



College of Engineering  
UNIVERSITY OF WISCONSIN-MADISON

GRAINGER  
**POWER**  
**ENGINEERING**  
AWARDS

APRIL 10, 2017

Supported by a grant from The Grainger Foundation



*The Grainger Foundation of Lake Forest, Illinois, established in 1949 by Mr. and Mrs. William Wallace Grainger, has provided substantive support over the years to a broad range of organizations, including museums and educational, medical, and human services institutions.*

*David W. Grainger, Chairman of The Grainger Foundation, received his BS in electrical engineering from the UW-Madison in 1950.*

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# GRAINGER POWER ENGINEERING AWARDS

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5:00 P.M.

## RECEPTION



5:30 P.M.

## OPENING REMARKS

Ian M. Robertson, Dean,  
College of Engineering



## DINNER



6:15 P.M.

## AWARDS PRESENTATION

*(Undergraduate and graduate awards)*

Dean Ian Robertson

*Power engineering faculty:*

Chris DeMarco  
Thomas Jahns  
Robert Lorenz  
Dan Ludois  
Bulent Sarlioglu

## 2017 AWARD RECIPIENTS



Joel Cruvant



Jake Cummins



Thomas Cunniff



Nicholas Dunn



Daniel Eckerson



Jonathan Herzog



Gabriel Kinzer



Andrew Lueneburg



Samuel Mattison



Matthew Smuda



Jay Zoborowski



Kevin Frankforter



Philip Hart



Ryan Knippel



Michael Rios

PhD

## JOEL CRUVANT



Ever since Joe Cruvant's childhood in Las Vegas, Nevada, he was fascinated by the evolution of technology. When his penchant for math and science emerged during high school, he realized that engineering would enable him to understand and possibly contribute to the modern march of innovation. As an electrical engineer, he considers power to be fundamental to almost every engineering application, and essential to bringing about technology to make the world a better place.

"I view power engineering as an essential field for developing solutions to some of the grand engineering challenges in energy sustainability," Cruvant says.

Right from the beginning of his college career, Cruvant sought opportunities to apply the concepts he learned in his coursework to real-world projects. Early on, he participated as a team member and vice president of the electrical division of the Formula SAE student racing team, where he helped build the wiring harness and controls for the vehicle.

During his junior year, Cruvant was accepted into the Nuclear Propulsion Officer Candidate Program with the U.S. Navy. Since graduating in December 2016, Cruvant has been training to become a nuclear submarine engineering officer in Rhode Island, South Carolina and New York. After finishing training, he will be a nuclear submarine officer responsible for the operation of a submarine's propulsion systems; he will work out of the U.S. Navy NUPOC program, headquartered in Arlington County, Virginia.

While at UW-Madison, Cruvant loved taking advantage of summer sunshine by touring on his bicycle and developing his abilities as a photographer. When the weather turned nasty, he enjoyed improving his cooking skills.

## JAKE CUMMINS



Like many kids, Jake Cummins grew up playing video games on his Xbox. But the popular gaming device became an educational toy when it broke and Cummins took it apart: “I instantly became intrigued with the circuit boards and other parts inside the Xbox,” he says. “After this experience, I was very interested in studying electrical engineering and learning about how circuits actually work.”

Coupling a lifelong interest in renewable energies with his newfound interest in circuits, Cummins decided to pursue an electrical engineering degree at UW-Madison. “Renewable energies have a very direct connection with electric machines and power engineering,” he says.

The Oshkosh, Wisconsin, native graduated in December 2016 and now optimizes machine operating points as an electrical engineer with Kimberly-Clark Corp. in Neenah, Wisconsin.

As a student, Cummins focused on professional-development activities, working three co-op terms with Kimberly-Clark on everything from safety-related projects to the company’s drives and controls team.

In his free time, Cummins enjoys watching and playing sports, and his allegiances include not only the Badgers sports teams and Milwaukee Bucks basketball team, but also the Denver Broncos football team.

## THOMAS CUNNIFF



In second grade, Thomas “Drew” Cuniff received a computer as a reward for obtaining exceptional grades—and that gift sparked a lifelong interest in electronics.

Once he left Barrington, Illinois, for UW-Madison,

Cuniff realized his passion for power engineering after learning about the important role that renewable energy sources will play in the planet’s future while taking ECE 356, *Electric Power Processing for Alternative Energy Systems*.

He gained firsthand experience working on renewable energy during summer 2016, when he worked on as a project engineer for Eisenmann Corporation on a biogas system startup. While on the site in California, Cuniff implemented and checked the power distribution systems, checked mechanical functions, and wrote PLC code to run the facilities. When it comes online, the system will be capable of powering 5,000 homes in the area from natural gas produced from biowaste, reducing the load on fossil fuels.

Cuniff worked for Eisenmann Corporation for two years during his undergraduate career, and was a participating member of the IEEE student organization. He graduated in December 2016, and during January, he began working for Motorola Solutions as a systems engineer in Chicago. At Motorola, Cuniff is setting up network infrastructure for first responders and upgrading current systems across North America.

During school, Cuniff managed the stress that sometimes comes with the demanding engineering curriculum by pursuing his passion for fitness. “Keeping your body healthy keeps your mind healthy,” he says. “The gym was my form of meditation and helped me through tough times in school.”

## NICHOLAS DUNN



As a child in Sparta, Wisconsin, Nicholas Dunn loved hearing stories about historical inventors such as Nikola Tesla and Thomas Edison, as well as modern-day technology pioneers like Steve Jobs. After taking engineering design classes in high school, Dunn realized that, with enough creativity and dedication, someday he might also be able to contribute to humanity in a similar manner as his childhood heroes. “Their innovative views and relentless dedication toward their work helped them achieve personal success while also developing products that changed the world,” says Dunn.

Dedicated to becoming an electrical engineer since the beginning of his undergraduate education, Dunn says his experiences in ECE 356, *Electric Power Processing for Alternative Energy Systems* and ECE 427, *Electric Power Systems*, solidified his interest in power engineering. He’s always been fascinated by the myriad manners by which humans capture and store energy to be used later for electrical and mechanical needs.

After his graduation in December 2017, Dunn hopes to attain a position working in energy storage and conversion. He anticipates that the move toward cleaner alternative energy sources will necessitate innovation in the way people store electricity, and he looks forward to contributing in whatever way he can. Although Dunn has not yet held an engineering job, he’s currently working on coordinating an internship for the upcoming summer.

While not focusing on coursework, Dunn is an avid sports fan and attends almost every Badger football, basketball and hockey game. He’s also an amateur writer, contributing fan articles to different sports media outlets.

## DANIEL ECKERSON



**H**obby electronics projects and high-quality high school classes set Daniel Eckerson down the path toward becoming an electrical engineer while he was growing up in Lakeville, Minnesota. He became interested in alternative energy after volunteering for Students for Energy Efficient Living during his freshman year at UW-Madison. Now, he's passionate about finding ways to incorporate renewable energy sources into the power grid to provide for an environmentally sustainable future.

Although Eckerson hasn't yet held positions specifically in the sustainability space, he's gained significant working experience during two summer internships at UTC Aerospace Systems in Burnsville, Minnesota. There, he contributed to two different projects designing video camera systems and servers for aircraft security.

Eckerson thrived at UTC, and aspires to keep using those skills in the future. "I hope to use my knowledge of power electronics to design low-radio-frequency-noise power supplies to meet aerospace communication standards," he says.

After graduating in May 2017, Eckerson will join UTC as an associate electrical engineer, where he will be designing, testing and verifying video camera systems and servers for use in security of commercial aircraft. He hasn't lost sight of his ultimate career goal to work in the renewable energy field, and hopes his design experience will prepare him with the skills he needs to pursue those dreams.

An avid cyclist, Eckerson participated heavily in the UW Cycling Club for the last three years, racing both road and mountain bikes all over the eastern Midwest in the spring and fall. He also worked as a student shop technician in the College of Engineering Student Shops, teaching wood shop classes and giving fabrication advice to students working on class projects.

## JONATHAN HERZOG



The Herzog family home in Cedar Grove, Wisconsin, boasts two generations of engineering talent: Jonathan Herzog, his father and two older brothers are all engineers. Ever since visiting a power plant with his father on “take your kid to work day,” Herzog knew he wanted to apply his natural aptitude for math and science in a field where he could help people.

“Working as a power engineer in the utility business would enable me to help provide thousands of people with electricity while continuously learning more about engineering practices and gaining a deeper understanding of electricity,” says Herzog.

Herzog helped deliver power to thousands of Wisconsin residents during his three terms working with We Energies during his undergraduate career. In summer 2014, Herzog worked in a coal power plant in Oak Creek, Wisconsin. He also did a co-op term in spring through summer of 2015 working in Milwaukee with the We Energies technical expertise and performance analysis group. Most recently, he worked in substation design during summer 2016.

After graduating with a degree in electrical engineering in May 2017, Herzog will join We Energies full time working in the electric operations department, focusing on the distribution side of the company. Before starting his job, Herzog is planning a post-graduation trip to Italy, France, Germany and Switzerland. Travel is one of Herzog’s main passions, but his other varied interests include sports and music. He loves playing basketball and golf and has been a drummer since the fourth grade.

## GABRIEL KINZER



**G**abriel Kinzer realized that his high school aptitude for science and mathematics suited him to pursue engineering after taking courses through Project Lead the Way. Although Kinzer was initially drawn to mechanical engineering, conversations with family friends from Glendale, Wisconsin, convinced him to pursue his first internship at Rockwell Automation. In the intervening five years, Kinzer has gained experience on a variety of electrical engineering projects.

After three years in drives development at Rockwell Automation, Kinzer switched to the power electronics group. For the next two years he worked on electromagnetic compatibility testing of drives, reverse engineering and building high-voltage DC power supplies, and debugging power boards in the proof-of-concept stage.

Although his responsibilities at Rockwell kept him busy, Kinzer found time to watch Packers games and cheer on UW sports teams during his time on campus. An amateur athlete himself, Kinzer was vice president of the university's Men's Rugby Club, and organized the team's annual spring break tour.

The electrical engineering major will graduate in May 2017 and has a job offer from Rockwell Automation working in its leadership development program. His first position will be based in Cleveland for six months in the engineer-in-training program, after which he will rotate around the company in three additional six-month-long postings.

## ANDREW LUENEBURG



Andrew Lueneburg's interest in electrical engineering was sparked early in childhood. His elementary school in Hudson, Wisconsin, held an annual "engineering week" where local engineers from companies such as 3M and IBM led activities like making robots with LEGOs. His enthusiasm for power engineering blossomed after a semester taking two concurrent power engineering courses, which gave him both interactive lab experience and a large-scale view of the future importance for power engineering as alternative energy begins to scale up.

"I don't play with as many LEGOs as I did during childhood," says Lueneburg, "but my passion for building and creating has only grown since."

Now Lueneburg has moved on to much bigger "toys" at his current position with Astronics Advanced Electrical Systems in Kirkland, Washington, where he helps design electric power systems that keep airplanes operational. Before working at Astronics, Lueneburg completed a year-long internship at UTC Aerospace Systems in Rockford, Illinois. Over the course of that rotating program, he spent time in three divisions: electric systems, test equipment, and actuation electronics.

The demanding ECE coursework and a part-time position at the Apple store consumed much of Lueneburg's free time during his undergraduate education. Since earning his bachelor's degree in May 2016, he's been delighted to have more time to pursue his passion for the outdoors by hiking, camping, and backpacking in the Cascade Mountains in the nearby Seattle area.

## SAMUEL MATTISON

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**G**rowing up in Tomah, Wisconsin, Samuel Mattison knew that he wanted to work in a field that inspired and fostered innovation to improve the quality of work and products. His first internship working on the power distribution among several ethanol plants opened his eyes to the intoxicating array of possibilities for power engineers to improve processes and systems for a variety of industries.

During his two summer internships with Flint Hills Resources, Mattison worked with the electrical reliability teams to maintain the integrity of the power distribution systems in ethanol plants and oil refineries. Now, Mattison works for the Naval Nuclear Laboratory in Idaho Falls, Idaho. He has been working with the facilities team to maintain the electrical systems around the worksite since his graduation in December of 2016.

A team player by nature, Mattison is involved with IEEE and volunteers with Habitat for Humanity. He also captained several intramural sports teams during his time on campus.

## MATTHEW SMUDA



Matthew Smuda first became interested in engineering during middle school, carrying on the legacy of his grandfather, an electrical engineer. Always curious about how to harness power, Smuda narrowed his general interest into a passion for alternative power systems after completing the courses ECE 356, *Electric Power Processing for Alternative Energy Systems* and ECE 427, *Electric Power Systems*.

While focusing on his studies, Smuda also finds time to contribute to the campus community. He is an active member of the IEEE student organization and acts as a student assistant for an ECE signal processing class. The position is giving Smuda teaching experience, and he enjoys helping students work through class exercises and answering their questions.

After Smuda's graduation in May 2017, he hopes to work for a company whose focus is on improving alternative energy systems such as solar power. He is currently seeking an internship for the upcoming summer.

Smuda is a fitness fanatic, avid snowboarder, and enjoys playing soccer.

## JAY ZOBOROWSKI



Jay Zoborowski's early interest in math and science motivated him to follow in his father's footsteps and become a chemical engineer. But after leaving White Bear Lake, Minnesota, and working in his first co-op with Kimberly Clark, Zoborowski discovered his fascination for electrical machines.

Since those seven months at a tissue plant in Tulsa, Oklahoma, Zoborowski took more power engineering classes to increase his knowledge. He also pursued two internships with 3M in control systems and project engineering. During those experiences he not only got his hands dirty designing and installing control systems for computerized cutting machines, but also managed 35 projects encompassing \$1.5 million throughout the 3M Corporate Research Labs.

After graduation in May 2017 with a bachelor's degree in electrical engineering, Zoborowski will continue working for 3M as a control systems engineer in its process instrumentation and control solutions group in St. Paul, Minnesota.

Even while keeping up with his coursework and internships, Zoborowski found time to volunteer as a leader in his church's middle school ministry program every Wednesday night. As the coordinator, he was responsible for planning the program, corresponding with parents, and delegating work among the leaders—skills that have helped him excel in his management roles. He also enjoys working out at the gym, attending Badger games, playing basketball, traveling, reading, and spending time with family and friends.

## KEVIN FRANKFORTER



Kevin Frankforter's childhood penchant for puzzles and taking things apart predestined him to become an engineer, even before he knew he had a knack for the discipline. Growing up in Grand Island, Nebraska, he was always fascinated by the physics behind converting energy among all its different forms—but his first internship experience at a coal-fired power plant sealed his interest in engineering.

Frankforter held positions at the power plant for three summers during his undergraduate education at the University of Nebraska, Lincoln. He worked with several of the various plant control systems, helped implement safety procedures, and assisted with day to day tasks of the system and instrument technicians.

Even though he's a devoted Cornhuskers fan, the deep sense of community and camaraderie within the Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC) combined with the consortium's outstanding reputation made UW-Madison Frankforter's top choice for PhD programs. In WEMPEC, Frankforter is investigating the dynamic performance of hybrid battery/ultracapacitor electrodes, where the active materials from both devices are implemented onto the same electrode.

His anticipated graduation date is in spring 2018. Upon receiving his PhD, Frankforter hopes to find a position in industry or a national lab. When not working in the lab, Frankforter enjoys golf, downhill skiing, craft beer, and following University of Nebraska athletics.

## PHILIP HART



When Philip Hart was in elementary school, he built an FM radio station that was capable of broadcasting music throughout his entire neighborhood in Niskayuna, New York. That childhood spent tinkering was partially inspired by his father's infectious enthusiasm for his job as a power engineer, and older brothers and cousins who served as role models. Now Hart proudly continues the family tradition, and shares his father's passion.

"Power engineering serves such a critical purpose for so many people and the theory involved also happens to be fascinating," says Hart.

After receiving his undergraduate degree in electrical engineering with a minor in sustainable energy systems engineering from Clarkson University in 2011, Hart came to UW-Madison to complete his master's degree in electrical engineering in 2013. During a summer 2013 internship at GE Global Research, he built dynamic models for a microgrid and a wind turbine, which piqued his interest in distributed energy generation.

Currently, Hart is pursuing a PhD in electrical engineering. The primary goal of his research is to help enable distributed generation resources to make the modern power grid more efficient, resilient, and integrated with renewable energy sources. He works to build reduced-order dynamic models of large-scale, inverter-based distributed generation networks in a way that can accurately predict nonlinear interactions between distributed generation resources.

Hart is passionate about science outreach, and enthusiastically participates in science fairs and other programs through the Wisconsin Energy Institute. He enjoys biking with the WEMPEC bike club and still dabbles in amateur radio.

After his anticipated graduation in early 2018, Hart aspires to pursue a job in industrial research, where he can work on technologies related to integrating distributed generation into the power system.

## RYAN KNIPPEL



**B**ill Nye and Carl Sagan—with their enthusiastic investigations into the wonders of the universe—piqued Ryan Knippel’s interest in science. As a boy in Wausau, Wisconsin, Knippel watched these charismatic communicators on TV and they opened his eyes to the power of engineering as a tool to answer questions across a variety of disciplines. And that still inspires him to pursue interdisciplinary research.

He gained his first experience working on all aspects of a project from start to finish during an internship at C-Motive Technologies, a startup founded by several WEMPEC alumni. While building small tests and prototypes at C-Motive, Knippel began to see that power engineering, by its very nature, draws from several different scientific traditions. Now, as a PhD student working under the mentorship of Assistant Professor Dan Ludois (who co-founded C-Motive as a grad student here) on a project to develop non-contacting approaches for effective power transfer to rotating assemblies, Knippel appreciates how power engineering encourages versatility.

“Our work is always an unconventional marriage of disciplines, which keeps things interesting,” says Knippel.

Knippel works as a teaching assistant for the engineering mechanics senior design courses, a position he has held repeatedly throughout his graduate training. He enjoys the chance to mentor UW-Madison undergraduates as they complete some of the same coursework he himself pursued while working toward his bachelor’s degree in engineering mechanics and astronautics, which he received in 2012. His fondness for the hiking and biking trails around Madison and the campus community motivated Knippel to remain at UW-Madison to finish his master’s degree in engineering mechanics.

After his anticipated graduation in 2018, Knippel hopes to work at a design consultancy where he can continue to develop and prototype new technologies. Eventually, however, Knippel aims to return to academia.

## MICHAEL RIOS



Never one to shy away from an adventure, Michael Rios initially pursued electrical engineering because the courses had a reputation for being among the most demanding classes at his undergraduate institution, the University of California, San Diego. “I felt motivated by the challenge and opportunity to become an active participant in applying some of the more interesting topics of math and physics,” says Rios.

After applying those topics to a solar panel installation for a school in South Sudan, Rios knew that power engineering was the discipline for him. He graduated with his bachelor’s degree in 2011 and is currently completing a PhD in electrical engineering through faculty in the Wisconsin Electric Machines and Power Electronics Consortium. His research is concerned with the use of foil windings in electric machines. Rios’ decision to leave sunny California for sometimes-snowy Wisconsin was motivated by the professionalism and camaraderie he witnessed when he visited for the ECE department’s open house.

A world traveler, Rios had the opportunity to spend six months in Graz, Austria, as a visiting researcher. During his time in Europe, Rios explored seven different countries and he still remembers fondly the wonderful people he met abroad.

Rios also has made his mark in the Madison community through his participation in science outreach with the Graduate Engineering Research Scholars cohort for the past four years for local elementary schools that have a high percentage of underrepresented minorities. When not performing research or volunteering, Rios enjoys spending time outdoors and playing intramural hockey.

After his anticipated graduation in 2018, Rios hopes to pursue postdoctoral research in preparation for a future role in academia.

