

**Purdue's School
of Aeronautics
and Astronautics
Graduates**

**Play Key Role
in NASA's Orion
Program**



LETTER FROM THE AAE HEAD

Tom I-P. Shih

It is a pleasure to share in this *AeroGram* some of the events and accomplishments during this past year at the School of Aeronautics and Astronautics (AAE) and at our College and University. On visions for the aerospace sector, AAE was honored to have had Major General Thomas Masiello speak on “National Defense Strategy: the Role of Science and Technology” at the Charles Rolls and Henry Royce Memorial Lecture held at Purdue on Oct. 8, 2014. AAE was also honored to have had President Mitch Daniels engage William Gerstenmaier, NASA associate administrator and AAE alumnus, on human space exploration at a Purdue forum held on Feb. 23, 2015. This is a continuation of the National Academy of Science’s committee on “Pathways to Human Space Exploration” that our president co-chaired.

Purdue’s rich history in space was recognized on Nov. 21, 2014 when the Purdue Libraries received a gift of the Neil A. Armstrong papers from Carol Armstrong, where Gene A. Cernan, the most recent man on the moon – also a Purdue alumnus – attended. The richness of that history continued in early Dec. 2014 with the successful Orion mission, where more than 60 engineers who worked on this mission at NASA, Lockheed Martin, and Honeywell are Purdue graduates, including the top program managers at NASA in Bill Gerstenmaier, Dan Dumbacher (now AAE Professor of Practice), Mark Geyer, and Julie Kramer White.

On diversity and inclusion, Dean Leah Jamieson was at the White House on July 9, 2015 for a roundtable discussion on ways to increase involvement of women and under represented minority (URM) students in STEM fields. Also, I had the privilege to speak on the subject at a plenary panel on “Diversity & Inclusion in the Aerospace Workforce” at the 2015 AIAA SciTech on Jan. 8, 2015. As of May 1, 2015, Purdue’s freshman engineering class is seeing its largest enrollment of URM students ever at 155 and counting! Excellence in this area has our highest priority.

To contain the cost of higher education, President Mitch Daniels again froze tuition to show Purdue’s commitment to this important matter. Even with the tightening of the budget, Purdue is committed to the College of Engineering’s strategic growth under Dean Leah Jamieson’s leadership. During this past year, four pre-eminent teams were selected from 27 that competed. One of the winning teams was led by AAE faculty Sergey Macheret, which seeks to develop breakthrough technologies in “cold” plasma for applications in aerodynamics, reconfigurable RF electronics, and food and medical technologies. Also, the college recruited 40+ outstanding faculty members. AAE is delighted to welcome five new faculty members who will start in the 2015 Fall Semester: Shaoshuai Mou, Jonathan Poggie, Alex Shashurin, Carson Slabaugh, and Tyler Tallman.

To further strengthen education, research, and engagement, Purdue received \$40 million from the Lilly Endowment on Feb. 18, 2015, where \$5 million has been allocated to expand the Maurice J. Zucrow Labs, one of the nation’s leading propulsion laboratories, led by AAE faculty, Steve Heister. On Feb. 24, 2015, AAE announced the formation of an industry consortium to support AFRL’s multi-university Center for Integrated Thermal Management of Aerospace Vehicles (CITMAV). The initial members of this consortium are Boeing, Honeywell, Lockheed Martin, and Rolls-Royce. On June 23, 2015, Purdue broke ground on the Indiana Manufacturing Institute at the Purdue Research Park, which will house the Design, Modeling and Simulation Enabling Technology Center to support the \$259M Institute for Advanced Composites Manufacturing Innovation – an institute for the nation – led by R. Byron Pipes – a faculty with an appointment in AAE.

On AAE alums, we are delighted that Ronald & Kathleen Kerber and James & Sherry Raisbeck received the Pinnacle Award from President Mitch Daniels and that Raymond Cosner and Anthony Thornton won the Distinguished Engineering Alumni Award from the College of Engineering. AAE had the privilege to honor nine of our distinguished alums at our annual Outstanding Aerospace Engineer banquet. Finally but not least, we thank our loyal alums for this year’s incredibly successful Purdue Day of Giving, where an astounding \$13,695,951 was raised in 24 hours!

Though Purdue created an aero club in 1910 and taught aero courses as early as 1921, our school did not become an independent department until 1945. Thus, we are celebrating our 70th anniversary this year. On Oct. 7, 2015, a forum on the Future of Aerospace will be held for our students, faculty, and staff in conjunction with our school’s IAC and SAC board meetings and our annual Research Symposium for our industry affiliate members.

In this *AeroGram*, you will read more about the aforementioned plus the many awards and honors won by our distinguished faculty, our outstanding students, and our accomplished alums. As we reflect on the year, our students, faculty, and staff are so grateful to our alums and friends in so many ways. Please keep in touch and share your news in future publications. We welcome your visit any time and would be pleased to show you the exciting things happening at Purdue.

Hail Purdue!

Tom I-P. Shih
Professor and Head

AEROGRAM Fall 2015

AEROGRAM

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Editor

Jennifer E. Merzdorf

Photos

Lisa M. Crain
Jennifer L. LaGuire
Jennifer E. Merzdorf

Design and Layout

Dawn Minns, Uppercase Design

Please send inquiries to:

Rita L. Baines
Director of Development
Purdue University
School of Aeronautics & Astronautics
Neil Armstrong Hall of Engineering
701 W. Stadium Ave.
West Lafayette, IN 47907-2045

Phone

(765) 494-9124

Fax

(765) 494-0307
E-mail: rlbaines@prf.org

Website

<https://engineering.purdue.edu/AAE>

Facebook

<https://www.facebook.com/PurdueAeroAstro>

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On the Cover

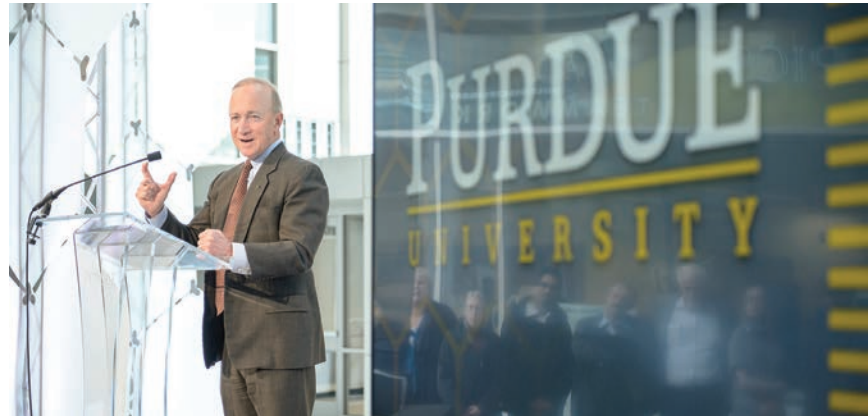
NASA's successful launch of Orion EFT-1 highlights contributions from AAE alumni/alumnae. See story on p. 10.

Letter from the AAE Head	2
\$40 million Lilly Endowment	4
Gift of Neil Armstrong (BSAE'55, DEA'67, HDR'70, OAE'99) Papers	5
\$259 Million IACMI Partnership	5
A Presidential Forum on Space Exploration	6
FAA Center of Excellence – PEGASAS	6
Zucrow Labs Set to Expand	7
Purdue Team Selected for NIST AMTech Consortia	7
Center for Integrated Thermal Management (CITMAV)	8
Pre-eminent Team on Cold Plasmas	8
Rolls-Royce Memorial Lecture	9
AAE Graduates' Role in the Orion Program	10
Six AAE Undergrads Attend Orion Launch	11
Industrial Advisory Council	12
Steering Advisory Council	13
Young Professionals Advisory Council	13
Purdue Space Day 2014	14
Purdue Space Day wins Outstanding Program Award	15
2015 Distinguished Engineering Alumni	16
Welcome to AAE's New Academic Advisor	16
NASA X-31	17
AAE Outreach to Minority Engineering Program	17
2014 Outstanding Aerospace Engineer Awards	18
Class Notes	20
Alumni Travel the World	22
Charlie Bock (BSAE'49) Visits AAE	22
Mark Polansky participates in Old Masters Program	23
Do you know these people?	23
AAE Celebrates 70 Years as an Independent School	24
Jose Guzman (BSAAE'93, MSAAE'95, PhD'01) Visits AAE	26
Mark Brave (BSAAE'73) Receives Hall of Fame Award	26
Pinnacle Award	27
Swains Endow Scholarship	27
Letter from Director of Development	28
New Faculty	29
Dr. C.T. Sun to Retire	29
Faculty List	30
Purdue Team Discovers New Crater	31
Excellence in Research Awards	31
Dr. Howell Inducted into Teaching Hall of Fame	32
Dr. Chen ratified as named professor	32
Purdue trustees approve faculty promotions	32
Elmer F. Bruhn Teaching Award	33
C.T. Sun Excellence in Research Award	33
W.A. Gustafson Award for Outstanding Teaching	33
Dr. Tomar Develops New Analytic Technology	33
Faculty Awards	34
Dr. Marais and Her Design Teams	34
Professor Drake Seeks Updates	34
Books by AAE Professors	35
Dr. Weisshaar receives NATO Award	35
Dr. Melosh Wins the 2014 McCoy Award	35
Congratulations to the Graduates	36
Student Awards	36
Students Research Green Propellant	41
ATK Winners	42
AAE Research Symposium Series	42
AAE 418	44
AAE 450	45
AAE 535	45
Keep in Touch	48

Crowd assembled in Kurz Atrium, Neil Armstrong Hall of Engineering (Photo provided by Charles Jischke, Purdue University Marketing & Media)



\$40 Million Lilly Endowment to Fund High-Tech Initiatives Including Expansion of the Zucrow Labs



Purdue University President Mitch Daniels (Photo provided by Charles Jischke, Purdue University Marketing & Media)

The biggest cash donation in Purdue University's history was announced on Wednesday, February 18, 2015 in the Kurz Atrium of the Neil Armstrong Hall of Engineering. A \$40 million Lilly endowment will support five transformative projects in the College of Engineering and the Purdue Polytechnic Institute to foster groundbreaking research, expand high-tech job growth throughout Indiana and nationally, and enhance opportunities for students.

One of the five projects funded at \$5 million is the expansion of the **Maurice J. Zucrow Labs**, a joint research facility of the School of Aeronautics and Astronautics and the School of Mechanical Engineering with Steve Heister, the Raisbeck Distinguished Professor for Engineering and Technology Integration, as the director.

The Zucrow Laboratories house the nation's leading and largest university propulsion laboratory. It has the capability to conduct research on liquid-propellant rockets and gas-turbine engines at engine-relevant temperature, pressure, and flow conditions. The Laboratory's capability also enables research on unsteady aerodynamics of turbo machinery, aeroacoustics, combustion instability, particle flow heat transfer, and fuel-spray atomization processes. Originally developed in 1964 as part of the Apollo space program, the Labs will be expanded to include five new test cells and a laser diagnostics lab.

Expansion of Zucrow Labs will significantly increase research capability and enable more opportunities for collaborations with government and industry as well as expand entrepreneurial relationships.

Sara B. Cobb, vice president of education for Lilly Endowment (Photo provided by Charles Jischke, Purdue University Marketing & Media)





Carol Armstrong, wife of the late Neil Armstrong. (Photo provided by Charles Jischke, Purdue University Marketing & Media)



Purdue alumnus astronaut Gene A. Cernan, the most recent person to walk on the moon. (Photo provided by Charles Jischke, Purdue University Marketing & Media)

Purdue Libraries celebrates gift of astronaut alumnus

NEIL A. ARMSTRONG (BSAE'55, DEA'67, HDR'70, OAE'99) PAPERS

Purdue University recognized Carol Armstrong on Friday, November 21, 2015 for the gift of papers valued at more than \$3.4 million from her late husband, **Neil A. Armstrong** (BSAE'55, DEA'67, HDR'70, OAE'99), the first person to step on the moon.

Carol Armstrong, along with alumnus astronaut Gene A. Cernan, the most recent person to walk on the moon, attended a private event honoring the gifts at the Purdue Libraries' *Virginia Kelly Karnes Archives and Special Collections Research Center*.

Neil Armstrong, a 1955 Purdue School of Aeronautics and Astronautics graduate, began donating personal papers to the Purdue Libraries' Division of Archives and Special Collections in 2008 after carefully considering repository options, said Sammie Morris, head of the Archives and Special Collections Division and associate professor.

"Neil carefully interviewed us to be sure the papers would not sit in storage, but rather be made available for scholarly research and access to students," Morris said.

While Armstrong donated a portion of his artifacts and papers before his death in 2012, Carol has since given the bulk to Purdue Libraries per his wishes. The papers span Armstrong's lifetime and have undergone archival processing. The collection is now part of the *Barron Hilton Flight and Space Exploration Archives* and is open for scholarly research.

To learn more about the Neil Armstrong papers, visit:

<http://www.purdue.edu/newsroom/releases/2014/Q4/purdue-libraries-celebrates-gift-of-armstrong-papers.html>.

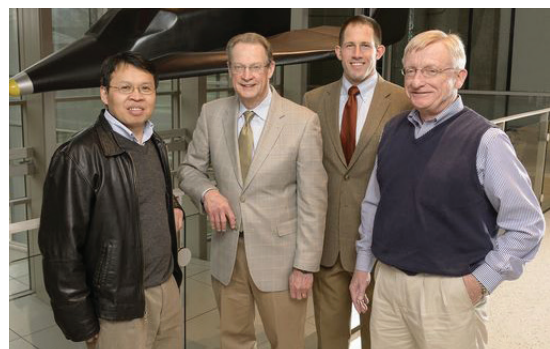
\$259M partnership aims to advance manufacturing of composites

Purdue University is part of a team selected by the U.S. Department of Energy to lead a five-year, \$259 million initiative to develop new low-cost, high-speed, and efficient manufacturing and recycling process technologies that will promote widespread use of advanced fiber-reinforced polymer composites. The **Institute for Advanced Composites Manufacturing Innovation (IACMI)** is a multi-state research effort comprised of centers located in primarily Midwestern states, where about 70 percent of U.S. auto production and more than 700 composite companies are headquartered.

As part of the IACMI initiative, the Indiana-based **Design, Modeling, and Simulation Enabling Technology Center** directed by **Dr. R. Byron Pipes**, the John Leighton Bray Distinguished Professor of Engineering, will offer modeling and simulation tools to help address the need to shorten the development cycle and decrease the cost of composites manufacturing while allowing more time for innovation throughout the entire supply chain. The Design, Modeling, and Simulation Technology Center will develop and launch the Composites Virtual Factory HUB (cvfHUB) to deploy and integrate simulation tools that capture the manufacturing phenomena under development in the other IACMI centers of excellence.

In addition to Dr. Pipes, team members at Purdue are **Dr. Wenbin Yu**, Associate Professor of Aeronautics and Astronautics; **Dr. Johnathan Goodsell**, Visiting Assistant Professor of Aeronautics and Astronautics; and **Ronald Steuterman**, the Center's managing director.

The multistate initiative will include a consortium of university researchers, manufacturers, national laboratories, and state and local government agencies. The research institute will work with materials that have a very high impact in many industries such as aerospace, aviation, automotive, energy, and sporting equipment.



Pictured, from left: School of Aeronautics and Astronautics Wenbin Yu, associate professor; R. Byron Pipes, engineering professor who is leading Purdue's research; Johnathan Goodsell, visiting assistant professor; and Ronald Steuterman, the center's managing director.

(Photo provided by John Underwood, Purdue University)



Purdue President Mitch Daniels (left) and NASA's William Gerstenmaier (right) discuss human space exploration on Feb. 23, 2015. (Photo provided by Charles Jischke, Purdue University Marketing & Media)

Purdue President Mitch Daniels and NASA official William Gerstenmaier (BSAAE'77; OAE'03; DEA'07) discuss human space exploration

Purdue University President Mitch Daniels and NASA associate administrator for the Human Exploration and Operations Directorate **William Gerstenmaier** (BSAAE'77; OAE'03; DEA'07) discussed human space exploration on February 23, 2015 during a public conversation in Stewart Center's Fowler Hall. As part of the conversation, Daniels and Gerstenmaier addressed questions relating to U.S. human space exploration, its rationales, and approaches.

Gerstenmaier is involved in the operation and utilization of the International Space Station and the development of the Space Launch System and the Orion spacecraft. He gives strategic guidance and direction to the commercial crew and cargo programs that will provide logistics and crew transportation for the International Space Station.

The conversation was a continuation of Daniels' work on the National Academy of Sciences "Pathways to Human Space Exploration" report, which examined the goals of the U.S. human spaceflight program and offered recommendations for a sustainable program moving forward. Daniels co-chaired the committee that produced the report and testified before a U.S. House of Representatives committee about the subject.



President Mitch Daniels, NASA's William Gerstenmaier, College of Engineering Dean Leah Jamieson, and AAE Head Tom Shih gather in Fowler Hall after the President's Conversation. (Photo provided by Charles Jischke, Purdue University Marketing & Media)



FAA Center of Excellence for General Aviation: PEGASAS

PEGASAS, the FAA Center of Excellence for General Aviation headed by AAE faculty, Professor William Crossley, continues its overarching mission to enhance general aviation safety, accessibility, and sustainability by partnering the FAA with a national network of world-class researchers, educators, and industry leaders. Also assisting with research and testing at the Center is AAE associate Professor Karen Marais.

PEGASAS views research as a truly collaborative effort. Nearly all research projects have been performed by a partnership of principal investigators from multiple universities. PEGASAS is able to accomplish this collaboration by fully understanding each university's individual core strengths supported by strong collegial working relationships.

Collaborating Universities

CORE UNIVERSITIES

Florida Institute of Technology
Georgia Institute of Technology
Iowa State University
The Ohio State University
Purdue University
Texas A&M University

AFFILIATE UNIVERSITIES

Arizona State University
Florida AMU
Hampton
Kent State University
North Carolina A&T
Oklahoma State
Southern Illinois University, Carbondale
Tufts University
University of Minnesota, Duluth
Western Michigan University



Maurice J. Zucrow Laboratories set to expand propulsion and combustion research

WRITTEN BY EMIL VENERE

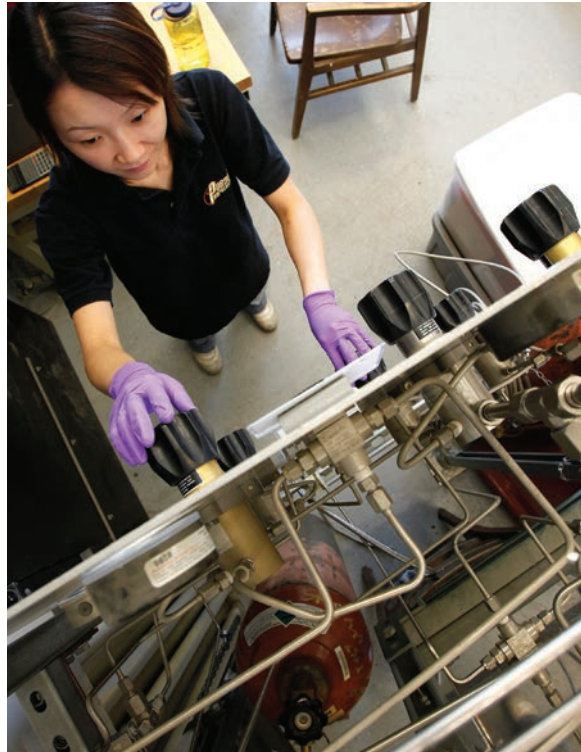
Purdue University is expanding the nation's leading and largest university propulsion laboratory for research aimed at reducing fuel consumption and emissions for next-generation jet engines. The expansion at the Maurice J. Zucrow Laboratories includes new test cells to support laser-based measurements in a building to be constructed adjacent to Zucrow's high-pressure lab. Developed in 1964 as part of NASA's Apollo program, the high-pressure lab houses research sponsored by aerospace companies — NASA, the U.S. Air Force, and other agencies. Industry collaborators have included GE, Rolls-Royce, and Siemens.

Propulsion research at Zucrow is a collaborative effort between the School of Aeronautics and Astronautics (AAE) and the School of Mechanical Engineering (ME), and is led by AAE faculty — **Dr. Stephen Heister**, the Raisbeck Distinguished Professor for Engineering and Technology Integration. Other AAE faculty members in the Zucrow Labs are Professor **William Anderson** and Associate Professor **Timothee Pourpoint**. ME faculty include **Dr. Robert Lucht** (AAE by courtesy), the Ralph and Bettye Bailey Distinguished Professor of Combustion; Associate Professor **Nicole Key** (AAE by courtesy); and Professor **Steven Son** (AAE by courtesy).

The one-floor, 9,600-square-foot building will cost \$8.2 million. Construction is expected to begin in 2016 and take about a year to complete. Much of the cost — \$5 million — is coming from the Lilly Endowment Inc. as part of a \$40 million grant, the largest cash donation in Purdue's history. The project will also include renovations to the current high-pressure lab as well as additional office space for growing numbers of faculty and students.

The existing high-pressure lab includes two test cells, and each cell contains two test beds, meaning four separate experiments can be configured at the same time. One of the cells is for rocket testing. The other is for combustion research in turbine engines. The new building will house five test cells and allow companies to have their own research space, and will also have a 2,000-square-foot laser lab to study high pressure combustion, allowing Purdue to expand its laser-based research. The studies are enabling engineers for the first time to see what happens inside a jet engine's combustor, providing data to construct models to better simulate performance and improve designs.

Another upgrade is a new air heater, installed in January 2015. The system will heat air to as high as 1,500 degrees Fahrenheit at a pressure of up to 850 pounds per square inch. The new heater is critical to developing better jet engines, allowing experiments to operate under engine-relevant temperatures and pressures.



Dr. Yen Yu Matsutomi (PhD 2009) working in the Rocket Propulsion Facilities at Purdue Maurice Zucrow Laboratory. (Photo provided by Charles Jischke, Purdue University Marketing & Media)

Purdue Team Selected for NIST AMTech Consortia Program

Dr. Alina Alexeenko, AAE associate professor, is part of a Purdue University team selected for the National Institute of Standards and Technology (NIST) Advanced Manufacturing Technology Consortia (AMTech) Program.

Dr. Elizabeth Topp, head of the Department of Industrial and Physical Pharmacy and Dane O. Kildsig Chair in Industrial and Physical Pharmacy will serve as PI. Dr. Alexeenko will be Co-PI. Several other faculty members will be involved as senior personnel including Dr. Dan Hirleman, Chief Corporate and Global Partnerships Officer, as advisor; Dr. Michael Pikal, Pfizer Distinguished Endowed Chair in Pharmaceutical Technology and Professor of Pharmaceutics, as consultant; and Krannert and Food Science faculty participants.

The award is part of the U.S. Commerce Department's National Institute of Standards and Technology plans to help accelerate the growth of advanced manufacturing in the United States. The grants will support industry-driven consortia in developing research plans and charting collaborative actions to solve high-priority technology challenges.

The Purdue team is planning a kick-off meeting in early fall 2015. Learn more about the selection at: <http://www.nist.gov/amo/amt-planning-grants.cfm>.



Dr. Alina Alexeenko, School of Aeronautics and Astronautics associate professor.

Companies join research effort to launch industry consortium **CITMAV**

STORY BY PURDUE NEWS

Purdue University announced the formation of an industry research consortium as part of a national center to create temperature-control technologies for dynamic energy systems on aerospace vehicles. The Center for Integrated Thermal Management of Aerospace Vehicles (CITMAV), launched in 2014, is funded with \$1.5 million over three years from the Aerospace Systems Directorate of the U.S. Air Force Research Laboratory. The School of Aeronautics and Astronautics has led the creation of an industry consortium as part of that center. Each of the new industry partners will provide \$100,000 per year, nearly doubling the funding.

The new industry research consortium was announced on Tuesday, February 24, 2015 in the Kurz Atrium of the Armstrong Hall of Engineering. The initial industry members are Boeing Co., Honeywell International Inc., Lockheed Martin Corp., and Rolls-Royce Corp. "This consortium injects key industrial partners whose involvement is necessary to achieve the goals of the center," said **Dr. Tom Shih**, professor and head of the School of Aeronautics and Astronautics. He is a member of the research team led by **Dr. Timothy Fisher**, director of the center and James G. Dwyer Professor of Mechanical Engineering (AAE by courtesy).

The center's academic partners are the University of Illinois at Urbana-Champaign, Wright State University, University of Dayton, and University of Texas at Austin. CITMAV also includes Dr. Stephen D. Heister, director of Purdue's Maurice J. Zucrow Laboratories and the Raisbeck Engineering Distinguished Professor for Engineering and Technology Integration in Purdue's School of Aeronautics and Astronautics; Dr. Peter Bermel, an assistant professor in Purdue's School of Electrical and Computer Engineering; Dr. Andrew Alleyne, Ralph M. and Catherine V. Fisher Professor in the Department of Mechanical Science and Engineering at the University of Illinois; Dr. Jayathi Y. Murthy, the Ernest Cockrell, Jr., Memorial Chair in Engineering and chair of the Department of Mechanical Engineering at The University of Texas at Austin; Dr. John Doty, an associate professor in the Department of Engineering Management and Systems University of Dayton; Dr. J. Mitch Wolff, a professor, and Dr. Rory Roberts, an assistant professor, both in the Department of Mechanical and Materials Engineering at Wright State University.

"This consortium injects key industrial partners whose involvement is necessary to achieve the goals of the center."



Dr. Timothy Fisher, director of the center and **James G. Dwyer Professor of Mechanical Engineering**. (Photo provided by Matthew Thomas, Purdue Marketing & Media)



Dean Leah Jamieson, **John A. Edwardson Dean of Engineering**, **Ransburg Distinguished Professor of Electrical and Computer Engineering**. (Photo provided by Matthew Thomas, Purdue Marketing & Media)

Pre-eminent Team to Focus Research on **Cold Plasmas**



Dr. Sergey Macheret



Dr. Alina Alexeenko



Dr. Sally Bane



Dr. Timothy Fisher



Dr. Robert Lucht

Purdue University's College of Engineering has named four pre-eminent teams to focus on research ranging from drug delivery to nanomanufacturing. One of the four teams is headed by **Dr. Sergey Macheret** and comprised of two other School of Aeronautics and Astronautics faculty members: **Dr. Alina Alexeenko**; and **Dr. Sally Bane**. Other team members include **Dr. Timothy Fisher** and **Dr. Robert Lucht**, professors of Mechanical Engineering, faculty members in the School of AAE by courtesy; Dr. Allen Garner, Nuclear Engineering; Dr. Ahmed Hassanein, Paul L. Wattelet Professor of Nuclear Engineering & Head, School of Nuclear Engineering; Dr. Kevin Keener, Food Science; and Dr. Dimitrios Peroulis, Electrical and Computer Engineering.

The team will focus on Cold Plasmas: extreme density, low-temperature plasmas for electronics, aerospace, food science and biotechnology applications. Low-temperature plasmas (LTP) are weakly ionized gases that are being extensively used in fluorescent lights and in microchip fabrication. New ways of generating and controlling LTP could lead to new applications ranging from medicine and food processing to enhancing aerodynamics and propulsion performance of existing and future airplanes. The ability of plasmas to interact with electromagnetic waves, combined with controllability and "tunability" of plasma characteristics, could enable novel radio-frequency devices.

Charles Rolls and Henry Royce Memorial Lecture Series

The School of Aeronautics and Astronautics was honored to have had Major General Thomas J. "Tom" Masiello give the 2014 Charles Rolls and Henry Royce Memorial Lecture on October 8, 2014. His talk was entitled, "National Defense Strategy: The Role of Science and Technology." Dr. Tom Shih, AAE Head and Professor, gave opening comments and introduced Purdue University President Mitch Daniels who then presented General Masiello to the audience.

Maj. Gen. Masiello is the Commander, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. He is responsible for managing a \$4 billion science and technology program that includes both Air Force and customer funded research and development. He is also responsible for a global workforce of approximately 10,000 people in the laboratory's component technology directorates, 711th Human Performance Wing and the Air Force Office of Scientific Research.

Begun in 2002, The Charles Rolls and Henry Royce Purdue Memorial Lecture Series is presented by Rolls-Royce and Purdue's School of Aeronautics and Astronautics. This Series brings to campus speakers from the aviation and aerospace industries to inspire students who are considering careers in these fields. The 2014 Lecture will be the seventh in the series.

Rolls-Royce has a long heritage and connection with the aviation industry, and is proud to have a partnership with Purdue University which represents a strong collaborative relationship. This Lecture Series provides an opportunity to showcase the capabilities and strengths of a world-class research facility while allowing Purdue students to meet and listen to top executives from the aviation and aerospace industries.



Major Gen. Masiello speaks with the audience in PMU South Ballroom.



Major Gen. Thomas Masiello



President Mitch Daniels introduces speaker Major Gen. Thomas Masiello during Rolls-Royce lecture.



President Mitch Daniels and Major Gen. Thomas Masiello greet attendees at reception following Rolls-Royce lecture.



NASA's Associate Administrator for Human Exploration and Operations, William H. Gerstenmaier (BSAAE'77; OAE'03; DEA'07) is the associate administrator for the Human Exploration and Operations Directorate at NASA Headquarters in Washington, DC. In this position, Gerstenmaier provides strategic direction for all aspects of NASA's human exploration of space and cross-agency space support functions of space communications and space launch vehicles. For more information about William Gerstenmaier, visit: http://www.nasa.gov/about/highlights/gerstenmaier_bio.html#.VMAe82PhKSo

Purdue's School of Aeronautics and Astronautics Graduates

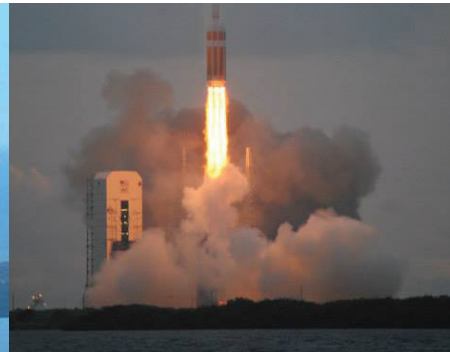
Play Key Role in NASA's Orion Program

On December 5, 2014, people around the world watched with excitement and fascination as NASA successfully launched the Orion spacecraft. The unmanned flight tested Orion systems critical to crew safety, such as heat shield performance, separation events, avionics and software performance, attitude control and guidance, and parachute deployment and recovery operations. The data gathered during the flight will influence design decisions and validate existing computer models and innovate new approaches to space systems development, as well as reduce overall mission risks and costs.

The Orion spacecraft will take astronauts beyond low-earth orbit to destinations such as an asteroid and eventually Mars on future missions. However, to ensure that the Orion is ready for humans to fly in, the December flight test was needed to stress its systems in the real environment it will face as it pushes the boundaries of human space exploration.

The crowd that gathered to view the Orion launch in the early morning hours at Kurz Atrium in Neil Armstrong Hall of Engineering was reminded again of the School of Aeronautics and Astronautics' contributions to the nation's space program. AAE's graduates are connected through the outstanding achievements of its past and present faculty members, and the countless aerospace engineers whom the school has had the honor and the privilege to nurture through its educational programs.

Four of the key leaders at NASA Headquarters who led the Orion Program are Purdue alums, and they are highlighted below. We are so proud.



Professor Dan Dumbacher (BSME'81) receives an Orion EFT-1 mission flown patch and signed certificate from Mark Geyer (BSAAE'82; MSAE'83), NASA Orion Program Manager



NASA Orion Program Manager Mark Geyer (BSAAE'82; MSAAE'83) is responsible for taking the Orion mission from the conceptual phase into a program which accomplishes the objectives set forth by NASA. This includes responsibility for the day-to-day management, development, and integration of Orion system crewed exploration system. He has held this position since 2007. Read more about Mark Geyer at: https://engineering.purdue.edu/AAE/AboutUs/News/Events/20140327_Colloquium_Mark_Geyer



NASA Orion Program Chief Engineer Julie Kramer White (BSAAE'90) represents the NASA engineering community on the Mission Management Team (MMT), which is comprised of a small group of the most senior spacecraft leadership. Kramer White has a broad array of NASA experience, including expertise in Structures and Materials, Loads and Dynamics, Propulsion, Mechanical Systems, Aerosciences, and Thermal Protection. For more on Julie Kramer White, including a video interview, visit: <http://women.nasa.gov/julie-kramer-white/>



School of AAE Professor of Practice Dan Dumbacher (BSME'81), most recently served as deputy associate administrator in the Exploration Systems Development Division, for the Human Exploration and Operations Mission Directorate at NASA Headquarters. In this position, Dumbacher provided leadership and management to the exploration systems development programs which include the Space Launch System (SLS), the Orion program, and the Ground Systems Development and Operations (GSDO) development and integration. To read Professor Dumbacher's complete biography, visit: https://engineering.purdue.edu/Engr/People/NewFaculty/New_Faculty_2014/Dumbacher.html

In addition to these high-ranking personnel, **Purdue University has more than 60 graduates who are directly involved in the Orion Program through their work at NASA, Lockheed Martin, and Honeywell.** These alumni/alumnae hold positions in thermal control systems, avionics, guidance, software, propulsion, mechanical systems, crew module, ground handling, and others. The contributions of these Purdue grads are numerous, and we salute them for their achievements in the Orion Program. For more information on the Orion Program, visit: http://www.nasa.gov/exploration/systems/mpcv/index.html#VL_IYmPhKSo.

Six AAE undergrads attended Orion EFT-1 Launch

Purdue's Chapter of the American Institute of Aeronautics and Astronautics (AIAA) sponsored a competition for AAE undergraduate students to attend the Orion EFT-1 launch in Cape Canaveral, Florida. The organization received 31 applications centered on the theme *Why Space Exploration is Important to the Future, and to Me?*

Based on student input, essays, and grade point average, six students were selected to attend the launch with former NASA deputy associate administrator and **AAE Professor Dan Dumbacher**. Students chosen were:

- Seniors**
Emily Zimovan
Stephen Whitnah
- Juniors**
Katherine Fowee
Paul Witsburger
- Sophomores**
Karl Jantze
Emily Schulz



AAE students with Purdue alumnus astronaut John Casper after the EFT-1 mission briefing

*Many of the classes I have taken were directly applicable to the launch. Specifically AAE 439 (Rocket Propulsion) and AAE 532 (Orbital Mechanics) allowed me to gain so much out of this experience that I would not have been able to get otherwise. **Emily Zimovan***

*The design courses I have taken at Purdue gave me an introduction to each component of a mission, but more importantly how each component worked together. **Stephen Whitnah***

Industrial Advisory Council 2014- 2015

The Industrial Advisory Council (IAC) 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 meets twice yearly, once in the fall and once in the spring to review and address issues related to the mission and the vision of our school.

The current members of the IAC are given below. We sincerely appreciate the efforts of the members of the IAC to take time from their busy schedules to assist us in our programs.



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

President • FBauer Aerospace Consulting Services

Mr. Bradley D. Belcher (BSAAE'82)

Program Director • U.S. Civil R&T Funded Programs • Research & Technology • Rolls-Royce Corporation

Mr. Douglas L. Bowers (BSAAE'72)

Retired, Director, Propulsion Directorate • AFRL/RZ • United States Air Force Research Laboratory

Col. (Ret.) Mark N. Brown (BSAAE'73)

Aerospace Consultant • Mark Brown Consulting, LLC

Ms. Andrea M. Chavez (BS'88)

Director of Operations and Planning for National Defense; Ball Aerospace & Technologies Corp.

Mr. Michael J. Corso (BS'71)

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

Mr. John P. Gleiter (BSAE'60)

Vice President of Engineering • Technical Oil Tool Company (Ret.); Adjunct Professor • California State University, Northridge, CA; Adjunct Professor • Woodbury University, Burbank, CA

Dr. Markus B. Heinemann (BSAAE'92, MSAAE'94, PhD'97)

Technology Manager • Aerospace, Alcoa, Inc • Alcoa Technical Center

Dr. Raymond Kamin (MS'89, PhD'93)

Senior Director, Rockwell Collins

Mr. Andrew H. Kasowski (BS'72)

Retired, Vice President • Engineering Product Development • Cessna Aircraft Company

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

Director, S & IS Mission Assurance • Boeing Defense, Space and Security • The Boeing Company

Mr. Stephen S. Kress

Group Technical Staff, Integrated and Programs • Lockheed Martin Missiles, and Fire Control • Lockheed Martin Corporation

Mr. Thomas L. Maxwell (BS'69)

Retired, General Manager • Military Systems and Design Integration • GE Aircraft Engines

Mr. David K. McGrath (BS'83, MS'84)

Director, Systems Engineer • Tactical Propulsion and Controls • ATK Elkton Operations

Mr. Leon McKinney (BSAAE'81, MS'82)

President • McKinney Associates

Mr. Gary E. Mitchell (BS'60)

Retired, Vice President • Boeing Integrated Defense System

Mr. Terrence H. Murphy (BSAAE'80)

Chairman & President • Hammond Group Products

Mr. Eric E. Ohmit (BSAAE'81)

Engineering Fellow • Northrop Grumman Aerospace Sector

Mr. Kevin Parsons (BSAAE'96)

Innovation Champion • Northrop Grumman Aerospace Systems

Col. Gary E. Payton (MSAAE'72)

The Philip J. Erdle Chair in Engineering Sciences • U.S. Air Force Academy • Retired Deputy Under Secretary for Space • U.S. Air Force

Ms. Erika J. Pearson (BSAAE'93)

Business Director/Deputy VP Asia Pacific & India Sales • Boeing Commercial Airplanes

Mr. James P. Renna (BS'86)

Director, Dynamic Systems Engineer • Sikorsky Aircraft Corporation

Dr. Richard Byram Rivir (BSAE'60)

Retired, Chief Scientist, Propulsion Directorate • United States Air Force, US Department of Defense Liaison for Purdue

Mr. Charles Robert Saff (BS'71)

Retired, Boeing Technical Fellow—Structures • Boeing Research and Technology

Dr. Robert L. Strickler (BS'60, MS'62, PhD ME'68)

Private Consultant

Retired Vice President / General Manager for Space and Missile Systems • Energy and Environmental Systems • TRW

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

Director — Program Manager • Phantom Works • Boeing Company

Mr. John J. Walsh (BS'82)

President • Sypris Electronics LLC

Mr. Glenn Weissinger (BSAAE'77)(MSIA'78)

Retired, Vice President — Strategic Planning • Lockheed Martin Aeronautics

Steering Advisory Council 2014-2015

The Steering Advisory Council (SAC) advises and helps AAE in exploring and creating major opportunities in the aerospace arena that are timely and important at the national level, where Purdue's AAE can take a leadership role.

The current members of the SAC are given below. We sincerely appreciate the efforts of the members of the SAC for taking time from their busy schedules to guide and support us in our programs.



Natalie W. Crawford

Senior Fellow • RAND Corporation
Previously Vice President and Director of RAND Project Air Force

Darryl W. Davis (BSAAE'78)

President • Phantom Works • Boeing Integrated Defense Systems

C. Douglas Ebersole (BSAAE'82)

US Department of Defense Liaison for Purdue
Director • Aerospace Systems Directorate • Air Force Research Laboratory, Wright-Patterson Air Force Base

William H. Gerstenmaier (BSAAE'77)

Associate Administrator • Human Exploration and Operations • NASA

Lt. General Jack Hudson

Director • National Museum of the U.S. Air Force • United States Air Force

Stephen Morford

Chief Engineer • Systems Analysis & Aerodynamics • Pratt & Whitney

Mark Pearson

General Manager • GE Aviation

Alton D. Romig, Jr.

Retired Vice President • Lockheed Martin
Executive Officer • National Academy of Engineering

Robert L. Strickler (BS'60, MS'62, PhD ME'68)

Private Consultant
Retired Vice President / General Manager for Space and Missile Systems • Energy and Environmental Systems • TRW

Matt Szolwinski (BSAAE'93, MSAAE'95, PhD'98)

Chief Engineer and Leader • GE9X Engineering • GE Aviation

Tom Vice (BS '86)

Corporate VP and President • Northrup Grumman Aerospace Systems • Northrup Grumman Corporation

Dennis Warner (BS'73, MSME'76)

President and CEO • Rolls-Royce North American Inc. • Aero Engine Control, North America

Sigmar Wittig

Professor • Karlsruhe Institute of Technology
Member of the Board of Presidents • the Technical University System of the State of Niedersachsen — Association of Universities of Hannover, Braunschweig, and Clausthal



Young Professionals Advisory Council 2014-2015

The 2014-15 Young Professionals Advisory Council is an inaugural group of young alumni/alumnae chosen from various backgrounds to facilitate discussions between recent alums and School of Aeronautics and Astronautics faculty with the goal of benefiting undergraduate students in AAE. The alums met with undergraduate students to answer questions about what lies ahead, how to excel, and any other concerns students had.

2014-15 YPAC Members include:

Sirisha Bandla (BSAAE'11)

Commercial Spaceflight Federation • Assistant Director

Alex Bauccho (BSAAE'11)

Test Vehicle Engineer • Rolls-Royce

Michael Bociaga (BSAAE'08; MSAAE'11)

Design Engineer • Lockheed-Martin

Jonathan Braun (BSAAE'06; MSAAE'08)

Associate Manager • Lockheed-Martin

Ashley Brawner (BSAAE'06; MSAAE'09)

Systems Integration and Test Manager • Northrop Grumman

Dean Bryson (BSAAE'08; MSAAE'10)

Research Aerospace Engineer • Air Force Research Laboratory

Mike Kowalkowski (BSAAE'07; MSAAE'09)

Design Engineer, Turbines • Rolls-Royce

Tyler Lulich (MSAAE'10)

Senior Aerospace Engineer • Emergent Space Technologies

Alan Pomp (BSAAE'11)

Structural Payload and Design Engineer • Boeing

James Tancred (BSAAE'10)

Aerospace Engineer • Air Force Research Laboratory

Brandon White (BSAAE'08)

Technical Program Manager • GE Aviation

PURDUE SPACE DAY 2014



The 19th annual Purdue Space Day (PSD) took place on October 24 and 25, 2014 with guest **VIP School of Aeronautics and Astronautics Alum and Astronaut Charlie Walker** (BSAAE'71, OAE'99). Charlie Walker is former President of the National Space Society and has flown three times on the Space Shuttle.

Hosted by the School of Aeronautics and Astronautics with support from the Indiana Space Grant Consortium, PSD is the largest educational STEM outreach program at Purdue. Mr. Walker gave a presentation on Friday, October 24 in the Class of 1950 Lecture Hall and kicked-off Space Day on Saturday morning in the Elliott Hall of Music.

A special feature at this year's PSD was the presentation of the Astronaut Scholarship by Mr. Walker to recipient, Emily Erickson. A senior from Clarks Hill, Indiana, Erickson has won both the 2013 and 2014 Astronaut Scholarship. The scholarship is funded by the Astronaut Scholarship Foundation, a nonprofit organization created by the Mercury 7 astronauts in 1984.





Purdue Space Day Wins Outstanding Program Award

Congratulations to Purdue Space Day for receiving Purdue University's Outstanding Program Award at a banquet on Thursday, April 9, 2015.

Given by the Student Activities and Organizations (SAO) office on behalf of the more than 900 active student organizations on campus, the award is one of only three such awards presented annually.

The Outstanding Program Award is given to the student organization that has implemented the most outstanding campus program during the academic year. Criteria for the award include a committee selection for the student program which has achieved the following:

- A creative and original program which is social, recreational, educational, cultural, or fundraising in nature;
- Benefited the membership, the University and/or the community;
- Successful publicity and promotion;
- Organizational participation, group effort;
- Effective pre-planning and implementation;
- Demonstrated successful evaluation of program.

Faculty advisor for Purdue Space Day is **Dr. Michael Sangid**, School of Aeronautics and Astronautics.



Back row (left to right): Varsha Ganapathy, Tommy Tang, Stephen Whitnah, Benjamin Vernhes, Michael Peters, Brachston Grubbs. Front row (left to right): Rowan del De Ronde, Blair Francis, Zarin Bari, Lauren Kolkman, Kristen Hector. Not pictured: Matthew Gripe, Nicoletta Fala, Kathryn May, Dr. Michael Sangid.

2015 DISTINGUISHED Engineering Alumni

The Distinguished Engineering Alumni Award is presented to those alumni/alumnae who have distinguished themselves in any field in ways that reflect favorably on Purdue University, the engineering profession, or society in general.

For those who have been engaged in engineering work, their record of accomplishments should indicate a high potential for future growth into positions of increasing responsibility. This is the highest honor that the College of Engineering can bestow upon an engineering alumnus/alumna.

The School of Aeronautics and Astronautics is proud that two AEE alumni were selected to receive the 2015 College of Engineering Distinguished Alumni Award.



Raymond R. Cosner
Senior Technical Fellow,
Director Technology,
Boeing Company
BSAAE'72; MSAAE'72

For his technical leadership of The Boeing Company to ensure its leadership in defense, space, and security



Anthony L. Thornton
Deputy to VP for
Technology & Programs,
Sandia National Laboratories
PhD'92

For decades of excellence in advancing critical technologies for national defense in vital leadership roles at both Sandia National Laboratories and Lockheed Martin Aeronautics

Welcome AAE's new Academic Advisor

The school is pleased to welcome **Rebecca Whitley** as Academic Advisor. Rebecca graduated in April 2015 from the Professional Counseling and College Student Affairs master's program at the University of West Georgia. She held graduate practicums within academic advising and athletic advising while at UWG, where she also served as the Graduate Assistant for Orientation for two years. Prior to attending graduate school, Rebecca received her bachelor's degree in Marketing and Real Estate in April 2013 from the University of West Georgia.



NASA X-31

Demonstrator Model to be Permanently Installed in Armstrong Hall



Through the generous gift of NASA Langley Research Center, the School of Aeronautics and Astronautics has received permanent ownership of the NASA X-31 Enhanced Fighter Maneuverability (EFM) demonstrator model. Previously on loan from NASA, the gift was facilitated by Dan Vicroy (BSAAE'80), Senior Research Engineer, Flight Dynamics Branch, at Langley.

The NASA X-31 program proved the value of using thrust vectoring (directing engine exhaust flow) coupled with advanced flight control systems, to provide controlled flight to very high angles of attack. The result was a significant advantage over most conventional fighters in a close-in-combat situation. "Angle-of-attack" (α) is an engineering term to describe the angle of an aircraft's body and wings relative to its actual flight path.

Alumnus Dr. Daniel Raymer (BSAAE'76, MSAAE'76) was Head of Air Vehicle design during the X-31 concept development phase, taking the project from a blank sheet of paper to the configuration that flew, except for minor loft changes done later to simplify construction. The X-31 was designed on the CDS aircraft conceptual CAD system, a system in which Dr. Raymer led development.

During the program's initial phase of flight test operations at the Rockwell Aerospace facility in Palmdale, California, the two X-31 aircraft were flown on 108 test missions, achieving thrust vectoring in flight and expanding the post-stall envelope to 40 degrees angle of attack. Operations were then moved to Dryden in February 1992 at the request of the Advanced Research Projects Agency (ARPA).

The X-31 program logged an X-plane record of 580 flights during the program, 559 research missions and 21 in Europe for the 1995 Paris Air Show. Fourteen pilots representing all agencies of the International Test Organization flew the aircraft.

The School of Aeronautics and Astronautics is pleased to have the NASA X-31 as part its permanent collection representing the important contributions of aeronautics and astronautics engineering in aircraft development.



AAE faculty participate in Minority Engineering Program outreach to 250 high school students

Purdue University's College of Engineering Minority Engineering Program (MEP) hosted 250 ninth-grade students from ITW David Speer Academy in Chicago, IL on Friday, November 21, 2014. School of Aeronautics and Astronautics professors **Dr. Mark Sangid (Structures & Materials)** and **Dr. Sally Bane (Aerodynamics)**, **Scott Meyer (Managing Director of Murice J. Zucrow Lab)**, and AAE graduate students shared their expertise with the Academy students.

College of Engineering professors and graduate students facilitated classroom experiences exploring fields of engineering which incorporate math and science concepts. Additionally, students gained insight on taking the engineering concepts and connecting them to some aspect of everyday life, such as kinematics and kinetics.

The students participated in learning opportunities from across the engineering Schools through a variety of hands-on and classroom activities. Academy students also participated in hands-on engineering activities which incorporate a high-level reference to the engineering design process or design cycle. These activities will give students an awareness of how the engineering discipline contributes to society.



AAE's Dr. Sally Bane talks with students from ITW David Speer Academy.

2014 Outstanding Aerospace Engineer Awards



The Purdue University designation Outstanding Aerospace Engineer recognizes the professional contributions of graduates from the School of Aeronautics and Astronautics and thanks them for the recognition that their success brings to Purdue and the School.

The School was pleased to honor nine graduates of AAE with the designation “Outstanding Aerospace Engineer Award” at an awards banquet on Friday November 7, 2014. 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.



*Student Masters of Ceremonies
Jackie Stephan and Stephen
Whitnah*

Congratulations to our 2014 Outstanding Aerospace Engineers



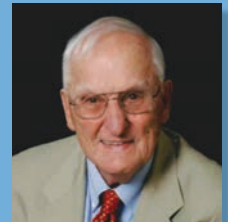
C. Douglas Ebersole
BSSAE'82
Director, Aerospace
Systems Directorate,
Air Force Research
Laboratory,
*Wright-Patterson
Air Force Base*



Amy S. Hess
BSSAE'89
Executive Assistant
Director, *FBI Science
and Technology
Branch*



Rakesh K. Kapania
PhD'85
Mitchell Professor of
Aerospace and Ocean
Engineering, Affiliate
Professor, Engineering
Science and Mechanics,
*Virginia Polytechnic
Institute and State*



Paul E. Petty
BSSAE'53
Vice President,
*Perkin-Elmer
Corporation,
Retired*



*Dr. Skip Grandt and alumnus
and IAC member Michael Corso
(BSSAE'71; OAE'11)*



2014 OAE Recipient Paul Petty with Dr. Kathleen Howell and Dr. Tom Shih



Rud and Corinne Mueller and AAE Head Dr. Tom Shih

2015-2016 Outstanding Aerospace Engineer Awards Banquet

Moves to Spring in 2016

To better accommodate the AAE's full slate of events, the 2015-2016 Outstanding Aerospace Engineer Awards banquet will move to spring 2016. Watch the *Aeroliner*, AAE's annual e-newsletter, in December 2015 for details and registration information.



Back row (L to R): J. William (Bill) Uhrig, C. Douglas (Doug) Ebersole, Jeffrey Schroeder, Amy Hess, John Schmisser, Paul Petty, Panagiotis Tsiotras. Front row (L to R): Professor Emeritus Gus Gustafson, Professor Emeritus George Palmer, Rakesh Kapania, Tamaira Ross, AAE Head Dr. Tom Shih



Tamaira E. Ross
BSAAE'96;
MSAAE'98
Configuration Design Engineer
Blue Origin



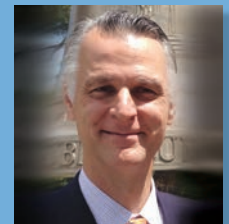
John D. Schmisser
PhD'97
Professor of Aerospace Engineering and H.H. Arnold Chair, *University of Tennessee Knoxville*



Jeffery A. Schroder
BSAAE'84; MSAAE'90
Chief Scientist for Flight Simulation Systems, *Federal Aviation Administration*



Panagiotis Tsiotras
PhD'93
Dean's Professor of Aerospace Engineering, Daniel Guggenheim School of Aerospace Engineering, *Georgia Institute of Technology*



J. William Uhrig, Jr.
BSAAE'82
Owner and President, *Three Cities Research, Inc.*



Andrew Weaver and Samantha Alberts



Brad Belcher with Dr. Christiane Keck and Dr. Dave Filmer



William (Bill) Uhrig and Professor Emeritus George Palmer

NEWS ABOUT YOU

1950s

Larry Lakamp (BSAE'58), Perris, CA, is Programmer/Analyst at Starcrest Products of California, Inc.

Tom Leech (BSAE'59), San Diego, CA, was selected as the winner of the Business: Communications/Public Relations category in the 2014 International Book Awards by USA Book News & USA Best Book Awards for *Say it like Shakespeare: The Bard's Timeless Tips for Communication Success*. Leech and wife, Leslie, also authored the children's Christmas poetry book, *The Curious Adventures of Santa's Wayward Elves*. It tells the story of two elves who connive to sneak onto Santa's sleigh. The book is available to purchase online at xlibris.com and amazon.com.

James Thompson (BSAE'57), Carmel, IN, has authored three fiction works under his pen name, M.L. Hollinger, including two adult science fiction titles, and one novel aimed at the teen/young adult audience. Titles of his works are *Adventures of Regen the Bremen*, *Josh and the Cargan*, and *Mauhad*.

Arthur Wiggins (BSAE'53), North Chesterfield, VA, published *Chasing the Goose*, a story about trips with a barnstormer on the East Coast and west to Iowa. The book is available for purchase at www.shopmybook.com.

1960s

James Gardner (BSAE'66), League City, TX, is retired as a Space Shuttle Flight Operations Safety Engineer, GHG Corporation. As a longtime flight instructor, he is now semi-retired but still teaching advanced flight techniques in his Twin Comanche at Ellington Field.

Donald Gray (MSAAE'69, PhD CE'74), Morgantown, WV, has retired from the Department of Civil and Environmental Engineering at West Virginia University after 30 years on the faculty.

Mike Pumilia (BSAAE'72) set to retire



AAE graduate **Mike Pumilia** (BSAAE'72) is retiring after 43 years in the aerospace field. His career began as a Naval Aviator and as an Air Admin Officer on the USS Lexington (CVT-16) in Pensacola, FL which led to working more than 30 years for Lockheed Martin Corporation. Mike also has been successful as a Utility Dog (UD) and Tracking Dog (TD) teacher and judge with the American Kennel Club (AKC). He is an author and columnist of dog training articles in national publications, including the book *Training the Competitive Dog*. After 36 years, he became Judge Emeritus with the AKC.



Mike and his Dalmatian, Winter, in 1978. Winter was three-time #1 Obedience Dalmatian of the Year in the U.S.

1970s

Michael Corso (BSAAE'71), Fort Myers, FL, has maintained Florida Bar Board Certification in civil trial law for 30 years. Board certification evaluates attorneys' special knowledge, skills, and proficiency in various areas of law and professionalism and ethics in practice.

Ronnie Miller (BSAAE'73, MSAA'75, PhD'79) has accepted an offer with Stress Engineering as a Consulting Engineer in pursuit of quantitative Acoustic Emission (AE). He previously was employed with MISTRAS Group, Inc.

Michael Pumilia (BSAAE'72), Fort Worth, TX, retired from Lockheed Martin as a staff systems engineer after 30 years of service. He overcame a spinal cord tumor called ependymoma that resulted in the loss of his spinal cord and is grateful that he was able to continue his career and be rewarded for his contributions to the company.

1980s

Mark Brockman (MSAAE'86; PhD'97), Dayton, OH, has been awarded a 2014 Woodrow Wilson Ohio Teaching Fellowship.

Kenneth Slota (BSAAE'87), Tempe, AZ, is Senior Project Manager of Special Projects for PCL Construction, Inc.

Rama Yedavalli (PhD'81), Columbus, OH, has been named a faculty member at Ohio State for 27 years in the former Department of Aerospace Engineering and the Current Department of Mechanical and Aerospace Engineering. Rama holds the rank of Professor, and is a Fellow of IEEE, ASME, and AAAS, and an Associate Fellow of AIAA. He recently authored a graduate level textbook, *Robust Control of Uncertain Dynamic Systems: A Linear State Space Approach*, and is currently writing an undergraduate level textbook, *Flight Vehicle Dynamics and Control*, to publish in 2015.

1990s

Jason Bowman (BSAAE'94), Bellbrook, OH, is Program Manager of Tactical Offboard Sensing at Air Force Research Laboratory.

Brett Hoffstadt (BSAAE'93), has created a website and blog for engineers and others to apply strengths in creative ways at howtobearocketscientist.com.



AAE Alumnus Dr. John Schmisser (PhD'97) named Professor of Aerospace Engineering and H.H. Arnold Chair

Purdue University School of Aeronautics and Astronautics alum **Dr. John D. Schmisser** (PhD'97) joined the faculty of the University of Tennessee Knoxville Department of Mechanical, Aerospace, and Biomedical Engineering on August 1, 2014. He will be teaching and leading research at the University of Tennessee Space Institute. Dr. Schmisser earned his B.S. (90) and M.S. (92) in Aerospace Engineering from the University of Texas at Austin and his PhD (97) in Aeronautics and Astronautics from Purdue University. He is a Fellow of the American Institute of Aeronautics and Astronautics (2012) and the Air Force Research Laboratory (2013) and is the 2008 recipient of the Air Force Science and Engineering Award in Research Management.

We appreciate your response to the Online Update Alumni/Alumnae 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>



Cindy Mahler (BSAAE'98), Aerospace Engineer at Boeing Corporation, was part of the program responsible for the International Space Station's Motion Control System. Recently, Cindy planned, implemented, and executed the Boeing Commercial Crew Transportation System (CCTS) Critical Design Review (CDR) including the CST-100 spacecraft. In 2010, Cindy founded *SpaceUp Houston* to provide a platform to develop concepts and partnerships to encourage people to create their future in the Houston area.

Mike McCool (BSAAE'91; MSCE'93), Fishers, IN, was promoted to partner and vice president of the Indianapolis engineering firm, Beam, Longest, and Neff LLC.

Andrea (Cook) Storch (BSAAE'99), Aerospace Engineer at NASA Langley Research Center, Hampton, VA, is currently working in Systems Analysis and Concepts Directorate in hypersonics. Andrea received the NASA Silver Achievement Medal in August 2013 for leadership on the highly-successful launch of an experimental hypersonic scramjet research flight, HIFiRE Flight 2.

2000s

Kim Hicks (BSAAE'06), Kent, WA, Systems Engineer, Boeing Defense & Space, was granted her first patent from the USPTO for her invention on Fluid Level Sensing. Also, Kim was selected for Boeing's Emerging Leaders Program, representing the top 1% of identified leaders in the Global Network Space & Security organization. Kim is the current national chair for AIAA's Young Professional Committee.

Marriages

Christine Poulin (BSAAE'06) married Michael Carter on Mar. 8, 2014.

Births and Adoptions

Wes Dafler (BSAAE'03) and wife, Melanie, California, MD, are excited about their future Boilermaker! They welcomed their first daughter, Eve-Marie, on Nov. 10, 2014.

Alex Fleck (BSAAE'02), and wife, Kacie (Burton) Fleck (BSAAE'01), Leonardtown, MD, welcomed their fourth child, Daniel Pryor, on Jun. 17.

Christopher Fugger, AAE PhD student, and wife Addie, welcomed their daughter, Lucille Mary Fugger on October 2, 2014.

W. Zach Hallum, AAE PhD student, and wife Lauren, welcomed their son, Cole Bradley Hallum on September 15, 2014.

Robert Manning, AAE PhD student, and wife Jeanette, welcomed their second daughter, Ruth Susannah, on November 12, 2014.

Dr. Oleg Sindiy (MSAAE'07; PhD'10) adopted Daniel J. Sindiy on June 2, 2015. All things considered, both dad and his teenage son are doing well. During his non-parenting time, Oleg is a systems architect at NASA's Jet Propulsion Laboratory. He is currently working on the design of the Asteroid Redirect Robotic Mission and Europa Clipper spacecraft.

Leon Walters (BSAAE'93; MSAAE'04) and **Becca (Dale) Walters** (BSAAE'06) welcomed their son, Jacob Thomas Walters, on May 8, 2015.

In Memoriam

1940s

Denison S. Bassett (BSAAE'48), O Fallon, MO, Aug. 24.

Barrett M. Billica (BSAAE'48), Fort Collins, CO, Jun. 19.

Paul L. Brink (BSAAE'43), Sun City West, AZ, Dec. 6, 2013.

George W. Chell (BSAAE'48), Brandon, SD, Jun. 8.

William B. Evans (BSAAE'49), Edmonds, WA, Sept. 28.

He is survived by his wife, Yvonne.

Robert A. Goff (BSAAE'49), Evansville, IN, Sept. 18.

He is survived by his wife, E. Rosalene.

Paul T. Holliday (BSAAE'47), Murrieta, CA, Jun. 30.

Thomas Jundanian (BSAAE'48), Lemont, IL, Dec. 1.

Lewis Murphy Jr. (BSAAE'47), Drummonds, TN, Mar. 16.

He is survived by his wife, Mary Louise.

Lawrence A. Quebbeman (BSAAE'48), Corydon, IN, Jan. 17.

Robert C. Schimmel (BSAAE'45), Salt Lake City, UT, Mar. 30.

He is survived by his wife, Eunice.

Martin W. Taylor (BSAAE'48), West Palm Beach, FL, Oct. 13.

He is survived by his wife, Jean.

Wayne Whitlock (BSAAE'48), Lakewood, CO, May 18.

1950s

Warren F. Able (BSAAE'53), Marlborough, CT, May 26.

Allen E. Alman (BSAAE'51), Palm Harbor, FL, Sept. 25.

Thomas E. Anderson (BSAAE'50), Fort Worth, TX, May 16.

Robert Edwin Begin (BSAAE'52), Springfield, OH, Jul. 1.

Robert Edward Campbell (BSAAE'53), Excelsior, MN, Jun. 11.

He is survived by his wife, Joan Judith.

Keith L. Carmichael (BSAAE'52), Columbus, IN, Jul. 24.

Frank H. Chaddock (BSAAE'51, MS M'60), San Diego, CA, Jul. 24.

Harold T. Cleaver (BSAAE'57), Stuart, FL, Jan. 29.

Maurice R. Dora (AAE'52), Connersville, IN, Nov. 26.

He is survived by his wife, Patricia.

Richard Freeman (BSAAE'50; MS M'54; DEA'73; OAE'99), Nov. 4.

He is survived by his wife, Jane.

James G. Gibboney (BSAAE'58), Orlando, FL, Jul. 30.

O. Mark Hanner, Jr. (BSAAE'52), Sun City West, AZ, Jul. 2, 2013.

Bruce R. Hering (BSAAE'57), Boonville, CA, Feb. 17.

David W. Jackson (BSAAE'51), Shoreline, WA, Apr. 1.

Warren K. James (BSAAE'50), Payson, AZ, Jan. 30.

James H. Kaufman (BSAAE'59, MS M'60), Elm Grove, WI, Sept. 4.

Philip G. Mack Jr. (BSAAE'50), Renton, WA, Nov. 25.

Clyde C. Matthews (BSAAE'50), Medford, OR, Oct. 31.

Lt Col (Ret) Marshall Norris (BSAAE'51), Sunnyvale, CA, Sept. 30.

Austin Peralme (BSAAE'51), Mountain Brook, AL, Feb. 14.

Joseph C. Ramsey (BSAAE'50), San Diego, CA, Sept. 7.

He is survived by his wife, Lois.

William C. Randall (BSAAE'50), Wickenburg, AZ, Oct. 1.

Charles W. Riffe (BSAAE'50), Sun City Center, FL, Nov. 6.

Robert R. Rodgers Jr. (BSAAE'50), Plainfield, IN, Mar. 4.

Robert Sharp (BSAAE'50), Albuquerque, NM, Mar. 16.

Edward E. Smith (BSAAE'53), Cincinnati, OH, Nov. 20.

He is survived by his wife, Suzanne (HHS'51).

Doyle W. Thomas (MSAAE'59), Huntsville, AL, Dec. 30.

Fredrick M. Waara (BSAAE'59), Bel Air, MD, Nov. 16.

Kenneth A. Wait (BSAAE'50), Seguin, TX, Apr. 11.

1960s

Douglas J. Becker (MSAAE'68), Springfield, OR, Jul. 24, 2013.

John P. Cosgrove (BSAAE'60), La Porte, PA, May 23.

Charles Y. Harley (BSAAE'67), Wichita, KS, Mar. 23.

James Jacoby (BSAAE'62), Dec. 2009. He is survived by his wife.

Robert R. Klopp (BSAAE'65), Lake City, FL, Mar. 2.

Michael G. Maguire (BSAAE'60), Jupiter, FL, Sept. 8.

Stanley Medanic (BSAAE'61), Naperville, IL, Oct. 27, 2013.

Henry Pankiw (BSAAE'69), Mishawaka, IN, Jul. 12.

He is survived by his wife, Cynthia.

Peter T. Reynolds (BSAAE'66), Goddard, KS, Apr. 10.

Thomas I. Strange (BSAAE'62), Austin, TX, Jun. 8.

1970s

Gregg R. Beitel (BSAAE'79), Murfreesboro, TN, Sept. 29.

Robert A. Large (BSAAE'70), North Vernon, IN, Jul. 22.

Hector J. Rosquete (BSAAE'72, MS S'75), Freeport, ME, Jul. 2.

He is survived by his wife, Elizabeth (BSA'74).

1980s

Brian J. Wolson (BSAAE'88), Trumbull, CT, Jul. 15.

Thomas A. Zeiler (PhD'85), Tuscaloosa, AL, Jun. 30

2000s

Chad J. Blodget (BSAAE'00), Valparaiso, IN, Mar. 17.

Stas Eric Gray (BSAAE'05), Seattle, WA, Aug. 30.

Boilermakers and Purdue flag travel the world

Purdue University alums **Kim Hicks** (BSAAE'06; MSE'13); **Doug Hicks** (AOT'99); and **Anne Marie Mills** (BSAAE'05) show their Purdue Pride at the “end of the world” in Antarctica. The group was part of a marine mammals expedition conducting whale research with Stanford University and Oregon State University. Part of the trip was tagging humpback whales to understand feeding behaviors. The trio talked with professors conducting the research about how the whale tags were engineered and how they could be improved so that the tags could take better data to compute velocity.



Cuverville Island, pictured left to right: Anne Marie Mills (AAE'05), Kim Hicks (with penguin hat) (AAE'06/MSE'13), Doug Hicks (AOT'99).



Whalers Bay in front of an abandoned aircraft hangar inside the volcano, pictured left to right; Anne Marie Mills, Kim Hicks, Doug Hicks.

Col. Charles C. “Charlie” Bock, Jr., USAF (BSAE'49) and wife, Joyce, Visit AAE

Col. Charles C. “Charlie” Bock, Jr., USAF (BSAE'49) and his wife, Joyce, recently returned to campus to visit with friends in the School of Aeronautics and Astronautics. Col. Bock received a Bachelor of Science in Aeronautical Engineering from Purdue in 1949. He was also a graduate of the USAF Test Pilot School, the USAF Aerospace Research Pilot School, the Air Command and Staff College, and the Industrial College of the Armed Forces.

A veteran of Korea with the 3rd Bomb Wing and Vietnam with the 35th Tactical Fighter Wing, Charlie Bock flew 103 combat missions. During his military career he was trained as a test pilot and later as a military astronaut-designee. He was twice assigned to Flight Test Operations at Edwards AFB.

After his distinguished career as an Air Force test pilot, in which he flew many planes, including the SR-71 and the first flight of the B1 bomber, Col. Bock worked with Rockwell. Additionally, he served as a consultant to Northrop Corp. on the B-2 Stealth Bomber.



From left, Dr. Tom I-P. Shih, Professor and Head of the School of Aeronautics and Astronautics; Col. Charles C. “Charlie” Bock, Jr., USAF (BSAE'49); and Mrs. Joyce Bock.



Col. Charles C. “Charlie” Bock, Jr. at the Bomber Test Operations Air Force Flight Test Center; Edwards AFB, California.

Photo: Purdue University Libraries, Archives and Special Collections.

AAE ALUMNUS PARTICIPATES IN **Purdue's 2014 Old Masters Program**

School of Aeronautics and Astronautics alumnus and Space Shuttle Commander **Mark Polansky** (BSAAE'78; MSAAE'78) was selected to participate in Purdue University's 2014 Old Masters Program, on November 2-4, 2014, including speaking in classroom talks, student organization receptions, social activities, and a campus-wide convocation.

Polansky received an Air Force commission following his receiving both his Bachelor and Master degrees from the School of Aeronautics & Astronautics at Purdue University in 1978. He earned his pilot wings in January 1980 at Vance Air Force Base (AFB), Oklahoma. From 1980 to 1983, he was assigned to Langley AFB, Virginia, where he flew the F-15 aircraft. In 1983, Polansky transitioned to the F-5E aircraft and served as an Aggressor Pilot, where he trained

tactical aircrews to defeat enemy aircraft tactics. He was assigned in this capacity to Clark Air Base, Republic of the Philippines, and Nellis AFB, Nevada, until he was selected to attend USAF Test Pilot School, Edwards AFB, California, in 1986. Upon graduation, he was assigned to Eglin AFB, Florida, where he conducted weapons and systems testing in the F-15, F-15E, and A-10 aircraft. Polansky left active duty in 1992 to pursue a career at NASA. He has logged over 5,000 flight hours in over 30 different aircraft.

Polansky joined NASA in August 1992, as an aerospace engineer and research pilot. He was assigned to the Aircraft Operations Division of the Johnson Space Center. His primary responsibilities involved teaching the astronaut pilots Space Shuttle landing techniques in the Shuttle Trainer Aircraft



and instructing astronaut pilots and mission specialists in the T-38 aircraft. Polansky also conducted flight testing of the NASA T-38 avionics upgrade aircraft.

Selected as an Astronaut Candidate by NASA in April 1996, Polansky began training in August 1996. His first flight was STS-98 (Atlantis) in February 2001. During this mission, the STS-98 crew continued the task of building and enhancing the International Space Station by delivering the U.S. laboratory module Destiny. Mission duration was 12 days, 21 hours, 20 minutes.

Good to Be Back, Class of '71



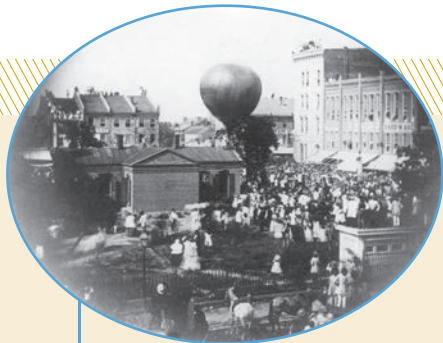
Do you know these people?

Look at page 26 to see
if your guess is correct.

Purdue University formed an aero club in **1910**, and has taught courses in aeronautics since 1921.

CELEBRATING 70 YEARS

As An Independent School in Aerospace Engineering • 1945-2015



1859 Before the Wright Brothers, **Lafayette was the site of the first U.S. airmail delivery on August 17, 1859**, accomplished with a hot air balloon piloted by John Wise of Lancaster, Pennsylvania, and directed by U.S. postmaster Thomas Wood of Lafayette.

Photo: Tippecanoe County Historical Association.

1921-1941 Purdue began limited education in aeronautical engineering during the **1921-22 academic year** with four elective courses offered by the School of Mechanical Engineering. Professor Martin L. Thornburg, a 1915 ME graduate and veteran of the Air Service, was in charge of instruction. An aerodynamics laboratory was soon established and equipped with a fully assembled airplane and operating engines. Students were offered numerous elective courses and many chose the senior aeronautical option to enter the new aeronautical industry of the 1920s and 1930s.



Amelia Earhart was recruited by President E.C. Elliott in 1935 to serve as consultant for Purdue's flight programs and as Counselor for Careers for Women. Purdue Research Foundation provided funding for the purchase of a Lockheed 10E Electra to serve as Earhart's flying laboratory, which was flown in her ill-fated around-the-world attempt.

Photo: Purdue Universities Libraries, Archives and Special Collections.

1859

1910

1921

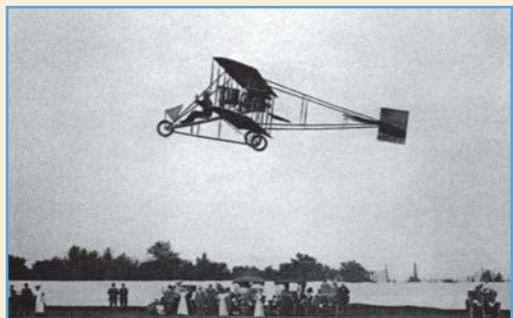
1930

1935

1942

1910-11 Community interest in aviation continued when **Purdue established the Purdue Aero Club**, organized in 1910 under the direction of Professor Cicero B. Veal of mechanical engineering. The community's first aircraft demonstration was held at Purdue's Stuart Field on June 13, 1911. Sponsored by the Purdue Alumni Association and a local newspaper, this Aviation Day attracted 17,000 people.

Photo: Purdue Universities Libraries, Archives and Special Collections.



On November 1, **1930**, the U.S. Bureau of Air Commerce designated a real estate gift from Board of Trustees member David E. Ross as the **first university-owned airport** in the United States. Paved runways were added, and construction of Hanger 1 (pictured) was completed in 1934. Purdue became the first university in the United States to offer college credit for flight training, becoming an important military flight-training center during World War II.

1942 Mechanical Engineering was changed to the **School of Mechanical and Aeronautical Engineering**, and the first BS degrees were awarded in August 1943.

School Titles

School of Mechanical and Aeronautical Engineering 1942-45

- First degree in aeronautical engineering – 1943

School of Aeronautics 1945-56

- Independent unit on July 1, 1945
- Aeronautical Engineering + Air Transportation

School of Aeronautical Engineering 1956-60

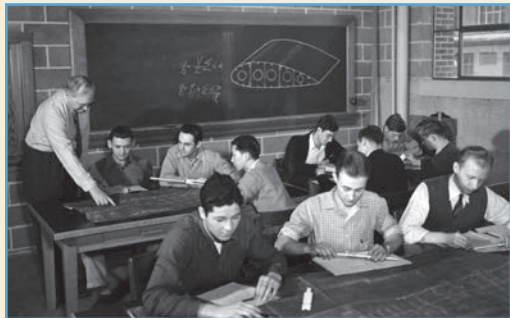
School of Aeronautical and Engineering Sciences 1960-64

- Merged with Engineering Sciences on July 1, 1960

School of Aeronautics, Astronautics, and Engineering Sciences 1965-73

- Engineering Sciences terminated January 1, 1973

School of Aeronautics and Astronautics 1973



An independent School of Aeronautics was formed on July 1, 1945. Curriculum offered included an Air Transportation Program and an Aeronautical Engineering Program. Professor Elmer F. Bruhn (pictured with students) served as head of the new School for five years, from 1945-1950. Photo: Purdue Universities Libraries, Archives and Special Collections.

1955 As enrollments in the program declined, the Air Transportation Program was discontinued. The School merged with the Division of Engineering Science in 1960, and changed its name to the School of Aeronautical and Engineering Sciences. This joint program continued until the engineering sciences effort was ended in 1972.

One-third of all human U.S. space missions have included at least one Purdue graduate as a crew member. Twenty-three Boilermakers, fourteen of whom are AAE graduates, have been selected as NASA astronauts. The first man, Neil Armstrong (below) and most recent man, Gene Cernan, to



set foot on the moon were Purdue Alumni. It's no wonder that Purdue is known as the Cradle of Astronauts.

1943

1945

1955

1973



1943-45 Curtis Wright Cadette Program was created to meet the labor shortage during WWII. The program took place at seven colleges. Purdue's program was led by Professors Wood and Bruhn, and 216 total Cadettes participated in the program. The curriculum included math, drafting, aeronautics, mechanics, and materials.

1973

The current name of the School of Aeronautics and Astronautics was approved.



The Legacy of the School of Aeronautics and Astronautics continues

Since its formation, the School of Aeronautics and Astronautics has graduated nearly 8,000 alumni/alumnae. Our alumni/alumnae have played key leadership roles in industry, government, and academia and have been involved in designing, building, testing, and flying the many vehicles that have changed the face of both flight and space exploration during the first century of flight. We look forward to continuing the excellence and impact in advancing flight, earth observation, and space exploration in the second century of flight for the benefit of humankind.

Photo: Mark Simons, Purdue University.



Pictured are Dr. Longuski, Dr. Guzmán, and Dr. Howell.

Alumnus Dr. José Guzmán (BSAAE'93; MSAAE'95; PhD'01) Visits AAE

Purdue University's School of Aeronautics and Astronautics was pleased to welcome alumnus **Dr. José J. Guzmán** to the department on August 27 and 28, 2014. Dr. Guzmán was on campus to visit with Dr. Kathleen Howell, his faculty advisor while earning his degrees in AAE (BSAAE'93; MSAAE'95; PhD'01).

Dr. Guzmán also met with Professor James Longuski. In 2014, Dr. Longuski and Dr. Guzmán, along with fellow co-author Professor John Prussing of the University of Illinois, published their text book, *Optimal Control with Aerospace Applications*. This book has met with acclaim in the field of optimal control theory in aerospace engineering.

Guzmán also was coauthor on a paper, "STEREO Trajectory and Maneuver Design," which won the 2009 Walter G. Berl Award for Outstanding Paper in the APL Technical Digest.

Currently, Dr. Guzmán is Senior Principal Engineer in the Flight Dynamics Group at Orbital Sciences, where he has been working on the design and planning for cargo missions to the International Space Station. He is a member of the American Astronautical Society and a senior member of the American Institute of Aeronautics and Astronautics. Dr. Guzmán has served as a lecturer at The Johns Hopkins University and the Virginia Polytechnic Institute and State University.

Mark Brave (BSAAE'73) receives National Space Club Florida Committee 2014 Hall of Fame Award



Mark Brave (right) receives national Space Club Florida Committee 2014 Hall of Fame Award.

Purdue University School of Aeronautics and Astronautics alumnus **Mark Brave** (BSAAE'73) received the National Space Club Florida Committee 2014 Hall of Fame Award for his significant contributions in Human Space Flight at a ceremony at the Radisson Hotel in Cape Canaveral, Florida on November 12, 2014. Mark was recognized for his sustained performance leading teams responsible for solving some of the most demanding technical and operational human spaceflight ground processing challenges, and for his exceptional contributions to the direct advancement of human sub-orbital, orbital, or beyond orbital spaceflight technology.

His career at Kennedy Space Center spans NASA's Space Shuttle and Spacelab Programs, the International Space Station (ISS) Program and, since 2012, the Space Launch System (SLS) Program. Mark is respected as a valuable and valued contributor, colleague, peer, task leader, manager, and chief engineer.

The National Space Club Florida Committee is one of three regional committees of the National Space Club in Washington, D.C. intended to provide information on space activities. For more information on the National Space Club Florida Committee, visit: <http://www.nscfl.org/Default.aspx>.

Class of '71 (page 23),

Marty Marler, Fred Smalley,
Ray Haseltine, Prof. George Palmer,
Earl Simpkins, Mike Corso, Rich Link

AeroGram Publication

Please contact us at aae-alumni@ecn.purdue.edu to be added to our electronic mailing list. Your private information will not be shared with any third party.

Two AAE alumni honored by President Mitch Daniels with

Pinnacle Award

Purdue University President Mitch Daniels honored two School of Aeronautics and Astronautics alumni with the President's Council Distinguished Pinnacle Award in 2014-15.



President Mitch Daniels (left) presents the Pinnacle Award to Dr. Ronald L. Kerber and Mrs. Kathleen M. Kerber on September 20, 2014.

Dr. Ronald L. Kerber (BSAE'65; DEA'88; OAE'99) and his wife **Kathleen M. Kerber** were recognized during a pre-game event at the Boilermaker's game against Southern Illinois University on September 20, 2014 for their investment in the education of future Purdue graduates through their establishment of The Ronald L. and Kathleen M. Kerber Engineering Scholarship. Dr. Ronald L. Kerber is an experienced executive with a successful record of leading and growing domestic and global businesses.

Dr. James D. Raisbeck (BSAE'61; DEA'79; OAE'99; HDR'05) and his wife **Sherry L. Raisbeck** were recognized on Wednesday, May 27, 2015 at the Diamond Club at Safeco Field in Seattle, Washington for their support of academic excellence through their donation toward the Raisbeck Engineering Distinguished Professorship for Engineering and

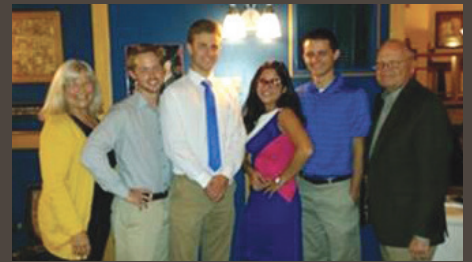


College of Engineering Dean Leah H. Jamieson (center) with Pinnacle recipients Dr. James D. Raisbeck and Mrs. Sherry L. Raisbeck on May 27, 2015.

Technology Integration held in AEE and a named professorship in Aviation Technology. Dr. James D. Raisbeck is CEO and Board Chairman of Raisbeck Engineering, Inc., and its subsidiary corporation, Raisbeck Commercial Air Group, Inc.

The President's Council was established in 1972 to recognize the distinguished alumni/alumnae and friends who understand that the University can fulfill its educational goals only with their loyal support

and financial involvement. These individuals have paved the way for the future and continue to support the excellent education afforded Purdue students. The Pinnacle Award recognizes University Donors who have given more than \$1 million to support the University.



David (BSAE'64, DEA'93, OAE'99, HDR'00) and Linda Swain establish \$1 Million Endowment of Scholarship

David (BSAE'64, DEA'93, OAE'99, HDR'00) and Linda Swain have established a \$1 million endowment to permanently support a School of Aeronautics and Astronautics scholarship in their name. Begun in 2005, the David and Linda Schimmel Swain Scholarship was motivated by the Swains' Indiana roots and funds AAE students who are residents of the state. The permanent endowment will provide scholarships to four students each year.

Recipients of the David and Linda Schimmel Swain Scholarship had the opportunity to meet with Dr. and Mrs. Swain. Pictured from left are Mrs. Linda Swain, Chris Polivick, James Pierce, Jani Dominguez, Nathan Gross, and Dr. David Swain.

THANK YOU!



The entire Purdue community came together to raise an astounding **\$13,695,951** from **9,592 gifts** in just **24 hours!** Your incredible generosity will grant countless opportunities and transform lives—thank you to everyone who helped make Purdue Day of Giving such a huge success!

It's not too late to donate. More information on giving can be found at www.purduedayofgiving.com.

The photo gallery of the day's events can be found at <http://purdue.photoshelter.com/gallery/Purdue-Day-of-Giving-2015/G0000LwkPSUJCCCc/>.

Ever Grateful – Ever True

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 and they signify your loyalty and belief in the university and the School of Aeronautics & Astronautics, its traditions and the power of a Purdue education to impact the world.

Our school continues to move forward. Students choosing aerospace engineering are outstanding and our faculty are committed to excellence in the classroom and laboratories. We want to continue to be the global leader in aerospace

engineering and with your continued support, we will maintain that role.

You can have an impact with your participation with the school and by contributing to the future success of the school.

Our annual Donor Honor Roll covers the period July 1, 2014 - June 30, 2015 and lists our alumni/alumnae, friends and corporate donors who have given generously of their financial resources to support the School of Aeronautics and Astronautics. Thank you for your support. The Donor Honor Roll is published on the alumni/alumnae page of the School Web site at <https://engineering.purdue.edu/AAE/AboutUs/Giving/honorroll>.

Dear Alumni and Friends,



We have had yet another exciting year in AAE, including several visits from many of you, and have hosted many special events throughout the year that are featured in this year's Aerogram. I have had the pleasure of meeting so many of the alumni/alumnae this year and hearing all of the fantastic stories of their days at Purdue and how their degrees have impacted their lives. Hosting one special alumni who had not been back to campus since graduating 65 years ago was truly a special visit!

Your generosity and commitment to this University and AAE are truly humbling. You are changing lives, and you are making a huge difference in so many areas. With your help and dedication, we will continue to provide Higher Education at the Highest Proven Value. As our enrollment continues to grow, it is important that we never lose sight of this important value and that we strive to maintain the excellence in education that is expected of us.

Knowing that we need to continue to expand and improve in order to meet the needs for today's industry and the future, we look to you for the support and guidance to achieve this vision. We must continue to push to retain and attract the best and brightest faculty, which in turn will bring the brightest students to the University. I look to each of you in your continued support to achieving this goal.

Thank you for your support, and I look forward to working with each of you to find ways to further engage with our school. Please visit our webpage and consider a pledge to AAE, or drop me a note and let me know that you would like to discuss your plans for supporting the school.

Again, thank you, and on our 70th anniversary, I would like to honor each of you for making this the best school at Purdue!
Go Boilers!

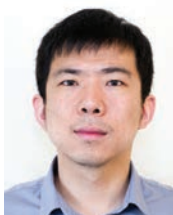
Rita Baines



Rita Baines
Director of Development
(765) 494-9124
r1baines@prf.org

AAE WELCOMES NEW FACULTY for 2015-16

The School of Aeronautics and Astronautics is pleased to welcome Dr. Shaoshuai Mou, Assistant Professor in Dynamics and Control, Dr. Jonathan Poggie, Associate Professor in Aerodynamics and member of the Cold Plasma Preeminent team, Dr. Alex Shashurin, Assistant Professor in Aerodynamics and member of the Cold Plasma Preeminent team, Dr. Carson Slabaugh, Assistant Professor in Propulsion, and Dr. Tyler Tallman, Assistant Professor in Structures and Materials.



Dr. Shaoshuai Mou earned his PhD from Yale University, and his MS and BS degrees from the Harbin Institute of Technology. Before joining Purdue, he was a Postdoctoral Fellow at Massachusetts Institute of Technology, and a Visiting Scholar at Australian National University. His research areas include distributed algorithm for solving a large systems of linear equations, distributed multi-agent formations, and cooperation of multi-UAVs.



Dr. Jonathan Poggie earned his PhD, MSE, and B.S. degrees from Princeton University. Dr. Poggie comes to us from the Air Force Research Laboratory where he was the team leader of AFRL's Computational Sciences Center and the technical advisor to AFRL's Hypersonic Sciences Branch. His research involves experimental, theoretical, and computational studies of compressible, viscous flow, shock-wave/boundary layer interaction, plasma aerodynamics, and hypersonic flight.



Dr. Alex Shashurin earned his PhD from Tel Aviv University, and his B.Sc. and M.Sc. from Nizhny Novgorod State University. He has held research positions at George Washington University, Tel Aviv University, and the Institute of Applied Physics of Russian Academy of Science. His research areas include Microplasmas, plasma-based synthesis of nanomaterials, hypersonic radio blackout, and advanced spacecraft propulsion.



Dr. Carson Slabaugh earned his PhD from Purdue University, and his MS and BS degrees from University of Central Florida. Previously, he was Senior Research Engineer at Purdue's Zucrow Laboratories. His research areas include turbulent flows, chemical kinetics, advanced combustion technologies, measurement and analysis technique development, and high thermal density.



Dr. Tyler Tallman earned his PhD and MSE from The University of Michigan in Ann Arbor, and two BS degrees from the University of Wisconsin. His research areas include smart aircraft structures, self-sensing nanocomposite materials, characterization of materials, non-invasive imaging, and structural-scale implementation.



Dr. C.T. Sun speaks to the audience in attendance at a reception in his honor in the Kurz Atrium of Armstrong Hall of Engineering.

Professor C.T. Sun set to retire January 2016

Neil A. Armstrong Distinguished Professor of Aeronautics and Astronautics Chin-Teh (C.T.) Sun has announced his plans to retire in January 2016. Professor Sun's long and distinguished career has spanned 47 years at Purdue University.

Professor Sun was honored and thanked for his many years of dedicated and exceptional teaching, research, and service to AAE at a retirement event on June 12, 2015 in the Armstrong Hall of Engineering Kurz Atrium. The event included comments by current and former faculty and students, College of Engineering Dean Leah Jamieson, School of Aeronautics and Astronautics department head Dr. Tom Shih, and Professor Sun.

Throughout his career, Professor Sun has received numerous awards and appointments including AIAA Fellow, ASME Life Fellow, ASC Fellow, Research Award for excellence in faculty research, College of Engineering, Sigma XI Purdue University Faculty Research Award, ASME Warner T. Koiter Medal, inaugural AIAA/ASC James H. Starnes Award, and the Alumni Merit Award from Northwestern University. The C.T. Sun School of Aeronautics and Astronautics Excellence in Research Award, presented annually, is named in honor of Professor Sun.



School of Aeronautics and Astronautics Professor C.T. Sun with his wife, Dr. Iris Sun.

FACULTY NEWS

AAE Faculty Roster

AERODYNAMICS

- A. Alexeenko**, Associate Professor; PhD, Penn State, 2003
- S. Bane**, Assistant Professor; PhD, CalTech, 2010
- G. A. Blaisdell**, Professor; PhD, Stanford, 1991
- S. H. Collicott**, Professor; PhD, Stanford, 1991
- M. C. Jischke**, President Emeritus; PhD, MIT, 1968
- S. Macheret**, Professor; PhD, Kurchatov Institute of Atomic Energy, Moscow, 1985
- J. Poggie**, Associate Professor; PhD, Princeton, 1995
- S. P. Schneider**, Professor; PhD, Caltech, 1989
- A. Shashurin**, Assistant Professor; PhD, Tel Aviv University, 2008
- T. Shih**, Professor and Head; PhD, Michigan-Ann Arbor, 1981
- J. P. Sullivan**, Professor; Sc.D., MIT, 1973
- D. Wolf**, Visiting Professor, Honorary PhD, Purdue, 2014

AEROSPACE SYSTEMS

- D. Andrisani II**, Associate Professor; PhD, SUNY at Buffalo, 1979
- W. A. Crossley**, Professor; PhD, Arizona State, 1995
- D. DeLaurentis**, Professor; PhD, Georgia Tech, 1998
- D. Dumbacher**, Professor of Practice
- M. Grant**, Assistant Professor; PhD, Georgia Tech, 2012
- I. Hwang**, Associate Professor; PhD, Stanford, 2004
- K. Marais**, Associate Professor; PhD, MIT, 2005
- J. P. Sullivan**, Professor; Sc.D., MIT, 1973
- D. Sun**, Associate Professor; PhD, UC-Berkeley, 2008

ASTRODYNAMICS AND SPACE APPLICATIONS

- C. Frueh**, Assistant Professor, University of Bern, Switzerland, 2011
- J. L. Garrison**, Associate Professor; PhD, Colorado-Boulder, 1997
- K. C. Howell**, Hsu Lo Distinguished Professor; PhD, Stanford, 1983
- J. M. Longuski**, Professor, PhD, Michigan-Ann Arbor, 1979

DYNAMICS AND CONTROL

- D. Andrisani**, Associate Professor; PhD, SUNY at Buffalo, 1979
- M. J. Corless**, Professor; PhD, UC-Berkeley, 1984
- D. DeLaurentis**, Professor; PhD, Georgia Tech, 1998
- A. E. Frazho**, Professor; PhD, Michigan-Ann Arbor, 1977
- I. Hwang**, Associate Professor; PhD, Stanford, 2004
- S. Mou**, Assistant Professor; PhD, Yale, 2014
- D. Sun**, Associate Professor; PhD, UC-Berkeley, 2008

PROPULSION

- W. Anderson**, Professor and Associate Head; PhD, Penn State, 1996
- S. D. Heister**, Raisbeck Engineering Distinguished Professor for Engineering and Technology Integration; PhD, UCLA, 1988
- T. Pourpoint**, Associate Professor, PhD, Purdue University, 2005
- L. Qiao**, Associate Professor; PhD, Michigan-Ann Arbor, 2007
- C. Slabaugh**, Assistant Professor; PhD, Purdue, 2014
- H. Wang**, Assistant Professor; PhD, Cornell, 2010

STRUCTURES AND MATERIALS

- W. Chen**, Reilly Professor and Associate Head; PhD, CalTech, 1995
- W. A. Crossley**, Professor, PhD, Arizona State, 1995
- J. F. Doyle**, Professor, PhD, UIUC, 1977
- A. F. Grandt, Jr.**, Raisbeck Distinguished Professor, PhD, UIUC, 1971
- R. B. Pipes**, John L. Bray Distinguished Professor of Engineering; PhD, University of Texas, 1972
- M. Sangid**, Assistant Professor; PhD, UIUC, 2010
- C. T. Sun**, Neil A. Armstrong Distinguished Professor; PhD, Northwestern, 1967
- T. Tallman**, Assistant Professor; PhD, Michigan-Ann Arbor, 2015
- V. Tomar**, Associate Professor; PhD, Georgia Tech, 2005
- W. Yu**, Associate Professor; PhD, Georgia Tech, 2002

Faculty Emeritus

- J. Drake** – Professor Emeritus
- W. Gustafson** – Professor Emeritus
- C. Kentzer** – Professor Emeritus
- M. C. Jischke** – President Emeritus
- F. Marshall** – Professor Emeritus
- C. Merkle** – Professor Emeritus, Reilly Professor of Engineering
- G. Palmer** – Professor Emeritus
- T. A. Weisshaar** – Professor Emeritus
- M. H. Williams** – Professor Emeritus

Adjunct Professor

AERODYNAMICS

- A. S. Lyrintzis**, Adjunct Professor; PhD, Cornell, 1988

ASTRODYNAMICS AND SPACE APPLICATIONS

- D. Filmer**, Adjunct Professor; PhD, Wisconsin, 1961
- B. Marchand**, PhD Purdue University, 2007

DYNAMICS AND CONTROL

- D. Filmer**, Adjunct Professor; PhD, Wisconsin, 1961

PROPULSION

- J. J. Rusek**, Adjunct Assistant Professor; PhD, Case Western Reserve, 1983
- K. Yerkes**, Adjunct Professor; PhD, University of Dayton, 1994

Faculty by Courtesy

AEROSPACE SYSTEMS

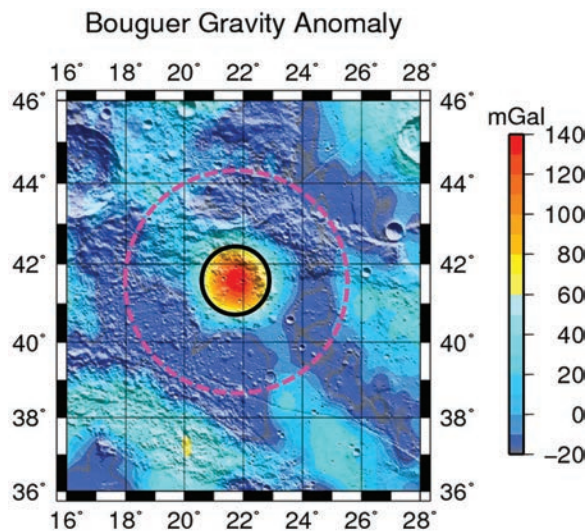
- B. Caldwell** (by courtesy), Professor of Industrial Engineering; PhD, University of California-Davis, 1990
- S. Landry** (by courtesy), Associate Head and Associate Professor of Industrial Engineering; PhD, Georgia Tech, 2004

ASTRODYNAMICS AND SPACE APPLICATIONS

- H. Melosh** (by courtesy), Distinguished Professor EAS/Physics, PhD Caltech 1972
- D. Minton** (by courtesy), Assistant Professor of Earth, Atmospheric, and Planetary Sciences; PhD, University of Arizona, 2009

PROPULSION

- T. Fisher**, Professor of Mechanical Engineering; PhD, Cornell University, 1998
- J. P. Gore**, Vincent P. Reilly Professor of Mechanical Engineering; PhD, The Pennsylvania State University, 1986
- N. Key**, Associate Professor of Mechanical Engineering; PhD, Purdue University, 2007
- R. Lucht**, Ralph and Bettye Bailey Professor of Combustion in Mechanical Engineering; PhD, Purdue 1981
- S. Son** (by courtesy), Professor of Mechanical Engineering; PhD, UIUC, 1993



The Earhart crater, a previously unknown lunar crater, is outlined in the magenta dash circle. A team of researchers at Purdue University found the crater through an analysis of data from NASA's Gravity Recovery and Interior Laboratory mission. The team provisionally named the crater Earhart, after the famous aviator Amelia Earhart. (Purdue University image/courtesy of Rohan Sood)

Purdue team puts Earhart on the moon with discovery of new crater

Purdue scientists have discovered a large, previously unknown lunar nearside crater revealed as part of NASA's Discovery Program, the Gravity Recovery and Interior Laboratory (GRAIL) Gradiometry. The team includes two professors and four students: Rohan Sood and Loic Chappaz are PhD students under **Professor Kathleen Howell** in the School of Aeronautics and Astronautics. Dave Blair is a PhD student in EAPS; Colleen Milbury is a Post-doc in EAPS and they are working with **Professor Jay Melosh** (EAPS and courtesy Professor in AAE). The discovery was announced at the Lunar and Planetary Science Conference on March 16, 2015.

The team provisionally named the crater Earhart, after the famous aviator Amelia Earhart. Names of planetary features must be submitted and approved by The International Astronomical Union. Earhart was a Purdue career counselor and adviser to the Department of Aeronautics from 1935-1937, and Purdue is home to the world's largest compilation of Earhart-related papers, memorabilia and artifacts. The collection includes documents related to Earhart's 1932 solo Atlantic flight, her second and fatal attempt at a world flight in 1937, and items related to her time at Purdue.



Excellence in Research Awards 2014

Nearly 200 Purdue faculty and staff gathered in November 2014 for the Excellence in Research Awards dinner, celebrating the accomplishments and contributions of Purdue's research community.

Among the honorees were faculty members who had received college or school awards for outstanding research in 2014, along with Seed for Success honorees – principal investigators and co-investigators garnering awards of \$1 million or more. Of the 131 principal investigators and co-investigators working on one of the 52 Seed for Success projects, 50 investigators earned their bronze acorn award in recognition of their contribution in acquiring for the first time an award of \$1 million or more.

As part of the ceremonies, **AAE Professor Jay Melosh** (by courtesy), a distinguished professor EAS/Physics, internationally known for his work on impact cratering, planetary tectonics, and the physics of earthquakes and landslides, was honored with the **Herbert Newby McCoy Award**. His name now appears in the Purdue Memorial Union on a plaque created this year to commemorate awardees for these distinctive Purdue awards.

The Seed for Success Award is given in recognition of the accomplishments of single investigators and teams of investigators for their efforts in obtaining a \$1 million dollar or more external sponsored award. The awards listed include single year and multi-year awards received in fiscal year 2014.

Three Seeds for Success awards went to faculty members and faculty by courtesy who were principal investigators or co-investigators from the School of Aeronautics and Astronautics.

Congratulations to:

Professors Timothy S. Fisher (by courtesy); **Stephen D. Heister**; **Tom I-P. Shih**, from Air Force Research Laboratory, *Center for Integrated Thermal Management of Aerospace Vehicles*.

Professor James L. Garrison (by courtesy), from National Aeronautics and Space Administration, *Signals of Opportunity Airborne Demonstrator (SoOp-AD)*.

Professor Steven F. Son (by courtesy), from National Nuclear Security Administration, *Shock Wave-Processing of Advanced Reactive Materials Experiments*.



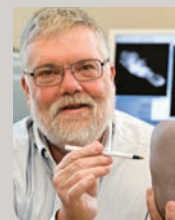
Fisher



Garrison



Heister



Melosh



Son



Shih



Professor Kathleen Howell inducted in Purdue University Teaching Academy

AAE Distinguished Hsu Lo Professor of Aeronautical and Astronautical Engineering Kathleen Howell was inducted in the Purdue University 2013-2014 Teaching Academy at a ceremony on Wednesday, September 24, 2015.

The Teaching Academy at Purdue strives to bring together the best teaching faculty across campus to create a collective voice for teaching and learning on campus. Faculty are nominated and selected by their peers to join this eclectic group of faculty. Faculty in the Teaching Academy contribute in a variety of ways, but even with the myriad activities their primary focus is to increase the effectiveness of all of the faculty at Purdue University.



Professor Weinong “Wayne” Chen named Reilly Professor of Aeronautics and Astronautics and Materials Engineering



The Purdue University Board of Trustees ratified **Professor Weinong Wayne Chen** as the **Reilly Professor of Aeronautics and Astronautics and Materials Engineering** on December 20, 2014. Dr. Chen has been associate head of graduate education in the School of Aeronautics and Astronautics since 2012 and came to Purdue in 2005 as a professor of aeronautics and astronautics and materials engineering. Before that, he was an associate professor and assistant professor of aerospace and mechanical engineering at the University of Arizona, Tucson. He worked in the aerospace industry before returning to graduate school at the California Institute of Technology in Pasadena.

His research areas involve the development of dynamic material characterization techniques and the determination of dynamic responses of advanced engineering materials at high loading rates. He built dynamic material characterization laboratories at Purdue, the California Institute of Technology and the University of Arizona, and assisted in the development of such laboratories at government labs such as Sandia National Laboratories, the Army Research Laboratory and the National Institute of Standards and Technology. He is the author or co-author of a book and 148 archival journal publications.

Professor Chen is a fellow in the Society for Experimental Mechanics and the American Society of Mechanical Engineers and an associate fellow in the American Institute of Aeronautics and Astronautics. He was a University Faculty Scholar at Purdue in 2005 and five times has received Purdue’s Acorn Research Award.

He received his bachelor’s and master’s degrees from Beijing University of Aeronautics and Astronautics and his doctorate from the California Institute of Technology.

Purdue trustees approve faculty promotions

Purdue University’s Board of Trustees approved faculty promotions on April 10, 2015. Promotions within the School of Aeronautics and Astronautics include:

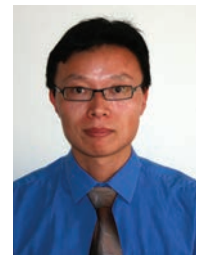
Assistant **Professors Karen Marais** and **Dengfeng Sun** were promoted to associate professor with tenure.

Associate **Professor Dan DeLaurentis** was promoted to full professor.

Associate **Professor Alina Alexeenko** was selected to win one of this year’s University Faculty Scholar Award.



Marais



Sun

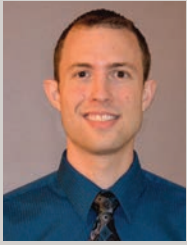


DeLaurentis



Alexeenko

The Elmer F. Bruhn Teaching Award 2015



Congratulations to **Professor Michael Grant** who has been selected to receive the School of Aeronautics and Astronautics prestigious Elmer F. Bruhn Award for 2015. The Bruhn teaching award is presented annually to an Outstanding Teacher in the School of Aeronautics and Astronautics. The selection is through a vote by AAE's sophomores, juniors, and seniors for excellence in teaching and is made possible by the interest and generosity of friends and alumni/alumnae of the school.

Several other outstanding faculty members were also nominated to receive this year's Bruhn Award. In order of the votes received, the next four after Professor Grant are as follows: **Professors Kathleen Howell, James Longuski, Alina Alexeenko, and William Crossley.** Professors Dominick Andrisani and Karen Marais, who won the Bruhn award during the past two years, were not eligible in the voting.

Congratulations to all for this recognition of their dedication to teaching and their efforts to provide the best possible education for AAE students.

The C.T. Sun School of Aeronautics and Astronautics Excellence in Research Award 2014



Congratulations to **Professor Steven Collicott** who is the recipient of the 2014 C.T. Sun School of Aeronautics and Astronautics Excellence in Research Award. Presented annually, this prestigious award is conferred to an individual

or a team of faculty members in the Purdue University School of Aeronautics and Astronautics to recognize high-quality contributions in science and engineering.

W.A. Gustafson Award for Outstanding Teaching



Congratulations to **Professor Greg Blaisdell**, winner of the prestigious 2014 W.A. Gustafson Award for Outstanding Teaching.

Four additional faculty members were also nominated for the W.A. Gustafson Award for Outstanding Teaching, and received the next four highest numbers of votes: **Professors Alina Alexeenko, Mike Sangid, Jim Longuski, and Karen Marais.**

The recipient of this award is selected by the juniors and seniors of the AAE student body. It is made possible by the interest and generosity of friends and alumni/alumnae of the school.

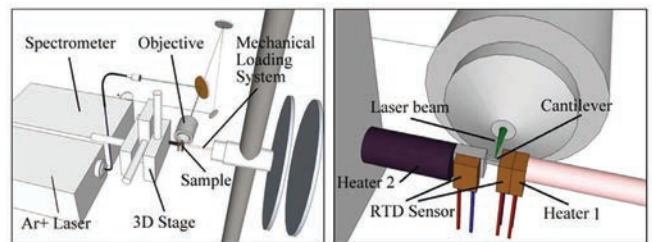
Dr. Vikas Tomar develops new analytical technology revealing 'nanomechanical' surface traits



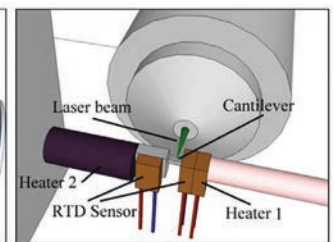
Dr. Vikas Tomar has developed a new research platform using a laser to measure the "nanomechanical" properties of tiny structures undergoing stress and heating, an approach likely to yield insights to improve designs for microelectronics and batteries.

This new technique, called nanomechanical Raman spectroscopy, reveals information about how heating and the surface stress of microscale structures affect their mechanical properties. Researchers have discussed the merits of surface-stress influence on mechanical properties for decades. However, the nanomechanical Raman spectroscopy has offered the first such measurement, said Dr. Tomar, an associate professor in Purdue's School of Aeronautics and Astronautics.

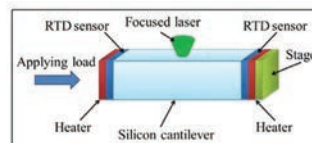
Information about the platform and new research findings were detailed in three papers published this year. The most recent appeared August 2014 in the Journal of Applied Physics. Tomar has led the research with former doctoral student Ming Gan (Bilsland Dissertation Fellow and Purdue Finalist Chorafus Foundation award for best PhD dissertation), who has graduated and is now working in industry, and current doctoral student Yang Zhang.



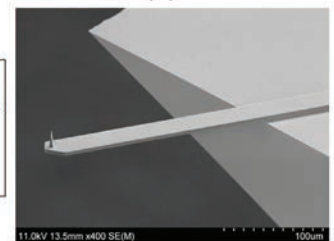
(a)



(b)



(c)



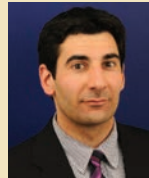
(d)

A new research platform uses a laser to measure the "nanomechanical" properties of tiny structures undergoing stress and heating, an approach likely to yield insights to improve designs for microelectronics and batteries. Clockwise from upper left, graphics of the instrument setup, and at bottom right a scanning electron microscope image of the tiny silicon cantilever used in the research. (Ming Gan/Purdue University photo)

Faculty Awards 2014-2015

The School of Aeronautics and Astronautics is pleased to recognize faculty who have received awards during the 2014 - 15 academic year:

Assistant Professor Michael Sangid received the American Society of Mechanical Engineers (ASME) Orr Early Career Award. This honor comes in recognition of Dr. Sangid's seminal contributions to the area of experimental and computational fatigue, fracture, and creep. The Orr Early Career Award is presented through the Materials Division of ASME, and is given by the Orr Family. Recipients are selected by the Materials Division Executive Committee. As part of the award, Dr. Sangid presented a lecture at the November 2015 International Mechanical Engineering Congress & Exposition (IMECE) during the presentation ceremony in Houston, Texas. Asst. Professor Michael Sangid also received a Defense Advanced Research Projects Agency (DARPA) Young Faculty Award. The objective of the DARPA Young Faculty Award (YFA) program is to identify and engage rising research stars in junior faculty positions at U.S. academic institutions and expose them to Department of Defense needs as well as DARPA's program development process. Dr. Sangid was also selected to attend the National Academy of Engineering 2014 Frontiers of Engineering Symposium held on November 10-12, 2014 in Seattle, Washington. Dr. Sangid is one of only 60 outstanding engineers under the age of 45 who were selected for an intensive 2-1/2 day symposium to discuss cutting-edge developments in four areas: Energy Storage Across Scales, Protein Design for Therapeutic Applications, Smart Homes, and Atoms to Airplanes: Designer/Engineered Aerospace Materials.



Sangid

Associate **Professor Vikas Tomar** been elected to the grade of Associate Fellow in the American Institute of Aeronautics and Astronautics (AIAA). Dr. Tomar was officially recognized as an Associate Fellow at the Awards Ceremony and Dinner in January 2015.



Tomar

Professor Robert Lucht (by courtesy), the Ralph and Bettye Bailey Professor of Combustion in Mechanical Engineering, has been elected a Fellow of the American Institute of Aeronautics and Astronautics (AIAA). The AIAA Fellows are individuals of distinction who have made notable and valuable contributions to the arts, sciences, or technology of aeronautics or astronautics. It is one of the highest honors that AIAA can bestow upon an engineer.



Lucht

Professor Wenbin Yu was selected as an Entrepreneurial Leadership Academy Fellow for 2014-2015. The Entrepreneurial Leadership Academy is a resource support program for Purdue faculty who have entrepreneurial interests.



Yu



AAE's Karen Marais and design team explore the causes of systems engineering failures

Karen Marais, Associate Professor in the School of Aeronautics and Astronautics, seeks to improve large-scale engineering projects in ways that could have applications throughout the aviation, space, and other industries. Professor Marais' design team is featured in a College of Engineering article which highlights their research exploring the causes of systems engineering failures.

To read the entire article, visit:

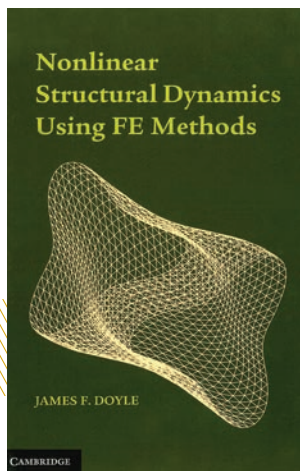
https://engineering.purdue.edu/discovery/2015_1/big-systems-analyst.

Professor Drake seeks updates from former students

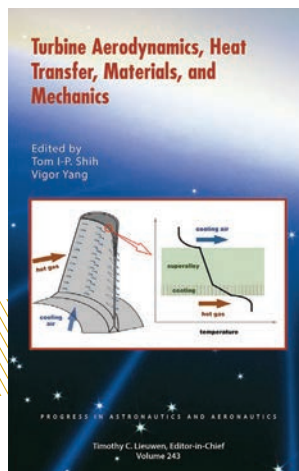
Dr. John Drake, Professor in the Air Transportation program between 1972-1992, would like to hear from his former students. Professor Drake is seeking updates on what his students are doing now, and how the Air Transportation courses have benefitted or influenced them. Students are encouraged to share any news. Professor Drake can be reached at: drake@purdue.edu.

AAE Professors author/edit books in aerospace engineering

Two School of Aeronautics and Astronautics professors have penned textbooks.



Professor James Doyle authored a textbook, *Nonlinear Structural Dynamics Using FE Methods*.



Professor Tom Shih (and Prof. Vigor Yang, of Georgia Tech) have co-edited *Turbine Aerodynamics, Heat Transfer, Materials, and Mechanics*.

Professor Melosh selected as Purdue's 2014 McCoy Award winner

Professor Jay Melosh, a distinguished professor internationally known for his work on impact cratering, planetary tectonics, and the physics of earthquakes and landslides, is the 2014 recipient of the Herbert Newby McCoy Award, established in 1964 by Ethel Terry McCoy in memory of her husband and is the most prestigious research honor in the natural sciences given by Purdue University.

Dr. Melosh, a distinguished professor in the College of Science's Department of Earth, Atmospheric and Planetary Sciences, was formally recognized on November 19, 2015 during the McCoy Distinguished Lecture. Dr. Melosh also has professorship appointments with the Department of Physics and Astronomy and the School of Aeronautics and Astronautics.



Professor Emeritus Terrence Weisshaar receives 2014 NATO Science and Technology Scientific Achievement Award

School of Aeronautics and Astronautics



Professor Emeritus Terrence Weisshaar has received the 2014 NATO Science and Technology Scientific Achievement Award

for his contribution to AVT-174 on Qualification and Structural Design Guidelines for Military UAVs.

In the period between 2010 and 2012, Dr. Weisshaar and the other members of the Technical Group provided an outstanding contribution to the mission of the NATO Science and Technology Organization, conducting extensive co-operative research in the field of Military UAVS. Further, the results generated by AVT-174 were directly and immediately exploited within NATO and NATO nations as they were specifically requested by various industry and research institutions.

Encompassing a network of over 3,000 scientists and engineers from across the Alliance and its Partners, the STO promotes and conducts co-operative research and information exchange across the full spectrum of defense research, develops and maintains a long-term NATO research and technology strategy, and provides advice to all elements of NATO on research and technology issues. As well, it is the largest such research group in the world. Congratulations to Dr. Weisshaar on this award!



AUGUST 2014

BS STUDENTS

Seung Soo Lee
 Joseph E. Morgan
 Abheejit Bhonsale
 Matthew M. Dupont
 Cameron B. Horton
 Collin L. Ramsey
 David A. Rankine
 Trevor R. Saturnino
 Bradley W. Templin
 Juanyong Wang

MS STUDENTS

Kevin Bonanne
 Robert Carter
 Jonathan Chrzanowski
 James D'Entremont
 Rishika Duvvur
 Nicoleta Fala
 Darin Flynn
 Jason Gabl
 Zherui Guo
 Keith Hair
 Di Huang
 Kathryn Lane
 Evan Maynard
 Joseph Neal
 Nicholas Rainville
 Peter Renslow
 Anthony Ronald
 Christopher Schwall
 Mughilan Thiruramasamy
 Gautham Varmaraja
 Kochanattu

PhD DEGREES

AUGUST 2014

Kurt Aikens
 Benjamin Bratschi
 Amanda Chou
 You Sung Han
 Matthew Kube-McDowell
 Hongsuk Lee
 Jeffrey Stuart
 Shashank Tamaskar

DECEMBER 2014

Mark Boas
 Jacob Dennis
 Arnab Ganguly
 Roger Greenwood
 Amanda Haapala
 Jeeyeon Hahn
 Mark Pfeil
 Christopher Ward
 Matthew Wierman
 Jian Xu

MAY 2015

Donald Fry
 Masaki Kakoi
 Frank Laipert
 Kaela Martin
 Natalie Smith
 Payuna Uday
 Andrew Weaver

Congratulations

to Our Graduates

2014-2015



DECEMBER 2014

BS STUDENTS

Michael L. Abram
John P. Bartos
Michael S. Caselton
Nicholas L. Correll
Robert B. Dailey
Andrew S. Davis
Joshua M. Davis
Nicholas J. Eisenhauer
Jonathan M. Glackin
Nathan A. Gray
John P. Hale
Weng Hang Ho
Alexander M. Hodges
Kathryn A. Johnson
Theresa J. Kaufman
Joshua J. Lee
Jorge Luis Lopes
Perdigao
Ryan I. Maserang
Alec R. O'Connor
Michael A. Overway
Samuel L. Reimer
Kyle J. Roche
Collin J. Shen
Reema Siddiqui
Nicolas M. Spoentgen
Jacquelyn R. Stephan
Albert L. Sze
Benjamin L. Van
Maastricht
Joseph R. Whitman
Nathan R. Wilkins
Yang Zhou

MS STUDENTS

Tiffany Allmandinger
Thomas Antony
Jun Chen
Ashwati Das
Romain Delerry
Benjamin Denos
Javier Esquivel
Giovanni Farag-hanna
Zachary Grey
Nickolas Hartwich
Christopher Heath
Ryan Henderson
Sarah Hester
Ravichandra Jagannath
Mark Kane
Peter Klintstiver
Christopher Kourloufas
Nick Kowalczyk
Zachary May
John Panickacheri
Mukul Rao

Carlos Rendon
Daniel Steen
Joseph Tuttle
Jayarama Vadlamannati
Nikhil Varma
Patrick Wandro
Yuankai Wang
Jared Willits
Joshua Wolf
Megan Youngs
Andy Yu

MAY 2015

BS STUDENTS

Joshua S. Adair
Alexander L. Adduci
Saphal Adhikari
Kartik Ancha
Blake A. Anderson
Cory D. Back
Tanner C. Bennett
Saketh Bhagavatam
Mayank Bhattarai
Andrew J. Bokhart
Frederick Bossaerts
Sarah E. Brennan
Zachary C. Brown
Dustin T. Case
John M. Castle
Liangchun Chen
Ho-An Chien
Nicholas A. Crass
Ted U. Danielson
Michael L. Davidson
Alex B. Davis
Jani A. Dominguez
Daniel R. Drabiak
Rohan S. Dudaney
Maksym Dzis
Jacob J. Ediger
Rhyse R. Elbert
Anthony J. Falter
Jeremy B. Feldstein
Samuel E. Ferdon
Lorenzo Garcia
Peter J. Geldermans
Corey M. Gerrish
James A. Geyer
Matthew G. Gibbs
Christopher M. Giunta
Daniel A. Goldberg
Justin R. Guastaferrero
Jorge Guerrero
Riley K. Hampton
Sadie M. Holbert
Philip D. Holt
Daniel F. Ingegno
Christopher M. Jacobus
Arjun Jayaraj



Zachary J. Jochum
Jacob S. Johnson
Reese T. Johnson
Brent O. Justice
Logan M. Kamperschroer
Roshni Kasturi
Daniel J. Kerstiens
Cory J. Kinsel
Hyeung Ko
Gavin J. Lachesky
Kevin P. Lapp
Dongju Lee
YiWei Lee
Hong Liu
Trevvor D. Long
Morgan J. Lucas
Colleen M. Mahoney
Alexandra G. Manguera
Brendan P. Martin
Nicholas J. McGregor
Brian P. McGuire
Andrew E. Melgar
Jacob E. Might
Anthony C. Miller
Bryan Minelli
Nathan E. Misenheimer
Eric L. Monson
Landon P. Moores
Anthony E. Moorman
Gillian E. Morse
Alec J. Mudek
Mallory C. Neet
Sean M. Nolan
Kevin F. O'Hara
Ayotomi M. Olokun
Courtney B. Parrott
Tina L. Phanmanivong
Kevin M. Porter
Kensley D. Pottebaum
Matthew C. Rachal
Alvaro Rangel Mendoza
Andrew R. Reibold
Robert L. Reich
Joseph P. Riedle
Bradley W. Robbins
Walter G. Schostak
Jenna M. Schreiner

Kyle S. Schwinn
Ji-Hoon Seo
Ellis A. Sepkovich
Todd H. Shinall
Zakary J. Sipich
Robert W. Skidmore
Patrick A. Smith
Phisitthep Srichawana
Marcie A. Stuber
Connor M. Sullivan
Kevin M. Szul
Benjamin M. Tackett
Dalan A. Talsma
Jie Tao
Taddese A. Tessema
Xavier M. Thierry
Nicole M. Vaughn
Christian A. Vuong
Takaaki Wakazono
Sean T. Walsh
Shaun P. Walsh
Julian C. Wang
Xingxing Wang
Lee T. Westropp
Stephen D. Whitnah
Drake E. Wisser
Alibek Yertay
Matthew A. Young
Xiaoxiao Yuan
Ryan M. Zeoli
Haonan Zhang
Emily M. Zimovan

MS STUDENTS

James Behmer
Mounia Belmouss
Timo Buschhagen
Nicolaus Caniza
Ishaan Chawla
Yongkai Chen
Paul Ciolek
David Cisneros Gonzalez
Brian Clegg
Andrew James Cox
Rebecca Cutting
Timothy Dannenhoffer
Michael Dehnbostel

Benjamin Dunajeski
Giovanna Espegio
Siwei Fan
Jose Flores
Le Gao
Zhenyuan Gao
Matthew Gerberich
James Hagan
Paht Juangphanich
Ilse Juarez Olivas
Kartik Kapoor
David Kun
Sangjun Lee
Ning Liu
Yufei Long
Daniel Lovelace
Jonathan Marsh
Robert McCabe
Emerald McKinney
Michael Munizzi
Anurag Nandi
Diwakar Naragani
Byung Hoon Oh
Chintankumar Patel
Christopher Potter
William C. Pyant
Greeshma Ramakrishna
Griffin Rowell
Matthew Schibler
David Schulz
Theodore Sieffert
Praveen Srikanth
Steven Stoot
Nishant Swaroop
Ryan Tedjasukmana
Christopher Trickle
Jayant Uppal
Ajey Venkataraman
Hao Wang
Chiyu Zhang
Robert Zhang
Wanjia Zhang

STUDENT AWARDS

2014 Scholarship Recipients

A. M. King Aeronautics and Astronautics Scholarship
Kensley Pottebaum

AAE General Scholarship
Wenjie Cai
Yucheng Chen
Hakusho Chin
Ujjwal Dalmia
Yiqing Ding
Min Kyum Kim
Jae Woo Lee

Andrew Kasowski Scholarship in Aeronautics and Astronautics
Logan Kamperschroer

Beering Scholarship
Kimberly Rink
Stephen Whitnah

Blaine L. Curtis Scholarship in Aeronautics and Astronautics
Andrew Siefert

Bob & Elly Hostetler Scholarship
Samuel Ferdon

Boeing Undergraduate Scholarship
Saphal Adhikari
Christian Vuong

Bruce A. Reese Aeronautics and Astronautics Scholarship
Joseph Lorenzetti
Ryan Willmot

Captain Iven C. Kincheloe Scholarship
Konrad Goc
Nathan Houtz
Kelly Kramer
Brock Miller
Aaron Nordhoff
William Sarmiento
Andrew Siefert
Christopher Treese

David L Filmer Scholarship
Gavin Lachesky

David O. and Linda Schimmel Swain Scholarship
Jani Dominguez
Nathan Gross

James Pierce
Christopher Polivick

Dr. Allen S. Novick AAE Distinguished Indiana Student Scholarship
Andrew Birky

Future Purdue Scholarship
Kensley Pottebaum

GE Foundation Scholarship
Marcie Stuber

George and Patricia Palmer Undergraduate Scholarship
Jenna Schreiner
Scott Schwenker

Grissom or Chaffee Scholarship
Catherine Courchaine
Feng Hai
Timothy Madzey

James Kirby Risk SR Memorial Scholarship
Courtney Parrott

John and Linda Hayhurst Scholarship in Aeronautics and Astronautics
Reese Johnson
Ellis Sepkovich

John Gleiter Perseverance Scholarship
Alexandra Dukes

Lilly Endowment Gift
Ashwin Bin Abdul Malik Jeyarajah
Nathan Gross
Kyle Schwinn

Mark and Laura Burgess Scholarship for Aeronautics and Astronautics
Christopher Jacobus

McDonnell Douglas Scholarship
Joshua Rivera
Marcus Lloyd
William Sarmiento
Tyler Holmes

Neil A. Armstrong Scholarship
Catherine Courchaine
Adam Willis
Feng Hai
Timothy Madzey
Courtney Murphy
Christopher Herr

Orrin Arthur Austin Memorial Scholarship in Aeronautics and Astronautics
Lauren Kolkman

Pratt & Whitney Rocketdyne Scholarship
Timothy Madzey
Sean Nolan

Roberta and John Gleiter Engineering Scholarship
Catherine Courchaine

Robert A. and Totyse H. Winslow Scholarship
Joseph Butcher

Space Shuttle Memorial Scholarship
Cory Back
Matthew Gripe
Emily Zimovan

Swenson Aeromodeler's Scholarship
Joshua Wise

The Arthur S. Remson Memorial Scholarship
Blair Francis

The John L. and Patricia R. Rich Scholarship for Aeronautical Engineering
Ishaan Bakhle
Konrad Goc
Michael Kobyra
Eric Nordin
Scott Schwenker

The Lawrence T. Cargino Cooperative Scholarship
Aaron Lemcherfi

The Marc Christopher Weaver Memorial Scholarship
Amit Soni
Jacob Stepec

The Marc Christopher Weaver Memorial Scholarship for Indiana Students
McClain Goggin
Aaron Lemcherfi
Alvaro Rangel Mendoza

The Peter Mueller Memorial Scholarship for Aeronautics and Astronautics
Emily Zimovan

The Swaminathan and Garg Scholarship in Aeronautics and Astronautics
Emine Atayurt

Warren G Koerner Scholarship
Alexander Adduci
Andrew Birky
Nate Byerly
Liangchun Chen
Alexander Corbin
Catherine Courchaine
Matthew Elliott
Hei Jung
Ethan Kayser
Colleen Mahoney
Silas Meriam
Samuel Otto
Aaron Pikus
Kevin Porter
Bryce Prior
Bryan Ryder
Tanvi Sawant
Dominic Vitello
Sean Walsh
Xingxing Wang
Shiyu Xia

William and Sally Dunton Scholarship in Aeronautics and Astronautics
Stephen Tucker

William J. & Diane G. O'Neil Scholarship for Undergraduate AAE Students at Purdue University
Jacob Madalon

Recipients of 2014 Purdue Forever Fellowship Named

Congratulations to **Anthony Cofer** (PhD student of Alina Alexeenko), **Nicholas Smith** (PhD student of Byron Pipes), and **Brandon Terry** (PhD student of Steven Son) who have been named as recipients of the 2014 Purdue Forever Fellowship.

The Purdue Forever Fellowship was established through a generous endowment from C.D. McAllister (BSEE'20), Jean McAllister Elrod (BSSCI'51) and Robert H. Elrod (BSSCI'51). This endowment provides supplemental support for exceptional PhD students in the School of Aeronautics and Astronautics. The selection of recipients is based on academic achievement, potential for future professional achievement and creativity in research.



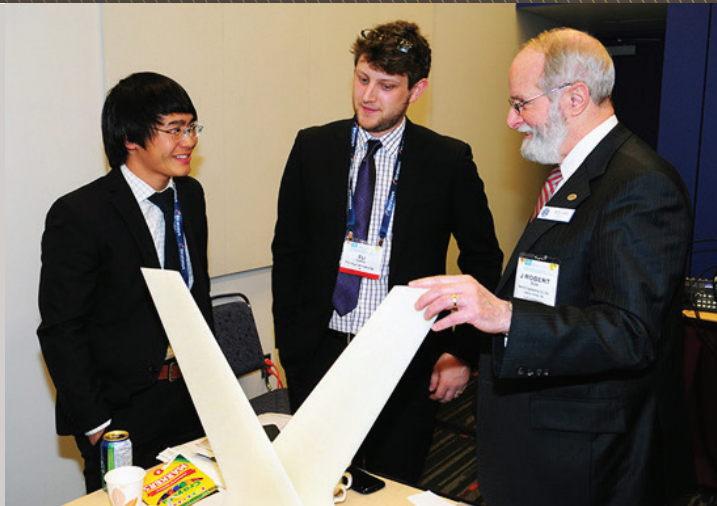
Cofer



Smith



Terry



Jean Ruggiero and Eli Cohen talk about their entry during the inaugural ASME Innovative Additive Manufacturing 3D (IAM3D) Challenge.

School of Aeronautics and Astronautics student team members win best overall in IAM3D Challenge

A team of students led by faculty advisor Dr. John Sullivan, professor of aerodynamics in Purdue University's School of Aeronautics and Astronautics, was awarded Best Overall in the inaugural ASME Innovative Additive Manufacturing 3D (IAM3D) Challenge on November 15, 2014.

Team members included students from Purdue University and Brigham Young University. Eli Cohen (Purdue, Team Leader), Jean Ruggiero (Purdue), and Aaron Inouye (BYU) submitted their entry based on their design and manufacture of the world's largest 3D printed UAV accomplished during the 2013-2014 Aerospace Partners for the Advancement of Collaborative Engineering (AerosPACE) course.

The goal of the competition, open to undergraduates around the world, was to "re-engineer existing products or create new designs that minimize energy consumption and/or improve energy efficiency. Students will showcase their creativity by demonstrating the value added through their ingenuity, application of sound engineering design principles, and leveraging Additive Manufacturing technology to address a broad spectrum of industrial, manufacturing, and humanitarian challenges."

The application consisted of a business case that was submitted in June where the AerosPACE team described the promise of using additive manufacturing to bring specialized UAV solutions to market far more quickly than traditional manufacturing techniques could hope to do. In September, winners were notified that they had made the final cut of 30 proposals. ASME, at no cost to the team, printed a scale model of our UAV (which was submitted along with the business case) and provided funding for the students to travel to Montreal and present to a panel of judges.

The judges' decisions were based on the following breakdown of criteria:

- Business case (Context and Relevance) 20%**
- Innovation and Creativity 30%**
- Efficiency and Feasibility 30%**
- Communication and Presentation 20%**

See the largest 3D Printed UAV first flight: <https://www.youtube.com/watch?v=rhjf-HuC13g>.

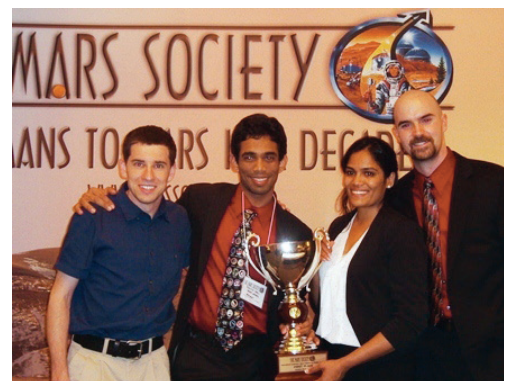


TEAM KANAU Wins International Inspiration Mars Student Design Contest

On August 9, 2014, the Mars Society declared Team Kanau, comprised primarily of students from Purdue University and Keio University, as the 1st place winner of the *International Inspiration Mars Student Design Contest*. The final round, held at League City, Texas during the International Mars Society Convention 2014, included 9 other teams from across the world, comprising Germany, India, Russia, the Netherlands, Poland and the U.S.

Pictured: **Max Fagin; Kshitij Mall; Ashwati Das; Jeff Stuart.**

Read more about Team Kanau at: <https://engineering.purdue.edu/AAE/Spotlights/20140811TeamKanauWinsMarsDesignContest>.



STUDENT AWARDS



Two Undergraduate Research Teams Win at 2014 American Institute of Aeronautics and Astronautics (AIAA) Conference

Two Purdue University undergraduate research teams won awards at the 2014 American Institute of Aeronautics and Astronautics (AIAA) Region III Student Conference this spring.

In the team division, a four-person team placed first with their paper on “Estimating Landing and Take-off Cycle Parameters Using MATLAB.” Team members were Pedram Motevalli, aviation technology; Demetrios Katsaduros, electrical engineering; Matthew Prall, mechanical engineering; and Jacob Varney, mathematics. One person from the winning team will attend the January 2015 conference in Florida to present the team’s research.

A two-person team placed second in the undergraduate division with their research titled, “A Comparison of Airport Operations Estimates for Non-Towered Airports from Two FAA Sources.” Team members were Noah Salas, industrial engineering, and Brian Wenzel, mathematics.

“The outstanding undergraduate education provided by these students’ departments makes it possible for us to do multidisciplinary student research projects at Purdue,” said Mary Johnson, Assistant Head for Graduate Education and Research for the Department of Aviation Technology. Johnson notes that these student papers help to better understand general aviation exhaust emissions and the inputs for models of exhaust emissions. Their findings contribute to the long-term sustainability research goals of our aviation-related research centers. Johnson is a member of the leadership team for the FAA Center of Excellence for general aviation, known as PEGASAS (Partnership to Enhance General Aviation Safety, Accessibility and Sustainability), and is engineering director for the Air Transportation Institute for Environmental Sustainability (AirTIES).

The PEGASAS team at Purdue is led by Professor of Aeronautics and Astronautics, William Crossley. He is supported by Karen Marais, Associate Professor of Aeronautics and Astronautics, and John Young, a Professor of Aviation Technology.

Congratulations to Winners of the 2015 Magoon Excellence in Teaching Award



Alden Black (PhD)
Advisor Prof. William Crossley



Davide Guzzetti (PhD)
Advisor Prof. Kathleen Howell



Saad Tanvir (PhD)
Advisor Prof. Li Qiao



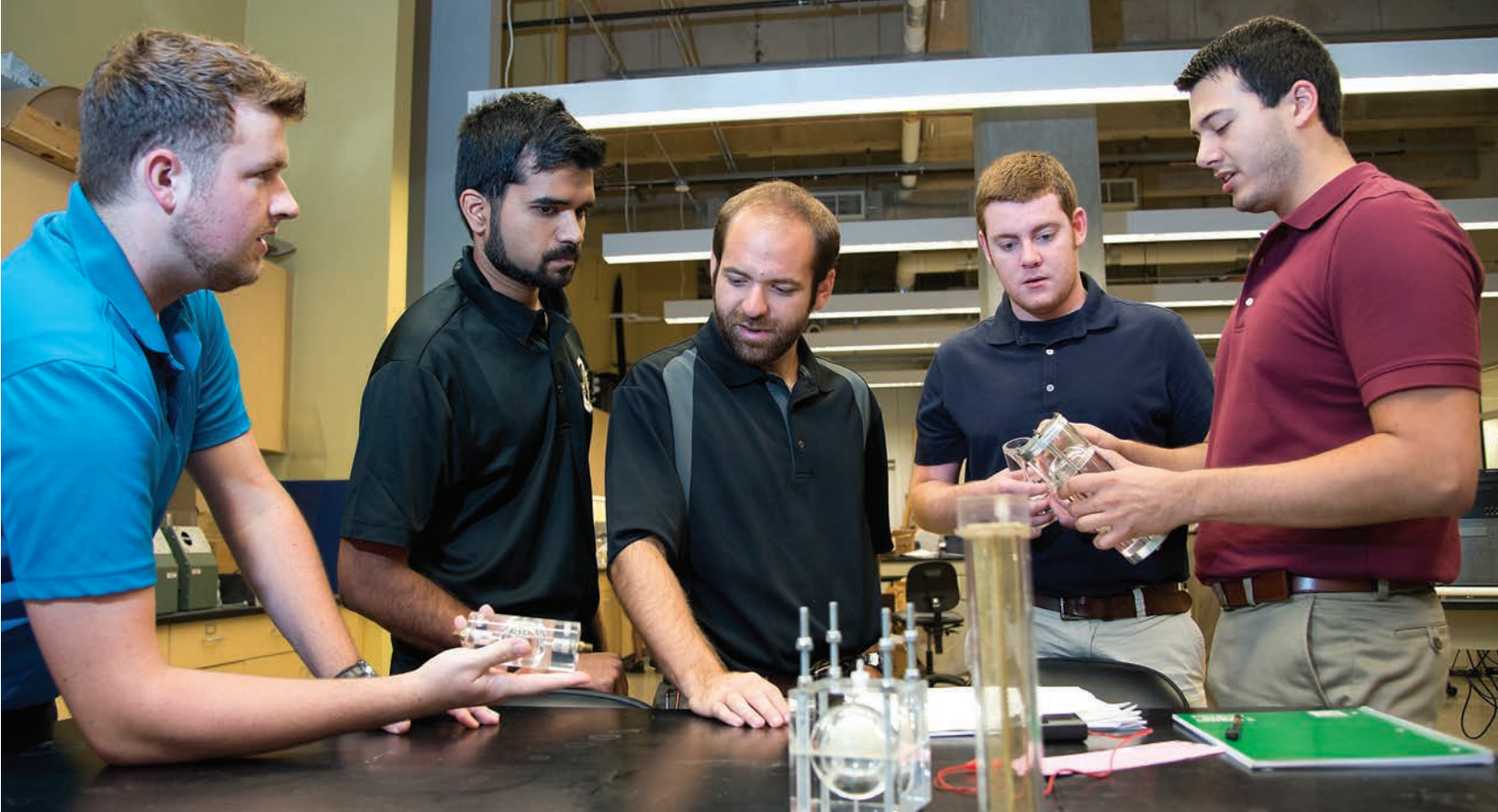
Andy Yu (PhD)
Advisor Prof. Daniel DeLaurentis



Prashanth Bangalore Venkatesh (MS)
Advisor Prof. Sally Bane

These recipients have been presented with Purdue’s College of Engineering Magoon Award for Excellence in Teaching. This award recognizes outstanding teaching assistants and instructors through funds generated by a trust established by Estes H. and Vashti L. Magoon. Mrs. Magoon died in 1986, just prior to her 103rd birthday. Through this award, they have influenced the careers of many engineering educators.

The winners will receive their awards at the Graduate Student Awards Program luncheon. Congratulations to the recipients for their dedication to enhancing AAE undergraduate education through their teaching.



Students design, build, and fly spaceflight experiment to test green propellant

Purdue students (from left) Ben Tackett, Siddharth Tripathi, Jordan Nykiel, Brian McGuire, and Andrew Melgar, are taking a Zero-Gravity Flight Experiment course and creating an experiment to study a new green propellant that could replace the traditional but highly toxic hydrazine fuel. (Purdue University photo/Mark Simons)

STORY BY EMIL VENERE, PURDUE UNIVERSITY

Students taking the Zero-Gravity Flight Experiment course at Purdue University will see their creation soar to the upper atmosphere to study a new green propellant, partnering with Aerojet Rocketdyne to demonstrate that the propellant can replace the traditional but highly toxic hydrazine fuel.

The students will design and build their experiment at Purdue and then NASA's Flight Opportunities Program will launch it on a commercial suborbital rocket flight. This type of launch allows testing of spaceflight technologies during minutes of weightlessness. "Launching on a commercial suborbital rocket flight allows us to demonstrate spaceflight technology operations in weightlessness rapidly and relatively inexpensively," said professor Steven Collicott in Purdue's School of Aeronautics and Astronautics. He has taught the course since 1996 to immerse undergraduate engineering students in the design-build-test cycle for zero-gravity experimentation in suborbital rocket flights, parabolic aircraft flights, and the Fluids Education payload for the International Space Station.

The experiment - the Purdue Green Propellant Suborbital Test (PGPST) - is designed to advance a green propellant to the next level of technology readiness. The low-toxicity propellant, developed by the U.S. Air Force Research Laboratory, is a hydroxyl ammonium nitrate fuel and oxidizer blend known as AF-M315E. The rocket flight is a precursor to the NASA Green Propellant Infusion Mission (GPIM) being led by Ball Aerospace

& Technologies Corp. as the prime contractor and principal investigator. The research builds on earlier collaboration by Purdue, Ball and Aerojet Rocketdyne and helps the STEM-education community engage in NASA's space technology mission and the emerging commercial space industry. "One of the appealing things for us is that we know we get a good data product, but also that we know there will be valuable hands-on work for the students," said Aerojet Rocketdyne's Executive Director for Space Joe Cassady. "Supporting STEM is a big priority for our company."

Collicott said, "Discussions with alumni and friends at Ball Aerospace and Aerojet Rocketdyne showed that they would be interested in additional technology advancement work for this exciting new propellant." The Purdue project tests the ability of traditional "surface-tension propellant management device" designs to properly control the propellant while in weightlessness. Such propellant management devices exploit surface tension and geometrical designs to cause propellant to wick into the proper positions in the propellant tanks when gravity is absent.

"Combining Purdue's zero-gravity experimentation expertise, Ball and Aerojet Rocketdyne's industry leadership, and commercial suborbital rocket flights offered through NASA's Flight Opportunities Program is a powerful blueprint for both technology advancement and teaching," Collicott said.

STUDENT AWARDS

2014-15 Winners of the ATK Thiokol Propulsion S.P.A.C.E Award

Spring 2014 AAE 251 - Aerospace Design

Team Rocket

Zarin Bari
Matt Schurman
Jennifer Galbari

Pictured with Professor Karen Marais



Fall 2014 AAE 251 - Aerospace Design

Team PM-10

Andrew Berger
Blair Francis
Chayna Guinto
Seth Hovland
Jason Ivanovic
Christopher Rogers

Pictured with Professor Michael Grant and David McGrath, (BSAAE'83; MSAAE'84) Director, Systems Engineer, Tactical Propulsion and Controls, ATK Elkton Operations



2014-2015 AAE Research Symposium Series Winners

Best Presentation

William O'Neill

*Heat and Mass Transfer Analysis of a Film
Evaporative MEMS Tuneable Array Thruster*

SECOND PLACE

Waterloo Tsutsui

Crash Energy Absorption of EV Battery Packs

THIRD PLACE

Benjamin Ashman

*Evaluation of the GNSS Multipath Environment
in Space Proximity Operations: Experimental
and Simulation Studies of Code Correlations
in Hubble Servicing Mission 4*

Best Abstract

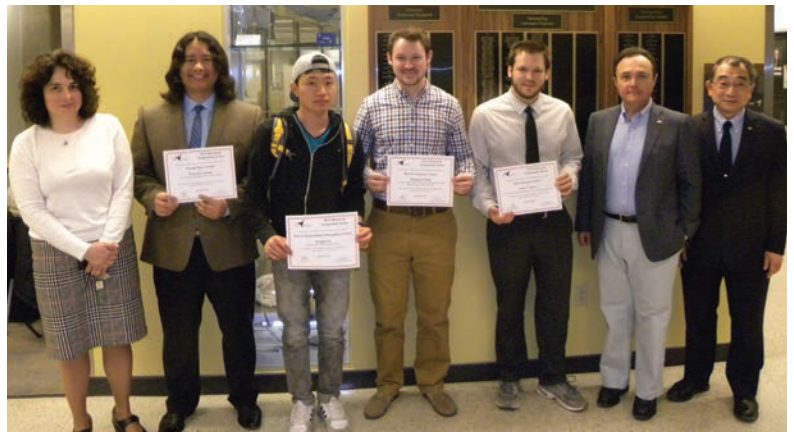
Adam Bruce

*Novel Ion Propulsion Enabled by
Nano-Structured Surfaces*

Best Undergraduate Presentation

Dongju Lee

High Vacuum Thrust Stand Analysis



(L-R) Professor Alina Alexeenko, Waterloo Tsutsui, Dongju Lee, William O'Neill, Adam Bruce, Professor Sergey Macheret, Dr. Tom Shih.

Student Emily Zimovan awarded Women in Aerospace Foundation and ATK Scholarship



School of Aeronautics and Astronautics undergraduate student **Emily Zimovan** was presented with the Women in Aerospace (WIA) Foundation and ATK Scholarship at the 29th Annual Women in Aerospace Awards on October 29, 2014. The awards ceremony took place at the Ritz Carlton Pentagon City Hotel in Arlington, Virginia.

The WIA awards celebrate women's professional excellence in aerospace by annually recognizing female leaders who have made outstanding contributions to the aerospace community. The goal of the WIA Foundation Scholarship program is to encourage young women interested in aerospace careers to pursue higher education degrees in engineering, science, or math.

Emily plans to pursue graduate school for her PhD.

PhD Student Matthew Hudspeth Wins Cloud Scholarship Award



School of Aeronautics and Astronautics graduate student **Matthew C. Hudspeth** was awarded the inaugural Gary L. Cloud Scholarship Award at the 2014 Society for Experimental Mechanics (SEM) Annual Conference in June. He was selected through a committee review process.

As the first Cloud Scholarship recipient, Matthew was presented the award at the Conference Luncheon and Awards Ceremony held in conjunction with the SEM Annual Conference in Greenville, South Carolina. The award is named for Professor Gary L. Cloud, a recognized leader in the field of experimental mechanics, pictured presenting the award to Matthew (right).

Matthew's graduate faculty advisor is Dr. Wayne Chen, Professor and Associate Head for Graduate Education in AAE.

Sangjin Lee and Saad Tanvir have been awarded the Bilsland Dissertation Fellowship

School of Aeronautics and Astronautics Engineering doctoral students **Sangjin Lee** and **Saad Tanvir** have been awarded the Bilsland Dissertation Fellowship for the 2015-16 academic year.

The Bilsland Dissertation Fellowship, administered by Purdue's Graduate School, provides support to outstanding PhD candidates in their final year of doctoral degree completion. Bilsland Fellows are expected to devote full-time effort to the completion of all doctoral degree requirements to receive their degree at the conclusion of the fellowship tenure.



Sangjin Lee is studying with Professor Inseok Hwang



Saad Tanvir is studying with Professor Li Qiao

Graduate Student Lauren Bowers Awarded Stipend from Transportation Research Board



School of Aeronautics and Astronautics graduate student **Lauren Bowers** has been selected as a recipient of a research stipend from the Airport Cooperative Research Program (ACRP) of the Transportation Research Board (TRB)/National Academies

which is sponsored by the Federal Aviation Administration of the U.S. Department of Transportation.

Lauren's research topic for the upcoming academic year is "Competitiveness and Relative Role of Air Travel Within Individuals' Annual Collection of Intercity Trips." A paper resulting from the research conducted by Lauren will be considered for presentation at the January 2016 TRB Annual Meeting, and for publication in a subsequent volume of the Transportation Research Record, the peer-reviewed Journal of the Transportation Research Board of the National Academies.

Lauren is a PhD student studying with Professor Daniel DeLaurentis. Her research interest includes systems-of-systems methodology in air transportation applications.

AAE 418 Students Test Protoype Asteroid Chipping Tool in NASA's Underwater Engineering Activity, Micro-g NEXT

Purdue's School of Aeronautics and Astronautics undergraduate class, AAE 418 "Zero-gravity Flight Experiment," was selected as one of 18 universities from across the nation to travel to NASA's Johnson Space Center (JSC) in Houston to participate in a new microgravity activity called Micro-g Neutral Buoyancy Experiment Design Teams (Micro-g NEXT) in June 2015.

Micro-g NEXT challenged students to work in teams with a faculty advisory over six months to design and build prototypes of tools to be used by astronauts during spacewalk training. The tools are designed to address authentic future space exploration problems.

The AAE student team, led by Brian McGuire, proposed their original design for a tool for astronaut use on future space exploration missions. Their student proposal, "Purdue University - Experimental Asteroid Chipping Tool (ExACT)," was selected by NASA. The students then completed the design and built their prototype chipping tool. Professor Collicott advised the team from the start and then Visiting Professor David Wolf, retired astronaut and honored Purdue ECE alum, joined in the advising effort, bringing his unique expertise in spaceflight operations and training to propel our students to a highly successful hardware design and testing program.

Testing was performed in NASA's unique Neutral Buoyancy Lab (NBL) which is a large pool used for various training and testing purposes, most commonly perhaps for Extravehicular Activity (EVA or spacewalks) training for NASA astronauts. Purdue Aeronautics and Astronautics students operated the testing from the control room, guiding the astronauts underwater in the NBL through the necessary testing steps. The ingenious sample containment system in our students' design generated interest from NASA researchers and thus may stimulate additional development effort.

AAE418 "Zero-gravity Flight Experiment" is one of several long-running hands-on design-build-test classes in the School of Aeronautics and Astronautics at Purdue University. These in-depth engineering classes provide Purdue AAE students opportunities to apply theory and modeling to create original solutions to challenging real-world aerospace problems.

In AAE418, Professor Collicott has led student teams to thirty two parabolic aircraft flight experiments with NASA since 1996, eight automated payloads for commercial sub-orbital rocket flights, and one undergraduate space station experiment which NASA then cancelled in the prototyping stage.

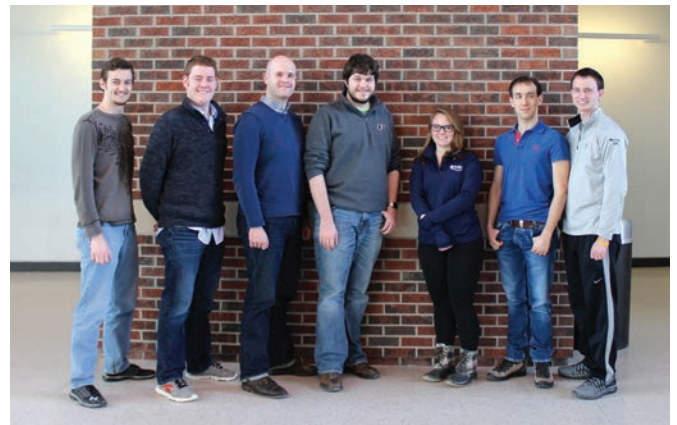
Micro-g NEXT is managed by the Office of Education at NASA's Johnson Space Center. AAE student travel to NASA JSC was supported by donations from young alums who participated in earlier AAE418 design-build-test projects.



Matt Gripe (left) and Brian McGuire (right) directing astronaut testing of the Purdue AAE asteroid chipping tool in the Neutral Buoyancy Lab. From this table, they communicate with the astronauts to perform the necessary testing of their original hardware design from AAE418 "Zero-Gravity Flight Experiment." (Photo by Professor David Wolf)



AAE students at the June 2, 2015 test of their team project from AAE418 "Zero-Gravity Flight Experiment" at the Test Conductors Room at NASA's Neutral Buoyancy Lab, Johnson Space Center in Houston, TX. Student team members are directing astronauts in the water of the Neutral Buoyancy Lab. Members include: Brian McGuire, Team Leader, Matt Gripe, Brock Miller, Tyler Murray, Samantha Sauers, and Prof. David Wolf. Third row: students from other schools awaiting their test time. (Photo by Professor David Wolf)



AAE 418 Team (pictured, from left): Brock Miller, Brian McGuire (team leader), Matt Gripe, Brian Smith, Sam Sauers, Maxime Pinchaud, and Tyler Murray.

AAE 450 Senior Spacecraft Design

Final Presentations reviewed by Dr. Buzz Aldrin

The School of Aeronautics and Astronautics AAE 450 Senior Spacecraft Design class held its final presentation on Thursday, April 23, 2015. The presentations, which included a review by Gemini and Apollo astronaut Dr. Buzz Aldrin, highlighted the culmination of work done as part of Professor James Longuski's class. In addition to the design reviews, Dr. Aldrin met with Purdue President Mitch Daniels in Hovde Hall to discuss human space exploration.

Students in the senior-level spacecraft design course presented a feasibility study on travel to Mars to Dr. Aldrin. The project is part of an ongoing collaboration among the students in Professor James Longuski's class and Aldrin to create a new class of spacecraft that could enable humans to travel in space and colonize Mars.

In his book *Mission to Mars: My Vision for Space Exploration*, Dr. Buzz Aldrin laid out a plan for human colonization of Mars. The mission concept included all of the steps that must be taken to reach Mars and establish the first permanent colony by 2040. To start, key technologies are tested in low earth orbit, at Lagrange points, and on the lunar surface. The next step is to establish cycler vehicles which will loop between Earth and Mars, supporting humans on the 5-6 month trip to Mars. A smaller base will be built on Phobos where astronauts can remotely operate rovers and cranes on the surface without the long time delay. Finally, after the first Martian base has been robotically constructed, the first humans will step onto the surface of Mars.

Professor Longuski worked with his research group and Dr. Aldrin for almost three months to craft a set of requirements that could be used for this feasibility study. Students worked as a 51-person team that was student managed and directed to test the numbers behind this version of Dr. Aldrin's vision.

The 51 students completed a 1,000-page feasibility report and a film describing their findings. A website about their efforts is available at <https://engineering.purdue.edu/AAE/Academics/Courses/aae450/2015/spring>.



Dr. Buzz Aldrin and President Mitch Daniels discuss human space exploration in Hovde Hall.



Project Manager Stephen Whitnah, Dr. Buzz Aldrin, Professor James Longuski, and Assistant Project Manager Jani Dominguez inscribe the final report for AAE 450.

AAE 535 Propulsion DBT students develop 3D printer for hybrid grains

A group of students has developed a 3D printer for hybrid grains as part of the spring 2014 AAE 535 Propulsion Design, Build, Test course. The course, taught by Dr. Timothée Pourpoint, associate professor in AAE, is intended to provide students with information on the design requirements, standard methods, and tools to develop propulsion systems.

The final project completed by the students consisted of a 3D printer for hybrid grains, which printed a 9" long grain in 72 layers. After printing, this grain was test fired on November 29, 2014 at the Zucrow Laboratories, demonstrating the basic operation of the printer.

Pressure data from the test demonstrated the design of the printer with a flat steady state operation at 300 psia. Future work with the 3D printer will make use of the capability to place two distinct powered additives within the paraffin grain, which will allow designers to vary the amount of thrust generated during a flight.

"To my knowledge, this is the very first '3D printed' paraffin wax grain and the first custom-made 3D printer for hybrid rocket propellants," notes Dr. Pourpoint.

The student AAE 535 project was made possible with the financial support of the School of Aeronautics and Astronautics. The resulting project was presented at the American Institute of Aeronautics and Astronautics SciTech Forum 2015 which was held January 5-9 in Kissimmee, Florida.



To view video of the AAE 535 3D printer hybrid grain test fire, visit: <http://youtu.be/OcLO5G4iIY8>.



AAE's graduate student Oluwatobi Busari (left) and senior Nicholas Eisenhauer (right) prepare the hybrid grain for the 3D paraffin printer as part of AAE 535. Other students involved in the project are: Alix Crandell, Michael Creech, Michael King, Austin Link, Sarah Marx, and Chris Zaseck. Jason Gabl, Research Engineer in AAE, also helped with the printer development.

STUDENT AWARDS

Amanda Haapala Receives Women in Hi-Tech Leading Light Award



Recent School of Aeronautics and Astronautics graduate Amanda Haapala received the 2014 Leading Light Award on October 1, 2014 in a special awards ceremony in Indianapolis. Sponsored by Women & Hi-Tech, the Leading Light Award honors women of achievement in science, education, and technology. As a recipient of the Rising Star Award, Amanda was recognized for her demonstrated exceptional and substantive accomplishments as a recipient of the Rising Star Award which notes achievements in technology, science or engineering related careers.

Amanda graduated with her PhD in December 2014. Her research interests include multi-body dynamics and mission design, and, in particular, the development of tools to aid in trajectory design. Her current focus is on the application of periapse Poincaré maps to trajectory design in multi-body regimes.

Women & Hi-Tech was established as a non-profit organization in 1999 to address the specific of women in high tech industries in Central Indiana and to encourage more women to consider careers in technology. Women and Hi Tech is an organization of women and men whose goal is to attract, develop, retain, support and promote women who are interested in technology, through

networking, role modeling, education and professional development.

For more information regarding the 2014 Leading Light Awards, visit: <http://womenandhitech.com/dnn/LLA/LLANominees2014.aspx>.

Purdue AMET Aerospace Team Wins Best Design in 2014 Global Space Balloon Challenge

The Purdue Association of Mechanical and Electrical Technologists (AMET) aerospace team won best design in the 2014 Global Space Balloon Challenge for the design and construction of a zero-pressure balloon that can fly higher than off-the-shelf that burst in low-pressure environments. The team plans to use a version of the balloon from which to launch rockets into space.



Team Members include Aeronautical and Astronautical students Christ East and Brent Justice, Rocket Team Design Leader. The team also included students from Computer Science, Electrical and Computer Engineering Technology, Mechanical Engineering, Mechanical Engineering Technology, and Faculty members P. Abel Chuang, Launch Supervisor; Mark French, Launch Supervisor; Davin Huston, Faculty Advisor; and James Condron.

See in flight video at <http://www.purdueamet.org/aerospace/>.



School of AAE Professor Kathleen Howell and PhD student Wayne Schlei received Best Paper Award at the AIAA Space and Astronautics Forum in August 2014 for their technical paper entitled "Enhanced Visualization and Autonomous Extraction of Poincaré Map Topology." Additional co-authors on the papers are Professor Xavier Tricoche from the Department of Computer Science at Purdue and Professor Christoph Garth from the University of Kaiserslautern in Germany.

AAE graduate student Zhemei Fang awarded Best Student Paper by CSER

School of Aeronautics and Astronautics student Zhemei Fang has been awarded Best Student Paper by the Conference on Systems Engineering Research (CSER). Fang, a graduate student of Dr. Daniel DeLaurentis, won for her submission, "Multi-Stakeholder Dynamic Planning of System of Systems Development and Evolution." Fang was presented with the award at the CSER dinner on Wednesday, March 18, 2015 in Hoboken, NJ.





School of AAE grad students with Bill Nye, The Science Guy. From left: School of Aeronautics and Astronautics graduate students and co-authors Michael Bedard (left) and Eric Meier (back), Anne Caraccio (chemical engineer from Kennedy Space Center and Eric's fiancé - front), and Bill Nye (right).

AAE Graduate Student Michael Bedard Presents Research Paper at 2014 International Astronautical Congress

Michael Bedard, graduate student of AAE Professor William Anderson, presented a paper to the 65th International Astronautical Congress in Toronto, Canada. The paper, *Student Design/Build/Test of a Throttleable LOX/LCH4 Thrust Chamber*, was written by Bedard, along with fellow AAE graduate student Eric Meier, and AAE faculty member, Dr. William Anderson. The project detailed in the paper is based on liquid oxygen/liquid methane rocket engine development for the NASA Morpheus test vehicle.

NASA's Morpheus Project has developed and tested a prototype planetary lander capable of vertical takeoff and landing. Designed to serve as a vertical testbed (VTB) for advanced spacecraft technologies, the vehicle provides a platform for bringing technologies from the laboratory into an integrated flight system at relatively low cost. This allows individual technologies to mature into capabilities that can be incorporated into human exploration missions.

To read more about NASA's Project Morpheus, visit: <http://morpheuslander.jsc.nasa.gov/about/>.

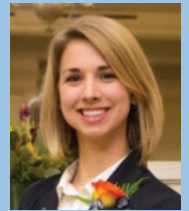
To see test day video from Purdue's world-class rocket test facility at the Maurice Zucrow Laboratories, visit: <https://www.youtube.com/watch?v=m2xytZDvmDM>.

AAE students receive Chappelle Fellowship for graduate studies at Purdue

School of AAE students **Kevin Vuong** and **Emily Zimovan** have been awarded the Charles C. Chappelle Graduate Fellowship for the 2015-16 academic year. The Chappelle Fellowship is a highly competitive and prestigious award which encourages Purdue alumni/alumnae to pursue graduate research at Purdue. The Chappelle Fellowship provides a stipend which accompanies a graduate tuition scholarship from the Graduate School. Chappelle Fellows are selected on the basis of character, intellectual ability, and promise of degree attainment.



Vuong



Zimovan

School of Aeronautics and Astronautics Welcomes Raisbeck Aviation High School Students to Seminar for Top Engineering Prospects (STEP) Program



AAE was pleased to welcome four Raisbeck Aviation High School (RAHS) students who were on campus for the July 2014 Seminar for Top Engineering Prospects (STEP) program.

Dr. Tom Shih, School of Aeronautics and Astronautics Professor and Department Head, and Rita Baines, Director of Development, enjoyed spending time with students Noah Palmer, Navath Nahn, Carlos Navarro, and Jacyn Wing (pictured right with Rita Baines). Congratulations go to Jacyn, who was recognized as the *Female Camper of the Week*.

Seminar for Top Engineering Prospects (STEP) program participants are involved in collaborative classroom experiences that help them develop vital skills needed as an engineer taught by world-renowned Purdue faculty members, Purdue engineering students, and guest lecturers. The goal of STEP is to give participants a taste of what it is like to "be an engineer" as well as allowing them to have an informal experience of being an engineering student at Purdue University. Raisbeck Aviation High School has received substantial generous support from Raisbeck Engineering, Inc. and its subsidiary Raisbeck Commercial Air Group, Inc. Chairman James D. Raisbeck (BSAE'61; DEA'79; OAE'99; HDR'05).

In part, RAHS received funding to construct a new building for its 400 students on the Seattle Museum of Flight's campus, which opened its doors in September 2013.

For more information on the STEP Program, visit: <https://engineering.purdue.edu/Engr/InfoFor/Honors/STEP>.

AEROGRAM

School of Aeronautics & Astronautics

Purdue University

Neil Armstrong Hall of Engineering

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News About You

We want to keep in touch with all of our alumni/alumnae and friends, and we welcome any news you'd like to have appear in the next edition of the *AeroGram* or our e-newsletter, *Aeroliner*. Please keep us posted on where you are and what you're doing by one of these convenient methods:

- Use the Update Alumni/Alumnae Records page from our alumni/alumnae section of our web site at: <https://engineering.purdue.edu/AAE/AboutUs/Alumni/Update/AlumniRecords>
- Email your updates to Rita Baines, AAE Director of Development, at rbaines@prf.org
- Mail any news you'd like to have appear in the next edition of the printed *AeroGram* or electronic *Aeroliner* to:

Rita Baines

Director of Development

Purdue University

School of Aeronautics & Astronautics

Neil Armstrong Hall of Engineering

701 W. Stadium Ave.

West Lafayette, IN 47907-2045

