUE UNIVERSITY



Gus and Sally Gustafson



Roy and Kari Eggink



Bill Aillor and Tom Shih

The Awards dinner and ceremony was held in the Shively Club in the Ross-Ade Stadium on September 24 with undergraduate's Courtney McManus and Ben Weiss acting as Master of Ceremonies.

The 2009 OAE awardees' are:



William H. Ailor III
PhD'74
Principal Director,
Center for Orbital and
Reentry Debris Studies
THE AEROSPACE CORP.



Charlene Edinboro
BSAAE'75, MSAAE'76,
PhD'02
Senior Scientist
EXPONENT INC.



Roy A. Eggink
BSAAE'81
Chief Engineer,
Product Development
and Performance Leader,
747 Program
BOEING COMMERCIAL
AIRPLANES



Andrew M. King
MSME'84, PhD'88
Director of Mission
Assurance, Space &
Intelligence Systems
THE BOEING CO.



**Master of Ceremonies Ben Weiss
and Courtney McManus**



Allen Yan, John Wheadon and Joseph Moore



Betsy Spencer and Dr. Al Novick



Charlene Edinboro and Tom Shih



**Andrew King
and guests**

More photos of the event can be found on the AAE web site: <https://engineering.purdue.edu/Intranet/Groups/Schools/AAE/AAEPhotos/>



Photo from L-R

(Back row) **Prof. Emeritus Gus Gustafson, Allen S. Novick; Roy A. Eggink; Dennis E. Warner; Thomas L. Maxwell; Prof. Tom Shih**

(Front row) **Prof. Emeritus Larry Cargino; John L. Rich; Andrew King; Charlene Edinboro; Suvendoo K. Ray; John R. Wheadon Jr.; Prof Emeritus George Palmer; William H. Ailor III**



Thomas L. Maxwell
BSAAE'69
General Manager,
Military Systems
Engineering
GE AVIATION CO



Suvendoo K. Ray
BSAAE'83, MSAAE'84,
PhD'87
Director of
International Sales
THE BOEING CO.



Dennis E. Warner
BSAAE'73, MSME'76
Chief Executive Officer
ROLLS-ROYCE GOODRICH
ENGINE CONTROL
SYSTEMS LLC



John R. Wheadon Jr
BSAAE'73
Analyst
CREATIVE STRATEGIES INC



Prof. Tom-IP Shih and Mrs. Audrey Shih, Stephanie Sumcad, David Cronin and Kevin Kuhlman



Dennis Warner and guests



Skip and Barbara Grandt, Suvendoo K. Ray and Rigoberto Perez



Gus Gustafson, Larry Cargino and Skip Grandt



Tom Maxwell and guests





12TH ANNUAL

Outstanding Aerospace Engineer Awards

THE FACULTY OF THE SCHOOL OF AERONAUTICS AND ASTRONAUTICS

Invites you to attend

**The Awards Dinner and Ceremony
to honor the recipients of the
2010 Outstanding Aerospace Engineer Awards**

Friday, November 5th, 2010

RECEPTION AT 6:30 P.M.
DINNER AT 7:30 P.M.

Holiday Inn Select City Center

515 SOUTH STREET
LAFAYETTE, INDIANA

Adult Meal is \$40 per person
Student Meal is \$30 per person

Seating is limited. Reservations must be received by October 18.
If you would like to attend, please complete the form on the
opposite page and mail in with the total amount due.



RECIPIENTS OF THE 2010
OUTSTANDING AEROSPACE
ENGINEER AWARDS WILL BE POSTED
ON THE SCHOOL OF AERONAUTICS
AND ASTRONAUTICS WEB SITE

[https://engineering.purdue.edu/
AAE/AboutUs/Alumni/oea](https://engineering.purdue.edu/AAE/AboutUs/Alumni/oea)

12TH ANNUAL

Outstanding Aerospace Engineer Awards Friday, November 5, 2010

If you plan to attend,
please complete and
mail this form along with
a check for the total
amount due to:

**Purdue University
Attn: OAE
School of Aeronautics
and Astronautics
701 W. Stadium Avenue
West Lafayette, IN
47907-2045**

Make checks payable to
Purdue Foundation

**Sorry no phone
reservations accepted.**

Seating is limited.

**Reservations must
be made by
October 18, 2010.**

____ ADULTS @ \$40 each

____ STUDENTS @ \$30 each

I am interested in sponsoring ____ students @ \$30 each

Name _____

Guest Name _____

Degree/Year _____

Address _____

City _____ State _____ Zip _____

Phone _____

E-Mail _____

Vegetarian or special meal – please specify _____

Industrial Advisory Council

The Industrial Advisory Council serves an important role in the School of Aeronautics & Astronautics. The success of our programs depends on strong support from Industry and the Industrial Advisory Council serves as a link between industry and the university. The IAC meet twice a year in the fall and spring and review a large variety of topics related to our current operations and future goals.

Mr. Frank H. Bauer (BSAAE'79, MSAAE'80)

Chief Engineer • Exploration Systems Mission Directorate • *NASA Headquarters*

Mr. Bradley Duane Belcher (BSAAE'82)

(IAP Member) • Chief Experimental Engineer • Joint Strike Fighter F136 Engine • *Rolls-Royce Corporation*

Dr. Paul M. Bevilaqua (MSAAE'68, PhD'73) Chief Scientist • Lockheed Martin ORD Systems
• *Lockheed Martin Skunk Works*

Col. (Ret) Mark N. Brown (BSAAE'73) Vice President • *MCR Federal LLC*

Ms. Andrea M. Chavez (BSAAE'88)

Director • Manufacturing & Test Operations • Ball Aerospace & Technologies Corp.

Mr. Michael J. Corso (BSAAE'71)

Department Chair • Tort and Insurance Litigation Department • *Henderson, Franklin, Starnes & Holt, P.A.*

Mr. Darryl W. Davis (BSAAE'78)

President • Phantom Works • Boeing Integrated Defense Systems • *The Boeing Company*

Mr. Daniel F. Devitt (BSAAE'75) Sr. Director of Engineering/ Chief Engineer • *American Eurocopter*

Mr. Michael P. Dreessen (BSAAE'83)

Vice President • Sensors & Avionics • *Miltec Missiles & Space*

Dr. John W. Gallman (BSAAE'84, MSAAE'86)

Principal Engineer • Research and Advanced Technology • *Cessna Aircraft Company*

Dr. Carl S. Gran (BSAAE'74, MSAAE'74, PhD'78)

Principal Director • Vehicle Performance Subdivision • *The Aerospace Corporation*

Mr. Andrew H. Kasowski (BSAAE'72)

Vice President • Engineering Product Development • *Cessna Aircraft Company*

Dr. Andrew M. King (MSME'84, PhD'88)

Director, Mission Assurance • Commercial & Civil Programs • Space & Intelligence Systems
• *The Boeing Company*

Ms. Mary Kriebel (BSAAE'85) Propulsion Systems Manager • *Northrop Grumman Corporation*

Mr. Kerry D. Masher (BSAAE'78)

Vice President • Technical Engineering • *Hawker Beechcraft Corporation*

Mr. Thomas L. Maxwell (BSAAE'69)

General Manager • Military Systems and Design Integration • *GE Aircraft Engines*

Mr. David K. McGrath (BSAAE'83, MSAAE'84)

Technical Director, Orion LAS ACM • *ATK Tactical Propulsion and Controls*

Mr. James R. Miller (BSAAE'86)

Executive Vice President • Industrial CleanTech and Multimedia Groups Sanmina • *SCI Corporation*

Mr. Gary E. Mitchell (BSAE'60) Vice President (Ret) • *Boeing Integrated Defense System*

Mr. Gary E. Payton (MSAAE'72) Deputy Under Secretary for Space (Ret) • *United States Air Force*

Ms. Erika J. Pearson (BSAAE'93)

Business Director/Deputy VP of Leasing and Asset Management • *The Boeing Company*

Mr. James P. Renna (BSAAE'86)

Vice President • Engineering Safety, Testing and Evaluation • *Sikorsky Aircraft Corporation*

Dr. Richard Byram Rivir (BSAE'60) Chief Scientist • *United States Air Force*

Mr. Charles Robert Saff (BSAAE'71) Boeing Technical Fellow • *The Boeing Company*

Mr. Randal E. Secor (BSAAE'76) F35 Deputy Program Manager - JSF • *Northrop Grumman Corp.*

Dr. Robert L. Strickler (BSAE'60, MSE.Sc'62, PhD ME'68) Private Consultant

Dr. Anthony L. Thornton (PhD'92)

Senior Manager, Organization 1530 • Validation & Qualification Sciences • *Sandia National Laboratories*

Mr. William "Ted" Torgerson (BSAAE'83)

Director - Special Programs • *Boeing Integrated Defense Systems*

Mr. John J. Walsh (BSAAE'82) President • *Sypris Electronics LLC*



PURDUE SPACE DAY 2009



Mike McCulley

The School of Aeronautics and Astronautics hosted the 14th annual Purdue Space Day which took place on Saturday November 7th, 2009 with astronaut **Michael J. McCulley** as guest VIP.

Purdue Space Day (PSD) is both a successful educational outreach program for third through eighth grade students and a professional development program for Purdue University student volunteers. The program inspires grade school students to learn about science, technology, engineering and math (STEM) by using a space theme.

The school students participate in three hands-on age-appropriate STEM activities during the day. PSD encourages the children to think about future careers in engineering and also lets the children become more familiar with a university campus as a place for them to ultimately come.

Mike McCulley started the weekend off with a talk on campus that was free and open to the public about his experiences as an astronaut. McCulley, who earned a master's degree in metallurgical engineering from Purdue in 1970, was the pilot on a space shuttle mission in 1989. He logged 119 hours in space. During this mission, crew members successfully deployed the Galileo spacecraft on its journey to explore Jupiter, mapped atmospheric ozone and performed several secondary experiments.

Following his retirement from NASA in 1990, he was employed by Lockheed Martin Space Operations and served as vice president and deputy launch site director for the Kennedy Space Center. McCulley next served as vice president and associate program manager for United Space Alliance's ground operations at the Kennedy Space Center in Florida in 1996. McCulley was named president and CEO of United Space Alliance in 2003, where he worked until his retirement in 2007.

More than 580 third- through eighth-graders are registered for the 14th annual Space Day, which is filled to capacity. Participants came from 461 schools in Indiana, Illinois, Ohio, Wisconsin and Washington. More than 190 Purdue students representing 27 majors volunteered to run the event.

The weather was glorious and the children took part in a total of nine hands-on activities throughout the day and also had an opportunity to talk to Mike McCulley as he toured the activities. The day ended up with group photos of both the children and Purdue students by the statue of Neil Armstrong outside of Armstrong Hall.

Purdue Space Day 2010 will take place on Saturday October 30, with VIP guest astronaut Dr. David Wolf.

Mike McCulley at the Elliott Hall of Music with Holley Dickmeyer and Collin Morgan
(Photo by Allen Chan)



PSD Executive board (L-R) Ben Weiss, Kevin Kuhlman, Holley Dickmeyer, David Cronin, Stephanie Sumcad, Jessica Holsinger, Collin Morgan and Sarah Lindsey

AAE Faculty Roster

Aerodynamics

- A. Alexeenko**
Assistant Professor; Ph.D., Penn State, 2003
- G. A. Blaisdell**
Associate Professor; Ph.D., Stanford, 1991
- S. H. Collicott**
Professor; Ph.D., Stanford, 1991
- M. C. Jischke**
President Emeritus; Ph.D., Massachusetts Institute of Technology, 1968.
- A. S. Lyrantzis**
Professor; Ph.D., Cornell, 1988
- S. P. Schneider**
Professor; Ph.D., Caltech, 1989
- T. I-P. Shih**
Professor and AAE Head; Ph.D., The University of Michigan, 1981
- J. P. Sullivan**
Professor; Sc.D., Massachusetts Institute of Technology, 1973
- M. H. Williams**
Professor and Associate Head; Ph.D., Princeton, 1975

Aerospace Systems

- D. Andrisani II**
Associate Professor; Ph.D., SUNY at Buffalo, 1979
- B. S. Caldwell (By Courtesy)**
Associate Professor of Industrial Engineering; Ph.D., University of California-Davis, 1990
- W. A. Crossley**
Professor; Ph.D., Arizona State, 1995
- D. A. DeLaurentis**
Associate Professor: Ph.D., Georgia Institute of Technology, 1998
- I. Hwang**
Associate Professor; Ph.D., Stanford University, 2004
- K. Marais**
Assistant Professor; Ph.D. Massachusetts Institute of Technology, 2005
- J. P. Sullivan**
Professor; Sc.D., Massachusetts Institute of Technology, 1973
- D. Sun**
Assistant Professor; Ph.D., University of California at Berkeley, 2008
- T. A. Weisshaar**
Professor; Ph.D., Stanford, 1971

Astrodynamics and Space Applications

- D. L. Filmer**
Adjunct Professor; Ph.D., Wisconsin, 1961
- J. L. Garrison**
Associate Professor; Ph.D., University of Colorado at Boulder, 1997
- K. C. Howell**
Hsu Lo Professor of Aeronautical and Astronautical Engineering; Ph.D., Stanford, 1983
- J. M. Longuski**
Professor, Ph.D., Michigan, 1979

Dynamics and Control

- D. Andrisani II**
Associate Professor; Ph.D., SUNY at Buffalo, 1979
- M. J. Corless**
Professor; Ph.D., Berkeley, 1984
- D. A. DeLaurentis**
Associate Professor: Ph.D., Georgia Institute of Technology, 1998
- D. L. Filmer**
Adjunct Professor; Ph.D., Wisconsin, 1961
- A. E. Frazho**
Professor; Ph.D., Michigan, 1977
- I. Hwang**
Associate Professor; Ph.D., Stanford University, 2004
- D. Sun**
Assistant Professor; Ph.D., University of California at Berkeley, 2008

Propulsion

- W. E. Anderson**
Associate Professor; Ph.D., The Pennsylvania State University, 1996
- J. P. Gore (By Courtesy)**
Vincent P. Reilly Professor of Mechanical Engineering; Ph.D., The Pennsylvania State University, 1986
- S. D. Heister**
Professor; Ph.D., UCLA, 1988
- I. Hrbud**
Adjunct Assistant Professor; Ph.D., Auburn University, 1997
- N. Key (By Courtesy)**
Assistant Professor of Mechanical Engineering; Ph.D., Purdue University, 2007

- C. L. Merkle**
Reilly Professor of Engineering; Ph.D., Princeton University, 1969
- T. L. Pourpoint**
Research Assistant Professor, Ph.D., Purdue University, 2005
- L. Qiao**
Assistant Professor; Ph.D., University of Michigan, 2007
- J. J. Rusek**
Adjunct Assistant Professor; Ph.D., Case Western Reserve, 1983
- S. F. Son (By Courtesy)**
Associate Professor of Mechanical Engineering; Ph.D., University of Illinois, 1993

Structures & Materials

- W. Chen**
Professor; Ph.D., California Institute of Technology, 1995
- W. A. Crossley**
Professor; Ph.D., Arizona State, 1995
- J. F. Doyle**
Professor; Ph.D., Illinois, 1977
- T. N. Farris**
Adjunct Professor; Ph.D., Northwestern, 1986
- A. F. Grandt**
Raisbeck Engineering Distinguished Professor for Engineering and Technology Integration; Ph.D., Illinois, 1971
- P. K. Imbrie (By Courtesy)**
Associate Professor; Ph.D., Texas A & M, 2000.
- R. B. Pipes**
John L. Bray Distinguished Professor of Engineering; Ph.D., University of Texas, 1972
- C. T. Sun**
Neil A. Armstrong Distinguished Professor; Ph.D., Northwestern, 1967
- V. Tomar**
Assistant Professor; Ph.D., Georgia Tech, 2005
- T. A. Weisshaar**
Professor; Ph.D., Stanford, 1971

Faculty Courtesy Appointments

Dr. Jay Melosh - University Distinguished Professor of the School of Earth and Atmospheric Sciences and Dr Robert Lucht, Ralph and Bettye Bailey Professor of Combustion in ME have been granted a courtesy appointment to the faculty of the School of Aeronautics and Astronautics.



Dr. Jay Melosh



Dr. Robert Lucht



(Purdue University photo/Andrew Hancock)

New aluminum-water rocket propellant promising for future space missions

Researchers from the School of Aeronautics and Astronautics and the Mechanical Engineering Department at Purdue are working with NASA, the Air Force Office of Scientific Research and Pennsylvania State University to develop a new type of rocket propellant made of a frozen mixture of water and “nanoscale aluminum” powder. The propellant, called ALICE, is more environmentally friendly and could be manufactured on the moon, Mars and other water-bearing bodies and might be used to launch rockets into orbit and for long-distance space missions and also to generate hydrogen for fuel cells.

The tiny size of the aluminum particles, which have a diameter of about 80 nanometers, or billionths of a meter, is key to the propellant’s performance. The nanoparticles combust more rapidly than larger particles and enable the fast reaction with water, said Timothée Pourpoint, a research assistant professor in the School of Aeronautics and Astronautics.

It is considered a green propellant, producing essentially hydrogen gas and aluminum oxide, said Steven Son, a professor in the Mechanical Engineering Department. “In contrast, each space shuttle flight consumes about 773 tons of the oxidizer ammonium perchlorate in the solid booster rockets. About 230 tons of hydrochloric acid immediately appears in the exhaust from such flights.”

ALICE provides thrust through a chemical reaction between water and aluminum. As the aluminum ignites, water molecules provide oxygen and hydrogen to fuel the combustion until all of the powder is burned.

Holding the 9 foot rocket launched earlier this year using the propellant, from left, are: mechanical engineering undergraduate student Cody Dezelan, mechanical engineering

graduate student Tyler Wood, mechanical engineering professor Steven Son, aeronautics and astronautics graduate student Mark Pfeil, mechanical engineering doctoral student Travis Sippel, aeronautics and astronautics research assistant professor Timothée Pourpoint, and postdoctoral researcher John Tsohas.

The rocket reached an altitude of 1,300 feet based on the propellant’s high burn rate and maximum thrust of 650 pounds during the flight test. ALICE reportedly has a toothpaste-like consistency, and is cooled to -30°C (-22°F) 24 hours before flight.

Research findings were detailed in technical papers presented in August 2009 at the 45th Joint Propulsion Conference organized by the American Institute of Aeronautics and Astronautics.

A video is available to view on YouTube @ <http://www.youtube.com/watch?v=-b7siH1Ausc>



Commercial Spaceflight Federation Creates Scientific Advisory Panel Focused on Suborbital Research Applications



Dr. Steven Collicott has been invited to part of the Suborbital Applications Researchers Group (SARG) of the Commercial Spaceflight Federation. Composed of experienced scientists, researchers, and educators dedicated to furthering the research and education potential of suborbital reusable launch vehicles under development by the commercial spaceflight sector.

The panel is chaired by Dr. S. Alan Stern of the Southwest Research Institute, a space scientist who previously served as head of the Science Mission Directorate at NASA Headquarters.

The members of the Suborbital Applications Researchers Group (SARG) are aiming to increase awareness of commercial suborbital vehicles in the science and R&D communities, to work with policy-makers to ensure that payloads can have easy access to these vehicles, and to further develop ideas for the uses of these vehicles for science, engineering, and education missions. The innovative vehicles being developed by a wide range of commercial suborbital companies, including Armadillo Aerospace, Blue Origin, Masten Space Systems, Virgin Galactic, and XCOR Aerospace, represent valuable new capability for scientists, engineers, and educators.

Elmer F. Bruhn Teaching Award 2010

Presented annually to an Outstanding Teacher in the School of Aeronautics and Astronautics, selected by the undergraduate student body for excellence in teaching and made possible by the interest and generosity of friends and alumni of the school.

Professor Kathleen Howell is this year's winner of the **Bruhn Award**.

Other top candidates for the Bruhn Award were; **Prof. Greg Blaisdell**, **Prof. Skip Grandt**, **Prof. Inseok Hwang**, **Prof. John Sullivan**. Congratulations to all for this recognition of their teaching efforts.

Prof Howell is now the school's nominee for the engineering wide 2011 A.A. Potter Best Teacher Award.



College of Engineering Faculty Awards of Excellence

An annual series of excellence awards for faculty in the College of Engineering was established in the fall of 2002. Nominated by Prof and Head of School Tom Shih, **Prof. Kathleen Howell** has been recognized with the Leadership Award for 2010.

The purpose of this award is to recognize excellence in faculty leadership that promotes a culture of improving the climate and environment for other faculty, staff, and students and that value and promotes diversity and inclusiveness in the College of Engineering.

Congratulations to Prof Howell who was honored during the eighth annual recognition banquet on April 24, 2010.

Vikas Tomar receives Honorable Mention Award



Assistant Professor Vikas Tomar received an Honorable Mention Award for Early Career Faculty Fellow at the TMS-AIME Annual Awards Banquet that was held on February 16th in Seattle.

This award recognizes an assistant professor for his or her accomplishments that have advanced the academic institution where employed, and for abilities to broaden the technological profile of TMS.

The recognition of outstanding accomplishments by members of the international minerals, metals, and materials community is one of the primary objectives of TMS. In the society's view, the bestowment of honors and awards is necessary to not only reward distinguished performances by a scientist or engineer, but to encourage his or her colleagues to strive toward the same—and perhaps a greater—level of distinction.

Dr. Tomar's main research thrust is in the area of computationally and experimentally analyzing new classes of ceramics matrix composites for extreme environments with a view of applications such as nuclear environments, nanoscale high voltage ionized environments, and high temperature environments. Another thrust is in analyzing bio-motivated polymer matrix composites such as tropocollagen (TC)-hydroxyapatite (HAP) materials and their use in structural mechanics, medicine, and energy related applications.

The emphasis is on primarily understanding the interplay of length scale and time scale related effects which could be manipulated in order to either develop new technologies or modify the existing technologies for serving aerospace, energy, and medicine fields. Research methods are based on, but not limited to, using cohesive finite element method, molecular dynamics method, Monte Carlo method, and quantum mechanical simulations and combining them with Scanning Probe Microscopy, Electron Microscopy, and nanoscale mechanical testing approaches for nanoscale fatigue and fracture strength measurements.

Professor Li Qiao wins Young Investigator Award

Professor Li Qiao

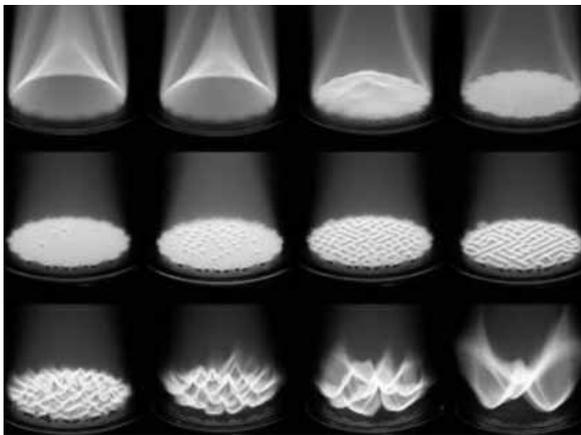
has received the Army Research Office (ARO) Young Investigator Program (YIP) Award for her proposal "Ignition and Burning Behavior of Fuel Droplets with Energetic Nanoparticle Addition."



The objective of the ARO YIP program is to foster creative research in science and engineering and enhance early career development of outstanding young investigators.

This award is intended to support Professor Qiao's research on novel tailored fuels using nanoscale additives, which have the potential to increase fuel energy density, improve combustion efficiency and enhance performance of future propulsion systems.

Professor Li Qiao and Ph.D. student Yanan Gan wins Second Place Prize for the 2010 Combustion Art Competition



Professor Li Qiao and Ph.D. student **Yanan Gan** won the Second Place Prize for the 2010 Combustion Art Competition of the Combustion Institute for their work "Flame, Gone with Butterfly."

The Combustion Art Competition was initiated in 2004 at the Combustion Symposium in Chicago. The awards were judged on the basis of creativity and innovation, display and presentation, and scientific and/or aesthetic value.

A description of the effect - CH₄/Air premixed flame attached to a carbon-coated brass matrix cooled with water. Fuel rich to fuel lean from left to right and top to bottom by increasing air flow rate and decreasing CH₄ flow rate. Small flames dance around and a butterfly appears. When the butterfly flies away, flame is gone.

Drs. Daniel DeLaurentis and Inseok Hwang promoted to Associate Professors

Dr. Barrett Caldwell (By Courtesy) promoted to full Professor

Dr. Daniel DeLaurentis has been with Purdue University's School of Aeronautics and Astronautics since 2004 as an Assistant Professor. He received his Ph.D. from the Georgia Institute of Technology in 1998. His areas of interest include: Design Methods: Mathematical modeling and object-oriented frameworks for the design of system-of systems, especially those for which air vehicles are a main element; approaches for robust design, including robust control analogies and uncertainty modeling/management in multi-disciplinary design Aerospace Systems and Flight Vehicles: sizing/synthesis algorithms for design & performance estimation of revolutionary flight vehicles; exploration of Personal Air Vehicle designs and concept of operations; aircraft flight stability and control, especially as an integral part of conceptual design



Dr. Inseok Hwang has been with Purdue University's School of Aeronautics and Astronautics since 2004 as an Assistant Professor. He received his Ph.D. from Stanford University in 2004. His areas of interest include: Hybrid Systems/Nonlinear Systems: Analysis: stability and control of hybrid systems; Estimation: state estimation for hybrid systems; Information Inference: system identification for hybrid systems; approximate reachable set computation for various dynamical systems Air Traffic Control: Target tracking and identity management, and conflict detection and resolution; Safe interface design; Real-time safety verification tools for safety critical systems Other applications: Biological systems; sensor networks; decentralized estimation and control of large scale interconnected dynamical systems.



Dr. Barrett Caldwell has been with Purdue University's School of Industrial Engineering since 2000. He became a Courtesy Appointed Professor in the School of Aeronautics and Astronautics in 2007. He received his Ph.D. from the University of California-Davis in Social Psychology in 1990.

His areas of interest include:

- Human factors engineering
- Distributed human supervisory control
- Team coordination and performance using information technology



AIAA Best Paper

Technical paper entitled, "Development and Launch of the Purdue Hybrid Rocket Technology Demonstrator," AIAA Paper 2009-4842 has been named the 2009 AIAA Best Paper by the AIAA Hybrid Rockets Technical Committee.

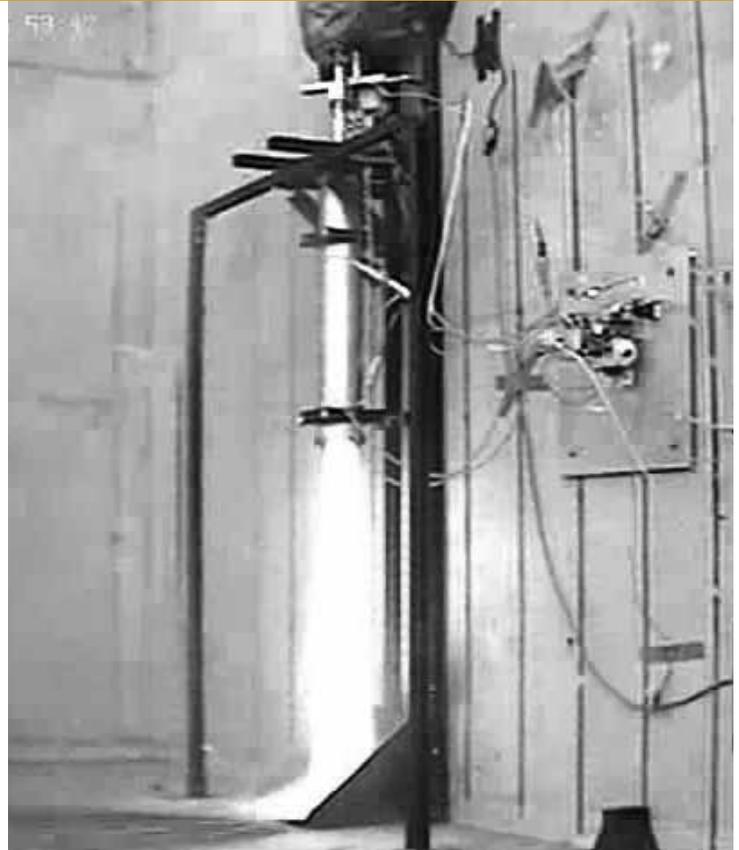
Dr. John Tsohas – Project Lead; Brad Appel; Andrew Rettenmaier; Mike Walker; Dr. Stephen D. Heister

The certificate will be given at the awards luncheon on Wednesday, 28 July 2010, during the AIAA/ASME/SAE/ASEE Joint Propulsion Conference, 25-28 July 2010, at the Nashville Convention Center & Renaissance Hotel in Nashville, TN.

The researchers led by Dr John Tsohas is developing a hybrid rocket technology demonstrator to serve as a test bed for technologies critical to the development of vehicles capable of delivering microgravity experiments to altitudes exceeding 100 km. These technologies will be demonstrated sequentially over a series of test flights which will allow the designers to validate each of these sub-systems before adding more complexity, risk and features to the technology demonstrator.

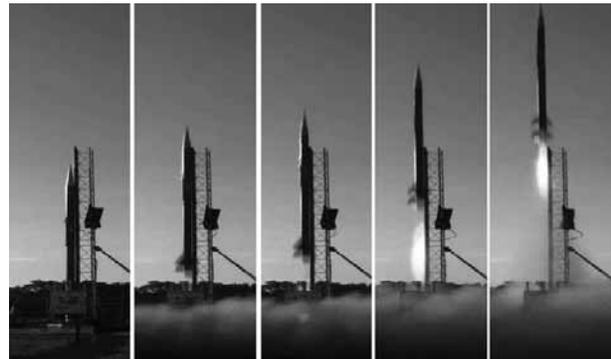
The group has designed, manufactured and tested three different hybrid rocket motors in over 40 hot-fire tests at the Purdue Zucrow rocket laboratories. The first generation hybrid flight-vehicle was successfully launched and reached an altitude of 6,100 ft and Mach 0.6 in June 2009, making an important step towards flight operations for this series of hybrid rocket technology demonstrators. This Purdue hybrid sounding rocket has been the largest hydrogen-peroxide hybrid rocket launched to date.

A second generation (GEN II), high propellant mass fraction flight-vehicle is currently being developed for supersonic flights to altitudes exceeding 30,000 ft and Mach 2.



Hot-fire test #5 of flight-weight, 900 lbf thrust hybrid rocket motor, at Purdue High Pressure Lab.

Snapshots of hybrid flight-vehicle clearing launch tower under 6 Gs of acceleration, in -0.4 sec.



Lt. Governor Receives Manufacturing Award from CAM director John Sullivan

Purdue University's Center for Advanced Manufacturing presented Lt. Gov. Becky Skillman with the "**Excellence in Manufacturing Innovation**" award Tuesday May 11 at its annual Advanced Manufacturing Summit.

PROFESSOR EMERITUS GEORGE PALMER

honored as the Designer of the Wind Tunnel



Prof John Sullivan with Prof Emeritus George Palmer

Professor Emeritus George Palmer impacted the lives of thousands of students during his tenure at Purdue with the School of Aeronautics and Astronautics. Designed and built by George, the Boeing Wind Tunnel in the Aerospace Sciences Laboratory has been the test site for thousands of students learning opportunities and a multitude of research projects.

For well over 40 years, he worked tirelessly to design and create the wind tunnel program that Purdue is known for today. His efforts, along with his students and colleagues have positioned Purdue as one of the premier higher educational institutions in the world for wind tunnel testing.

Current research includes projects for Gulf Stream, Rolls-Royce, NASA and the Army, Air Force and Navy.

Completion of improvements last fall provided an opportunity to honor George, now 88, for creating the wind tunnel and its testing programs and for his contributions to the laboratory.

Many people joined in this special event for Prof. Palmer and his family. The word was spread to alumni and friends who worked with him at Purdue and numerous people had sent in photos and fond remembrances of the wind tunnel that were on display.

During the ceremony, Prof. John Sullivan read out some letters and emails that had come in to honor George who was very moved by the comments. Each letter commented on his dedication and determination to succeed.

In keeping with his love of guiding young people, George volunteered for the Boy Scouts of America, swerving various leadership posts including council vice president for exploring and earning the 1972 Silver Beaver Award.

During the dedication for the Wind Tunnel on September 25th 2009, a donation in honor of Professor Palmer was made by owner of New York investment firm, **William Uhrig (BSAAE'82) & Anastasia Vournas** for use in Aeronautical and Astronautical Engineering. **Rom Murty Ph.D.'65** made an additional contribution. They have created the **George & Patricia Palmer Undergraduate Scholarship and the George & Patricia Palmer Design Teaching Assistantship Fund.**

The undergraduate scholarship will be for a Presidential & Trustee Scholarship-eligible Aeronautical and Astronautical Engineering student and the Design Teaching Assistantship will be for graduate teaching assistants in Aerospace Systems Design.

The two endowments are created to encourage additional donations from AAE alumni and friends and George and Patricia Palmer invite you to help build this endowment by contacting Diane Klassen, Director of Development, School of Aeronautics & Astronautics, at dklassen@purdue.edu or 765-494-9124.



A montage of photos sent in by past students



Rocket test will carry *Purdue experiment*



Aerospace company Blue Origin LLC selected a team of Purdue University researchers led by **Prof Steven Collicott** to design and build an experiment that will operate during a test flight of a new type of reusable rocket. Selection for this prestigious and historic event is a significant

opportunity for Purdue to continue to lead in space flight topics. Professor Collicott comments that already a number of AAE alums are active in design and leadership roles at Blue Origin.

Purdue's experiment, funded by the National Science Foundation, is the first to study conditions in which liquid wicks or remains stationary when influenced by a specially designed structure inside a spherical vessel. Previous experiments relied on the mathematical theories available for cylindrical geometries. Results of experiment will be used to design two-phase fluids systems for spaceflight and Earth-bound applications.

The transparent spherical vessel will contain vanes, or thin metal plates, that will be moved progressively closer to the vessel's inner walls during the three-minute, low-gravity portion of the flight. The researchers will use a camera to

record and study how fluid wicks within this shrinking gap between the vanes and vessel walls. The sphere is about 5 inches in diameter, and the entire experiment, including the camera and lighting system, will fit in a container about 18 inches square and 9 inches high.

It is one of three scientific research payloads recently selected by Blue Origin to be carried to suborbital altitudes during a flight test of the company's New Shepard rocket. The rocket enables researchers to study phenomena that cannot be effectively observed on Earth or during the relatively brief low-gravity periods that can be created in aircraft flights. Such experiments provide critical data for creating better mathematical models used to design technologies that rely on the precise control of fluids.

The Purdue team is scheduled to deliver the experiment by November to Blue Origin, based in Kent, Wash. The company will launch the rocket from its West Texas launch site. The rocket will reach an altitude of about 100 kilometers, or 60 miles. The New Shepard rockets are reusable, reducing the cost of flights. A launch date has not yet been announced.

Collicott has extensive zero-gravity research experience, with dozens of experiments on NASA aircraft and several suborbital rocket experiments, and he designed a major portion of an experiment that flew on the International

Space Station in 2006 and 2007. The space station experiment was motivated by previous research in Collicott's Purdue lab using a drop tower to create a short-duration zero-gravity test. He is now building a larger and improved drop tower for microgravity experiments in the university's Neil Armstrong Hall of Engineering.

Suborbital Scientist Training Program

The Suborbital Scientist Training Program provides space flight physiology training for prospective Suborbital Scientist-Astronauts. Located in the NASTAR Center, Philadelphia, PA, Prof. Steven Collicott took part in this program in June 2010.

In this program, Suborbital Scientist-Astronauts will experience the same physiological forces that professional astronauts encounter. Trainees become better prepared, both physically and mentally, to take on the challenges of a space flight including performing suborbital research experiments in a distraction-filled environment.



AAE Alum Mentors Vomit Comet Team

AAE Alumni **Jonathan Braun BSAE'06, MSAE'08**, recently mentored a team from Carthage College when they took part in the NASA reduced gravity flight opportunities program at NASA JSC. Jon, who flew with the Purdue team in 2004, was Principal Investigator for the team of seniors where their project - **Propellant Sloshing/Zero Gravity Equilibrium for Orion Service Module Tanks**, flew on the well known "Vomit Comet." The project involved analyzing a scaled model of the Orion service module NTO propellant tanks for things like slosh damping, propellant settling times, and fluid microgravity equilibrium behavior.

Carthage first took part in the program in 2007 and Jon was impressed that both the captain Samantha Kreppel and the rest of the team all worked extremely hard and Jon's support of their project was made possible by Lockheed Martin. A member of the team, Isa Fritz starts as a grad student at Purdue AAE in fall 2010.

Jon is 2nd right at the back with the team.



NASA Reduced Gravity Student Flight Opportunities Program

The 43rd team from AAE was accepted to fly from Prof. Steven Collicott's AAE418 class in NASA's KC-135 aircraft, also affectionately known as the Vomit comet in June 2010. Purdue has had one or more teams every year selected since the program began in 1996. The team's proposal led by Stephanie Sumcad was "Effect of Textured Surfaces on Bubble Detachment and Contact Area in Microgravity." The full team was: **Matt Baldwin – Alternate Flier, Michael Brod, Alvin Chang, Kartik Dalal, Clara Garman, Christa Humbert – Flier, Chad Kiel, Collin Morgan – Flier, Kevin Quach, Stephanie Sumcad - Flier and Team Leader, Ricky Tayek – Flier.**

Periods of weightlessness lasting about 25 seconds during downward "parabola" give students scant time to ready their experiments for the next parabola. The plane varies the steepness of its maneuvers, and this varying steepness produces different degrees of weightless. Most of the maneuvers reproduce the weightlessness experienced by space shuttle astronauts flying in orbit around Earth, but a few of the maneuvers reproduce the gravity on Mars and the moon.

The team was also featured on "Boiler Bytes 6," which is a 30-minute video news magazine produced by Purdue, and was premiered on the Big Ten Network on December 24. The program featured the team from AAE 418 class.



United Nations Climate Change Conference COPENHAGEN, DENMARK

The U.S. Department of State, in coordination with the White House and multiple federal departments and agencies, hosted the first-ever U.S. Center at the Conference of the Parties to the UN Framework Convention on Climate Change in Copenhagen December 7-18.

The Partnership for Air Transportation Noise & Emissions Reduction - PARTNER is a leading aviation cooperative research organization, and a FAA/NAS/Transport Canada-sponsored Center of Excellence. In conjunction with the US Department of Transportation and the FAA's Office of Environment and Energy PARTNER had a number of speakers who touched upon aviation's climate impact, and record of environmental progress, challenges, solutions, and plans.

Assistant Professor Karen Marais spoke at the conference as co-lead investigator for PARTNER Project 32, Near-term Operational Changes. She reviewed how improved operations enabled environmental impact reductions and discussed upcoming research in that area.



Other PARTNER speakers discussed aircraft technologies, and how advanced engines and airframes mitigated environmental impacts while enabling growth, and achievements in, and plans for, alternative fuel research and application.

The U.S. Center hosted more than 70 events at the conference, highlighting U.S. actions to combat global climate change. It provided an opportunity for the approximately 15,000 accredited participants to learn more about U.S. climate actions.

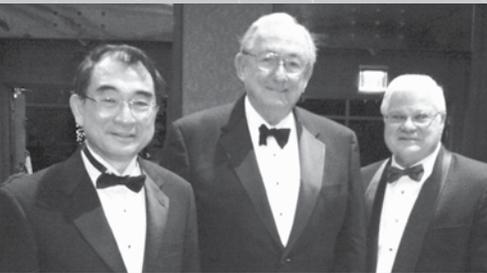
The Center featured panel presentations, publications and videotape screenings to describe U.S. climate change policies and initiatives, including public-private partnerships and collaboration with other governments.



Prof. Emeritus John Robert Osborne - Obituary

The School of Aeronautics and Astronautics was sad to hear of the passing of **Professor Emeritus John Robert "Bob" Osborne**. He earned his PhD in Mechanical Engineering from Purdue University in 1957 in the laboratory of Professor Zucrow. He worked as a mechanical engineer at Morton Thiokol in Huntsville, Alabama working on rocketry and solid propellants. He then worked as a professor at Purdue University in the Department of Mechanical Engineering from 1957 until 1980 when he transferred to Aeronautics and Astronautics where he continued until his retirement in 1990.

In April 1989, he won Outstanding Teacher and Researcher at Purdue presented by his students and colleagues. The American Institute of Aeronautics and Astronautics in July of 1995 awarded him the prestigious Wyld Propulsion Award for the outstanding contributions in analytical studies of rocket propulsion, which contributed to successful development of rocket propulsion systems including the Space Shuttle main engine and rocket motor.



The Engineers' Council Distinguished Engineering Educator Award

Professor and Head of School, **Dr. Tom Shih** was awarded the "Distinguished Engineering Educator Award" from the Engineers' Council of San Fernando Valley, CA. The award was given at their 55th Annual Awards and Honors Banquet held on February 20, 2010 with keynote speaker Thomas J. Cassidy, Jr. President Aircraft Systems Group, General Atomics Aeronautical Systems.

The Distinguished Engineering Educator Award is made to individuals who are outstanding in professional qualities and have a top reputation for engineering education and leadership. Nominees include individuals who have significantly contributed to students' extracurricular engineering activities, and/or to scientific achievements with respect to industry applications.



(L-R) Paul Druselis, Courtney McManus and Ben Weiss

Indiana State Fair 2009

The Indiana Space Grant Consortium (INSGC) hosted *Indiana Space Travels* at the Indiana State Fair in summer 2009. Over 70,000 people visited the exhibition during the 17 days of the fair. AAE alumni **Mark Brown (BSAAE'73)** opened the exhibition on its opening day which coincided with Purdue Day.

The exhibit traced significant aeronautic Hoosiers and events dating back to 1859 with the nation's first airmail delivery by balloon that originated from Lafayette. The exhibit included a Challenger Center Exhibit highlighting in-service and pre-service teacher programs; a Mars roving unit from the EPICS program from Purdue; NASA provided replicas of the Space Shuttle and the Hubble Telescope; the IMAX Hubble STS-125 high school contest winners; and much more information about Indiana's long history of contribution to aerospace and space flight.



Barrett Caldwell and former Astronaut Mark Brown in front of the INSGC banner at the Indiana Space Travels exhibit at the 2009 Indiana State Fair

Indiana has played a key role in aerospace history from the days of early flight with Cliff Turpin and Amelia Earhart, including the first and the last men to step on the moon, to the future explorers of Mars and beyond. *Indiana Space Travels* show-cased how Indiana has been at the forefront and cutting edge of technology, engineering, and the pioneering spirit from the mid-nineteenth century to today.

INSGC director Barrett Caldwell (AAE by courtesy) was delighted with both the impact on the community and the large numbers of visitors.

AAE students Paul Druselis, Courtney McManus and Ben Weiss all contributed their expertise at this event.

Indiana Airline Fuel Developer Moves Ahead With Testing

AAE Adjunct Assistant Professor John Rusek, Research Director, Swift Enterprises, Ltd. has developed a new aviation fuel and says its product has been approved as a test fuel by one of the world's largest standards organizations.

Swift Enterprises Ltd. uses renewable feedstocks to make the lead-free fuel. President and co-owner Mary Rusek says the approval by ASTM International allows the company to begin full-scale testing.



Mary and John Rusek Photo courtesy of Inside INdiana Business

Boeing/AFOSR Mach 6 Quiet Tunnel

The 19 May edition of *Aviation Week & Space Technology* highlighted the Purdue Boeing/AFOSR Mach 6 Quiet Tunnel and its aid in testing the Falcon HTV-2.

Capable of running quietly at hypersonic speeds, researchers led by **Prof. Steven Schneider** are conducting experiments on a number of high profile projects including the design for the Falcon Hypersonic Technology Vehicle 2 (HTV-2), built by Lockheed Martin.

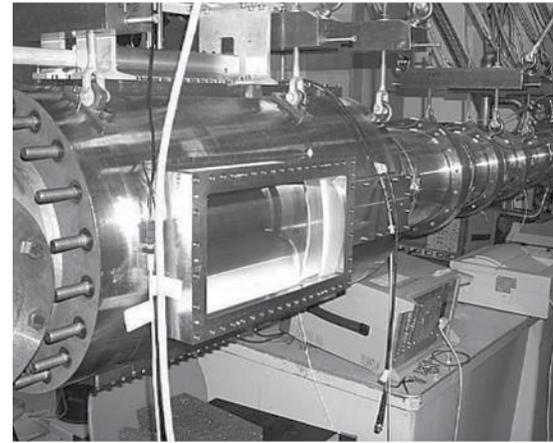
DARPA's Falcon HTV-2 program objective is developing and testing an unmanned, rocket-launched, maneuverable, hypersonic air vehicle that glides through the Earth's atmosphere at incredibly fast speeds—up to Mach 20. The key technical challenges of the HTV-2 program are the design and testing of an innovative high lift-to-drag aerodynamic shape, advanced lightweight but tough thermal protection structures, materials and fabrication technologies, autonomous hypersonic navigation guidance and control systems, and an autonomous flight safety system.

Design changes were made to the leading edges of the HTV-2 which involved further wind tunnel testing. The Purdue wind tunnel was instrumental in helping verify the predicted high Mach performance, as the tunnel is designed to minimize aerodynamic perturbations created by the tunnel itself. This gave DARPA the confidence they would not get a boundary layer transition problem. The first flight took place on April 22 at Vandenberg AFB, California.

This work by **Prof. Steven**

Schneider's team was also mentioned in a speech given on 2 February 2010 by Maj Gen Curtis M. Bedke, Commander, U.S. Air Force Research Laboratory, Wright-Patterson AFB, OH. His presentation "What is Different Today," was given at the 2010 Air Force T&E Days Conference, Nashville, TN. Bedke's slides comment that: "Quiet Tunnel measurements counter indications of early transition obtained in conventional facilities." See http://www.aiaa.org/documents/industry/presentations/MG_Bedke_High_Speed_Weapons.ppt

Purdue's wind tunnel, which has been funded by the Air Force Office of Scientific Research, NASA, Sandia National Laboratories, the Ballistic Missile Defense Organization and the Boeing Co., is named the Boeing/AFOSR Mach 6 Quiet Tunnel. The quiet wind tunnel operation is critical for collecting data to show precisely how air flows over a vehicle's surface in flight. The old NASA Langley nozzle, now located at Texas A&M, is the only other wind tunnel in the world that runs quietly while conducting experiments in airstreams traveling at Mach 6.



The Boeing/AFOSR Mach 6 Quiet Tunnel



Falcon Hypersonic Test Vehicle 2 (HTV-2)



Rolls-Royce and Northrop Grumman display Global Hawk at Purdue Airport

Rolls-Royce brought a full-scale model of the Northrop Grumman Global Hawk unmanned military aircraft to Purdue University Airport for public view September 2009.

The RQ-4 Global Hawk unmanned aircraft system is used by the U.S. Air Force as an intelligence, surveillance and reconnaissance aircraft. Cruising at altitudes of more than 60,000 feet, it can survey large geographic areas with pinpoint accuracy, giving military decision-makers real-time information regarding enemy location, resources and personnel.

The model came coming to Purdue after a stop at Rolls-Royce in Indianapolis, where the AE 3007H engines that power the Global Hawk are produced. Approximately 500 Rolls-Royce employees hold Purdue degrees.



Congratulations to our 2009-2010

graduates

During the 2009-2010 school year the School of Aeronautics and Astronautics awarded 138 BSAAE degrees, 74 MS degrees, and 18 Ph.D. degrees.



August 2009

- BS**
 Dodiet Wiraatmaja
 Jeffrey Knowlton
- MS**
 Benjamin Ahn
 Alinda Aligawesa
 Rebecca Browning
 Katya Casper
 Prakash Dikshit
 Oscar Garibaldi
 Peter Hamel
 David Helderman
 Michael Kowalkowski
 Yujun Leng
 Edward Londner
 Eugene Petrov
 Amanda Schmidt
 Bhisham Sharma
 John Tapee
 Aaron Wypszynski

December 2009

- BS**
 Cory Alban
 Wei Ping Ang
 Meghan Bartholomay
 Skyler Bodey
 Christopher Buchanan
 Austin Butler
 Jay Chargualaf
 Michael Christopher
 Patrick Cooney
 Timothy Duquette
 Brian Erson
 Karen Hadsell
 Ji Hye Hong
 Jonathan Huseman
 Gregory Klein
 Kevin Kuhlman
 Seung Min Lee
 Shian Lee
 Curtis Leppanen
 Joseph Markoff
 Jon Meier
 Elizabeth Mikolaj
 Jonathan Miller
 Tuan Nguyen
 Nicholas Przygoda
 Matthew Sharkey
 Kevin Steck
 John Stern
 James Stohler
 Matthew Stover
 Stephanie Thomas
 Richard Valenta
 Kyle Young
- MS**
 Manikkavasagan
 Ambalavanan
 Digvijay Chauhan
 Joshua Dustin
 Yuqiang Fu
 Kuo Guo
 John Horst
 Seung-il Kim
 Zengyue Lin
 Weiyi Liu
 Alfred Lynam
 Galen Needham
 Loral O'Hara
 Michael Palumbo
 Brian Pomeroy
 Mario Roa
 Brian Roth
 Titus Sgro
 Ankit Tyagi
 Kautilya Vemulapalli
 Bradley Wheaton
 Nicole Wilcox

CONGRATULATIONS TO
 ALL OF OUR GRADUATES



May 2010

BS

Abhinav Agraharapu
Hartman Aguirre
Matthew Baldwin
Elizabeth Barrett
Alexander Belshaw
Jacob Bills
Joseph Blake
Ryan Bourlier
Anthony Braun
Michael Brod
Katherine Brumbaugh
Alexander Brunk
Joseph Buckley
Lynda Budiman
Brandon Cabot
Chad Carmack
Matthew Cherry
Heath Cheung
Jeffrey Cohen
Brian Combs
Adam Coulon
Martin Czerep
Paul Deignan
Isaac Detrinidad
Addison Dunn
Peter Edelman
Kristopher Ezra
Timothy Fechner
Ryan Foley
Nathaniel Forton
Kristopher Fransen

Ryan Garecht
Clara Garman
Daniel Glover
Benjamin Goldman
Elizabeth Grilliott
Derek Grohnke
Russell Hammer
Lauren Hansen
Christopher Hartman
Christopher Heims
Paul Hubbard
Christa Humbert
Michael Iwanicki
William Kamizeles
Brent Kam-Young
Brandon Kan
Kyle Kennedy
Katie Kortum
Nicholas Kuczera
Richard Lange
Sarah Lindsey
Jason Liu
Adam Loesch
Timothy Maes
Devin Mahoney
Aaron Martin
Ryan Mayer
Phillip Mazurek
Ian Meginnis
Luke Mitchell
Andrew Moenter
Alex Mondal
Shane Mooney
Collin Morgan
Michael Mueterthies

Steven Murphy
Kamawana Mwara
Murugan Palaniappan
Niraj Patel
Bryce Petersen
Brien Piesol
James Polivka
Frank Prior
Kevin Quach
Zachary Ramey
Travis Ramp
Andrew Rettenmaier
Kevin Ruhs
Todsadol Rungswang
Jacob Schaefer
John Schutzius
Christopher Simpson
Jeremy Smith
Andrew Smith
David Smith
Hwan Song
Christopher Spreen
Isaac Steffen
David Stone
Victor Strimbu
Stephanie Sumcad
Richard Tayek
Charles Tytler
Christopher Uberti
Jonathan Van Horn
Jeremy Voigt
Nicholas Walls
Jeremy Wightman
Cody Williams
Eric Williams
Mo Jern Wong
Di S. Xiao

MS

Rebecca Baker
Dean Bryson
Anthony Cofer
Kara Cunzeman
Yuchuan Deng
Arnab Ganguly
Jonathan Goodsell
Nico Gross
Venugopal Gudimetia
Jacob Haderlie
Bonil Ku
Stephan Lehner
Wai-chak Luk
James Manimala
Chandra Martha
Kota Mikoshiba
Jeremy Nabeth
Ken Nakasugi
Yasaswi Narasimha
Murthy
Patrick Nguyen Huu
Erik Nishida
Kyle Noth
Thomas Pavlak
Lucas Robinson
Olav Saboe
Mansi Shah
Justin Slaby
James Spitler
Isaac Tetzloff
Deepak Thirumurthy
Ian Thompson
Tatiana Vazuero
Escribanto
Brandon Walsh-Reed
Andrew Weaver
Matthew Wierman
Torrence Wilson

Ph.D. degrees

AUGUST

Matthew Borg
Matthew Churchfield
Hsin-Haou Huang
Hogirl Jung
Kristin Gates
Nicholas Nugent
John Tsohas

DECEMBER

John Foster
Liaquat Iqbal
Jinhua Li
Mohammad Uddin

MAY

Kuan-Hua (Joseph)
Chen
Suvanit Chitsiriphanit
Daniel Grebow
Bhawesh Kumar
Yu Matsutomi
Martin Ozimek
George Pollock

STUDENT *awards*

Herbert F. Rogers Award

Ian Meginnis

Warren G. Koerner Scholarship

Christopher Heims, Alex Lucky,
Jessica Powell, Yuray Rodriguez

Magoon Award Winners

Venkatraman Ayyaswamy,
Ebenezer Gnanamanickam,
Kyle Herwig, Kevin Kloster,
Christopher Patterson,
George Pollock, Shae Williams

Committee for the Education of Teaching Assistants - CETA Teaching Award

Ebenezer Gnanamanickam,
Kevin Kloster

Graduate Excellence in Teaching Award

George Pollock

Outstanding Service Award

Robert Manning

David O. and Linda Schimmel Swain Scholarship

Robert McCabe, Aamod Samuel,
Itanza Wright

Purdue Forever Fellowships

Diane Craig Davis, Erick Dambach,
George Pollock, Robert Manning,
George Wawrzyniak

The Marc Christopher Weaver Memorial Scholarship

Sarah Arnac, Rebecca Johanning,
Eric Meier

Orrin Arthur Austin Memorial Scholarship

Alex Jordan

David L. Filmer Scholarship

David Replogle

Arthur S. Remson Memorial Scholarship

Cory Davis, Paul Frankes

Zonta Fellowship

Diane Craig Davis

Peter Mueller Memorial Scholarship

Katherine Brumbaugh

Andrea Chavez Scholarship

Jessica Powell

Boeing Scholars

Nathaniel Forton, Even Helmeid,
Mark Lefebvre, Laura, Managan,
Daniel O'Brien, Nicholas Stallings,
Zachary Stratton

Robert and Totsye Winslow Scholarship

Anthony Braun, Drew Crenwelge,
Galen Harden, Collin Weir

Space Shuttle Memorial Scholarship

Sarah Lindsey

Bilsland Dissertation Fellowship

Robert Manning, Joseph Gangestad

Outstanding Co-Op Award NASA Johnson Space Center

Randy Eckman

Outstanding Co-Op Award NASA Johnson Space Center

Ian Meginnis



The Outstanding Senior Award

Each year the Aeronautics Honorary Society, Sigma Gamma Tau, sponsors the outstanding senior award. The nominees are selected by the faculty, and the Outstanding Senior is selected by a student vote. Congratulations to **Stephanie Sumcad**.

Winners of the ATK AAE 251 Thiokol Propulsion S.P.A.C.E. Awards

First Place Team

*Pictured with
Dave McGrath*

Braden Anderson
Andrew Angellotti
Alaina Austin
Katie Belesky
Derek Berg
Quyen Tong



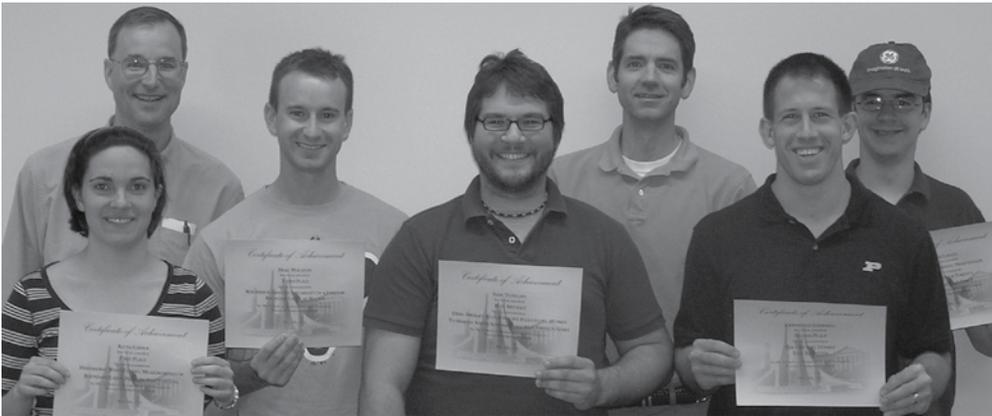
First Place Team Winners of the AAE 251 fall 2009

*Pictured with
Dave McGrath*

Cassandra Sands
Daniel Jones
Saviero Rotella
Nandagopal
Sathyamoorthy
Christopher Schwall
Stuart Shippee
Robert Shoemaker



*Courtney
McManus*



(L-R) Katya Casper, Prof. Steve Schneider, Brad Wheaton, Isaac Tetzloff, Prof. William Crossley, Johnathan Goodsell, Adam Loesch

AAE Research Symposium

The 2009 AAE Research Symposium Series awards are given to recognize excellence in technical presentation skills.

First place - **Katya Casper**

"Hypersonic Wind-Tunnel Measurements of Boundary-Layer Pressure Fluctuations"

Second place - **Jonathan Goodsell**

"The off-Axis Tensile Test Revisited"

Third place - **Brad Wheaton**

"Roughness-Induced Instability in a Laminar Boundary Layer at Mach 6"

Best undergraduate presentation - **Adam Loesch**

"CFD Analysis of Purdue's Two-Second Drop Tower"

Best Abstract - **Isaac Tetzloff**

"Using Aircraft Allocation and Fleet-Level Metrics to Analyze NASA's Subsonic Fixed Wing Emission Goals"

The Research Symposium Series is a department-sponsored forum for graduate students and advanced-level undergraduates to present their research to a general audience. Feedback is provided to all presenters both by the audience and symposium judges. This symposium has been held each week during the Fall Semester for the past 8 years.

PhD student attends the International Space University – Summer 2010

Amanda Knutson, a PhD student in ASA (Astrodynamics and Space Applications) was selected to attend the International Space University (ISU) - Space Studies Program (SSP).

The nine week program ran from June 26, August 28, 2010 and took place in Strasbourg, France. Amanda is one of ten students sponsored by the Canadian Foundation for the International Space University (CFISU).

The International Space University provides training to the future leaders of the emerging global space community. In its two-month Space Studies Program (SSP), ISU offers a unique Core Curriculum covering all disciplines related to space programs and enterprises – space science, space engineering, systems engineering, space policy and law, business and management, and space and society. The program also involves an intense student research Team Project providing international graduate students and young space professionals the opportunity to solve complex problems by working together in an intercultural environment.

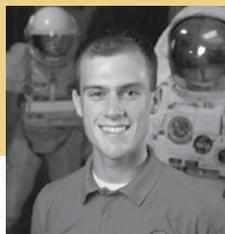


School of Aeronautics and Astronautics Outstanding Graduate Student – Martin Ozimek



Plaque presented by Prof. Kathleen Howell

School of Aeronautics and Astronautics Outstanding Senior – Ian Meginnis



Diane Craig Davis was invited to participate in the Women in Aerospace Symposium at Massachusetts Institute of Technology in October



Congratulations to the 2010 Summer Research Grant Winners

Congratulations to Navindran Davendralingam, Aurelie Heritier, Lucia Irrgang, and Shae Williams on receiving the 2010 Summer Research Grant!

This is a grant that provides two months of thesis research support for doctoral students who have been exclusively teaching during both of the preceding academic semesters.



Navindran Davendralingam



Aurelie Heritier



Shae Williams



Lucia Irrgang



Dr. Michael Smith, Dr. Kathleen Howell and Dr. David Filmer

Purdue SEDS Spring Space Forum 2010



The Purdue Chapter of Students for the Exploration and Development of Space (SEDS), held the Spring Space Forum 2010 on April 6th, in the Loeb Playhouse.

This year's speaker was **Dr. Michael Griffin**, the Former Administrator of NASA (2005-2009). Dr. Griffin holds seven degrees in many different subject areas including, Physics, Aerospace science, Aerospace Engineering, Electrical Engineering, Applied Physics, Business Administration, and Civil Engineering.

Dr. Michael Smith from the Department of History, **Dr. Kathleen Howell** and **Dr. David Filmer** from the School of Aeronautics and Astronautics acted as panel members. He spoke to a large audience about the future of space flight and America's lead in the Aerospace industry.



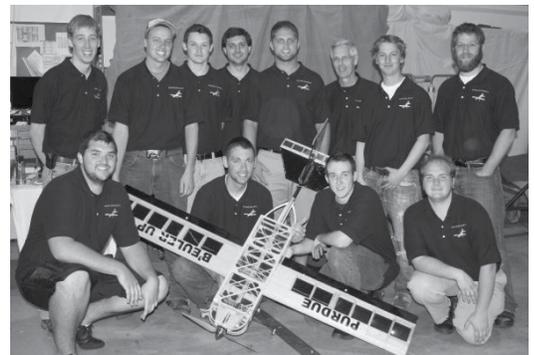
(L-R) Dr. James Longuski, Dr. David Filmer, Dr. Barrett Caldwell, Kelly Man, Dr. Mike Griffin, Kevin Bonanne, Dr. Kathleen Howell, Rich O'Connor, Mr. Al Diaz, Brendon Mueller, Bill O'Neil, Dr. Tom Shih, Dan Kolenz, and Alexander Roth,

Event photos courtesy of Allen Yan

Congratulations to the 2009-2010 DBF Team finishing 3rd!

The 14th annual AIAA Cessna/Raytheon Missile Systems Student Design/Build/Fly Competition was held April 16-18th at Cessna AirField in Wichita, Kansas, hosting 69 teams.

The Purdue team of Neal Allgood (TA for the course), Shane Hartman, Bill O'Neill, Nickolai Belakovski, Eric Williams, Dr. John Sullivan (Course Instructor), Tim Maes, Nick Setar, Brandon Cabot, John Schutzius, Frank Prior, and James Polivka placed 3rd out of the 69 teams.



Student Leadership Council



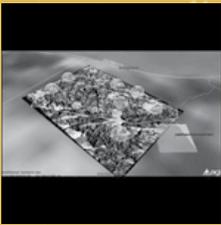
The Student Leadership Council (SLC) is an initiative started by head of school Dr. Tom Shih at the start of fall semester 2009. The Council is formed by presidents of student organizations connected with the School of Aeronautics and Astronautics and meets on a monthly basis.

It is Dr. Shih's intent to provide AAE students with the best possible education and the SLC helps with issues or concerns between students, faculty and the school. It was also an excellent opportunity for each student organization to know what events were happening within both the school and with rest of the student organizations.

Various topics have been discussed over the school year including peer tutoring with all student organizations volunteering to tutor; mid-term course evaluation; class officers as student representatives; numbers of available computers; space in the student lounge and study areas; and lockers for students, which have now been installed.

The student organizations represented are:

Aeronautical and Astronautical Engineering Student Advisory Council (AAESAC)
American Institute of Aeronautics and Astronautics (AIAA)
Aero Assist
Purdue Solar Racing
Purdue Space Day (PSD)
Purdue Student Hybrid Rocket
Students for the Exploration and Development of Space (Purdue SEDS)
Sigma Gamma Tau (SGT)



AAE 590 Systems-of-Systems modeling and Analysis graduate class team wins first place

Congratulations to the ISR Firefighting team, led by team captain Shashank Tamaskar for winning 1st place in the spring 2010 AGI University Grant Competition!

The team developed a complex simulation incorporating multiple wildfire surveillance assets applied to an area in Southern California. MATLAB was used to drive STK in a system-of-systems simulation, attempting to optimize a set of system design parameters.



AAE Graduate Student, Daniel Grebow, Selected by NASA to Attend IAC 2009

Daniel Grebow was selected, as one of only ten graduate students nationwide, as a NASA student representative to the 2009 International Astronautical Congress (IAC) in Daejeon, South Korea.

An event sponsored by the International Astronautical Federation, the Congress was held October 12-16, 2009 with a theme: "Space for Sustainable Peace and Progress." Dan presented a paper at the Congress and participated in a number of events including a meeting between students and senior agency representatives from the different worldwide space agencies who were attending the IAC in Daejeon.



Congratulations to Mar Vaquero, Department of Foreign Languages and Literatures 2010 Excellence in Teaching Award Winner

Mar is a Teaching Assistant for Spanish and is finishing her Master's Degree under Prof. Kathleen Howell. Mar is a Teaching Assistant for Spanish and is finishing her Master's Degree under Prof. Kathleen Howell.

This award recognizes outstanding teaching assistants and instructors in the Department of Foreign Languages and Literatures. Congratulations Mar on your dedication to enhancing the undergraduate education through your teaching.

STUDENT *awards*

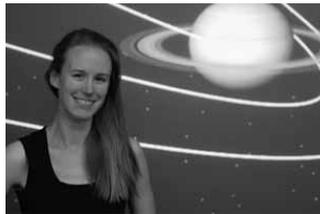
Zonta International 2010

The Zonta International Amelia Earhart Fellowships were established in 1938 in honor of Amelia Earhart, famed pilot and Zonta club member. The Fellowships are granted annually to women pursuing graduate Ph.D./doctoral degrees in aerospace-related sciences and aerospace-related engineering. The Fellowship of US\$10,000, awarded to 35 Fellows around the globe each year, may be used at any university or college offering accredited post-graduate courses and degrees.

The School of Aeronautics and Astronautics is delighted that three doctoral students have been awarded this Prestigious Fellowship.

Diane Craig Davis is a currently a PhD student in School of Aeronautics and Astronautics Engineering at Purdue. After receiving an MS degree from the University of Texas, Diane went on to work in the Navigation Section at NASA's Jet Propulsion Laboratory for three years. She received recognition and awards for her contributions in support of numerous spacecraft missions including Mars Express and Genesis.

Diane's field of study for her PhD program in AAE at Purdue is interplanetary spacecraft trajectory design and mission planning. Her main focus is on the development of a strategy that incorporates multiple gravity fields and facilitates the design of spacecraft trajectories in these complex dynamical regimes. She has participated in research to support the Cassini mission as well as other flight proposals.



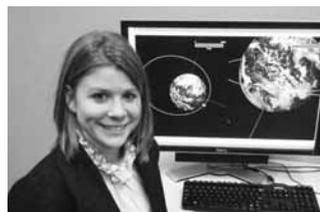
Farhana Pervin, a graduate research assistant working with Dr. Weinong Chen has been awarded the prestigious Zonta International Amelia Earhart Fellowship for the second time. She was a previous recipient of this award in 2007.

She received her BS degree in Mechanical Engineering from Bangladesh University of Engineering and Technology. She then joined the Tuskegee University Center for Advanced Materials Lab as a research assistant to pursue her MS degree in Mechanical Engineering in 2004.

Farhana moved to Purdue to continue her education as a PhD student with her research field mechanics of biological tissues. She developed experimental technique to conduct high impact test on soft materials. Her main focus is to study the dynamic behavior of brain tissues at high strain rate to assess the traumatic brain injury (TBI).



Amanda Knutson is a Ph.D. student working under the guidance of Dr. Kathleen Howell. Amanda earned her B.Sc. degree (May 2005) in Mechanical Engineering at Queen's University, in Kingston, Ontario, Canada. She continued her studies and received her M.Sc. degree (May 2008), also in Mechanical Engineering at Queen's, where she specialized in the area dynamic modeling. Amanda began her Ph.D. studies at Purdue in the fall of 2008, and her field of research is astrodynamics, with her focus in the area of attitude dynamics and mission design.



Aurelie Heritier Selected for 2009 Space Science Program in Austria: "Exoplanets: Discovering and Characterizing Earth Type Planets"

AAE graduate student Aurelie Heritier was one of only 60 young science and/or engineering students and graduates worldwide selected for this program.

AAE graduate student Aurelie Heritier was selected for and attended the 2009 Alpbach space science and space technology program.

Organized by the Aeronautics and Space Agency of Austria and co-sponsored by the European Space Agency (ESA) and the national space authorities of its member and cooperating states, the space science and technology program is open to 60 selected young science and/or engineering students and graduates from among the member and cooperating states of ESA.

Participants are given the opportunity to expand and strengthen their knowledge of selected space issues. This year, the focus was innovative mission concepts aiming to increase our knowledge of extrasolar planets. Such future missions will increase the number of known planetary systems and add to knowledge of the physical characteristics of the planets themselves. A particular emphasis was Earth-like planets in the habitable zone of other stars since these planets could harbor life.

Aurelie and her group designed a mission to place an astrophysical observatory in an orbit near the Sun-Earth L2 libration point.



The AIAA Regional Student Conference

with keynote speaker
**Dr. Allen S. Novick, BSAE'65,
MSAE'67, PhD'72, OAE'06, DEA'06**

The AIAA Student Conference for Region III was hosted by the Purdue Chapter of AIAA and the School of Aeronautics and Astronautics at Purdue April 10-11.

The conference consisted of several events which included an information session, opening remarks, and technical sessions, tours of both the Purdue Airport facilities as well as Zucrow Labs in West Lafayette, an evening banquet with keynote speaker **Dr. Allen S. Novick**, and luncheons and awards banquet.

This year's conference consisted of four competitions: an undergraduate presentation and technical paper category; a master's presentation and technical paper category; an undergraduate presentation only category; and a master's presentation only category.

The conference began with an information session conducted by conference sponsor Aero Engine Controls on Friday, April 9, evening before the conference which provided the opportunity for attendees to learn about the company.

Opening remarks took place Saturday morning, April 10, during which the School of Aeronautics and Astronautics Department Head, Dr. Tom Shih, welcomed all attendees.

Tours of the Purdue Airport and Zucrow Labs was held Saturday afternoon following the conclusion of the technical sessions. Saturday evening there was a banquet dinner featuring keynote speaker Dr. Al Novick who spoke about the aircraft Gas Turbine industry as it is today and the future challenges that the industry faces. Additionally, he provided a review of significant events that might have inspired some students/alumni to pursue a career in Aerospace and also provide some comments as to being successful in their careers.

Technical presentations recommenced Sunday morning, April 11. A luncheon was then held in Armstrong Hall followed by the awards ceremony. There were a total of 19 papers scored at the conference this year. With 7 of the papers in the graduate category, and 12 were in the undergraduate category.



DEAN BRYSON wins Best Paper Award at 51st AIAA/ ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference

Congratulations to **Dean Bryson** who presented "Aeroelastic Optimization of a Two-Dimensional Flapping Mechanism" - **Dean E. Bryson** and **Terrence A. Weisshaar** and **Richard D. Snyder** and **Philip S. Beran** Air Force Research Laboratory, Air Vehicles Directorate, Wright-Patterson AFB, OH at the 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference

The paper presents a new capability for 2D aeroelastic analysis of flapping micro air vehicles, integrating an unsteady vortex aerodynamics code developed by Dr. Rich Snyder of AFRL and a new structural model developed by Bryson. A gradient-based optimization of the structure was performed in a service-oriented framework to produce peak propulsive efficiency in forward flight. The results of the study highlight the importance of including aeroelasticity in flapping MAV analysis.

Dean was presented with the Jefferson Goblet for Outstanding Student Paper Award. The finalists were selected from approximately 60 papers with the 5 finalists presenting in a special session.

AeroGRAM

School of Aeronautics & Astronautics

Purdue University

Neil Armstrong Hall of Engineering

701 W. Stadium Ave.

West Lafayette, IN 47907-2045

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There are many ways for you to stay involved with our school. Please keep us posted on where you are and what you are doing using the Update Alumni Records page from our Alumni section of our web site at: <https://engineering.purdue.edu/AAE/AboutUs/Alumni/Update/AlumniRecords>

Alternatively, you can jot down personal news that you want to appear in the next edition of AeroGram or our E-newsletter the Aeroliner and either email it or send to the address below.

Our goal is to keep you abreast of the activities in the School of Aeronautics and Astronautics and across Purdue University. We hope that you find this information useful and relevant. We want to keep in touch with all our alumni and friends. Information provided by you is used to deliver up-to-date news and other information. We will not share your information with any other person or organization.

We can be contacted at the following email address:

aae-alumni@ecn.purdue.edu

Or by mail at:

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AeroGRAM

A newsletter published for the alumni and friends of the School of Aeronautics & Astronautics

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