BITS & SPARKS

THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Alumni Magazine

DEPARTMENT OF ELECTRICAL
AND COMPUTER ENGINEERING

Points of Pride

A shared passion for teaching, progress and partnerships

As the chair of the Department of Electrical and Computer Engineering (ECE), I can honestly tell you that I have the best job in the world. Why do I say that? It's because of the great colleagues I get to work with everyday, the dedicated staff and alumni who support our program here, and of course, the outstanding undergraduate and graduate students who everyday are pursuing and achieving their educational goals. We are proud to remain among the leading departments in the nation, in terms of our reputation, research impact and student training. We continue to set high goals and have made significant progress toward the milestones identified in the department's strategic plan.

Our faculty members continue to make important teaching, research, and service contributions. We were pleased to welcome Profs. **Ayman Fayed** and **Abhishek Gupta** to the department in August 2015, and **Jian Tan** arrives in January 2016. The coming few years will provide an opportunity for growth in the ECE faculty size through multiple programs within Ohio State's Discovery Themes initiative, including the areas of Data Analytics, Materials and Manufacturing for Sustainability, as well as the Center for Prevention and Treatment of Chronic Brain Injury. Recruitments in these areas start in the 2015-16 academic year. I am also pleased to inform you that Profs. **Fernando Teixeira** and **Chi-Chih Chen** are among the 2015 class of IEEE Fellows, bringing the department's total to 21 IEEE Fellows among the regular faculty.

Several educational initiatives made important progress over the last year. For example, preparations for the department's "Radar Systems" track in the Master of Global Engineering Leadership program were completed, and the first students begin taking part in the online degree program this Fall. Our students also continue to lead new activities. The IEEE Student Branch hosted the 2014 Region 2 Student Activities Conference here in Columbus, bringing scholars from throughout the Midwest to participate. The department's Electronics Club also hosted its first "Makeathon" in April, providing students with yet another opportunity to put their engineering training into practice, creating new electronic designs and systems over a 24-hour period.

In this issue, we report on how the department's activities are reaching the farthest parts of the solar system, building a more efficient future for transportation, monitoring the Earth's environment, and sharing the excitement of engineering with local K-12 students. I hope you enjoy learning more about just a few of the many projects conducted by our faculty and students this past year. We also invite you to participate in the Department's Alumni Society, our Meetup group and its activities, and to consider joining your fellow alumni in supporting our progress. Happy reading!

Joel T. Johnson
Chair, Department of Electrical and Computer Engineering

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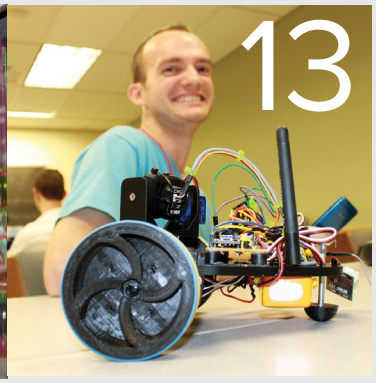

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University President

Joel T. Johnson
Department Chair

David D. Williams
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Ashley Waltermeyer
Development Officer

Ryan Horns
Public Relations Coordinator

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Spring Forward

ECE alumnus Mike Herman reflects back on graduating cancer free

For outgoing ECE senior, **Michael Herman,** the road to spring 2015 graduation was not just an academic challenge, it was the fight of his life.

Two years earlier, the Ohio State ECE student was diagnosed with acute lymphoblastic leukemia (ALL), a type of cancer where the bone marrow produces an influx of certain white blood cells in the system.

Herman said the sudden diagnosis stopped him in his tracks. His bright future in engineering was put on hold as he ended up at the Ohio State James Cancer Hospital beginning the long road to recovery.

"I had come as far as my junior year and didn't want to simply dismiss the idea of obtaining a degree. Yet, I had come to see the reality in the situation I was in," Herman said. "The way I saw it, I had two options: pity and questioning, or focus and positivity. The latter seemed more fun. I knew I would overcome cancer – everyone should. You simply cannot accept anything less."

Herman said his journey over the past few years has now defined who he is today: healthy, successful and active.

"I am cancer free and feeling great," Herman said. "Cancer is simply adversity – like the most impossible ECE homework assignment. If you don't believe you can do it and don't do anything about it, you'll probably fail the assignment. On the other hand, you can go to office hours, get help and maybe find the assignment wasn't all that bad. You may even end up learning something new. I went to office hours and discovered a whole new perspective on life. I'm truly grateful that I have been so fortunate."

ECE Academic Program Administrator, **Susan Noble**, said Herman's achievements are inspiring. Even before his diagnosis, she said, he was volunteering for cancer research fundraisers at Ohio State. Despite struggling with cancer, she said, he still graduated magna cum laude.

"He has had some very close calls," Noble said. "I feel this is one of the best examples of perseverance I have seen, and his attitude is one of his finest attributes."

Herman's struggle fighting cancer, and his commitment to giving back throughout his time at Ohio State, were documented in the local news. The *Columbus Dispatch* highlighted his participation in the Buckeyethon fundraiser. The *Ohio State Lantern* also featured him being named the honorary runner for the Clunger Beats 5000 5K Race.

Most importantly, Herman said, what he learned at Ohio State is that he is capable of doing anything, if he puts his mind to it.

"ECE, in general, has made me a better problem solver. It has taught me a different way of learning and analyzing problems. ECE has also taught me patience," Herman said. "I was a very impatient person before encountering real-world intellectual challenges that I've been presented with in my courses. Though frustrating, overcoming the adversity of extensive problem solving is truly rewarding."

Today, Herman remains active on the EE/ECE Alumni Society Committee. After graduation, he accepted a position at The Johns Hopkins University Applied Physics Laboratory working with Air and Missile Defense, with a main goal to ultimately give back in the hospital setting, creating prostheses for patients.

"The way I saw it, I had two options: pity and questioning, or focus and positivity. The latter seemed more fun." —ECE 2015 graduate Mike Herman


CALDWELL LABORATORY
ELECTRICAL ENGINEERING

On a roll...

ECE student Andrew Huster checks out EcoCAR trophies from years past.

Ohio State takes first place in Year One EcoCAR 3 Competition

"I don't know what's in the water in Columbus," said **Al Oppenheimer**, Camaro Chief Engineer at General Motors.

He then presented The Ohio State University's EcoCAR 3 team with the first place prize in the Year One national advanced vehicle technology competition. The awards were handed out after five days of presentations in Seattle this summer.

The EcoCAR 3 competition is managed by Argonne National Laboratory. ECE students make up a significant portion of Ohio State's team. They are tasked with designing, building and demonstrating eco-friendly innovative automotive technologies within the 2016 Chevrolet Camaro.

"Ohio State EcoCAR topped 15 other teams from universities across the United States and Canada," team communications manager **Trevor Thompkins** said. "This is the second victory for The Ohio State University in two years."

The team previously won the overall EcoCAR 2 three-year challenge to create a more efficient Chevrolet Malibu.

Ohio State Center for Automotive Research Director **Giorgio Rizzoni** said he was proud to see the students walk away with another "dominating performance."

Sponsored by the United States Department of Energy, General Motors and 30 other government and industry leaders, the EcoCAR 3 overall top award includes a trophy, $10,000 to be used toward continued development of their vehicle, as well as additional prizes attributed to top three wins in other award categories.

Ohio State's EcoCAR 3 program ultimately finished with 937 out of 1000 points possible.

Ohio State also took first place in awards for Control Systems, System Modeling and Simulation; Innovation Project; Best Trade Show; Project Management Stakeholder event; Communications; and dSPACE Embedded Success.

The team garnered second place awards in fields such as Mechanical, Project Management, Outreach and Mathworks model-based design.

“Under the leadership of Prof. **Shawn Midlam-Mohler**, the team is already working on Year 2, in which they will demonstrate their first steps toward converting a 2016 Chevrolet Camaro to a high-performance PHEV architecture,” Rizzoni said.

The second place overall winner was Virginia Tech with 895 points, third place was Waterloo with 847, fourth place was Embry Riddle with 824, the fifth place team was Penn State with 772 and in sixth place was McMaster University.

About The Ohio State University EcoCAR Team

The Ohio State University EcoCAR team is one of 16 teams competing in the EcoCAR 3 advanced vehicle technology competition. The group is made up of around 40 students, ranging from undergraduate freshmen to Ph.D. candidates. Students on the team have a diverse variety of majors, from mechanical and electrical engineering to business and public relations.

To learn more about Ohio State’s team, visit ecocar.osu.edu.

Find more online

Watch a video of ECE student and EcoCAR 3 team member **Andrew Huster** talking about Ohio State’s role in the future of electric vehicle technology: **go.osu.edu/ece-electric-cars**

Ohio State EcoCAR 3 team members accept their awards at the Seattle, Washington banquet this summer.

Missions into Space...

New Horizons journey to Pluto

On July 14, the world saw the first detailed photographs of Pluto in history, thanks in part to Ohio State-trained electrical and computer engineers.

Launched in 2006, NASA's New Horizons space probe spent nine and a half years hurtling through space, at speeds of 31,000 mph, traveling more than 3 billion miles before reaching its destination.

Almost 10 years earlier, researchers in ECE's ElectroScience Lab were busy assisting **Ron Schulze**, lead engineer for the high gain dish antenna project on the mission.

High gain antennas provide focused and narrow radio wave beam widths, allowing for more precise targeting of radio signals.

Schulze, an ECE alumnus, works for the Johns Hopkins University/Applied Physics Laboratory. He was joined in the New Horizons effort by **Willie Theunissen**, now a principal radio frequency engineer at Lockheed Martin Space Systems in Colorado. What followed were two months of brainstorming sessions with fellow Ohio State researchers - calibrating and testing inside the ElectroScience Lab's anechoic chamber to ensure Schulze's design for the dish antenna was successful.

Ten years later, they finally learned their hard work paid off, as the first images of the dwarf planet appeared back on Earth right on schedule.

Schulze said the project remains a highlight of his career.

"The high gain antenna is the most prominent feature on the spacecraft," he said. "It is the last piece of hardware that the images and science from Pluto will touch before the data is received on Earth. It better work!"

Schulze said the project also gave him the unique opportunity to work alongside his mentors as a peer, completing his journey from student to expert. From 1989 to 1991 he earned his MS degree at Ohio State, studying under the academic guidance of former ESL director, **Walter Dennis Burnside**.

"I was introduced to the art of antenna measurements and design," Schulze said.

A key challenge to the antenna project, he said, was its alignment toward Earth.

"At a Pluto-like distance of 3 billion miles, the high gain antenna boresight, mispointed by 0.2 degrees, would miss Earth by over 10 million miles," Schulze wrote in his research paper. "The antenna beam width makes up for it."

For the scientific community, the New Horizons probe remains an achievement in engineering that has already graced the cover of countless tech magazines, as well as National Geographic.

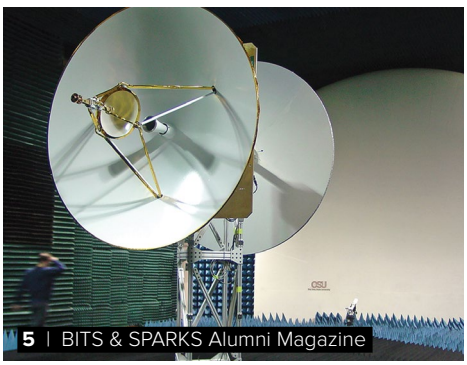
For those involved in the creation of the probe, the flyby was a time of long-anticipated celebration.

From an engineering standpoint, Ohio State ElectroScience Laboratory researcher **Teh-Hong Lee** said, the precision was admirable.

"It is amazing that they can achieve that," Lee said. "I was glad that our lab could help accommodate them."

"Everything that we test has to be perfect," said **Jim Moncrief**, anechoic chamber manager and lab technician. "You could have the most expensive probe in the world; billions of dollars. But if the antenna didn't work right, especially where (New Horizons) is right now, it would be useless. It would be just a rock in space."

Launched on Jan. 19, 2006, the New Horizons probe had essentially been in hibernation mode for the past several years. Hibernation, in this case, meant traveling at speeds of 31,000 miles per hour and nearly one million miles a day. Communication with the probe was performed



periodically to change its direction. It ultimately flew closest to Pluto on July 14, 2015, before heading out to explore the frozen outskirts of the solar system and beyond. NASA reported that the equipment onboard the New Horizons probe made for "incredible" views.

"If we flew this instrument over Earth, at the same altitude we plan to fly over Pluto, you would see individual buildings and their shapes. There could be all kinds of surprises," a NASA promotional video declares.

New Horizons' principal investigator **Alan Stern** said, "You could count the ponds in New York's Central Park."

Indeed, once released, the first high resolution images of Pluto became front-page news across the world.

New Horizons keeps going from here, documenting the Kuiper belt, a region of the solar system beyond the planets. It also explores the Oort cloud, which is a region loosely bound to the solar system and believed to be the source of many asteroids.

Beyond Pluto, Lee said, everything New Horizons discovers is new to mankind.

"You could have the most expensive probe in the world; billions of dollars. But if the antenna didn't work right, especially where (New Horizons) is right now, it would be useless. It would be just a rock in space," —Jim Moncrief

Watch a video about ECE and the New Horizons mission to Pluto online:
go.osu.edu/PLUTO

Missions into Space...

SMAP (Soil Moisture Active Passive)

A NASA satellite successfully launched into space this winter is now sending detailed global soil moisture data back to Earth.

Known as the Soil Moisture Active Passive satellite, or SMAP, Ohio State ECE faculty and students were intimately tied to the research that made it possible. Now in orbit, SMAP is helping to improve the understanding of global water and carbon cycles, as well as the ability to manage each as resources on the planet.

ECE ElectroScience Lab graduate students involved in the project include **Jeff Ouellette** and **Mustafa Aksoy**, as well as post-doctoral researcher **Alexandra Bringer** and ECE Chair and Professor **Joel Johnson**.

Johnson said approximately six different Ohio State projects contributed to SMAP research over the years. He said SMAP uses both a radar and microwave radiometer to monitor the Earth. The radiometer measurements are susceptible to corruption emitted by man-made Radio Frequency Interference (RFI) from other transmitters.

Since 2001, Johnson's team has focused on separating RFI from the natural microwave signals used in measuring soil moisture levels. Over time, he said, NASA determined this could be applicable to the SMAP project, so RFI detection technologies were added to the SMAP design in 2009.

"SMAP is one of the most exciting projects in the remote sensing field," Aksoy said. "It's very exciting to see it is finally in orbit."

"It's a good ending point in our graduate careers," Ouellette said about the project.

During the post-launch press conference, NASA thanked those university students from around the country who participated in the SMAP research.

As NBC News reported, "Currently, scientists rely on computer models to account for soil moisture. SMAP is designed to provide hard numbers on the amount of water in the soil worldwide."

Looking forward, Johnson said he will continue his work on SMAP research.

"It is a three-year mission, but often Earth science satellites last much longer," he said. "We will be working to help improve RFI removal throughout."

To learn more about ECE and its involvement in SMAP, visit **ece.osu.edu/news/2015/02/smap-launch-successful**

From left, Jeff Ouellette, Alexandra Bringer and Mustafa Aksoy

EE/ECE Alumni Society President reflects on staying connected

I remember the day I became involved in the EE/ECE Alumni Society. I was walking the halls of Caldwell in 2007 looking for a place to post a flyer advertising for a student worker. As I walked by professor **Bradley Clymer**'s office, I noted that it had not changed since I was in school, circa 1989. Professor Clymer happened to be there. He mentioned during our conversation that he was starting an alumni society and asked if I wanted to be involved. Fast forward to today and here I am, president of the society. A board member since inception, I have served as treasurer throughout.

As I reflect over these eight or so years, what I have enjoyed most is interacting with the students. I have also enjoyed the relationships I made with professors and my fellow alumni. In addition to various other events, we host a Q&A panel twice per year, once for graduating seniors and again for incoming freshmen. I have met some great friends and colleagues as a result of those panels.

I encourage you to participate as an alumni Q&A panel member. You can participate remotely by telephone or video conference! Not only will you help current students, I am confident you will be enriched as I have been.

There are other ways to become involved as well. Serve as a board member and/or join one of our committees. The time involved is not taxing and you can do so remotely from anywhere. We have five meetings scheduled for 2015 so far.

I invite you to jump in! I'm sure you will discover, as I have, the satisfaction of being part of something larger than yourself. It is easy to float meaninglessly through our careers, focused on the rat race. Staying connected with your alma mater helps give you perspective. It keeps you current with what's happening in the Department of Electrical and Computer Engineering and at the university as a whole. Additionally, you can build a meaningful professional network. Contact me if you are interested in joining.

Hope to see you soon!
Ron Koch,
Alumni Society President (BSEE 1989)
ron@ronaldkoch.com

ECE Program Receives Top Ohio State Outreach Award

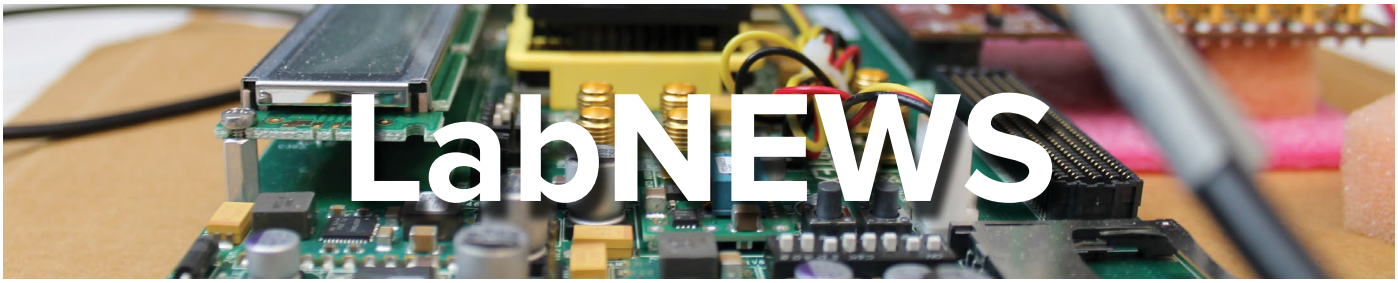
The K-12 Engineering Outreach program, led by Department of Electrical and Computer Engineering associate chair **Betty Lise Anderson** and assistant **Clayton Greenbaum**, won the top University Outreach and Engagement Recognition Award in 2015.

The Ohio State University Office of Outreach and Engagement honored the K-12 Engineering Outreach Program and other award recipients at a ceremony held in the Archie Griffin East Ballroom on May 6, prior to the Patterson Lecture at the Union.

By earning the overall top partnership, Anderson, Greenbaum, and numerous student volunteers now serve as the university's nominee for the national C. Peter Magrath Community Engagement Scholarship Award. The group was also presented the Ohio State Distinguished Community Engagement Award.

The K-12 Engineering Outreach Program has developed hands-on engineering projects for K-12 schools, as part of the Capstone Design program, and members then visit high schools with the help of approximately 50 Ohio State student volunteers per year. Together, they have collectively visited 78 schools, plus camps, after-school programs, STEM clubs, scouts, 4H groups and more, reaching the impressive milestone of 11,000 K-12 student contacts since 2008.

Head online to watch a video of the ECE K-12 Engineering Outreach event in action at the Marysville, Ohio Early College High School: **go.osu.edu/K12-outreach**



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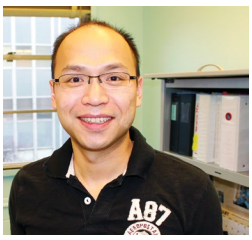


Research Assistant Professor **Fang Luo** became director of the Center for High Performance Power Electronics (CHPPE) on Nov. 1. His focus area includes high density EMI filtering and wide bandgap power module packaging.

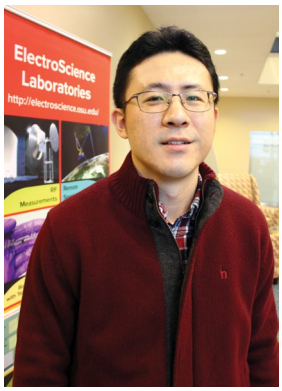
ECE researcher **Georgios Trichopoulos,** pictured left, and professor **Kubilay Sertel** were both recognized for their work in building a terahertz camera that can "see" through practically any material. The two received the Inspiration Award from ElectronicsProducts.com, which is given to the top 10 stories on the site in terms of page views. Their work on the camera was deemed "one of the year's best technologies."

Jiankang Wang joined the ECE faculty in January 2014 with a joint appointment in Integrated Systems Engineering. Her research areas include emerging technologies of modern power systems, especially variable energy resources and demand side participation. Her work also includes electricity market operation and design, as well as transmission and distribution systems automation and planning.

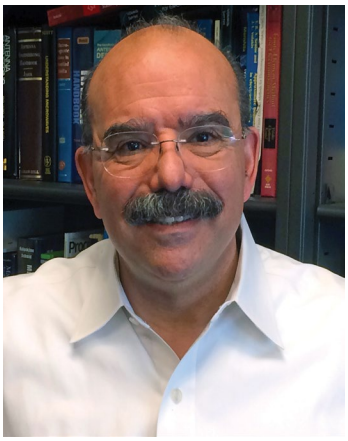
Ayman Fayed joined the Analog and RF Electronic Circuits faculty in August. He received his M.S. and Ph.D. from Ohio State in 2000 and 2004, respectively. His previous work was in analog and mixed-signal design at Texas Instruments Inc., where he contributed to many product lines for wire-line, wireless, and multi-media devices.

Professor **Antonio Conejo** joined the ECE faculty in 2014, and now holds a joint appointment with the Department of Integrated Systems Engineering. His research includes electric energy systems and mathematical tools for decision-making in energy systems. His interests include devising ways to enable a large-scale integration of renewable sources in electric energy systems. He is editor-in-chief of the IEEE Transactions on Power Systems, an IEEE Fellow, and chair of the IEEE PES Power System Operations Committee.

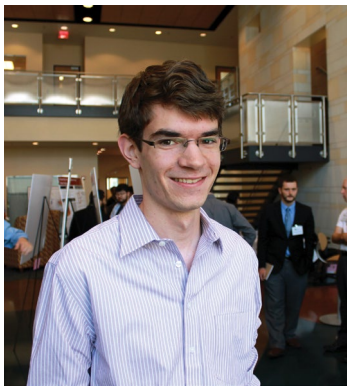
ECE/CSE Professor **Ness Shroff** received the 2014 INFOCOM Achievement Award from the Institute of Electronics and Electrical Engineers (IEEE). Shroff, the Ohio Eminent Scholar Chaired Professorship of Networking and Communications, received the lifetime achievement award for his seminal contributions to scheduling and resource allocation in wireless networks at the 33rd annual INFOCOM Conference in Toronto. The INFOCOM Achievement Award was created in 2007 for recipients whose body of work (or a single paper) had a significant impact on the research community.



ECE graduate researcher **Haksu Moon** received the coveted 2015 Graduate School Presidential Fellowship during the winter season. Moon's research work at the ElectroScience Lab specializes in computational electromagnetics. He develops numerical algorithms to compute electromagnetic fields more efficiently.



Professor **John Volakis** received the 2014 IEEE Antenna and Propagation Society's Distinguished Achievement Award at IEEE's APS/URSI Symposium in Memphis July 9. The award was presented for the professor's "game-changing contributions to computational electromagnetics, radar scattering and antennas, and for educational leadership and service to the electromagnetics community." Volakis has served as director of the ElectroScience Lab since 2003. His research interests include wireless communication and propagation; antennas and arrays; RF materials and packaging; RF matching and tunable circuits; RFIDs; medical sensing; millimeter waves and terahertz; computational electromagnetics; electromagnetic compatibility and interference; and scattering and diffraction.

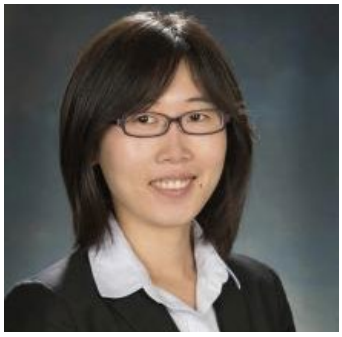


Out of 136 submissions, Electrical Engineering Ph.D. student **Markus Novak** tied for fourth place in a NASA research challenge regarding the dangers of cosmic radiation during proposed manned missions to Mars.

The award earned him $1,000 for his solution.

Novak proposed a safe space for astronauts to travel through, lessening their exposure to galactic cosmic rays. He found some previous NASA research that used magnets to deflect the rays. Instead, Novak developed a lens to alter their trajectory just enough to miss a spacecraft.

NASA has already announced the next adventure in the engineering challenge, and is now offering an award up to $30,000 for design ideas to protect a crew on long-duration space missions.



It was a good year for **Yuejie Chi**, assistant professor of ECE and Biomedical Informatics. The Office of Naval Research announced Chi as a winner of its prestigious 2015 Young Investigator Program (YIP) - one of the oldest and most selective scientific research advancement programs in the county. Candidates were chosen from 383 research proposals based on merit and potential breakthrough advances for the Navy and Marine Corps. Previously, Chi was also among the winners in the Young Investigator Program of the Air Force Office of Scientific Research this year. Chi has been working with Ohio State since 2012.

Ph.D. students **Ye Shao** and **Cosan Caglayan** made the short list of 2015 Presidential Fellowship winners this year.

Caglayan said the award helps further his research on disruptive technology, which can be transformational for the electronics testing industry.

Shao said winning the Presidential fellowship will help advance his work on wide bandgap semiconductor nanowire field effect transistors and resonant tunneling devices.

Lori Dalton, assistant professor of electrical and computer engineering, as well as biomedical informatics, received a five-year, $449,341 National Science Foundation (NSF) Faculty Early Career Development (CAREER) award for her research in optimal Bayesian methods for classification.

The CAREER award is considered the NSF's most prestigious in offering support for junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of both.

A major application for her work is in diagnosis and prognosis prediction for cancer patients.

What's in a name?

"Are you brothers?"

Understandably, ECE undergraduates **Ryan and David Scherer** (pictured left to right) get asked this question a lot. They don't mind.

"I often joke that we're brothers in engineering," David said. "But the fact that we have the same last name is actually complete coincidence."

Sharing last names made for a good conversation starter when the two Scherers first met during sophomore year, but they soon learned how much they actually had in common. Both took the same classes and had the same passion for engineering.

Ultimately, their work as co-presidents within the Ohio State student branch of the Institute of Electrical and Electronics Engineers (IEEE) helped teach them the true meaning of teamwork as well. On April 6, the IEEE hosted the 2015 Student Activities Conference (SAC) at Ohio State.

The event brought in student IEEE branches from six different states in this region, all meeting and engaging in leadership training, paper competitions, robotics competitions as well as other competitive activities. This year's SAC had 26 universities and over 230 students and faculty in attendance.

"IEEE has always been about connecting ECE students to a larger network of engineers around the world," David said. "In our world, many of the great challenges we face are electrical in nature. From finding sustainable energy solutions, to updating our power grid, to improving our communication systems, there's so much need today for great problem solvers."

Being an engineer, David said, makes him feel like part of the solution instead of part of the problem.

"It's my hope that when I leave Ohio State, the work I did in IEEE will help provide future students with even more opportunities to learn and grow as engineers," Ryan said. After graduation, David started his career as a systems engineer for Harris RF in Rochester, New York. Meanwhile, Ryan is now in Denver, Colorado as a systems engineer with United Launch Alliance.

Ringel Receives 2015 Distinguished Scholar Award

In a surprise ceremony that brought Ohio State University President **Michael Drake** and entourage to Dreese Laboratories this winter, ECE professor **Dr. Steven Ringel** was named a 2015 Distinguished Scholar.

The award touches upon Ringel's scholarly activities in wide bandgap semiconductors and photovoltaics, as well as his leadership of the OSU Institute for Materials Research (IMR) and, most recently, as the Principal Investigator of the Materials and Manufacturing for Sustainability Discovery Theme Initiative.

ECE faculty and staff, members of Ringel's research group, as well as President Drake, College of Engineering Dean **David Williams**, Vice President for Research **Carol Whitacre**, and Senior Associate Vice President for Research **Jan Weisenberger** all spoke about Ringel's accomplishments in research and in propelling Ohio State to excellence in materials-allied research.

"You now join an elite group of faculty at Ohio State," Drake said. "Your energy and dedication to the university community are really appreciated."

The Distinguished Scholar Award, established in 1978, recognizes exceptional accomplishments by senior professors who have compiled a substantial body of research. The award is supported by the Office of Research. Recipients are nominated by their departments and chosen by a committee of senior faculty, including several past recipients of the award. Distinguished Scholars receive a $3,000 honorarium and a research grant of $20,000 to be used over the next three years.

Four at ECE retire, leaving a lasting legacy

After decades of leadership, four respected ECE faculty members retired in 2015.

The work and research legacy of professors Umit Ozguner, Fusun Ozguner, Roberto Rojas-Teran and Furrukh Khan ultimately helped shape the current prestige of the department at Ohio State.

Their colleagues and staff honored the outgoing four during a retirement party held in May.

Husband and wife duo, **Umit and Fusun Ozguner** both came to teach at ECE back on Jan. 1, 1981. They retire with almost 35 years of work within the department. Umit has served as the Transportation Research Center Inc. Chair on Intelligent Transportation Systems and Director of the Crash Imminent Safety University Transportation Center since 2013. He received his Ph.D. from the University of Illinois at Urbana-Champaign and worked in the past at IBM Research, Istanbul Technical University and Ohio State. His research interests include large scale systems, decentralized control, intelligent transportation systems and autonomous vehicles. He has over 400 publications and advised over two-dozen students in their Ph.D. studies. Fusun also received her Ph.D. from the University of Illinois at Urbana-Champaign. She previously worked at the IBM Research, Istanbul Technical University and the University of Toronto. Her research areas of interest include high performance parallel computing, fault tolerance in parallel architectures, communication hardware and algorithms for massively parallel structures and multiprocessor architectures in engineering.

Roberto Rojas-Teran has served ECE as a professor since April 12, 1985. He gave 30 years to the department and his many students. He specializes in active integrated arrays, reconfigurable antennas, conformal arrays, coupled oscillators, optical phased arrays, RF integrated circuits and the application of nonlinear dynamics concepts in the analysis and design of active microwave circuits. He is a Fellow of IEEE and an elected member of U.S. Commission B of the International Union of Radio Science (URSI). He has won several university and IEEE awards and over the years published more than 100 papers.

Furrukh Khan came to ECE on Oct. 1, 1985. He is an associate professor of both electrical and computer engineering, as well as anesthesiology. Khan received his Ph.D. in 1983 from the State University of New York at Stony Brook. His research interests include solid state electronics and applied software engineering. He also led the creation of the department's sophomore curriculum and laboratories.


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Photo descriptions: *1) Furrukh Khan stops for a picture during the retirement event. 2) ECE Chair Joel Johnson, left, thanks Roberto Rojas-Teran and family. 3) Faculty Emeritus Robert Fenton, left, talks with Umit Ozguner. Their combined work in autonomous vehicle spans many decades. 4) Johnson presents Fusun Ozguner with a plaque for her service to ECE. She was joined by her daughter and husband.*

What's next?

Find individual articles about the plans for each retiree, complete with comments from their colleagues and family, online at:

go.osu.edu/ece-retirement

Inaugural Makeathon a success

You wouldn't know it from their energy, but many of the participants in the first-ever Makeathon never went to bed Saturday night.

Over 24 straight hours, April 18 to 19, Ohio State engineering students invaded several rooms in Dreese Laboratories, just to get more people excited about electronics. They created apps, designed systems and generally unleashed brand new inventions on the world while everyone else was asleep at night.

Created and led by ECE's Electronics Club at Ohio State, Makeathon is expected to become an annual event. The top winner this year was the Pancake Printer team, consisting of students **Carter Hurd, David Frank** and **Ryan Niemocienski**. They used electronics to power a pancake maker that created custom designs. Tying for second place was an automated Etch-a-Sketch team, as well as some mechanical engineers who went overboard, bringing their own hand-made 3D printer to create a remote-controlled video camera robot with a head goggle viewer.

By about 3 p.m. Sunday, box fans were blowing full blast into work-filled rooms, while remnants of midnight snacking fuel-ups competed for space on the tables.

"I thought the event went very well overall. I was pleasantly surprised at the caliber of everyone's projects and what they were able to do in a 24-hour period," Electronics Club President **Eric Bauer** said. "We definitely want to repeat this event again."

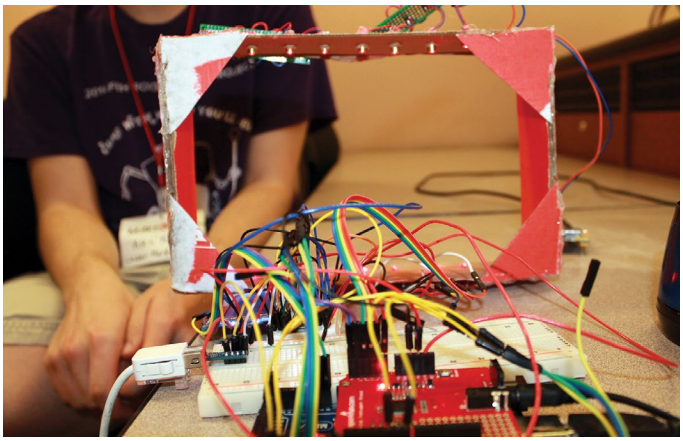
ECE student and club member, **Gus Fragasse**, said he feels the Makeathon accomplished what he hoped it would in the end.

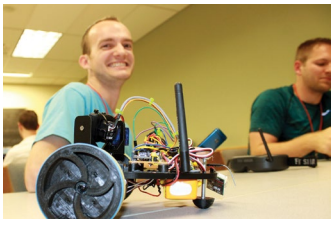
"The mission statement of the club was just to educate people about electronics, and to inspire people to create or make things," he said. "It's just a really cool event. It went pretty well. Better than we expected."

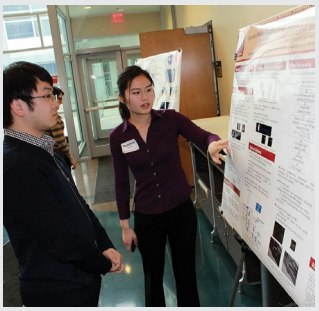
Fragasse said Makeathon teams got ambitious. One team created a graphic equalizer with a laser light display. Other students built a laser-powered harp. Engineering classes provide great theoretical knowledge, he said, but there are times when some students want to get more hands-on. That's where the Electronics Club comes in.

The judging for the 2015 Makeathon was handled by ECE professors **Jin Wang** and **Liang Guo** and MAE professor **Sandra Metzler**, who is also the faculty advisor of the D4 Maker's Club at Ohio State. Prof. **Mohammed Ismail**, former ECE professor and now Chair of ECE at Khalifa University, completed the faculty judging group. Industry judges involved were **Jeff Becker** from Awareability, **Brian Sherwin** from Microsoft and **Eric Troth**. Dr. **Shane Smith** from Physics was an Ohio State staff judge and ECE grad student judges were **Salma Elabd, Brandon Mathieu, Mark Scott, David Du and Luke Duncan**. Texas Instruments helped with sponsorship as well. The event was made possible through financial support from The OHI/O Hackathon Program. For more information, head online to **http://make-oh.io**

Watch a short video about the Makeathon:
go.osu.edu/makeathon-osu







@OhioStateECE MeetUp

Equal parts socializing, networking and research discovery, the **Department of Electrical and Computer Engineering** created the ongoing MeetUp alumni event series to help keep our past graduates connected. Stay informed about the groundbreaking research students and faculty are exploring today.

So far, the series led alumni on a personal tour of Ohio State's EcoCAR program at the Center for Automotive Research, and opened the doors to the ElectroScience Lab during the annual John D. and Alice Nelson Kraus Memorial Student Poster Competition. Join us for new events scheduled throughout the year. Each Meetup starts with a presentation on current research projects, followed by a personal tour of the facility or program, ending with socializing and networking over snacks. Upcoming events will explore the Department's Commercialization activities, the High Voltage Lab and more.

Watch Online:
go.osu.edu/meetup-video

Learn more by joining the **ECE MeetUp** page: **go.osu.edu/Meetup**

ECE Campaign Committee

Rodolfo M. Bellesi
Co-founder/managing partner, IKOVE Capital Partners, LLC - MS, Electrical Engineering, Ohio State (2000); BS, Electrical Engineering, Federal University of Paraguay (1997)

Mark Morscher
Owner, C2R Consulting, LLC - BS, Electrical Engineering, Ohio State (1989)

Liza Toher-Reed
Proposal Developer, Great Lakes Energy Institute - BS (2006) and MS (2010), Electrical and Computer Engineering, Ohio State

Dr. Robert B. Dybdal
Retired, Engineer, The Aerospace Corporation - BS, MS (1964) and Ph.D. (1968), Electrical Engineering, Ohio State

Dr. Mark Frankford
Engineer, Northrop Grumman - BS (2004) and MS (2006), Electrical Engineering and Ph.D. (2011), Electrical and Computer Engineering, Ohio State.

Jim Sipes
Retired, Engineer, Quest/CenturyLink - BS (1965) and MS (1966), Electrical Engineering, Ohio State.

Robert Borel
CEO, BeamAlloy Technologies, LLC - BS and MS, Electrical Engineering (1965), Ohio State, MBA, University of Rochester (1974)

Dr. Tamer Ibrahim
Associate Professor of Radiology and Bioengineering at Swanson School of Engineering (University of Pittsburgh) - BS, Electrical and Computer Engineering (1996), MS, Electrical Engineering (1998) and Ph.D., Electrical and Computer Engineering (2003), Ohio State

Reza Norouzian
VP, Worldwide Sales and Business Development, ClariPhy Communications - BS, Electrical Engineering, Ohio State (1981)

Dr. Marvin White
Professor (Auxiliary) Electrical and Computer Engineering - Ph.D., Electrical Engineering, at Ohio State (1969)

Liza Toher-Reed

ECE alumna Liza Toher-Reed ('06 and '10) explains why she stays so connected to her alma-mater after graduating years ago.

"Ohio State and the Department of Electrical and Computer Engineering have meant so much to me and really changed a lot of the trajectory of my life," she said. "I started at Ohio State as a Math major and then came to electrical engineering through seeing my friends and what they were doing... and realizing that this was the place that I wanted to be, and this is what I was really passionate about."

Toher-Reed serves on the ECE Campaign Committee, EE/ECE Alumni Society and the Ohio State Alumni Association Board of Directors. Watch a short video interview with Toher-Reed at: **go.osu.edu/Reed**

Robert Dybdal

Esteemed ECE alumnus, Robert Dybdal, received his BS, MS and Ph.D. in electrical engineering through Ohio State over the years. He sees participating in ECE alumni activities as a vital part of the educational process. Students become mentors and mentors help more students.

"A very important part of one's education is learning to grow and evolve," he said. "I very much enjoyed the time that I spent here and that has continued over the years. I've also sponsored some work at the ElectroScience Lab. I have a great fondness for Ohio State. One of the reasons for my participation here is to help the university continue to grow and evolve." Dybdal serves on the ECE Campaign Committee. Watch a short video interview with Dybdal at: **go.osu.edu/dybdal-video**

ECE Priorities

RECRUIT OUTSTANDING FACULTY:

The new faculty we are recruiting will perform cutting-edge ECE research to impact our future in autonomous vehicles, smart robotics, cancer treatment, concussion prevention/diagnosis, energy systems, and the internet-of-things. Support from our alumni is crucial for helping us to provide start up funds and endowed chair support to enable these innovations and endowed chair positions to attract outstanding new faculty.

STUDENT LED INNOVATION:

Our graduate students are the driving force behind Ohio State's research progress. Their success builds not only their future career, but also the university's reputation and our nation's critical technologies. Support from our alumni helps us to provide fellowships for the graduate program that enable these students to concentrate on their research rather than day-to-day financial concerns.

UNDERGRADUATE ACCESS:

Department scholarships enhance the ability of our students to pursue their dreams of an ECE education. These are especially important for the freshman and sophomore years, as students build their skills to pursue future internships and co-ops. We are proud of the generous support ECE alumni have provided to our undergraduate students and hope to build upon this success to further reduce college costs for deserving students in the programs.

MODERN LEARNING ENVIRONMENTS:

ECE facilities are meeting the needs of our student body, but face challenges moving forward. The replacement of Caldwell Laboratory is a long term goal; more immediate needs include smaller renovations of the Control Systems Laboratory, relocation of the electronics group, improvements in equipment for the sophomore teaching laboratories, enhancements to the laboratory space for our project-based master's program, and the creation of a "maker" space for our undergraduate students to pursue their innovative ideas. Alumni support helps us meet our facility needs going forward.

OTHER OPPORTUNITIES:

Several other opportunities exist for our alumni to make a significant impact. These include endowments to support annual awards recognizing outstanding performance by our graduate or undergraduate students, support for expansion of the ECE-led Humanitarian Engineering program (including support for students to participate in humanitarian projects) and support for the ECE K-12 Engineering Outreach Program that has already taught more than 11,000 young students across Ohio about STEM topics applicable to society.

SUPPORT

Ways to Give

There are many ways to give to the Department of Electrical and Computer Engineering, including establishing an endowed or support fund, or contributing to the ECE fund of your choice.
You can contribute directly to an ECE fund through The Ohio State University Online Giving secure website and online donation form. Visit our list of ECE department program support and scholarship funds to find out more.

New Opportunity

A generous gift left by Ohio State alumna **Hazel Lodge** (1938), helped create the new **ECE Alumni Scholarship Fund**. The endowment is now the main outlet for alumni financial gifts toward ECE student scholarships. Each year, the EE/ECE Alumni Society committee members select recipients. The College of Engineering will also invite the Lodge family and other donors to help honor ECE Alumni Scholarship Fund recipients at an annual scholarship luncheon event.

Contact Us

Please contact the College of Engineering Development Office, or **Joel T. Johnson**, ECE Chair, with any questions or to discuss giving opportunities at **ece.osu.edu/alumni/support**

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Come home again Oct. 10

Celebrate Homecoming Weekend with fellow alumni

Join friends in the Department of Electrical and Computer Engineering and the EE/ECE Alumni Society for a pre-game Homecoming tailgate party, with a breakfast buffet, live DJ and interactive stations. The event runs from 9 a.m. to 11 a.m. on the patio between Knowlton and Hitchcock halls.

Game-plus-tailgate package
Each $105 game/tailgate package* includes one ticket to the Ohio State vs. Maryland game, plus one ticket to the College of Engineering Homecoming pre-game tailgate. Tickets are available when you check in at the tailgate.
Note: We cannot mail tickets. A photo ID will be required at pickup. We cannot offer football tickets only.

Tailgate only
The cost is $20 per person. Children 9 and under are free. You may buy tickets via the College of Engineering online system at go.osu.edu/homecoming-2015.

Sponsor current ECE students to attend the tailgate
While registering for the tailgate package, you may wish to sponsor an ECE student to attend the tailgate for $20 per person.

Questions?
Call Carol Duhigg at (614) 292-7392 or email duhigg.2@osu.edu

**A paid $20 annual EE/ECE Alumni Society activity fee is required to be eligible to buy up to two game/tailgate packages. The activity fee is for calendar year 2015 and also counts toward your OSUAA sustaining membership requirement for 2016. In addition to the required EE/ECE Alumni Society activity fee, you must be an active member (Sustaining or Life Member) of the Ohio State Alumni Association. Alumni who are season ticket holders (whether in your name or your spouse's name) are not eligible.*

Ticket Availability

Ticket packages are available on a first-come, first-serve basis.

August 10: Registration opens

Registration:
Register for the EE/ECE Alumni Society Homecoming by calling Ohio State Alumni Association's customer service desk at (614) 292-2281 or (800) 762-5646.