Message from Dr. Mazzola

Greetings from the EPIC faculty, staff, and students. EPIC has had a busy and highly productive quarter. The workforce development mission of EPIC is always foremost on our minds. New additions to our signature EPIC Affiliates Program signals the value of this program to our corporate clients. The EPIC Affiliates program is essential to EPIC’s many workforce development programs, such as broadening our student participation in the Energy Concentration career preparation program, supporting the college of engineering's industry acclaimed senior project experience, and supporting our recently announced five year renewal of our student exchange program with the Karlsruhe Institute of Technology in Germany.

Beyond workforce development, EPIC continues to make progress in our goal to further the public-private partnership with research that is clearly relevant to industry. We are especially excited by the tremendous progress made by EPIC to address two major issues important to the citizens of the mid Atlantic region. The first is the need to improve the resiliency of the electric grid against the violent weather that this region regularly experiences. Our motivation for this work is reinforced by the heart wrenching experiences of so many communities still struggling with the aftermath of Hurricane Florence.

The other challenge becoming apparent in our own parking garage behind the beautiful EPIC building is the need for more electric vehicle charging infrastructure. When I drive my all-electric Nissan Leaf to work every day, I marvel at how many other electric cars are seeking charging stations on our campus. With our most recent research awards, EPIC is poised to make many contributions to the challenge of charging a future filled with electric cars.

Finally, it was our privilege to welcome many distinguished visitors to EPIC this quarter, but none more so than Mr. Michael Pesin, Deputy Assistant Secretary of Energy. Mr. Pesin gave a well-received standing-room-only presentation to students and faculty about the future of the electric grid. I hope you will enjoy reading the many stories in this newsletter that sum up to EPIC on the move!

EPIC Assistant Directors' teaching recognized

We are fortunate to have had two outstanding EPIC faculty and Assistant Directors, Rob Cox and Tony Schmitz, nominated for the Bank of America Award for Teaching Excellence. The award honors outstanding tenured teachers on our campus and provides an example of the University's commitment to
excellence in teaching. On September 7, it was announced that Tony was selected for the award for investing a significant amount of time in his students with a goal to "train decision makers." In his acceptance speech, Tony credited EPIC for contributing to his success.

**Visit by DOE Deputy Assistant Secretary Michael Pesin**

On October 5, 2018, EPIC was pleased to welcome Michael Pesin, deputy assistant secretary, US Department of Energy. It was standing room only for his presentation on *U.S. Department of Energy Grid Modernization Programs* and faculty and students had an opportunity to engage in meaningful conversations about ongoing research at UNC Charlotte. Pesin was impressed with the sophisticated labs at EPIC and the expertise our students possess.

**EPIC Affiliates news**

**EPIC Affiliates Program welcomes Power Engineers**

POWER Engineers is a global consulting engineering firm specializing in the delivery of integrated solutions. Since POWER Engineers began in 1976, they have grown into a 100% employee-owned, flexible and progressive consulting services and engineering firm. As innovators, they encourage new ideas and fresh approaches. As trusted advisors, they strive to be their clients’ first choice. These traits, combined with deep technical skill, account for the mutual success of their clients, employees and shareholders.

It's their people and their processes that have helped POWER Engineers grow from a two-person firm to an internationally recognized leader in engineering and consulting services. In terms of working with POWER, their clients describe their process in three simple words: flexible, reliable, and knowledgeable. They embrace flexibility by accommodating their clients' specific needs through our collaborative approach and personal working style. You can rely on POWER to seek the best solution for each design challenge. The knowledge they have to meet your specific requirements is furthered with a high level of resourcefulness and perseverance that is found naturally in the way we work.

**Well Attended 2018 EPIC Affiliates Annual Meeting**

The 2018 EPIC Affiliates annual meeting took place on May 11th at the EPIC building. The two hour meeting was followed by a small reception. Twelve Affiliates from eight member companies attended and together with 20 faculty and students they discussed the current membership year, plans for FY2019 and heard about this year's seed and KIT research projects from the participating students.

Research projects:

- Solid State Protection Devices Validation
- Hardware Based Security Architectures for smart GRID
- Application of Advanced 3D Metrology to Large-Scale Manufacturing
- Predicting Impact of Thermal Energy Storage on German Power Market
- Fault Detection for Solid State Circuit Breakers
- Evaluation of Instruments for Large-scale Metrology

**EPIC Energy Seminar Series is in full swing**

During the Fall and Spring semesters, EPIC presents an Energy Seminar Series with speakers from around the region. These experts share valuable information and their insight into trends and news that is related to energy. Seminars are free and are open to students, faculty, industry partners and friends of EPIC.

**Upcoming Seminars**

11/6/18

*Innovative Directions in Unconventional Power: Off-Shore Wind, Solar-Thermal Towers, and Nuclear*

**Speaker:** Scott Poole, Vice President of Design & Engineering, Energy, Nuclear, Atkins

11/20/18
EPIC awarded $942,000 DOE grant

EPIC was awarded a $942,000 grant from the U.S. Department of Energy to develop an innovative solution related to curbside charging of electric vehicles. The federal grant awarded EPIC is part of an $80 million investment in advanced vehicle technologies research to enable more affordable mobility, strengthen domestic energy security, reduce the nation’s dependence on foreign sources of critical materials and enhance U.S. economic growth. This work supports the U.S. Department of Energy’s (DOE) goal to invest in early-stage research of transportation technologies that can give families and businesses greater choice in how they meet their mobility needs.

EPIC will be responsible for the project management and design of unique structural and electrical upgrades to the utility light poles selected to receive the curbside EV charging infrastructure made by Eaton Corporation. EPIC will perform testing and validation of the communications, electric and structural subsystems before delivery to Duke Energy’s Mount Holly research facility for full system testing and qualification. Centralina Council of Governments will manage the process of selecting the Charlotte area government to host the demonstration and assisting in community relations during the planning and execution of the demo.

Read more here.

State Energy Office selected for DOE Grant

On September 21, 2018, the US DOE’s Office of Energy Efficiency and Renewable Energy (EERE) notified the NC Dept. of Environmental Quality that the application submitted by the State Energy Office was selected for award negotiations.

The application, Planning an Affordable, Resilient, and Sustainable Grid in North Carolina, is a joint project proposed by the SEO in NCDEQ, in partnership with EPIC, and the North Carolina Clean Energy Technology Center at NC State University. The goal of the project is to develop a roadmap for use during utility integrated resource planning (IRP) to support investments that enhance grid resiliency, improve reliability, and maintain affordability. Specifically, the project will emphasize resiliency-based grid investment targeting high-consequence, low-predictability events (i.e. large weather events), that when optimized in the IRP and other regulatory and policy mechanisms, allow for the economic value of grid technologies to be captured in public rate-making.

EPIC working to advance EV charging

EPIC is pleased to announce our research partnership with ZapGo, Inc. Founded in Oxford, England, ZapGo has recently located its US office in Charlotte, NC, joining hundreds of other energy-related companies in the Charlotte region. ZapGo leads the way in ultra-fast sub-five-minute charging with its Carbon-Ion (C-Ion) cells that can replace slow-charging lithium-ion batteries.

EPIC is providing engineering expertise leading to the first large-format grid-tied energy storage...
system based exclusively on C-Ion cells with EPIC partner, Parker Hannifin’s Energy Grid Tie Division as the system integrator. Parker Hannifin brings their field-proven power conversion technology to the project. EPIC will also work closely with Duke Energy to test the system at their Mount Holly Microgrid Research Center to confirm its easy integration into a utility distribution network. This work is led by EPIC’s Dr. Mike Mazzola and Dr. Madav Manjrekar.

Energy Concentrations

EPIC is focused on broadening the awareness of the availability of energy concentrations within engineering and we have just released a video that highlights the benefits of pursuing an energy concentration. Overall, since its inception, energy concentrations have seen a 97% increase in participation from 91 to 179. With an ongoing focus to attract students to this program, EPIC looks to continue this upward trend.

Watch video here.

EPIC staffing updates

EPIC is pleased to announce the following staff changes at EPIC.

- Jim Gafford joined EPIC in October, as the Assistant Director of Research and Special Projects. Prior to joining EPIC, Jim was a Senior Research Engineer in the Advanced Vehicle System Group at Mississippi State University’s Center for Advanced Vehicular Systems.
- Ehab Shoubaki joined UNC Charlotte as a Post Doctoral Fellow in 2015, and has now been named a Research Engineer at EPIC.
- Nicolas Sockeel joined EPIC in August as a Post Doctoral Fellow. Prior to joining EPIC, Nicolas served as a Research Assistant at Mississippi State University’s Center for Advanced Vehicular Systems.

EPIC out and about

EPIC will have a presence at the following conferences in the upcoming months. These conferences will focus on areas ranging from energy storage to power electronics. Stop by and say hello!

DistribuTECH - New Orleans, LA, Feb. 5-7, 2019
State Energy Conference - Raleigh, NC, April 30 -May 1, 2019
Energy Storage Association - Phoenix, AZ, April 16-18, 2019
IEEE eGrid 2018 - Charleston, SC, Nov. 12-14, 2018

EPIC generates the interest of industries, organizations, and educational institutions from across the US and countries around the world. We’d welcome a visit from you! Contact Christina Kopitopoulou to schedule your visit.

African Investment Corporation
Atkins
Atom Power
Mitsubishi
Power Engineers
About EPIC: The Energy Production and Infrastructure Center (EPIC) at UNC Charlotte, serves as a state-of-the-art research center that provides education and applied research opportunities to students with energy related interests. Our industry-education partnerships unite students, faculty and industrial partners to collaborate on interdisciplinary research and learning.

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