



TEXAS TECH UNIVERSITY

Department of Electrical  
& Computer Engineering™

**NEWSLETTER**





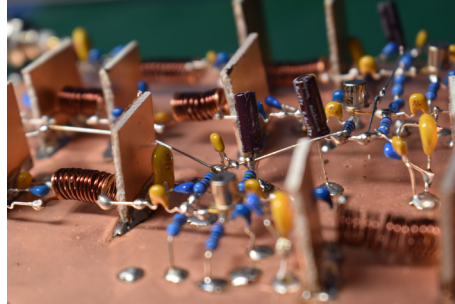
# CONTENTS

## WHAT'S INSIDE!

Welcome to the Spring 2024 Texas Tech Electrical and Computer Engineering newsletter!



### 02 CHAIR'S MESSAGE



### 03 RESEARCH SPOTLIGHT



### 08 STUDENT AWARDS



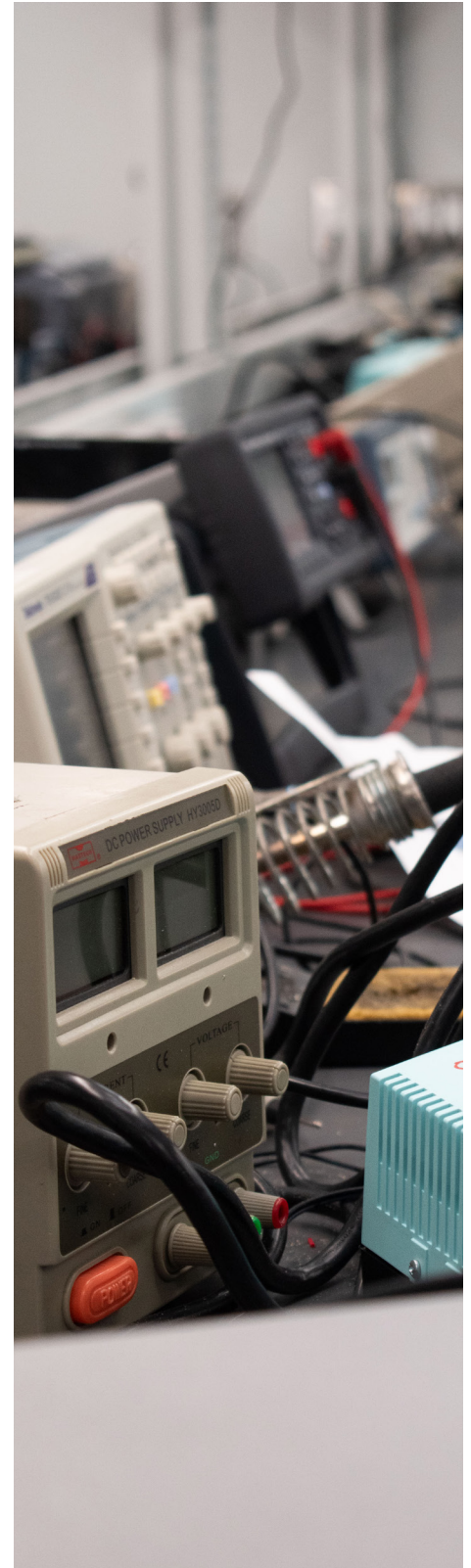
### 09 TEACHING EXCELLENCE



### 11 COMMUNITY CONNECTION



### 16 CONTACT US





## Message From the Chair

Dear Colleagues, Alums, and Friends,

I am pleased to highlight the achievements made by the Texas Tech Electrical and Computer Engineering Department over the past months. Through pioneering research, transformative teaching, and vibrant community engagement, this department is shaping future leaders and engineers while advancing our university motto, “From here, it’s possible.”

ABET, the Accreditation Board for Engineering and Technology, and the department’s IAB, Industrial Advisory Board, recently had a positive visit to the department. Since the beginning of 2023, the department boasts nearly \$6 million in grants and funding among 34 faculty members and instructors. Of 705 undergraduate and 154 graduate students, 43 undergraduate and 23 graduate degrees were awarded in Fall 2023 with a 100% Fundamentals of Engineering exam pass rate among our graduating PhD students. Lastly, I am excited to announce a new robotics lab funded by Evelyn Davies on the first floor of our building, as well as the forthcoming addition of a robotics minor, an aerospace minor, and a master’s program in computer engineering. As a department, we strive to uphold boundless opportunities for our students.

I am proud to share the Spring 2024 issue of the Texas Tech Electrical and Computer Engineering Department’s newsletter.

**Dr. Stephen Bayne**

Department Chair

Electrical and Computer Engineering



## Texas Tech ECE Faculty Recognized Among Global Top 2% of Scientists List

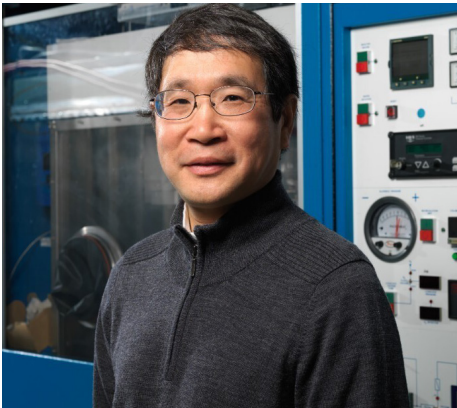
Stanford University released the “Global Top 2% Scientists List for 2023,” based on the Scopus database. The list was compiled by Professor John P.A. Ioannidis’ team at Stanford University in collaboration with Mendeley Data, a subsidiary of Elsevier. The compiled papers encompass journals and conferences indexed in SSCI, SCI, EI journals, and EI conferences. They are evaluated comprehensively based on factors such as citations, h-index, co-authorship adjusted hm-index, citations to papers in different authorship positions, and a composite indicator (c-score). The list is divided into two main categories: Career-long Scientific Impact Rankings and Single Recent Year Scientific Impact Rankings, corresponding to comprehensive data from the periods 1960 to 2022 and the year 2022, respectively. From a pool of nearly 7 million scientists worldwide, scientists ranking in the top 2% globally were selected, spanning 22 scientific fields and 174 subfields. Several faculty members of the ECE Department were named on these lists.

### Career-long:

Dr. Hongxing Jiang, Applied Physics  
 Dr. Ravindra Joshi, Applied Physics  
 Dr. Changzhi Li, Networking & Telecommunications  
 Dr. Jingyu Lin, Applied Physics  
 Dr. Donald Lie, Electrical & Electronic Engineering

### Single-year:

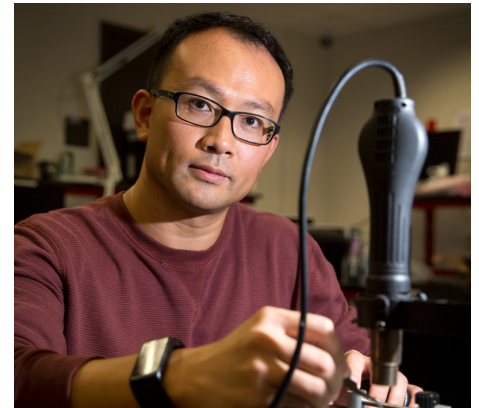
Dr. Changzhi Li, Networking & Telecommunications  
 Dr. Hongxing Jiang, Applied Physics  
 Dr. Jingyu Lin, Applied Physics  
 Dr. Kai Wu, Applied Physics



**Dr. Hongxing Jiang**



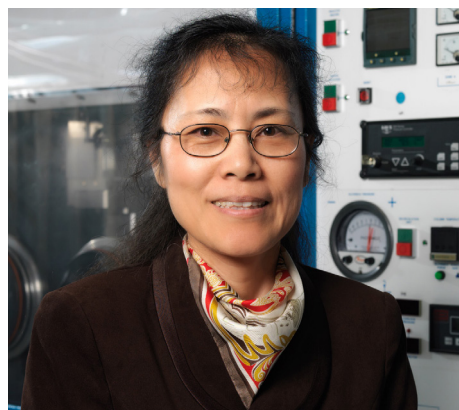
**Dr. Ravindra Joshi**



**Dr. Changzhi Li**



**Dr. Donald Lie**



**Dr. Jingyu Lin**



**Dr. Kai Wu**



## Faculty Member Dr. Ravindra Joshi Elected as an AAAS Fellow



Ravindra P. Joshi, a Professor in the Department of Electrical and Computer Engineering at Texas Tech University (TTU), was elected fellow of the American Association for the Advancement of Science (AAAS) in 2024.

The AAAS is the world's largest general scientific society. Joshi joins 502 scientists, engineers, and innovators spanning all 24 AAAS disciplinary sections in the class of 2023. He will be presented with an official certificate and a gold-and-blue rosette pin, which represents science and engineering, in September in Washington, D.C.

Ravi Joshi was recognized for "significant and sustained interdisciplinary contributions to the understanding and insightful studies of electric field driven phenomena towards electro-manipulation for bioengineered therapies, electron transport in materials, plasma physics, and laser-matter interactions," according to the AAAS.

Ravi Joshi has diverse research interests and capabilities and has contributed to several areas. The underlying theme and unifying focus of his investigations and contributions have been effects, mechanisms, and inherent processes driven by high electric fields in various applications. He seamlessly incorporates multidisciplinary aspects such as physics, material science, plasma-related engineering, charge transport, and biomedicine engineering for comprehensive analyses.

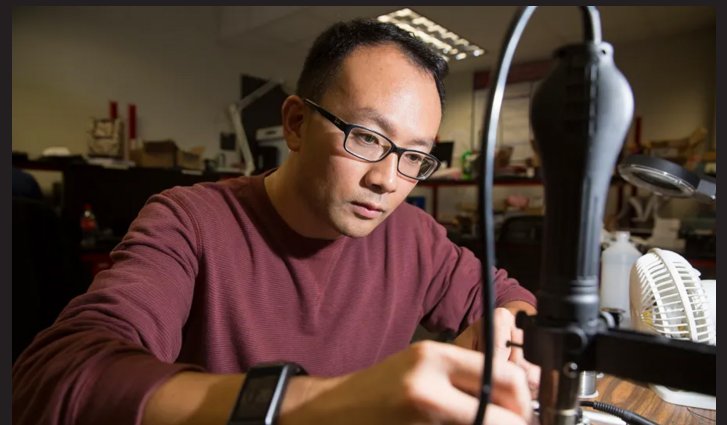
## Faculty Member Dr. Changzhi Li Selected as an IEEE Fellow

The Institute of Electrical and Electronics Engineers (IEEE) Board of Directors has elevated Dr. Changzhi Li to IEEE Fellow. The recognition honors Li's contributions to the advancement of portable microwave radar sensor technologies. Each year, following a rigorous evaluation procedure, the IEEE Fellow Committee recommends a select group of recipients for elevation to IEEE Fellow. Less than 0.1% of voting members are selected annually for elevation to the highest grade of membership in the IEEE.

Dr. Li's research interests are microwave/millimeter-wave sensing for healthcare, security, energy efficiency, structural monitoring, and human-machine interface. He is an IEEE Microwave Theory and Techniques Society (MTT-S) Distinguished Microwave Lecturer and the General Chair of the 2024 IEEE Radio Wireless Week (RWW) in San Antonio, TX. Dr. Li is also a Fellow of the National Academy of Inventors.

The IEEE is the world's leading professional organization for advancing technology. With 400,000 members in 160 countries, the organization is at the forefront of innovation in aerospace systems, computers, telecommunications, biomedical engineering, electric power, and consumer electronics.

The IEEE publishes 30% of the world's electrical and electronics engineering and computer science literature and has developed more than 900 active industry standards. The IEEE also sponsors or co-sponsors nearly 400 international technical conferences each year.



## Faculty Member Dr. Stephen Bayne Awarded \$2.5 Million From DOE for Cybersecurity Center

Texas Tech University has been granted approximately \$2.5 million by the U.S. Department of Energy (DOE) to establish a university-based cybersecurity center towards safeguarding America's rural electric industry. This initiative, part of a \$15 million investment by the DOE, aims to create six similar centers nationwide. This project will be led by Stephen Bayne, chair of the Department of Electrical & Computer Engineering, and will collaborate with energy sector stakeholders and DOE National Laboratories to conduct cybersecurity research and develop training plans.

The center will focus on rural utilities within the Texas power grid, tackling various areas of cyber attacks, from detection to prevention and recovery strategies. Bayne emphasized the importance of this endeavor, stating, "Cyber-physical attacks are a growing concern for national security. This project will help train the next generation of energy professionals, which is critically needed for the cyber-physical resiliency of the electrical power grid." This significant allocation from the DOE's Office of Cybersecurity, Energy Security, and Emergency Response (CESER) reflects a strategic investment in bolstering the nation's grid resiliency. CESER Director Puesh M. Kumar notes, "This investment in university-based cybersecurity centers will enable us to simultaneously grow the U.S. cyber workforce and build the expertise we need to take on the evolving cyber threats to our nation's energy systems." Kumar emphasized the importance of cutting-edge research and a highly skilled workforce in advancing economic and national security through these projects.





# ECE JOURNAL PUBLICATION AWARD RECIPIENTS

The Electrical and Computer Engineering Department encourages student publishing with a one-time award of \$3000 for ECE graduate students who have published five or more research articles in academic peer-reviewed journals. Submissions are reviewed by a faculty committee on a rolling basis.

- Requirements:
- 5 or more research articles in academic peer-reviewed journals.
  - At least 2 of the 5 articles must be first author.
  - Average journal impact factor of 3 or more.

For the 2023-24 calendar year, 6 PhD students have received this award:



**Syed Z. Ahmed**  
Advisor: Dr. Bernussi



**Kamrul Foysal**  
Advisor: Dr. Pal



**Shahriar Mostufa**  
Advisor: Dr. Wu



**Mahtab Murshed**  
Advisor: Dr. Bayne



**Konrad Schmitt**  
Advisor: Dr. Bayne



**Parsa Yari**  
Advisor: Dr. Wu

# Center for Pulsed Power and Power Electronics Graduate Student Publication Selected as an Editor's Pick for the March 2024 Issue of *Physics of Plasmas*



A publication authored by the Center for Pulsed Power and Power Electronics was selected as an Editor's Pick for the March 2024 Issue of *Physics of Plasmas*. The publication was first authored by graduate student Raimi Clark, with fellow graduate students Michael Mounho and William Brooks, ECE faculty members Drs. Jacob Stephens and Andreas Neuber, and Sandia National Laboratories collaborator Dr. Matthew Hopkins. The article, entitled "Spectroscopic investigation of early light emission from anode-initiated surface flashover in vacuum" (DOI: 10.1063/5.0190819), examines the development of a critical type of insulation failure in high-voltage systems. The light emitted from excited matter in the immediate lead-up to the failure is used to help identify what physical processes contribute to the event and how quickly they take place. Understanding these types of flashover failures is essential to designing machines capable of delivering higher voltages and energies into vacuum environments. In turn, these capabilities will enable accessing new experimental regimes in focus areas like national security, inertial confinement fusion, and radiation effects.



## Two ECE Students Selected as Finalists for 2024 James A. “Jim” McAuley Distinguished Engineering Student Award



**Katrina Hellmann**  
Computer Engineering



**Silas Rodriguez**  
Computer Engineering

The James A. “Jim” McAuley Distinguished Engineering Student Award is named in memory of James A. McAuley and offered by members of the Whitacre College of Engineering (WCOE) Dean’s Council. Graduating WCOE seniors are eligible for the award, which also comes with a scholarship. TTU ECE students Katrina Hellmann and Silas Rodriguez were recognized as finalists for the 2024 award for their outstanding efforts and involvement during their time as engineering undergraduates at Texas Tech.



## Leslie Omonzane Receives Two NSBE Awards

During a ceremony, Texas Tech computer engineering student Leslie Omonzane was awarded two scholarships at the 50th National Society of Black Engineers (NSBE) Annual Conference in Atlanta, Georgia.

He was selected for the NSBE Board of Corporate Affiliates (BCA) Scholarship for his extensive involvement on campus and the NSBE Most Improved Scholarship in recognition of his efforts toward raising his grade point average (GPA).

Leslie is a member of NSBE, the African Student Organization, the Student Government Association, Sponsors for Educational Opportunity, ColorStack, Inroads, TrUE Scholars, and McNair Scholars. His ambitious nature and drive for success are clear, and we look forward to seeing all he accomplishes in the future!

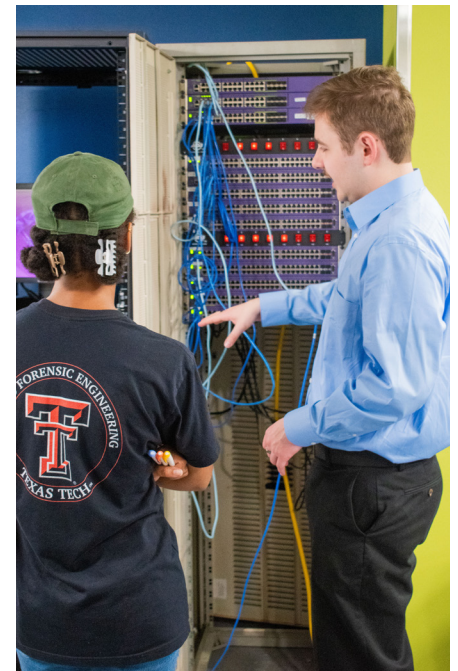
## Faculty Member Dr. Michael Giesselmann Receives 2023-2024 Lockheed-Martin Teaching Award



Dr. Michael Giesselmann has recently been honored with the 2023-2024 Lockheed-Martin Teaching Award from the Whitacre College of Engineering's Teaching and Service Award Committee. His dedication to teaching and continuous improvement, as well as being an early pioneer of distance education, has earned recognition by both his peers and students. According to one student testimonial, "Dr. Giesselmann is an amazing professor. I always take his classes any chance I get because he is so knowledgeable and I learn so much about real world engineering. He is so approachable and is willing to help if I don't understand material. Best professor on campus!!!"

## PROJECT LAB SPOTLIGHT

A Texas Tech ECE tradition, "Demo Day," has enriched students' engineering education for over a decade. It is the time when project lab students' hard work throughout the semester culminates into an exciting opportunity to showcase their hands-on technical projects to faculty, alums, and other students. On the night before, the ECE department provides support in the form of free food to students, keeping the building open overnight. Currently, ten project labs are offered to undergraduate ECE students, with topics including robotics, microcontrollers, RF communications, digital communications, power systems, software development, electromagnetics, computer networks, capstone, and advanced capstone.

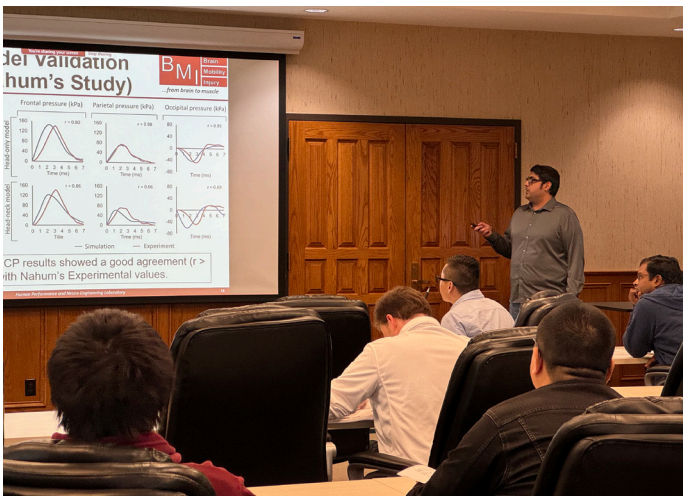




## BIOMED JOURNAL CLUB

### A PLATFORM FOR PHD STUDENTS TO EXCEL IN BIOSCIENCE AND BIOTECHNOLOGY

The ECE Department is proud to announce the continuation of the BioMed Journal Club, an initiative aimed at fostering academic excellence among PhD students while advancing collaboration and innovation in bioscience and biotechnology. The primary goals of the BioMed Journal Club are to encourage PhD students to read research papers, enhance their academic presentation skills, broaden their understanding of biosensors, biomedical equipment, and related biotechnologies, and facilitate potential collaborations and new research ideas among faculty members at TTU. The club's format comprises weekly in-person research talks given by one PhD student. Participating PhD students take turns presenting weekly, with each student delivering one presentation per semester.



Organized by Dr. Kai Wu from the ECE Department, the BioMed Journal Club has attracted 12 faculty members from the Chemical Engineering, Mechanical Engineering, and Industrial, Manufacturing & Systems Engineering Departments. The club has completed two seasons and is currently in its third season (Spring 2024). The BioMed Journal Club recognizes outstanding student presenters in each season. Below is a list of the best student presenters from Season Two: Marielena Molinares (1st place), Bahareh Rezaei (2nd place), Andrés Mena (2nd place), Leonardo Wei (3rd place), A K M Ahasun Habib (3rd place), Sanjay Mahat (3rd place).

## A SHORT COURSE IN PULSED POWER

### PRESENTED BY THE P3E CENTER

The Center for Pulsed Power & Power Electronics at Texas Tech University prepared a Short Course in Pulsed Power, held at the McKenzie-Merket Alumni Center on the Texas Tech University campus. This event is not typically held every year, but the course was so successful in 2024 the Center decided to offer it again January 7-9, 2025.

A Short Course in Pulsed Power is designed for Electrical Engineers, Mechanical Engineers, Physicists, and any other professionals who are involved in the work of pulsed power and power electronics (P3E). This material was presented in a lecture format by the faculty and research members of the Center for Pulsed Power & Power Electronics.

Some course topics included:

- Introduction to Pulsed Power
- Electromagnetic Field Theory
- High Voltage Breakdown and Physics
- High Power Vacuum and Gas Switches
- Grounding, Shielding, and Safety
- Computer Simulations



## Get Excited About Robotics! An Educational Opportunity for K-8 Students in the West Texas Region



Since 2006, the Get Excited About Robotics (GEAR) competition has been offered annually during the spring semester (6 - 8 weeks) to students in elementary and middle schools and after-school programs across Texas. Some schools previously offered LEGO robotics as an after-school activity, while others incorporated it into their math, science, technology, or gifted and talented classes. During this time, the competition has grown from a small trial run held with Harwell Elementary School to a competition with 150 teams from grades K-5 and 185 teams from grades 6-8. Typically, 3-5 students are on a team, with the furthest teams coming all the way from Port Arthur, TX.

GEAR is a nonprofit 501(c)(3) volunteer organization that provides an exciting hands-on LEGO robotics challenge to K-8 students to increase interest in STEM (science, technology, engineering, and math) disciplines while offering mentoring opportunities to engineering undergraduate students at Texas Tech University to improve their education and increase retention rates. Dr. Tanja Karp and Mr. Derek Johnston organize the program with the help of 5 undergraduate student assistants and approximately 80 ECE volunteers.

The competition challenge changes annually, but general rules remain the same. This year's challenge, "RoboPark," was designed by Megan Lehmann, an electrical engineering graduate student in the department. The tournament is held among the Amarillo League, Frenship League, Lubbock League, Midland League, and Remote League. The game is introduced below:

As spring approaches, the city of Roboville is busy cleaning and upgrading its most popular outdoor location: RoboPark. This year, a robot was hired to clean up and improve the park so that it could be enjoyed by the whole community. Many tasks are to be completed in the little time left until the park opens.

During a 2-minute match, the robot is tasked with collecting and recycling trash items, installing playground equipment and a statue, and planting trees.

To solve the challenge, student teams design, construct, and program robots using LEGO SPIKE Prime kits or LEGO MINDSTORMS EV3/NXT kits. These kits contain structural elements, wheels, axles, gears, motors, sensors, and a simple microprocessor with a rechargeable battery. Robot programming is accomplished through a graphical user interface



patterned after the widely popular Scratch software.

The top 24 teams of each age group were invited to the championship at the Region 17 Education Service Center. GEAR is funded by SM Energy, which allows teams to participate at no cost other than time and travel.

To obtain more information, please get in touch with Dr. Tanja Karp ([tanja.karp@ttu.edu](mailto:tanja.karp@ttu.edu)).





## Get to Know Texas Tech's Chief Academic Advisor of Electrical Engineering

### Jennifer Maddox

Jennifer Maddox, a Texas Tech University alumna with nearly 17 years of dedicated service, serves as the Chief Academic Advisor for the Electrical and Computer Engineering (ECE) Department. Her multifaceted role involves advising countless students, supporting the ECE department in various projects, and fostering a vibrant academic community.

Jennifer's guiding philosophy, "To try and leave people better than I found them," underscores her commitment to making a meaningful impact on students' lives throughout their college journey and beyond. Her role involves not just academic guidance but also counseling, support, and celebration of each student's success.

Outside of work, she enjoys spending time with her family, reading with a hot cup of tea, listening to great podcasts and music, and cheering for the Green Bay Packers!



## Retirement Announcement of Texas Tech Electrical and Computer Engineering Administrative Coordinator

### Janet McKelvey



Texas Tech Electrical and Computer Engineering's (ECE) Administrative Coordinator Janet McKelvey's retirement was announced and celebrated earlier this year in February 2024.

Throughout Janet's 14-year career with the Texas Tech ECE department, she helped keep the department running smoothly and helped make the ECE main office a welcoming place for faculty, staff, and students. She was instrumental in coordinating department initiatives, serving as a point of contact, and handling all administrative tasks.

Janet's departure leaves a void in the department, as her warm smile and steadying presence will be greatly missed, but the department earnestly wishes her all the best in her well-deserved retirement!

# WELCOMING STEPHEN BARRETT AND HONORING DEPARTING MEMBERS IN TEXAS TECH'S ELECTRICAL AND COMPUTER ENGINEERING INDUSTRIAL ADVISORY BOARD

The Industrial Advisory Board (IAB) at Texas Tech University's Department of Electrical and Computer Engineering comprises accomplished professionals from diverse industries, including defense, power, semiconductor, computer, instrumentation, and telecommunications. Twice a year, members convene for lively discussions, gathering on the Friday before the Fall homecoming football game and in early to mid-April in the Spring. These gatherings foster a supportive environment where alumni and industry leaders provide invaluable insights and guidance to faculty, staff, and students.

The IAB's commitment to student engagement is evident through its annual students-only forum, where candid feedback is solicited and constructive dialogue ensues. This tradition enables the IAB to collaborate closely with faculty, addressing concerns and amplifying positive feedback to enhance the department's offerings. Recently, the IAB welcomed Stephen Barrett, a distinguished addition to its ranks, whose expertise promises to enrich discussions and initiatives. Simultaneously, the board bids farewell to esteemed members Daryl Ellis, Theodore "Chris" Grabowski, and Mark Newton, expressing heartfelt gratitude for their impactful contributions in steering the department's trajectory.

Leading the IAB are Tony Bruton as Chair, Allison McMahon as Vice Chair, and Diana Loree as Recording Secretary, along with a dedicated roster of members. Their collective commitment underscores the IAB's mission to foster collaboration, innovation, and excellence within the realm of electrical and computer engineering. With their guidance, the department continues to thrive, poised to meet the evolving challenges and opportunities in the ever-changing landscape of technology.



**Stephen Barrett**



**Daryl Ellis**



**Theodore Grabowski**



**Mark Newton**



# Texas Tech Electrical and Computer Engineering Department People of the Year Awards

In April 2024, the Texas Tech Electrical and Computer Engineering (ECE) department hosted its Annual Scholarship Banquet at CenterPointe Event Center. Outstanding achievements of this academic year's faculty, staff, and students were recognized. Members of the Texas Tech ECE community were selected for an award based on nominations by students, staff, and faculty. The department extends its heartfelt appreciation to everyone who helped make the event possible and to those who attended in support of our ECE Red Raiders!



**Kaleb Badgett**  
**Freshman of the Year**



**Dominik Kuzniarz**  
**Sophomore of the Year**



**Zachary Bonneau**  
**Junior of the Year**



**Erik Vaughn**  
**Senior of the Year**



**Cody Baker**  
**Master's Student of the Year**



**Raimi Clark**  
**PhD Student of the Year**



**Dino Castro**  
**Staff Member of the Year**



**Student Life Snapshots**



**IEEE Pie an Officer Fundraiser!**



**WIE Bahama Bucks Social!**



**Extra Credit Trip to the Path of Totality!**



**TTU ECE IAB x WIE Snack and Chat!**



**Hard at Work!**



**Studying Up!**



**IEEE Verilog Tutorial!**



**HKN Lab Tour!**



**HKN Night Before Demo Day!**



## **Acknowledgements:**

Jenny Erdmann, Managing Editor  
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