

PENN STATE AEROSPACE ENGINEERING

FALL 2015 NEWSLETTER

Pictured above: S-70B helicopter

Message from the Department Head



Penn State aerospace engineers continue to impact the global aerospace enterprise and make the world a better place. For the third time in five years, Penn State topped the list of preferred suppliers of engineering talent to the aerospace and defense industry, according to the *Aviation Week* 2015 Workforce Study. Our major continues to be in high demand, and we have among the highest teaching responsibilities per faculty member of any program

in the country. To meet growing needs for professional education, we also launched a one-year non-thesis residence Master of Engineering (M.Eng.) degree this year.

Our undergraduate curriculum is distinguished by opportunities for students to participate in team-based, hands-on projects and design competitions. One group, advised by Professor **Mark Maughmer**, took 7th place at the AIAA Design/Build/Fly competition. Another group, advised by Professors **Edward Smith** (B.S. '88) and **Joseph Horn**, took 2nd place in the AHS Undergraduate Student Design Competition. And yet another, advised by Professor **Susan Stewart**, took 3rd in the DOE Collegiate Wind Competition. Participation in these competitions provides great experience for our students as they prepare to enter the workforce or pursue graduate study. We are pleased to feature **Mark Maughmer's** aerodynamics work in this year's research article. Many additional activities are highlighted within this newsletter.

Our faculty members continue to garner well-deserved recognition and provide high-profile service to our nation and industry. Professor **David Spencer** was elected a corresponding member of the International Academy of Astronautics, **Susan Stewart** received the Outstanding Wind Leadership in Education Award from the U.S. Department of Energy, and I had the honor of serving as the general chair of AIAA SciTech 2015—the world's largest event focused on aerospace RD&T. And we congratulate **Sven Bilén** on his promotion to professor.

Other alumni and students earned additional awards. **Ian Waitz** (B.S. '86), dean of engineering at MIT, was named an Outstanding Engineering Alumnus

by Penn State's College of Engineering. We had two exceptional McCormick Lectures this year from **Philip Balaam** (Ph.D. '90), VP AsiaSat, and Professor **I. Michael Ross** (Ph.D. '90), Naval Postgraduate School. **Emilia Speal-Harris** (B.S. '04) received an Alumni Achievement Award from the Penn State Alumni Association, and **Heather Nelson** (M.S. '15) received the 2015 Graduate Student Service Award. **Ethan Corle** (B.S. '13) won the Pauling-Eisenhuth Award for outstanding academic achievement in studies focused on national defense. **Matthew Honeychuck** (B.S. '14) received this year's Anthony E. Wolk best senior thesis award, advised by Professor **Robert Melton**, while **Walter Maier** (B.S. '15) and **Jared Soltis** (B.S. '11, M.S. '13) were recognized with Wolk Citizenship Awards. **Edward Rocco** (B.S. '15) was named the aerospace engineering student marshal for the spring 2015 commencement ceremony. Many graduate students won prestigious external fellowships.

We are delighted to welcome several new staff members to our department community, including **Lindsay Moist**, staff assistant for the graduate program; **Ben Enders**, IT support specialist; and **Chris Spallino**, communications strategist.

Through your collective generosity, we awarded almost \$160,000 of departmental and college scholarships to more than 40 students this year. We appreciate your assistance and loyalty to Penn State, and your continued support is more important than ever. We depend on your gifts to support initiatives that provide the foundation for our future curriculum.

Last but not least, we are grateful to Professor **Dennis McLaughlin** for nearly 30 years of service to the department—18 years of it as department head. Dennis has had a profound influence on Penn State Aerospace Engineering—including thousands of students—not to mention the broader fields of aeroacoustics and measurement technology for high-speed flows. With the assistance of many of you, we raised over \$25,000 to establish "The Professor Dennis K. McLaughlin Academic Excellence Fund in Aerospace Engineering" in his honor. Thanks!

We are dedicated to the education of productive and ethical citizens, and we continue to advance aerospace technology and systems that address critical societal issues related to air and space vehicles, defense, and energy. I know you will enjoy reading about the many activities and accomplishments of our students, staff, faculty, and alums. We always like to hear from you, and we welcome your feedback. Please send us news at: aerospace@engr.psu.edu

Best regards,

George A. Lesieutre

George A. Lesieutre

Upcoming Alumni Events

**Reception at AIAA Science and Technology
Forum & Exposition (SciTech 2016)**
January 4, 2016 – San Diego, CA

Please visit www.aero.psu.edu for
information regarding upcoming events.



PennState
College of Engineering

**AEROSPACE
ENGINEERING**

Awards & Recognition

PROMOTIONS

Sven G. Bilén was promoted to professor in engineering design, electrical engineering, and aerospace engineering, effective July 1, 2015. Bilén, who joined the Penn State engineering faculty in 2000, graduated from Penn State with his B.S. in 1991 and received his M.S.E. in 1993 and Ph.D. in 1998 from the University of Michigan. He is also head of the School of Engineering Design, Technology, and Professional Programs and chief technologist for the Center for Space Research Programs.

FACULTY AWARDS/RECOGNITION

A paper titled "Design and Analysis of a Supersonic Jet Noise Reduction Concept" was selected as the overall winner of the 2015 Lockheed Martin Aeronautics Best Technical Paper competition. **Russell W. Powers**, graduate student in aerospace engineering; **Dennis K. McLaughlin**, professor of aerospace engineering; and **Philip J. Morris**, Boeing/A. D. Welliver Professor of Aerospace Engineering, were coauthors with Anthony R. Pilon, Lockheed Martin Aeronautics Co.

Joe Horn, professor of aerospace engineering, was featured in the Notebook section of the June 2015 issue of AIAA's *Aerospace America*. The article, which addresses sea-based helicopter operations, is titled "Roiling seas? No problem."



Susan Stewart, research associate and assistant professor of aerospace engineering and director of the Pennsylvania Wind for Schools Program, was presented with the U.S. Department of Energy (DOE) Outstanding Wind Leadership in Education Award at the DOE's WINDEXchange Summit in Orlando, FL, in May. The summit is an opportunity for participants to get the current status of the wind energy industry. Participants included members of

the DOE, national lab representatives, DOE Regional Resource Centers staff, state energy officials, and professional and institutional partners.

George Lesieutre, professor and head of aerospace engineering, and **Lyle Long**, Distinguished Professor of Aerospace Engineering and director of the Computational Science Graduate minor, were honored for 25 years of service to Penn State at a College of Engineering ceremony held in April.



David B. Spencer, professor of aerospace engineering, was elected a corresponding member of the International Academy of Astronautics (IAA). The IAA is an independent, non-governmental organization that brings together the world's foremost experts in the disciplines of astronautics to explore cutting-edge issues in space research and technology, and to provide guidance in the non-military uses of space and the ongoing

exploration of the solar system.

George Lesieutre, professor and head of aerospace engineering, served as general chair of the AIAA's Science and Technology Forum and Exposition (SciTech) 2015, held January 5-9 in Kissimmee, FL.



Victor W. Sparrow, professor of acoustics, was named director of the Graduate Program in Acoustics in the College of Engineering. He assumed his new role July 1. Sparrow joined Penn State in 1990, has served as the interim director of the program since 2010, and has supervised the theses of more than 40 master's and doctoral students. He is a Fellow of the Acoustical Society of America and an Associate Fellow of the American Institute of Aeronautics and Astronautics.

RETIREMENTS

After almost 30 years of service to Penn State, **Dennis K. McLaughlin** retired as Professor Emeritus of Aerospace Engineering. As the department's longest-serving head (18 years), McLaughlin hired most of the current faculty members and launched numerous initiatives—many related to undergraduate student projects. His leadership has had a tremendous influence on Penn State Aerospace Engineering faculty, staff, and thousands of students.

McLaughlin has also been a leader in the aerospace profession, serving at various times on the FAA Research Advisory Committee, as chair of the national AIAA Aeroacoustics Technical Committee, as chair of the Aerospace Department Chairs Association, as chair of the AIAA Academic Affairs Committee, and as an ABET academic program evaluator. He is a Fellow of AIAA and a recipient of the AIAA Aeroacoustics Award. He has also had a profound influence on the broader fields of aeroacoustics and measurement technology for high-speed flows.



George Lesieutre hands **Dennis McLaughlin** a token of appreciation for his years of service in the department.

A native of Manitoba, Winnipeg, McLaughlin earned his Ph.D. at MIT and spent 11 years on the faculty of Oklahoma State University, where he rose through the ranks teaching and researching in aerodynamics and high speed jet noise. In 1986 he joined Penn State and built a unique facility for subsonic and supersonic jet noise experiments that continues to support research for a broad range of federal and industrial sponsors.

To celebrate his retirement and honor his practice of engaging and encouraging students, the department established the Dennis K. McLaughlin Academic Excellence Fund in Aerospace Engineering. This fund will support student projects, especially those involving hands-on vehicle systems design, integration, and project management. An endowed McLaughlin Fund will also ensure that his legacy is a perpetual part of the department.

Editors: George Lesieutre, Deborah Mayes, Michelle Barnyak, and Chris Spallino, with contributions from the College of Engineering Office of Communications.

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Scholarships/Fellowships 2014-15

Department of Aerospace Engineering

Aero Pioneers Class of 1944 Scholarship

Richard Hayward, Creed Reilly, Joshua Shaffer

Lou Borges Scholarship

Anton Antolick, Amy Maffei, Joseph Schreckengost

Mary Ilgen Scholarship

Zachary Fisher

Richard W. Leonhard Scholarship

Garrett Blake, Alexander Borowski, Christopher Curry, Ian Fitzsimmons, Matthew Honeychuck, Jacob Johnson, Christian O'Toole, Edward Rocco, Matthew Shaw, Darren Slotnick, Brandon Starr, Daniel Streeter, Patrick Wittick

James Reynolds Norris Memorial Scholarship

Andrew Willard

David J. Peery Memorial Scholarship

Joshua Moser

Carl A. Shollenberger Memorial Scholarship

Joseph Plummer

Donald G. and Jayne L. Steva Scholarship

Daniel Parks, Timothy Weathers

College of Engineering

AT&T Trustee Scholarship

Joseph Plummer

Diefenderfer Scholarship

Kara Morgan

DigitalGlobe Foundation Scholarship

Christopher Tombasco, Patrick Wittick

John Pierre Hemler Memorial Scholarship

Gretchen Buttorff

Russell H. and Sandra R. Herman Trustee Scholarship

John Targonski

David P. and JoAnne C. Kulig Trustee Scholarship

Thomas Dauber II

John R. and Brenda T. Myers Trustee Scholarship

Davendra Chatterpaul

John and Betty Palmer Scholarship

David Irizarry

Dr. Jeannie McKenzie Pedlow Trustee Scholarship

Lachlan Blubaugh

Penn State Engineering Society Endowed Scholarship

Alexander Borowski

John A. Pursley Trustee Scholarship

Zachary Fisher

Loren and Bernardine Stolp Family Trustee Scholarship

Alexandro Retamozo, Belen Veras-Alba

Trustee Scholarship Fund for Engineering

Casey Leavens, Andrew Willard

Elizabeth, Sharon, and Stephanie Woodruff Trustee

Scholarship in the College of Engineering

Corbin Weaver

Graduate Scholarships/Fellowships

AHS Vertical Flight Foundation Scholarship

Guillermo Costa, Bernardo A. Oliveira Vieira, Adam Thorsen

Bell Graduate Fellowship

Michael Spires, Abishek Jain

College of Engineering Graduate Excellence Fellowship

Junyi Geng

DoD SMART Scholarship

Leighton Myers, Russell Powers

Richard W. Leonhard Graduate Scholarship

Ethan Corle, Gregory Walsh

LORD Corporation Graduate Fellowship

Alexandre Bondoux

NASA Aeronautic Fellowship

Zachary Cameron

National Defense Science and Engineering Graduate Fellowship

Ethan Corle, Guillermo Costa

Pauling-Eisenhuth Award

Ethan Corle

PA Space Grant Consortium Graduate Fellowship

Neal Parsons

Science, Technology, Engineering and Math (STEM) Award

Guillermo Costa

University Graduate Fellowship

Regis Santos Thedin

Eric Walker Fellowship (Penn State/Applied Research Laboratory)

Mark DeAngelo, Lawrence DiGirolamo, Jason Halwick, David Hanson, Adam Lavelly, Erika Lieberknecht, Sean McIntyre, David Reich

SEMINARS AND SHORT COURSES

SERENA AUÑON, Astronaut, NASA, "The International Space Station: An update on the vehicle and the challenges involving engineering, research, and human physiology" – October 2014

MARKUS VILLINGER, president, Villinger Research and Development, Telfes, Austria, "Development and testing of in-flight ice protection systems based on semi conductive coatings" – December 2014

DEREK PALEY, associate professor, University of Maryland, "Distributed Sensing and Feedback Control of Autonomous Aerospace Vehicles" – February 2015

MATT DOMONKOS, principal physicist, Air Force Research Laboratory, "Magnetized Plasma Compression for Advanced Propulsion: Aerospace Engineering at High Energy Density" – March 2015

THOMAS MCGUIRE, aeronautical engineer, Revolutionary Technology Programs, Lockheed Martin Aeronautics Company, CA, "How to Build a Small Fusion Reactor to Power the Future" – April 2015

SEONGKYU LEE, Advanced Design Tools program manager, GE Global Research, "Overview of GE Global Research Center and Wind Turbine Noise Research at GE" – May 2015

ULF MICHEL, senior aeroacoustics consultant, CFD Software Development and Research, GmbH, Berlin, "Why large turbulence scales are the only contributors to jet noise" – July 2015

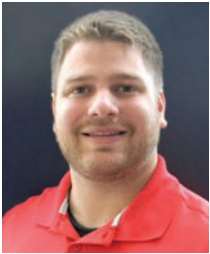
EDWARD SMITH, professor of aerospace engineering, Penn State, "48th Rotary Wing Technology Short Course" – August 2015

Awards & Recognition

ADDITIONS TO THE DEPARTMENT



Lindsay Moist joined the aerospace engineering department as the graduate program staff assistant in January. Moist has worked at Penn State since 2002 in various positions within the Office of Global Programs (International Student Services) and most recently with Career Services as an interview center coordinator.



Benjamin (Ben) Enders joined the aerospace engineering department as an IT Support Specialist 3 in September. Enders transferred from the College of Engineering's School of Engineering Design, Technology, and Professional Programs, where he served as their IT Support Specialist since November 2014.



Chris Spallino (H&HD '91) joined the aerospace engineering department in September as a communications strategist. Spallino brings more than 20 years of experience to the department in developing and executing innovative marketing, communications, and creative strategies. He will be responsible for the department's marketing and communications strategy and implementation.

IN MEMORIAM

Dr. John Leask Lumley, 84, passed away on May 30, 2015, in Ithaca, NY. Lumley joined the Penn State aerospace engineering faculty in 1959 and was promoted to Evan Pugh Professor of Aerospace Engineering in 1974. He spent almost 20 years at Penn State before moving on to Cornell University. He was an expert in the field of turbulence and received numerous professional honors, including the Timoshenko Medal in 1993, the Fluid Dynamics Prize of the American Physical Society in 1990, and the Fluid and Plasma Dynamics Award of the American Institute of Aeronautics and Astronautics (AIAA) in 1982. He was also a Fellow of the AIAA and the American Academy of Arts and Sciences.

Blaine R. Parkin, 92, passed away on December 4, 2014, in Morro Bay, CA. In 1972, Parkin joined Penn State as a professor of aerospace engineering and director of the ORL Garfield Thomas Water Tunnel. Parkin was born in Oakland, CA, and served in the Army Air Corps as a bomber pilot in Italy during World War II. A Ph.D. graduate of California Institute of Technology, he worked in the aerospace industry (Convair) for many years prior to joining Penn State. He retired from the University in 1989.

The department was saddened to hear of the passing of two of Penn State Aero Pioneers from the Class of 1944, **Albert Yackle** and **Luther Boyer**. In 1942, Yackle and Boyer were part of a group of mechanical engineering students who were recruited as "Aero Option" students into a newly established aeronautical engineering curriculum, which later became the Department of Aerospace Engineering.

INDUSTRIAL AND PROFESSIONAL ADVISORY COUNCIL



IPAC members, standing from left: D. Heverly, **M. Rudy**, **S. Corbets**, **R. Sedwick**, **L. Trick**, D. Senft, **D. Hallman**.

Each year a group of prominent individuals from industry, government, and academia are invited to serve on the department's external advisory committee—the Industrial and Professional Advisory Council (IPAC). IPAC is tasked with reviewing the department's activities and plans, and presents a report of its findings. This year's meeting was held March 25-26, and the focus was on the theme, "Our Research Enterprise and Graduate Program." Findings included: there is continuing high demand for our programs; student-to-faculty ratios are high; facilities, labs, and equipment need investment; and retirements will affect four to six tenured faculty positions in the next three to five years. Recommendations included: increase the number of faculty positions one to two people per year, start succession planning now, and conduct a college-wide facility utilization and rationalization study.

IPAC members participating in 2015 include:

Shelly Corbets (B.S. '01), manager Aerodynamics and Acoustics, Lockheed Martin Aeronautics Corporation, Palmdale, CA

Douglas Hallman (B.S. '85), program manager for the F-35 Aircraft Program in Turkey, Lockheed Martin Aeronautics Company, Fort Worth, TX

David Heverly II (B.S. '90, M.S. '91, Ph.D. '02 – M.E.), principal engineer, Structural Dynamics, Bell Helicopter Textron, Inc., Fort Worth, TX

Michael Rudy (Chair) (B.S. '70, M.S. '73), vice president/general manager, Teledyne Turbine Engines, Toledo, OH

Raymond Sedwick (B.S. '92), associate professor of aerospace engineering and director of the Space Power and Propulsion Laboratory, University of Maryland, College Park, MD

Donna Cowell Senft (B.S. '83 – E.Sci.), mission lead, Space Communications, Air Force Research Laboratory/RV, Kirtland AFB, NM

Lawrence Trick (B.S. '82, M.Eng. '94), lead air vehicle systems engineer, RQ-21A Blackjack, Naval Air Systems Command, Patuxent River, MD

Unable to attend this year was **Kevin Leath** (B.S. '85), director of affordability and the Boeing Product Development System, Boeing Commercial Airplanes, Seattle, WA; **Tibor Balint**, senior technical advisor, Space Technology Mission Directorate, NASA Headquarters, Washington, D.C.; and **Donald Weir** (B.S. '73, M.S. '75), engineering fellow and technical manager, Acoustics, Honeywell Aerospace, Phoenix, AZ.

The department would like to extend a special thank you to IPAC members **Tibor Balint**, **Shelly Corbets**, **Michael Rudy**, **Raymond Sedwick**, and **Donald Weir**, who rotated off IPAC following this year's meeting.

Awards & Recognition

BARNES W. MCCORMICK HONORARY ALUMNI LECTURES



Philip Balaam (center), the fall 2014 Barnes W. McCormick Honorary Alumni Lecturer, pictured with **Barnes McCormick** (left) and **George Lesieutre** (right).

Philip A. Balaam (Ph.D. '90), the fall 2014 Barnes W. McCormick Honorary Lecturer, presented "From Happy Valley to Happy Valley (HK) ... and back again." Balaam is vice president, business development at Asia Satellite Telecommunications Co. Ltd. (AsiaSat), Hong Kong. After graduating from Penn State, he worked and lived in France, then Singapore and Hong Kong, while remaining in the satellite and launch industry. Balaam's lecture focused on a few of the more interesting chapters of his experiences, and he offered encouragement to students to explore different career paths within the global aerospace enterprise.



I. Michael Ross (center), the spring 2015 Barnes W. McCormick Honorary Alumni Lecturer, pictured with **George Lesieutre** (left) and **Barnes McCormick** (right).

I. Michael Ross (Ph.D. '90), the spring 2015 Barnes W. McCormick Honorary Lecturer, presented "Unscented Optimal Control." Ross's lecture addressed how pseudospectral optimal control theory, as implemented in his DIDO software, seeks to manage the uncertainties that occur in space flight. One example showed how the theory can support the operational viability of the Hubble Space Telescope until the launch of the James Webb Space Telescope. Ross is professor of mechanical and aerospace engineering and program director, control and optimization, at the Naval Postgraduate School in Monterey, CA. He is a Fellow of the American Astronautical Society and received the 2010 AIAA Mechanics and Control of Flight Award for advancing pseudospectral optimal control theory and its flight implementations.

OUTSTANDING ENGINEERING ALUMNUS

Ian Waitz (B.S. '86), was honored as an Outstanding Engineering Alumnus (OEA) of the Penn State College of Engineering in spring 2015. Waitz is dean of the school of engineering and the Jerome C. Hunsaker Professor of Aeronautics and Astronautics at the Massachusetts Institute of Technology (MIT). He has been on the faculty at MIT since 1991 and served as department head in aeronautics and astronautics from 2008 until his appointment as dean in 2011. As dean, Waitz has focused on advancing the School of Engineering through the development of new programs and spaces for innovation and entrepreneurship; novel models and opportunities in residential education; expanded pathways for engagement with the Institute's alumni, friends, and industry partners; and programs and policies that will further enable MIT's ability to provide an exceptional learning and research environment for students, faculty, and staff. As a researcher, Waitz has made advances in gas turbine engines, fluid mechanics, combustion, and acoustics. The principal focus of his current work is on the modeling and evaluation of climate, the air-quality and noise impacts of aviation, and the assessment of technological, operational, and policy options for mitigating these impacts. He is a member of the National Academy of Engineering and a Fellow of the American Institute of Aeronautics and Astronautics. Waitz received his M.S. in 1988 from George Washington University and his Ph.D. in 1991 from the California Institute of Technology.



Ian Waitz receives his OEA award from College of Engineering Dean Amr Elnashai.

Attention Aerospace Grads! What are you doing now?

If you have some exciting news or a success story, we want to hear about it—and share it with our community of alumni and peers! Email us at aerospace@engr.psu.edu and tell us what you've been up to lately.

If you've moved, please remember to update your address with the Alumni Association at www.aero.psu.edu/Alumni/addresschange.html.

Alumni News

Robert D. Braun (B.S. '87), professor of space technology at Georgia Institute of Technology, was the guest speaker at the November 6, 2014, Penn State Forum speaker series. Braun, the David and Andrew Lewis Professor of Space Technology, spoke about the commercial space exploration industry in his talk titled *Our Generation's Space Race*.



Dana (Brutsche) Day (B.S. '08) was selected as a 2015 recipient of the Society of Women Engineers Distinguished New Engineer Award. This award honors women engineers who have been actively engaged in engineering and the community in the first 10 years of their careers. Day currently works for Boeing as a 737 primary flight controls engineer. She was recognized at the awards banquet during SWE15, the world's largest conference for women engineers, in October.

Mike Doty (M.S. '98, Ph.D. '02) was promoted to Acoustics Branch Chief at NASA Langley Research Center.



Emilia Speal-Harris (B.S. '04) received the Penn State Alumni Association's Alumni Achievement Award in March. Speal-Harris leads the Military Aircraft Intellectual Property Strategy Team at the Boeing Company, as well as Boeing's Research and Technology's IP Strategy division. In these roles, she develops and implements strategies to manage the company's IP both nationally and internationally. Speal-Harris earned an M.B.A. from Pepperdine University in 2008. She is a member of the Society of Women Engineers, the Aircraft Owner's and Pilot's Association, and the American Institute of Aeronautics and Astronautics.

Brett Hoffstadt (M.S. '97) published a book on career advice for aerospace engineers and professionals called "How To Be a Rocket Scientist," available on Amazon. His website, www.howtobearocketscientist.com, has a blog with more resources and a form to request a free chapter.



Ryan Kobrick (M.S. '05), project manager for Space Florida, was named a 2015 International Astronautical Federation Young Space Leader. He was inducted at the 66th International Astronautical Congress on October 16, 2015.

Jamie Landers (B.S. '02) opened a Philadelphia-based bakery, Luscious Bakery, in July, 2014. If you're in Philadelphia, stop by!



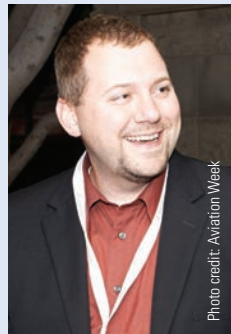
Popular Science named **Eric Loth** (M.S. '85) one of the 12 scientists and entrepreneurs at the forefront of the new energy revolution. Loth is Rolls-Royce Commonwealth Professor of Engineering, Director of Fluid Research & Innovation Lab, and Associate Chair of Aerospace Engineering at the University of Virginia.

Ed Manns (B.S. '87), manager, aerospace standards at SAE International, and **Mark DeAngelo** (B.S. '10, M.S. '12), consultant for aerospace standards at SAE International, visited Penn State and the Department of Aerospace Engineering in July 2015 to discuss their organization's future goals. Along with SAE standards staff members from the U.S. and London, they met with the dean of engineering, aerospace faculty members, aerospace research lab staff, and graduate students.

Samantha (Kahn) Pappas (B.S. '02, M.S. '04) (right), air vehicle test lead for the Triton Unmanned Air System program, was the 2014 recipient of the Women in Aerospace Initiative, Inspiration, Impact Award for "being an impeccable leader, inspiring mentor, and exceptional engineer whose technical expertise and unwavering dedication were paramount to the advancement of Naval Aviation."



Pete Phillips (B.S. '90) and **Jim Valenti** (B.S. '90) each were awarded 2014 Robert H. Goddard Awards by the NASA Goddard Space Flight Center. Phillips received the Exceptional Achievement Award for Customer Service for significant contributions to three high-visibility interagency missions: Suomi-National Polar Partnership (S-NPP), Landsat 8, and the Geostationary Operational Environmental Satellite-R (GOES-R). Valenti received the Exceptional Achievement Award for Leadership for outstanding leadership of the GOES-R Ground Segment Project.



Ryan Rudy (B.S. '02) (left) was named one of *Aviation Week's* Top 40 Under Forty in 2014. A flight test engineer at Boeing Test and Evaluation in St. Louis, Rudy develops and executes aircraft testing for the F-15 Saudi Advanced program.

Christopher Rumble (B.S. '11, M.S. '14) was selected as a Fulbright Student Researcher for 2015-2016. He will travel to Indonesia to focus on renewable energy solutions for developing communities there.

The Graduates

SUMMER 2014

Bachelor of Science

Eric R. Anderson
Robert W. Donaldson
Yashasvi Soni

Master of Science

Monica Christiansen
Margalit Goldschmidt
Abbas Kafae Razavi
Alex M. Karns
Justin A. Long
Michael J. Policelli
Christopher R. Rumble
Matthew F. Shanks
Gregory L. Soneson
Adam T. Thorsen
Pierre F. Thurier

Doctor of Philosophy

Arnaud P. Borner
Anjan Chakrabarty
James G. Coder
Todd C. Henry

FALL 2014

Bachelor of Science

Gabriel A. Adams
Saeed Muneef Abdulla M. Al Jaber[§]
Brendan G. Biscan
Matthew C. Honeychuck[§]
Dylan N. Kempton
Alexander J. Kershetsky
Brian J. Killeen
Kevin C. Knechtel
Evan Y. Masters
Douglas R. Rohrbaugh
Gabriel A. Rosenwald
Luiz Felipe R. Santos
Grant M. Schneeberger
Nicholas E. Showalter
Lucas A. Willson

Master of Science

Matthew J. Bailey
Unmukt R. Bhatnagar
David B. Caudle
Lawrence J. DiGirolamo
ZuQun Li
Raheel S. Mahmood
John P. Muncks
Heather Nelson
Anagha Ray

Doctor of Philosophy

Neal S. Parsons

SPRING 2015

Bachelor of Science

Sarah Aguasvivas
Miguel Alvarez
Christopher N. Bachman
Brian K. Bender
Rachel A. Bires
Garrett S. Blake[§]
David J. Blyton[§]
Jacob Bresler
Ryan M. Burns
Gretchen S. Buttorff
Saray M. Checo
Philip Chow[§]
James E. Crawford
Christopher S. Drobnick
George A. El-Mallakh
Kevan M. Ellis
George F. Farah Jr.
Kevin Farrah
Zachary M. Fisher
Ryan P. Halwick
Jacob D. Harper
Eric T. Hazen
Stephen A. Himelfarb
Linda John
Peter J. Keller
Logan J. Krawchyk
Andy Lee
Morton Lin[§]
Eric P. Ly
Walter T. Maier
Tyler C. Martin

Christopher M. McElroy
Leonard P. Metkowsky
Jessica E. Meyers
Tyler A. Molnar
David J. Mulqueen
Chloe E. Nagle
Troy S. Newhart
Steven Nguyen
Daniel J. Parks
Thomas C. Pastor
Alwin S. Paul
Joseph A. Plummer
Blair A. Rakowski
Damon L. Raynor
Austin V. Re
Edward T. Rocco[#]
Michelle R. Rusek
Jason A. Satira
Michael Scholz
Jesse W. Shaffer
Shahed A. Shirazi
Tyler C. Simches
Nicholas C. Sofocleous
David J. Spadaro
Jason D. Stanko
Brandon P. Starr
Samuel A. Stoley
Zachary J. Struss
Mohammad A. Syed
Austin B. Taylor
Adam M. Thames

Jian L. Tian
Christopher P. Tombasco[§]
William E. Ullrich
Justin D. Valenti
Belen Veras-Alba
Timothy R. Weathers
Corbin T. Weaver
Adam L. Witsberger
Patrick T. Wittick[§]
Luke A. Young
Imran K. Yousufzai

Master of Science

Peter M. Blasco
Matthew J. Kapusta
Erika N. Lieberknecht
Christine M. Lihn
Ghanghoon Paik
Vikram Rout

Master of Engineering

Emery C. Etter
Ripudaman Ripudaman
Neel F. Sheth

Doctor of Philosophy

Nidhi Sikarwar
Jason E. Town

SUMMER 2015

Bachelor of Science

Patrick L. Gorski
Ana L. Jimenez
Zachary J. Skank

Master of Science

Mikhail D. Abaimov
Ethan L. Corle
Guillermo Costa
Taylor J. Hoover
Abhishek Jain
Taylor D. Knuth
Yaowei Li
Racheet Matai
Sylvie Garrett Schafer
Zhixiang Wang
Tianliang Yu
Mengyao Zhu

Master of Engineering

Hsiaoting Ko

Doctor of Philosophy

Pankaj Jha
Michael B. Lurie
Leighton M. Myers
Russell W. Powers
Brian D. Wallace

[§] Schreyer Scholar

[#] Aerospace Student Marshal



Above: Aerospace engineering students and members of the Penn State chapter of the AHS at AHS Rotor Day 2014.

Above right: Penn State Aerospace Engineering head **George Lesieutre** chairs AIAA SciTech 2015.

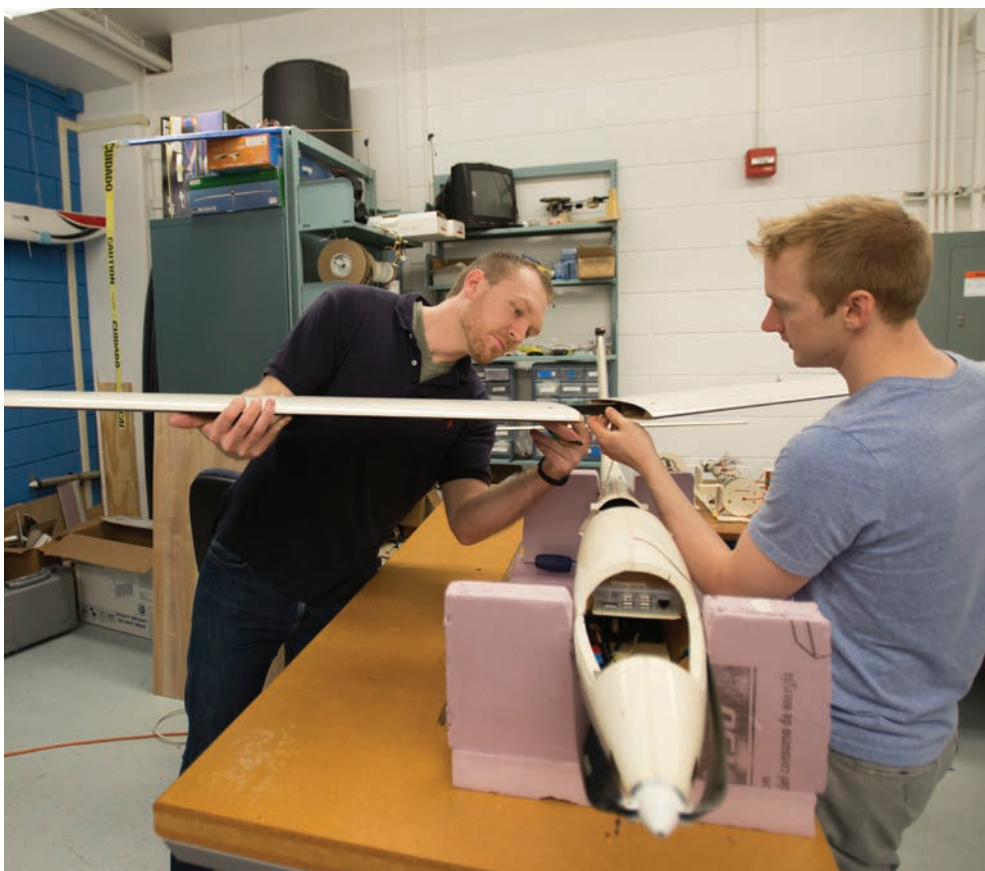
Right: **Jack Langelaan**, associate professor of aerospace engineering, works on the AutoSOAR aircraft in the Air Vehicle Intelligence and Autonomy Lab, with a hexacopter in the foreground that is being used for autonomous ship-board landing research.



At left: **Jose Palacios**, assistant professor of aerospace engineering, serves ice cream at the College of Engineering ice cream social.

Below: SAE International visit to Penn State. Pictured L to R: **Mark P. DeAngelo** (B.S. '10, M.S. '12); **George Lesieutre**; Dr. Richard Greaves, president, SAE International; **Ed Manns** (B.S. '87) manager, Aerospace Standards, SAE International; and **Ed Smith**, professor of aerospace engineering.





Top: Members of the Penn State student chapter of AIAA at the National Air Force Museum.

Above left: **Junyi Geng** (M.S. '16) works on a Micro UAV (Unmanned Aerial Vehicle) in the Air Vehicle Intelligence and Autonomy Lab.

Above Right: SciTech 2015 attendees. Pictured L to R: **Todd Lowe**; **Ken Brentner**, professor of aerospace engineering; **Dennis McLaughlin**, Professor Emeritus Aerospace Engineering; **Alex Karns** (M.S. '14), **Philip J. Morris**, Boeing/A.D. Welliver Professor of Aerospace Engineering; Tony Pilon, **Leighton Myers** (Ph.D. '15), **Brian Wallace** (Ph.D. '15), **Russell Powers** (Ph.D. '15), and **George Lesieutre**.

Left: **Nathan Depenbusch** (B.S. '09, M.S. '11, Ph.D. '15) and **John Bird** (M.S. '13) working on AutoSOAR.

Student Highlights



Ryan Burke, a senior in aerospace engineering, participated in an engineering course that gives Penn State students an opportunity to collaborate in international virtual teams. The International Leadership of Engineering and Development course provides an opportunity for Penn State students to work with business students at Corvinus University (Budapest) and Middlesex University (London), as well as engineering students at Taibah University (Medina, Saudi

Arabia). Burke, along with Kevin Magee, who graduated last spring with his B.S. in mechanical engineering, worked on a global team that planned a community-based construction company on Gonâve Island, Haiti. Burke said, "After the 2010 earthquake, the population of Haiti decreased by one third. Now many people are returning and there is no heavy machinery to rebuild." Their team's project was sponsored by Roots of Development, a nonprofit which helps impoverished communities acquire the resources and organizational skills they need to manage their own development.

Heather Nelson (M.S. '14) was honored in March with the 2015 Graduate Student Service Award, which recognizes graduate students who have best combined high academic achievement with leadership in University or other public activities. Nelson, a graduate of the United States Air Force Academy, has used her military background to help the Penn State fencing team, the local chapter of Trout Unlimited, and fellow veterans. "Penn State is doing great things when it comes to the inclusion of all people. I hope to make the University an even greater example to its peers," said Nelson.



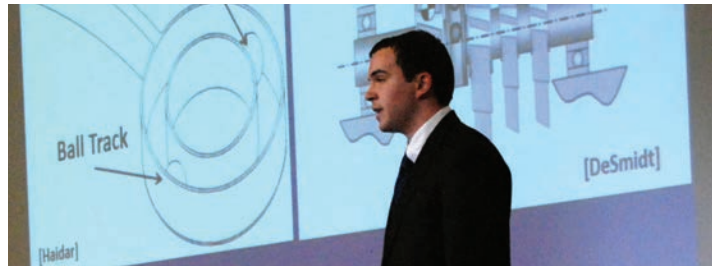
Davide Conte, graduate student in aerospace engineering, was one of 32 invited students who participated in the 2015 Caltech (California Institute of Technology) Space Challenge, a five-day space mission design competition. This is the first year Penn State was represented. Students selected for the challenge were split into teams to design a mission to land humans on an asteroid, bring it back to lunar orbit, extract the asteroid's resources and demonstrate their use. Conte, a native of Genova, Italy, was mentored by NASA Jet Propulsion Laboratory and Caltech faculty.

Aerospace engineering majors **Miguel Alvarez** and **Belen Veras-Alba** were members of one of eight Penn State undergraduate student research teams from five campuses representing Penn State at the Capitol Rotunda on March 3 in Harrisburg. They presented their research, "Ice Crystal Generator for Engine Icing," with students from more than 100 Pennsylvania colleges and universities as part of the Undergraduate Research at the Capitol-Pennsylvania event.



Edward Rocco served as the aerospace engineering student marshal for the College of Engineering's spring 2015 commencement ceremony. A native of Atco, NJ, Rocco is a member of Sigma Gamma Tau, the aerospace engineering honor society, as well as a recipient of the Vertical Flight Foundation Frank N. Piasecki Scholarship and the College of Engineering Richard W. Leonhard Scholarship in Aerospace Engineering. He

is a 2013 recipient of the *Aviation Week* Twenty20s Award, established to recognize the next generation of aerospace talent that will create the technology to drive industry in the 21st century. Outside of his engineering studies, Rocco is a member of the American Helicopter Society (AHS) and the Nittany Hockey League. He was a member of the AHS' STEM Rotor Day Community Outreach Committee. A recipient of a prestigious College of Engineering Graduate Excellence Award, Rocco is presently pursuing a master's in aerospace engineering at Penn State under the supervision of **Jose Palacios**, assistant professor of aerospace engineering.



Bryce Connelly, aerospace engineering student, was one of eight engineering students selected for the finals of the spring Leonhard Center Speaking Contest. Connelly was one of 20 semifinalists and more than 200 eligible participants from all undergraduates in CAS100A.

STUDENT AWARDS

Anthony E. Wolk Senior Thesis Award

Matthew Honeychuck (B.S. '14) was the recipient of the Anthony E. Wolk Senior Thesis Award for the 2014-15 academic year. He presently works in the Flight Dynamics and Operations group at NASA's Johnson Space Center. His thesis, titled "Investigation of Initialization Methods for Particle Swarm Optimization of Finite-Thrust Orbital Transfers," was advised by **Robert Melton**, professor of aerospace engineering.

Anthony E. Wolk Citizenship Award

This year we honored two of our student leaders, **Walter Maier** ('15) and **Jared Soltis** (B.S. '11, M.S. '13), with the Anthony E. Wolk Citizenship Award. Maier was president of the Sigma Gamma Tau (SGT) chapter. With his SGT members, he coordinated the SGT banquet and the Aerospace Career Fair and Networking Reception, as well as innumerable lab tours for prospective students. Soltis is a Ph.D. candidate and a very involved student leader. As president of the AHS student chapter, he organized and implemented the first Rotor Day—a STEM event to capture the imagination of young students, get them excited about STEM fields, and show them the unrivaled opportunities Penn State has to offer. He also led STEM outreach efforts at a local high school by conducting experiments with a portable wind tunnel and an 8 ft. tall co-axial rotor stand.

Pauling-Eisenhuth Award

Ethan Corle (B.S. '13, M.S. '15) was this year's recipient of the Pauling-Eisenhuth Award, which honors outstanding academic achievement by a master's degree student whose studies focus on national defense or homeland security. Advised by **Sven Schmitz**, assistant professor of aerospace engineering, Corle's M.S. thesis research has been groundbreaking in the area of active rotor concepts for performance enhancement and noise reduction. He was also awarded a prestigious National Defense Science and Engineering Graduate Fellowship to continue his research.

Student Highlights

Lion Launch Pad Grant



Aerospace engineering student **Richard Zang** was one of three engineering students awarded grants by Lion Launch Pad last spring. He pitched ideas about his company to a panel of judges in April 2015. Zang's company, Odyssey Innovations, is developing a closed-loop system that recycles water within a greenhouse. "This system could save water, energy and electricity consumed by a greenhouse, producing the same crop yield with fewer resources," Zang said. Based at the

University Park campus, Lion Launch Pad is a business accelerator program that helps student entrepreneurs turn innovative product and service concepts into viable startup companies.

STUDENT SOCIETIES

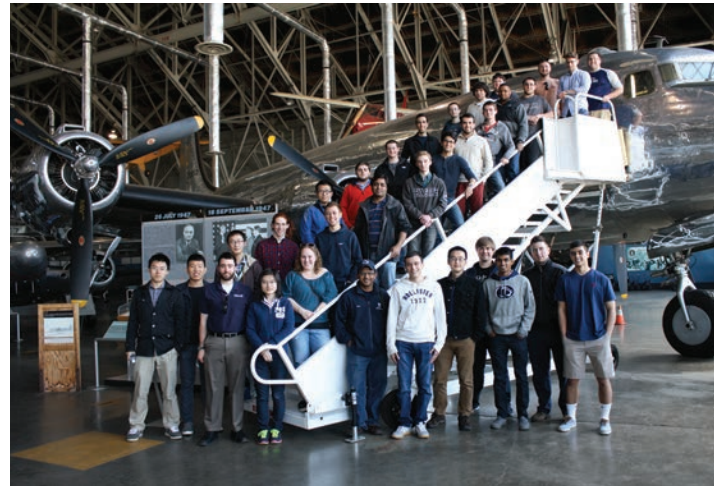


AHS members at Rotorfest in West Chester, PA.

American Helicopter Society (AHS)

The Penn State chapter of AHS International held many new, exciting activities this year and hosted informative seminars by government and industry leaders. These included presentations on engineering ethics by mechanical engineering alumnus **Steve Glusman**; wind-tunnel testing of the OH-58F; the evolution of helicopter aviation over the years by College of Business graduate Colonel **Michael O'Halloran**; and the needs of the flight Emergency Medical Service helicopter community by the Geisinger Life Flight crew. The chapter also took a field trip to Rotorfest at the American Helicopter Museum and Education Center in West Chester, PA.

The chapter's STEM outreach activities included hosting Rotor Day, a one-day, rotor-themed event for middle and high school students, featuring hands-on activities such as ground resonance, gyroscopic stability, gears, helicopter control, lift, drag, and a quadcopter obstacle course. All the participants and their parents enjoyed Penn State Berkey Creamery ice cream and students received a hand rotor toy when they finished the activities. The chapter took this concept to a local middle school STEM fair later in the year. The chapter also assisted a local children's museum, Discovery Space of Central Pennsylvania, in developing a helicopter-themed after-school program. In it, students would learn about basic rotary-wing aerodynamics (windmills, wind turbines, and helicopters) and build hand-copters from scratch, competing to make the best one. A small open-loop wind tunnel will be designed and fabricated to test the hand-copters.



AIAA members at the National Air Force Museum in Dayton, OH.

American Institute of Aeronautics and Astronautics (AIAA)

Thirty-two members of the Penn State student chapter of AIAA traveled to the National Air Force Museum and were given special access to hangars housing Air Force One airplanes and rare research and development aircraft. These included President Kennedy's Boeing 707, the X-15 hypersonic research aircraft, and the XB-70 supersonic bomber. In addition to seeing so many amazing aircraft, the students were given tours of the museum, which provided fascinating aviation history from the Wright brothers to the present.



SGT members at the 2015 induction banquet.

Sigma Gamma Tau (SGT)

The Penn State chapter of SGT had another busy and exciting year. For the second year in a row, SGT participated in the Reverse Career Fair, helping further strengthen the chapter's connections with employers such as Boeing, GE Aviation, GKN Aerospace, and Textron. SGT president **Chris O'Toole**, along with department head **George Lesieutre**, met Senior Vice President and General Manager of Lycoming Engines (Textron), Michael Kraft, to discuss how the company can improve its relations with Penn State. Corporate attendance at SGT's 4th annual Aerospace Engineering Networking Reception included representatives from Boeing, GKN Aerospace, Pratt & Whitney, and Sikorsky. More than 100 aerospace engineering students attended. An induction banquet for new members is being planned for spring 2016.

Student Highlights

STUDENT ORGANIZATIONS/EVENTS



Mark Maughmer (standing center) with members of Penn State's Design/Build/Fly Competition team.

The AIAA Student Design/Build/Fly Competition

A team of Penn State students took seventh place at the 19th annual American Institute of Aeronautics and Astronautics (AIAA) Design/Build/Fly competition (DBF) in April 2015. A total of 100 teams registered for the competition in August 2014, 84 submitted design reports in February 2015, and 65 attended the competition fly-off, hosted by Raytheon Missile Systems at TIMPA Field in Tucson, AZ. Team members included aerospace engineering undergraduates **Jason Cornelius**, **Sahil Desai**, **George Farah**, **Nate Keegan**, **Len Metkowski**, **Evan Savage** and **Rachel Schellberg**. **Chris Saunders** (B.S. '08) was the aircraft's pilot. **Mark Maughmer**, professor of aerospace engineering, served as the faculty adviser, and **Nick Grasser**, a 2014 aerospace engineering alumnus, was the graduate student adviser. DBF challenges student teams to design, fabricate, and demonstrate the flight capabilities of an unmanned, electric powered, radio-controlled airplane which can best meet a specified mission profile. This year's contest theme was to design a remote sensor delivery and drop system. The teams' aircrafts attempted three flight missions and one ground mission. Penn State's entry was named "The Flugmeister."

LionTech Rocket Labs

Penn State's LionTech Rocket Labs won first place in the 2015 Battle of the Rockets Competition in March. The competition, sponsored by Space News, consists of three events with a range of complexity to test all skill levels. Penn State won the University Altitude Event, which focuses on the rocket design skills, proven in flight.

The DOE Collegiate Wind Competition

The National Renewable Energy Laboratory selected Penn State as one of 12 colleges that will compete in the U.S. Department of Energy's (DOE) Collegiate Wind Competition 2016. The event challenges teams of undergraduate students to design and build a model wind turbine based on market research and siting considerations, develop a business plan to market their products, and test their turbines against a set of rigorous performance criteria. The competition will take place at the annual American Wind Energy Association (AWEA) WINDPOWER Conference and Exhibition in New Orleans, LA, May 23 to 26, 2016. **Susan Stewart**,



M. Proulx, **K. Kolc**, **A. Thames** and **J. Cornelius**.

research associate and assistant professor of aerospace engineering, will again advise the team. In 2014 she coached the Penn State team to a dramatic win, and earlier this year she helped the team take third place. Aerospace engineering team members included undergraduate students **Jason Cornelius** and **Karol Kolc**, and **Adam Thames** (B.S. '15). Additional team advisers included **Dennis McLaughlin**, Professor Emeritus of Aerospace Engineering; **Brian Wallace**, Ph.D. candidate in aerospace engineering; and **Rick Auhl**, senior research associate.

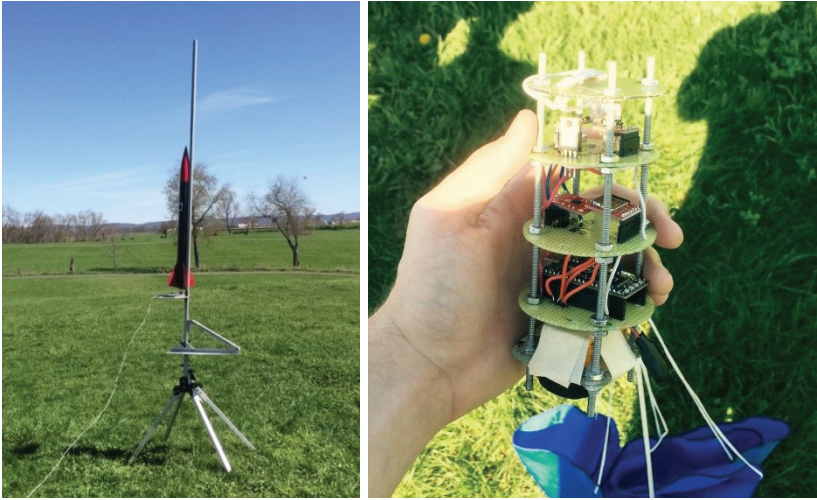
American Helicopter Society (AHS) Student Design Competition

A team of Penn State aerospace engineering students received two awards in the American Helicopter Society International's 32nd annual Student Design Competition. Sponsored by the Boeing Company, the 2015 contest challenged students to design a small, distributed logistics delivery vehicle and describe its role in a large logistics system concept. Penn State's team ROAR placed second in the undergraduate design contest and first in the optional hardware validation contest, garnering a \$1,000 prize. Team ROAR included aerospace engineering undergraduates **George El-Mallakh**, **Ryan Halwick**, **Edward Lauser**, **Damon Raynor**, **Priscilla Sangama Campos**, **Jason Satira**, **Michael Scholz** and **Jason Stanko**. The students were advised by **Joseph Horn** and **Edward Smith**, professors of aerospace engineering, and **Dr. Kobi Enciu**, a postdoctoral scholar in aerospace engineering. A total of 14 teams from around the world competed.

Student Space Programs Laboratory (SSPL)

The SSPL team grew to more than 80 undergraduate and graduate students in 2015, with students engaged in both the OSIRIS-3U CubeSat and the SSPL-run Student Training Program. OSIRIS-3U is a student-managed mission to explore Earth's ionosphere. The satellite, poised for launch in early 2016, will investigate space-weather interaction with the Earth's atmosphere. The Student Training Program introduces students to space systems engineering. A team of first-year students through third-year students is designing and building a soda can-sized rocket payload ("CanSat"). The payload is required to report telemetry data, including GPS data; atmospheric pressure; acceleration; and roll and pitch throughout the flight. Additionally, the payload must safely descend to the ground and land upright. Students will launch their payloads in December.

Student Highlights



SSPL students launch model rockets (left) containing their payloads (right), developed as part of the Student Training Program.

SSPL participated in several education outreach activities during the 2014-2015 year. They included a take-your-child-to-work-day station where K-12 students learned about 555 timers and how to solder electronics. Students also staffed a table at the State College and Bellefonte Exploration-U events to teach students about chemical propulsion using film-canister rockets fueled by antacid tablets and water. The group is advised by **Sven Bilén**, head, School of Engineering Design, Technology, and Professional Programs, and professor of engineering design, electrical engineering, and aerospace engineering.

Lunar Lions

Members of the Penn State Lunar Lion Team joined Penn State President Eric J. Barron and WPSU-TV's Patty Satalia during an episode of "Higher Education in Focus" in November 2014 on WPSU-TV. Penn State undergraduate students **Gretchen Buttorff** (B.S. '15) and **Liam K. Neigh** represented the Lunar Lion Team during the 30-minute program.



Thon 2015 Participation by Aerospace Students

- Christopher Bachman, Security Leader for Rules & Regulations Committee
- Abby Brandtmeier, Rules & Regulations Committee
- Ryan Burke, Canning and THONvelopes, runs THON 5K
- Ryan Burns, Security Leader for Rules & Regulations Committee
- Cory Caldwell, Rules & Regulations Committee
- Chris Drobnick, Penn State Baseball Club
- Kyle Ellingson, OPP Committee, Club Croquet supporter
- Peter Flanagan, Dancer Relations Committee
- Ryan George, Rules & Regulations Committee, Club Tennis supporter
- Brandon Goss, Sigma Alpha Epsilon
- Mark Kelly, Chair for Snowboard Club THON group
- Jason LaPre, Arnold Air Society (AFROTC)
- Tyler Molnar, Ohana, Technology Captain
- Mitansh Shah, OPP Committee
- Kyle Snowberger, Blue Band member, played in the Pep Band for THON
- Teddy Steinhart, Club Hockey
- John Targonski, Kappa Delta Rho

(Both) Nigel Lamb's wingleted MXS-R Red Bull Air Race airplane.

Photo credit: AeroResource.co.uk



Photo credit: Aeroplato

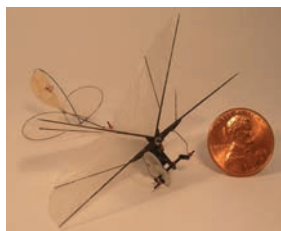


OF WINGS AND THINGS

Mark Maughmer, professor of aerospace engineering, and his group of talented graduate students, conduct research in the broad area of design aerodynamics, with an emphasis on aircraft, rotorcraft, and wind energy. A few of the current activities relating to these research areas are highlighted below.

Airfoil Design and Testing

Over the past 20 years, airfoils designed at Penn State have been rigorously tested in our low-speed, low-turbulence wind tunnel and successfully employed on a number of different types of aircraft. Current efforts are focused on airfoils that can better operate in the very unsteady environment found on helicopter rotor blades.



Micro-Air Vehicles

One of the more challenging recent research efforts is the fabrication and flight testing of very small radio-controlled air vehicles that weigh approximately 2.3 g with maximum

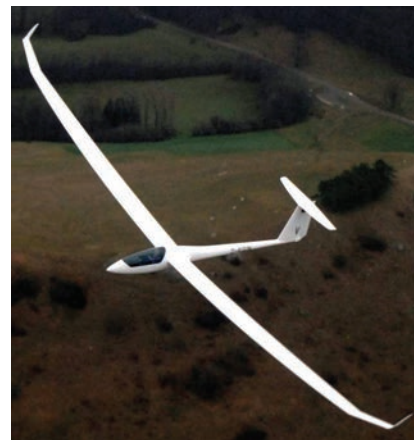
dimensions of just over two inches. Successful flights have been made with fixed wing, propeller-driven aircraft, helicopters, and insect-mimicking craft with flapping wings; however, a great deal remains to be learned with regard to micro-scale aerodynamics.

Wing and Rotor Wakes Modeling

Modeling of the disturbed air that persists behind a passing aircraft wing or rotor blade is an important contributor to the accurate determination of a vehicle's performance. Since 1991, efforts at Penn State have led to the improved modeling of wakes behind aircraft and wind turbines; current efforts are focused on the wakes behind helicopter rotors in forward flight and in hover.

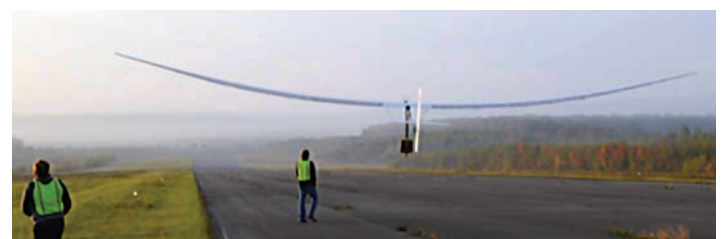
Winglets

Since the late 1980s, Penn State has contributed greatly to the design and practical use of winglets. Early efforts focused on flight-test experiments that led to the first winglet on a production sailplane, and Penn State designs have now been fitted to thousands of gliders. Other types of aircraft also benefit from winglets that share heritage and design tools with those developed for sailplanes. For example, these tools improved the performance of the Schweizer 2-37A and RU-28, a special-mission surveillance aircraft built for the CIA and the U.S. Army. Recently, Penn State winglets were employed on Nigel Lamb's Red Bull MSX racing aircraft and contributed to his winning the 2014 Red Bull Air Race World Championship.



Maughmer's real-world research brings excitement into the classroom. A notable example is the human-powered aircraft project that is ongoing in the Flight Vehicle Design and Fabrication course. This aircraft has a wingspan of approximately 78 feet, an empty weight of only 72 pounds, and is intended to

compete for the Kremer Prize, offered by the Royal Aeronautical Society, London. A prototype has already flown under electric power, and the pedal-powered version is currently under construction.



Outreach and Other News

2015 Top Schools to Hire for Aerospace and Defense

For the third time in five years, Penn State topped the list of preferred suppliers of engineering talent to the aerospace and defense industry, according to the *Aviation Week* 2015 Workforce Report. Penn State is the only university to appear in the top five in all three survey categories: **Preferred Supplier**, **Where Most Grads Hired** (#3), and **Alma Mater by Young Professionals** (#5-tie).



Pennsylvania State Wind Energy Forum at Penn State

On October 14, the American Wind Energy Association (AWEA), in collaboration with the Mid-Atlantic Renewable Energy Coalition, hosted the Pennsylvania State Wind Energy Forum at Penn State Harrisburg to address a wide variety of Pennsylvania wind stakeholders' questions about the current status of wind energy technology, markets, and impacts, as well as explore the future of Pennsylvania's wind energy opportunities and challenges.

Susan Stewart, research associate and assistant professor of aerospace engineering, hosted an in-depth Q&A session.



Acoustics is Golden at Penn State

The Graduate Program in Acoustics at Penn State celebrated its 50th year with a special event in May at the 169th meeting of the Acoustical Society of America in Pittsburgh. Penn State's is the only program in the United States offering a Ph.D., as well as M.S. and M.Eng. degrees, in Acoustics. An interdisciplinary program with faculty from a variety of academic disciplines, the acoustics program is administratively aligned with the Department of Aerospace Engineering and is closely affiliated with Penn State's Applied Research Laboratory.

In September 2015, *Military Times* named Penn State as one of the most veteran-friendly engineering schools in the country. Ranked at #5, Penn State was the only Big Ten school listed in the top 10 and was specifically cited for its strong aerospace engineering program.





THANK YOU TO ALL WHO HAVE CONTRIBUTED TO THE DEPARTMENT!

The department is grateful to all who have provided financial support of its students and activities. Following is a list of individual donors to the department from July 1, 2014, to June 30, 2015. We apologize if there are any omissions. If you contributed and have not been acknowledged below, please contact us so we can correct our records. If you are already giving to Penn State, you might consider directing your future gifts to the Department of Aerospace Engineering.

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