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2021 ASEE Annual Conference & Exposition

Virtual Meeting, July 26–29, 2021

ECCD 2021 Sessions  [Find Online](#)

Visit us @ <https://sites.asee.org/eccd/>

MESSAGE FROM THE DIVISION CHAIR

July 2021

Dear ECCD Members,



Greetings! What a year this has been for all of us. I hope you had some time to rest this summer, and I wish you all the best as you prepare your teaching and research in the fall. I also would like to thank Dr. Robert Kerestes, who has

worked tirelessly to make this year's conference successful as the Program Chair. Under his leadership, the division has prepared a superb program, and I am deeply grateful for his work.

The division is honored to host the presentations from our excellent authors, and I invite you to

join us in promoting energy engineering education in this critical moment in history. In particular, I would like to note that the division will have its Business Meeting on July 28 at 1:45 PM PDT. We would love to see you there and hear from you.

On behalf of ECCD, I appreciate each one of you for the interest and support you provide to the division. Thank you, and I look forward to seeing you at this virtual conference.

Yours Truly,
Ted Song, Ph.D.

Division Chair

Energy Conversion and Conservation Division

ASEE 2021 Annual Meeting: ECCD Sessions can be found [here](#).



EDITOR'S COLUMN

Kudos to Engineering Educators



Greetings ECCD Members!



Welcome to the Spring 2021 ECCD Newsletter!

A grueling challenge was posed to the engineering educators around the world when the pandemic hit us suddenly. Educators of Engineering and many STEM fields experienced unique challenges due to lab components in their curriculum. Engineering educators have successfully tackled such never-before-seen challenges through pedagogical innovation, collaboration and by implementation of technology tools.

One year later, as the world continues to heal, the higher education sector in the US is looking forward to reopening full-fledged face-to-face classes soon. Along with massive damages, the pandemic has also made our education system more flexible, resilient, and in many cases led to

long-term transformational changes. This makes the ASEE 2021 Annual Conference a great place to learn from our colleagues, and share our innovations, experiences and remarkable achievements in teaching and research with our peers.

I am delighted to launch this Volume (Vol. 37) of the ECCD Newsletter. With this Volume, my one-year term as the Newsletter Editor for the ECC Division will be completed. It was a great pleasure to serve at this role and I hope to see continued growth of our newsletter and other division activities in the coming years.

I look forward to seeing you all at the 2021 ASEE Annual Conference virtually!

Sincerely,

Sandip Das, Ph.D.
Editor, Newsletter

Energy Conversion & Conservation Division
American Society of Engineering Education

DIVISION ANNOUNCEMENTS

Highlights from the 2020 Conference:

At the 2020 Virtual ASEE Annual Conference, the Energy Conversion & Conservation Division had 28 papers presented in 6 technical sessions, held 2 discussion panels including one guest speaker, and one business event (Energy Conversion and Conservation Division Business Meeting).

Division Announcements:

- The 2020 ASEE Annual Conference has moved online! The main page for the conference is at: [asee.org/annual-conference/2021](https://www.asee.org/annual-conference/2021)
- Find specific conference sessions and events for

the 2021 annual conference and build your personalized conference schedule of sessions and events at:

<https://www.asee.org/public/conferences/223/registration/sessions?>

- ECCD will have its annual division social event (ECCD virtual Tour and Dinner) on Thursday, July 28th at 6:00 PM PDT. Use the link above to find and join us at this online event!
- The ECCD Business Meeting will be held on Friday, July 28th at 1:45 PM PDT. Visit [this link](#) and then click 'Add to schedule' button to add this event in your conference schedule.



- Technical Sessions at the 2021 ASEE Annual Conference will take the following format:
 - Technical sessions are 90-minute live sessions.
 - Moderators will introduce each paper.
 - Authors can share their screens for their presentations.
 - The presenters will be live, and the audience will be virtual.

➢ Moderator will end session at the conclusion of the 20 minutes.

- Please join the ECCD LinkedIn group for all of the latest information! The URL for the group is: <https://www.linkedin.com/groups/12134751>
- You can access all previously published ECCD Newsletters here: <https://sites.asee.org/eccd/about/newsletters/>

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ECCD 2021 CONFERENCE SESSIONS

M416 • Technical Session 1: Mechanical and CAD Track

Mon. July 26, 2021 1:15 PM to 2:45 PM - Pacific Daylight Time

This technical session will focus on energy-related educational and research papers with topics falling under fluid mechanics, thermal systems, or CAD.

Moderators: Dr. Seyed "Hossein" Mousavinezhad P.E. and Dr. Siamak Farhad

1. **A Hands-on Learning Module Pipe-flow Velocity Profile Interrogator Laboratory Kit for Remote Online Fluid Mechanics Instruction** [[view paper](#)]

Ms. Nina T. Jones (University of Florida), Dr. Sean R. Niemi (University of Florida), and Dr. Matthew J. Traum (Engineer Inc.)

2. **Hydro-Island: Undergraduate Research Modeling an Ocean Thermal Energy Conversion (OTEC) System** [[view paper](#)]

Ms. Leah Hope Sirkis (University of Pittsburgh) and Dr. Tony Lee Kerzmann (University of Pittsburgh)

3. **Project-based Learning Program for Nuclear Workforce Development Phase II: Implementation** [[view paper](#)]

Dr. Hayrettin Bora Karayaka (Western Carolina University), Dr. Chip W. Ferguson (Western Carolina University), and Dr. Amber C. Thompson (Western Carolina University)



4. **Integration of COMSOL Multiphysics into an Undergraduate Electrical Engineering Curriculum** [[view paper](#)]

Dr. Robert J. Kerestes (University of Pittsburgh), Mr. Anthony M. Popovski (University of Pittsburgh), and Prof. Feng Xiong (University of Pittsburgh)

T316 • Technical Session 2: Solar Track

Tue. July 27, 2021 11:30 AM to 1:00 PM - Pacific Daylight Time

This technical session covers educational and research papers focused on solar power technologies.

Moderators: Dr. Robert J Kerestes

1. **A Model Passive Solar Home Student Design Project** [[view paper](#)]

Dr. Matt Aldeman (Illinois State University) and Dr. Jin Ho Jo (Illinois State University)

2. **Design and Implementation of Solar PV Charging Stations for City of Huntsville Aquatic Center** [[view paper](#)]

Dr. Reg Pecen (Sam Houston State University), Dr. Keith L. Coogler (Sam Houston State University), Dr. Faruk Yildiz (Sam Houston State University), Dr. Ulan Dakeev (Sam Houston State University), and Mr. Lance David Sebesta

3. **ETHR-ENRG Smart Solar Project Kits** [[view paper](#)]

Ms. Danielle S. Washington (North Carolina Agricultural and Technical State University), Mr. Tony D. Martin Jr. (Affiliation unknown), and Dr. Evelyn Sowell-Boone (North Carolina Agricultural and Technical State University)

4. **Simulation and Validation of Battery Management System** [[view paper](#)]

Mr. Edmund Huminski (United States Coast Guard Academy), Salena Marie Bantz (Affiliation unknown), Mr. Joseph Roth (United States Coast Guard Academy), Mr. Liam Scott Caro (Affiliation unknown), Dr. Tooran Emami (United States Coast Guard Academy), and Mr. David Fournier (United States Coast Guard Academy)

5. **Resilience in the Home Office Through a Scaled-down Microgrid** [[view paper](#)]

Ms. Tessa Veurink (University of Pittsburgh), Mr. Bradley G. Fox (University of Pittsburgh), Ms. Sabrina R. Helbig (University of Pittsburgh), Mr. Duncan Penizotto (University of Pittsburgh), Dr. Robert J. Kerestes (University of Pittsburgh), and Prof. Brandon M. Grainger (University of Pittsburgh)

T416 • Technical Session 3: Education Track

Tue. July 27, 2021 1:45 PM to 3:15 PM - Pacific Daylight Time

Moderators: Dr. Matt Aldeman and Dr. Sandip Das

1. **Food to Energy: A K12/University Partnership to Develop a Resource Recovery Program** [[view paper](#)]

Dr. Jan DeWaters P.E. (Clarkson University)

2. **Project-based Learning Approach in Teaching Power and Energy Engineering Courses** [[view paper](#)]

Dr. Radian G. Belu (Southern University), Dr. Alexandru Belu (Affiliation unknown), and Dr. Zhengmao Ye (Southern University)

3. **Teaching Power Electronics to Electrical Engineering Undergraduates in an Interactive Two-semester Integrated Sequence** [[view paper](#)]

Dr. Herbert L. Hess (University of Idaho)

4. **Teaching STEM Early-college Students: A New Methodology to Teach Energy Complex Systems** [[view paper](#)]

Dr. Ahmed Cherif Megri (North Carolina Agricultural and Technical State University), Dr. Sameer Hamoush (North Carolina Agricultural and Technical State University), and Dr. Taher M. Abu-Lebdeh P.E. (North Carolina Agricultural and Technical State University)

5. **Teaching Maximum Power Point Tracking (MPPT) Algorithms of Photovoltaic (PV) Systems Using MATLAB** [[view paper](#)]

Dr. Lihong Heidi Jiao (Grand Valley State University)



W216 · Poster Session: Energy and Analysis

Wed. July 28, 2021 9:45 AM to 11:15 AM - Pacific Daylight Time

Moderators: Dr. Robert J Kerestes

M516 · Panel: International Collaboration in Teaching Sustainable Energy Solutions

Mon. July 26, 2021 3:00 PM to 4:30 PM - Pacific Daylight Time

Moderators: Dr. Herbert L. Hess P.E.

Speakers:

1. Dr. Robert J Kerestes (University of Pittsburgh)
2. Mr. Daniel Tyler Theis (Technical University of Denmark)
3. Patrick Connor (University of Pittsburgh)
4. Maiken Jakobsen (Technical University of Denmark)

W416 · ECCD Business Meeting

Wed. July 28, 2021 1:45 PM to 3:15 PM - Pacific Daylight Time

Moderators: Dr. Robert J Kerestes

W716 · ECCD Tour and Dinner

Wed. July 28, 2021 6:00 PM to 8:00 PM - Pacific Daylight Time

An ECCD and OMED joint tour and dinner. This "dinner" session will be a virtual congregation of ECCD and OMED members who will get a chance to chat in breakout rooms. In addition, there will be a "virtual" tour/demonstration of Eaton's Power Systems Experience Center.

Moderators: Dr. Robert J Kerestes

R316 · Panel: Energy and Environmental Education in the Midst of Misfortunes

Th. July 29, 2021 11:30 AM to 1:00 PM - Pacific Daylight Time

Panelists in this session will discuss the challenges and opportunities to advance energy and environmental engineering education, especially in the midst of outbreaks, natural disasters, and other social and economic injustices.

Moderators: Dr. Robert J Kerestes

Speakers: Dr. Veera Gnanaswar Gude P.E. (Mississippi State University), Dr. Bala Maheswaran (Northeastern University), Dr. Tooran Emami (United States Coast Guard Academy), Dr. Ramanitharan Kandiah P.E. (Central State University)

ENERGY CONVERSION AND CONSERVATION DIVISION

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