

# Energy Conversion and Conservation Division (ECCD)

## *Spring 2019 Newsletter*

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### Message from the Division Chair

Dear Wonderful Members,

A very warm welcome to the 126th Annual Conference and Exposition of the American Society for Engineering Education. This conference marks the first year of the next 125 years of ASEE! I never thought that I would become chair of this wonderful division when I sat in my first ECCD technical session in 2010 but it has been my pleasure and honor to serve you these past five years. It takes a village to make our division successful and our village came together beautifully during this time. Together, we saw our division return to over 1100 members, making it the largest in PIC III and the third largest division in ASEE. We welcomed the members of the Nuclear and Radiological Division, developed a new logo, created a LinkedIn account, approved a diversity statement, formed a Journal Committee, and had the honor of witnessing Dr. Herbert Hess receive the Fellow Grade of Membership.

This year, our Program Chair, Dr. Ted Song, has done an outstanding job creating an informative and fun program for us. He has managed 42 abstracts resulting in 27 published papers, a 50% increase from last year. A very special thank you to our authors for sharing your time, talent, and expertise with our division. We are most grateful for you. We are also pleased to present Dr. Ned Mohan as our distinguished guest lecturer in collaboration with the Electrical and Computer Engineering Division; lecture title "Can Combating

Climate Change Result in Renaissance of Electric Power Engineering?"

For fun, Ted has arranged a dolphin cruise and technical tour at the Florida Aquarium for us on Tuesday followed by our Business Meeting where you are cordially invited to attend and become involved with the division. Every year we hold nominations from the floor and elect a newsletter editor. Last year, Dr. Robert Kerestes was elected and has done a fantastic job driving our team and creating the newsletter.

Much thanks to our Chair-Elect, Dr. S. Hossein Mousavinezhad for leading our awards committee, and hosting a panel for the fourth year in a row on the latest research and pedagogy in energy conversion and conservation. Also, thank you to Immediate Past Chair, Dr. Madhumi Mitra for hosting a panel session on bioenergy, and inspiring the Journal Committee. Dr. Sandip Das has been working diligently on updating our website, and Dr. Siamak Farhad has been securing our finances and records. Everyone has worked very hard to bring you a great program, please support them by enjoying our sessions, meeting new colleagues at our business meeting, and engaging in fellowship at our social events.

ASEE is not only an avenue to share new pedagogy to inspire the next generation of engineers but it is also a means to help each other grow. Before presenting my paper in 2010, Dr. Margaret Bailey, then division chair, reassured me that this was a friendly and supportive division. She was, without a doubt, correct. Through this

division, I have grown tremendously as a researcher, educator, reviewer, and planner. I thank you sincerely and look forward to seeing you in Tampa, Florida.

Cheers,

Lynn Albers

2018-2019 Division Chair

### 2018 – 2019 Division Officers

#### Chair

Dr. Lynn Albers  
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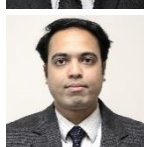
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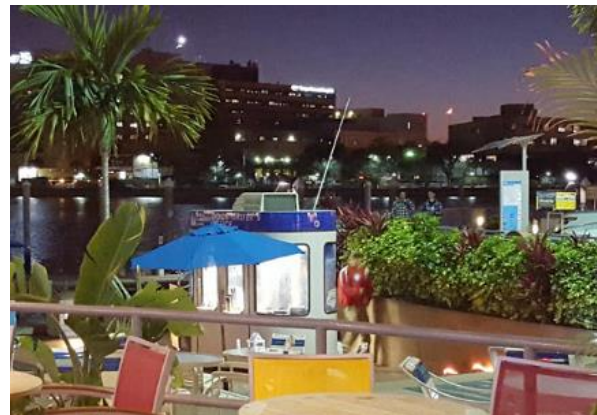


### Special Announcements

- ECCD will be visiting the [Florida Aquarium](#) for a behind-the-scenes tour to learn about its energy-efficient efforts during the ASEE 2019 Annual Conference on Tuesday, June 18<sup>th</sup> at 12:30 p.m. The site is 0.6 miles away ([14-minute walking distance](#)) from the convention center, and we will meet at the aquarium entrance at 12:30 p.m. We also would like to let you know that a 75-minute dolphin cruise tour is included in this tour. Please register ASAP and join us at this special event!



- ECCD will have its annual business meeting during the ASEE 2019 Annual Conference on Tuesday, June 18<sup>th</sup> at 5:00 p.m.
- ECCD will have its annual social event on Tuesday, June 18<sup>th</sup> at 7:00 p.m. **Please RSVP** using the ASEE website and join the division at the Sail ([a two-minute walk from the convention center](#)). RSVP is needed for finalizing the reservation, and each attendee is expected to pay her or his own bill at the site.



- [Dr. Ned Mohan](#) (a member of National Academy of Engineering and an IEEE fellow, the University of Minnesota, Twin Cities) will speak as a distinguished lecturer (in collaboration with the ECE Division) on Wednesday at 9:45 a.m.

### Highlights from the Fall of 2018

At the 2018 ASEE Annual Conference and Exposition, ECCD had 21 papers presented, 4 technical sessions, 2 discussion panels, 1 social events (Dinner at Mazza Middle Eastern Cuisine), 1 business events (Energy Conversion and Conservation Division Business Meeting), and 1 workshop.

## 2019 Annual Conference ECCD Sessions

### [Papers: U416-Energy Conversion and Conservation Division Technical Session 5](#)

#### **Moderated by**

Dr. Lynn A Albers and Dr. Patrick A. Tebbe P.E.

1. Adding the Concept of Improving Product Value to a Design Project in a Course on Internal Combustion Engines [[view paper](#)]; Dr. John Reisel (University of Wisconsin, Milwaukee)
2. Integrating Geothermal Energy Education to an Engineering Technology Curriculum [[view paper](#)]; Dr. Reg Pecan (Sam Houston State University), Dr. Faruk Yildiz (Sam Houston State University), and Dr. Ulan Dakeev (Texas A&M University, Kingsville)
3. Pipeline Development of Skilled Students in Advanced Control Systems [[view paper](#)]; Dr. Ahmed Cherif Megri (North Carolina A&T State University) and Dr. Sameer Hamoush P.E. (North Carolina A&T State University)
4. Undergraduate Students' Research on Energy Saving in Industrial Robots: Effect of Regular and Irregular Meetings on Deductive Research [[view paper](#)]; Dr. Siamak Farhad (University of Akron), Mr. Daniel E. Kandray Sr. (University of Akron), and Dr. Maryam Younessi Sinaki (Cleveland State University)

### [Panel: U545-Energy Innovation and Environmental Impact \(with Eng. Physics Div\)](#)

#### **Moderated by**

Dr. Bala Waheswaran

#### **Speakers:**

1. Dr. Tooran Emami, U.S. Coast Guard Academy
2. Dr. Veera Gnanaswar Gude P.E., Mississippi State University
3. Dr. Bala Maheswaran, Northeastern University
4. Mr. Paul Dykshoorn Dykshoorn, Kent State University at Tuscarawas
5. Dr. Ramanitharan Kandiah P.E., Central State University

### [Papers: M316-Energy Conversion and Conservation Division Technical Session 1](#)

#### **Moderated by**

Dr. Herbert Hess

1. Improving Students' Understanding of Electromagnetic Principles with an Alternator Design-Build-Test Project [[view paper](#)]; Dr. Matthew R. Aldeman (Illinois State University)
2. Conversion of a Prime Mover: One-third Scale Model-T from Gasoline to Electric Power [[view paper](#)]; Dr. John M. Mativo (University of Georgia), Daniel Plant (University of Georgia), and Mr. Daniel Ethan Wallon (University of Georgia)
3. Teaching Power Transformer Testing to Undergraduates [[view paper](#)]; Dr. Glenn T. Wrate P.E. (Northern Michigan University)
4. Extended Summer Research to Senior Design Project [[view paper](#)]; Dr. Jinmyun Jo (Virginia State University), Xiaoyu Zhang (Old Dominion University), Dr. Ali A. Ansari (Virginia State University), Dr. Pamela Leigh-Mack (Virginia State University), and Dr. James Irvin Cooke Jr. (Virginia State University)
5. Project Based Learning Program for Nuclear Workforce Development Phase I: Outreach, Recruiting, and Selection [[view paper](#)]; Dr. Hayrettin Bora Karayaka (Western Carolina University), Dr. Amber C. Thompson (Western Carolina University), and Dr. Chip W. Ferguson (Western Carolina University)

### [Papers: M416-Energy Conversion and Conservation Division Technical Session 2](#)

#### **Moderated by**

Dr. Robert J Kerestes and Dr. Teodora Rutar Shuman

1. Autonomous PV Systems for Developing Countries: Assessing Student Learning of Experiential Study Abroad Programs [[view paper](#)]; Dr. Jeremy C. Ferrell (Appalachian State University) and Brent Jason Summerville P.E. (Appalachian State University)
2. Development of Low-cost Remote Online Laboratory for Photovoltaic Cell and Module Characterization [[view paper](#)]; Dr. Sandip Das (Kennesaw State University)
3. Using Recycled Photovoltaic Modules and Batteries for Engineering Education, Student Projects, and as Viable Portable, Backup Storage Power Sources [[view paper](#)]; Dr. Robert W. Fletcher (Lawrence Technological University) and Naim R. Shandi (Lawrence Technological University)
4. Managing a Multi-Institution Block Grant for Renewable Electricity Research [[view paper](#)]; Dr. Patrick A. Tebbe (Minnesota State University,

Mankato) and Mr. Bruce Allen Peterson (Minnesota State Energy Center of Excellence)

[Papers: M516-ECCD Technical Session](#)

**Moderated by**

Dr. Glenn T. Wrate P.E. and Dr. Sandip Das

1. Simulation for Energy Savings in AC Systems Equipped with Shaded Condensing Units [[view paper](#)]; Dr. Maher Shehadi (Purdue Polytechnic Institute)
2. A Highly Practical and Affordable Microgrid Design Project for Developing Rural Communities: Case Study in Ghana [[view paper](#)]; Dr. Hossein Salehfar (University of North Dakota) and Michael Klein (University of North Dakota)
3. Using Campus Energy System Data to Save Energy and Provide Students with Real-world Learning Experiences [[view paper](#)]; Dr. Jennifer Lynn Wade (Northern Arizona University), Dr. Karin E. Wadsack (Northern Arizona University School of Earth & Sustainability), Dr. Benjamin L. Ruddell (Northern Arizona University), and Dr. Brent A. Nelson (Northern Arizona University)
4. Virtual Instrumentation for Study of a Fluid Power System [[view paper](#)]; Dr. Alamgir A. Choudhury (Western Michigan University), Dr. Jorge Rodriguez P.E. (Western Michigan University), and Awilma Paola Ventura Lugo (Western Michigan University)

[Papers: T116-Energy Conversion and Conservation Division Technical Session 3](#)

**Moderated by**

Dr. Madhumi Mitra Ph.D and Dr. Siamak Farhad

1. Student Energy Audits of Buildings Can Be Done! [[view paper](#)]; Dr. Victoria A. Scala (United States Military Academy) and Dr. James Ledlie Klosky P.E. (United States Military Academy)
2. Photovoltaic System Performance Under Partial Shading: An Undergraduate Research Experience [[view paper](#)]; Xichen Jiang (Western Washington University), Ms. Jill Davishahl (Western Washington University), Mr. Dana Hickenbottom (), Daniel Saunders (Western Washington University), and Mr. Troy Thornton (Western Washington University)
3. Visualizing Power-Quality Phenomena in a Hands-On Electric Power Systems Laboratory [[view paper](#)]; Mr. Thomas Vernon Cook (University of Pittsburgh), Dr. Robert J. Kerestes (University of

Pittsburgh), and Prof. Brandon M. Grainger (University of Pittsburgh)

4. A First-Year Power Plant Design Project [[view paper](#)]; Dr. Benjamin Emery Mertz (Rose-Hulman Institute of Technology)

[Posters: T316-Energy Conversion and Conservation Division Poster Session](#)

1. Board 69: Project-based Teaching Approach of a Combined Undergraduate and Graduate Course in Power Electronics [[view paper](#)]; Dr. Radian G. Belu (Southern University and A&M College)
2. Board 70: Development and Implementation of a Non-Intrusive Load Monitoring Algorithm [[view paper](#)]; Dr. Robert J. Kerestes (University of Pittsburgh), Mr. Dekwuan Stokes (University of Pittsburgh), Ryan M. Brody (University of Pittsburgh), Adam Emes (University of Pittsburgh), and Mr. Alexander Williams (University of Pittsburgh)

[Panel: W116-The Latest Research and Pedagogy in Energy Conversion and Conservation](#)

**Moderated by**

Dr. S. "Hossein" Mousavinezhad P.E. and Dr. Chengying Xu

**Speakers:**

1. Charles K. Alexander, Cleveland State University
2. Dr. Herbert L. Hess P.E., University of Idaho, Moscow
3. Dr. Dagmar Niebur, Drexel University (Eng. & Eng. Tech.)
4. Dr. Howard Rockman, University of Illinois at Chicago
5. Dr. Aaron St. Leger, U.S. Military Academy

[Lecture: W216-DISTINGUISHED LECTURE: Can Combating Climate Change Result in Renaissance of Electric Power Engineering?](#)

**Speaker:**

Prof. Ned Mohan  
University of Minnesota, Twin Cities

[Panel: W316-Bioenergy, Sustainability, and Green Entrepreneurship in STEM Curricula](#)

**Moderated by**

Dr. Madhumi Mitra Ph.D and Dr. Abhijit Nagchaudhuri



**Speakers:**

1. Dr. Lynn A Albers, Hofstra University
2. Dr. Ted Song, John Brown University

[Papers: W416-Energy Conversion and Conservation Division Technical Session 4](#)

**Moderated by**

Dr. Abhijit Nagchaudhuri and Dr. S. "Hossein" Mousavinezhad P.E.

1. A Smart Grid Implementation for an Engineering Technology Curriculum [[view paper](#)]; Dr. Reg Pecen (Sam Houston State University) and Dr. Faruk Yildiz (Sam Houston State University)
2. Delivery of a Revamped Course on Electric Power Distribution Engineering and Smart Grids [[view paper](#)]; Dr. Robert J. Kerestes (University of Pittsburgh), Dr. Paul A. Dolloff PE (University of Kentucky), and Dr. Renee M. Clark (University of Pittsburgh)
3. Impact of Electric Vehicles on Residential Power Grid: An Educational Review [[view paper](#)]; Mitch J. Campion (University of North Dakota), Dr. Hossein Salehfar (University of North Dakota), and Prof. Prakash Ranganathan (University of North Dakota)
4. Student-Led Study of Energy Flow and Storage in an Emergency Microgrid [[view paper](#)]; Dr. Herbert L. Hess (University of Idaho, Moscow)

**Best Papers Award**

**The 1<sup>st</sup> best paper:** Dr. Benjamin Emery Mertz “A First-Year Power Plant Design Project”

**The 2<sup>nd</sup> best paper:** Mr. Thomas Vernon Cook , Dr. Robert J. Kerestes, and Prof. Brandon M. Grainger “Visualizing Power-Quality Phenomena in a Hands-On Electric Power Systems Laboratory”

**The 3<sup>rd</sup> best paper:** Xichen Jian, Ms. Jill Davishahl, Mr. Dana Hickenbottom, Daniel Saunders, and Mr. Troy Thornton “Photovoltaic System Performance Under Partial Shading: An Undergraduate Research Experience”

**We would like to thank our breakfast sponsor!!**



**Madhumi Mitra, Lynn Albers, Ted Song at Division Mixer**

**Editor’s Note**

Hello everyone,  
It is my pleasure to serve once again as the Newsletter Editor for the Energy Conversion and Conservation Division. We have a jam-packed schedule for this year’s annual conference. I feel honored to be a part of such a hardworking division with such an important focus on engineering a sustainable and environmentally conscientious world. I am looking forward to a wonderful 2018-2019 school year and the 126<sup>th</sup> Annual Conference and Exposition in Tampa with all of you!  
Robert Kerestes, Ph.D.