










INSIDE THIS ISSUE

-  Message from the Division Chair (Pg. 1)
-  Editor's Note (Pg. 2)
-  2020 – 2021 Division Officers (Pg. 2)
-  Division Announcements (Pg. 3)
-  Call for Papers: 2021 Conference (Pg. 3-4)
-  2020 Conference Highlights (Pg. 4)
-  2020 Papers, Posters, & Panels (Pg. 5-7)
-  2020 Best Papers Award (Pg. 8)
-  Event Photos (Pg. 8-9)

2021 ASEE Annual Conference & Exposition

Long Beach, California | June 27-30, 2021

**Abstract Submissions are OPEN until
Friday October 16, 2020 @ 23:59 EDT**

Workshop Applications are OPEN until
Monday, October 26, 2020 @ 23:59 EDT

ECCD Call for Papers  [View Online](#)

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

MESSAGE FROM THE DIVISION CHAIR

October 2020

Dear ECCD Members,



I send you greetings on behalf of the ECCD officers! First of all, I would like to thank Drs. Siamak Farhad and Hossein Mousavinezhad for their service during the 2020 conference. Dr. Farhad served as the program chair, and Dr. Mousavinezhad provided leadership as the division chair in the past year. We all know that it takes a tremendous amount

to run conference meetings virtually, and we thank these leaders for making it happen with patience and diligence. I also thank you all for your participation this summer.

Covid-19 has indeed impacted how we educate the next generation of engineers. While the pandemic created new challenges for educators and students, we also see innovative ways of teaching. I am sure there are many strategies you have taken to continue equipping students, and ECCD would love to hear about them!

ASEE 2021 Annual Meeting: Important deadlines can be found [here](#).



On behalf of the division, I invite you to submit an abstract (400 words or less) so that we all can share your excellent work that contributes to engineering education. ECCD welcomes various topics in energy conversion and conservation, so please look them over and join our discussion to advance engineering education.

Last but not the least, Dr. Bob Kerestes, a faculty member at the University of Pittsburgh, is serving

as the Program Chair this year, and he has been doing great work for our division.

I am deeply grateful for our community where engineering education is celebrated, and I look forward to connecting with you again soon.

Yours Truly,

Ted Song, Ph.D.

Chair

Energy Conversion and Conservation Division

Covid-19 has indeed impacted how we educate the next generation of engineers. While the pandemic created new challenges for educators and students, we also see innovative ways of teaching.

EDITOR'S NOTE

Newsletter Gets a New Look



Hello Division Members and Readers,



It is my pleasure to serve as the Newsletter Editor of the **Energy Conversion and Conservation Division** of ASEE this year. I would like to express my gratitude to the division members and the current and past officers for their continued

support that has always motivated and inspired me to continue to serve in this division to the best of my capacity, particularly in this important role as the Newsletter Editor.

I am delighted to launch this Volume (Vol. 31) of the ECCD Newsletter with a fresh new look enabling easy navigation, which I hope gives you a pleasant reading experience. It was a great joy and satisfying experience for me to take up this opportunity to overhaul the Newsletter design. I hope you enjoy reading the newsletter and find the information useful. Your valuable inputs and suggestions for future

improvement on all activities of the division are appreciated.

I have devoted my career in research and education in the field of solar photovoltaics and renewable energy engineering. The **Energy Conversion and Conservation Division** of ASEE has provided an excellent platform to learn from other passionate educators, researchers and leading experts in the field which helped me to bring new innovations in my own classroom and grow as an engineering educator. I would like to continue learning from this community and working with the ECC Division. Wish you all a thriving academic year ahead overcoming the challenges of the pandemic and I look forward to seeing you all at the 128th ASEE Annual Conference in Long Beach, California!

Sincerely,

Sandip Das, Ph.D.

Editor, Newsletter

Energy Conversion & Conservation Division



2020 – 2021 DIVISION OFFICERS

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DIVISION ANNOUNCEMENTS

The ECCD Call for Papers for the 2020 ASEE Conference and Exposition has been released. For more information and to view the paper guidelines, please visit the Call for Papers webpage, [available here](#).

Please join the ECCD LinkedIn group for all the latest information! The URL for this group is: <https://www.linkedin.com/groups/12134751> 

Access all previously published ECCD Newsletters here: <https://sites.asee.org/eccd/about/newsletters/>

ECCD Business Meeting for the year 2020 was held on June 26, 2020 (3:00 – 4:00 PM) virtually (online) during the 127th ASEE Annual Conference. [[Minutes](#)]

2021 CONFERENCE CALL FOR PAPERS

Dear Energy Conversion and Conservation Division (ECCD) Members,

I hope that your semesters are off to a good start during this challenging time for academic institutions. Although last year's conference was virtual, we are hoping to have a strong in-person conference in Long Beach, California from June 27–30th, 2021:

<https://www.asee.org/annual-conference/2021>.

Abstracts should be 400 words or less and should include a brief introduction, a statement about the focus of the paper, the work which has been done, assessments, and a conclusion. All abstracts must be submitted via the ASEE Monolith system and will be peer reviewed. Abstract submission opens on September 8, 2020. The deadline for abstract submission is October 16, 2020.



Topics may include:

- Innovative research and its dissemination into grades P-20.
- Innovative teaching and learning strategies
- Research methods to assess teaching and learning strategies.
- Curriculum content innovation.
- Pandemic related changes to pedagogy.
- Innovative remote learning teaching and learning strategies.
- Hands-on Projects for grades P-20.
- Novel experiments and use of laboratory equipment and their impact on learning.
- Integrating research and engineering education.
- Impact of problem-based learning, collaborative learning, cooperative learning, discovery learning and inverted learning.
- Outreach programs that involve energy conversion and conservation industry.
- Renewable Energy Sources.
- Manufacturing—processes including 3D printing.
- Energy conversion technologies.
- Energy storage technologies.
- Engineering for sustainability and emissions reductions.
- Worldwide energy supply/demand issues.
- Electrical distribution and power systems.
- Industrial and commercial scale energy conversion and conservation.
- Nuclear engineering technologies.
- Discipline-specific engineering research relating to energy conversion and conservation (electrical, mechanical, nuclear, chemical, aerospace, civil, computer, textile, petroleum, biological, agricultural, natural resources, etc.).
- Role of engineers in the formulation and enforcement of public policy related to energy at all levels.
- Research Experiences for Undergraduates (REU) projects related to energy conversion or conservation.

The ECC Division will accept **works in progress**.

The 2020 ASEE Annual Conference and Exposition Author's Kit, Plagiarism Guidelines, and Best Paper Rubric can be found here. Authors should submit an abstract of 400 words or less on their paper topic. All ASEE papers are published to present. Papers accepted for publication in the Proceedings must be presented by at least one registered conference participant in a designated technical session or poster session. ECCD will not accept WIP papers or papers that overlap significantly in content that had been (or will be) published elsewhere. All authors are expected to adhere to the guidelines put forth in the Author's Kit and Plagiarism Guidelines. Of particular importance is the "double-blind" requirement.

If you are interested in assembling a workshop or panel session, please email me asap! Panels and Workshops must be requested now before the application process closes on October 12th. Panels must also submit an abstract, which will be used as the description for the panel session and may submit a full paper.

If you are interested in reviewing abstracts and/or papers, please let me know by sending me an email to rjk39@pitt.edu.

Thank you very much for your time and your participation! We welcome your wonderful ideas!

Sincerely,

Robert Kerestes, Ph.D.

ASEE Program Chair

Energy Conversion and Conservation Division

HEIGHLIGHTS 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).



ECCD 2020 PAPERS PRESENTED, POSTERS & PANELS

M216 · Technical Session 1: Energy & Electrical Engineering

Moderators: Dr. Seyed "Hossein" Mousavinezhad and Herbert L. Hess, P.E.

- 1. Electrical Energy Engineering Education for the 21st Century** [[view paper](#)]
Dr. Radian G. Belu (Southern University and A&M College) and Prof. Lucian Ionel Cioca (Lucian Blaga University of Sibiu)
- 2. A Multidisciplinary Energy Project: Rebuilding a Non-working Electric Car with Students** [[view paper](#)]
Dr. Faruk Yildiz (Sam Houston State University), Dr. Keith L. Coogler (Sam Houston State University), Dr. Reg Pecen (Sam Houston State University), and Dr. Ulan Dakeev (Sam Houston State University)
- 3. Teaching Substation Battery Testing to Undergraduates** [[view paper](#)]
Dr. Glenn T. Wrate P.E. (Northern Michigan University)
- 4. Voltage and Current Loop Controlled Three-stage, Three-port Solid State Transformer** [[view paper](#)]
Mr. Abdullah Al Hadi (Texas A&M University-Kingsville) and Dr. Rajab Chaloo (Texas A&M University-Kingsville)
- 5. Harnessing Drag Energy in Electric Automobiles** [[view paper](#)]
Mr. Aman Luthra (University of Georgia), Dr. Tom Lawrence P.E. (University of Georgia), and Dr. John M. Mativo (University of Georgia)

T216 · Technical Session 2: Solar Energy

Moderators: Dr. Ted Song and Dr. Robert J Kerestes

- 1. Enlightened Education: Solar Engineering Design to Energize School Facilities** [[view paper](#)]
Dr. Kenneth A. Walz (Madison Area Technical College), Mr. Joel B. Shoemaker (Madison Area Technical College), Steven Michael Ansoorge (Madison Area Technical College), Mr. Adam Gusse (Sunvest Solar, Inc), and Nicholas J. Hylla (Midwest Renewable Energy Association)
- 2. Photovoltaic Solar Grill** [[view paper](#)]
Mrs. Brittany Weber (Renewable Energy Society), Miss Katelyn Renee Dunnagan (Renewable Energy Society), and Dr. Matthew Aldeman (Illinois State University)
- 3. Prototype Automated Solar Tracking with Power Generation System** [[view paper](#)]
Dr. Saeed Sean Monemi (California State Polytechnic University Pomona)
- 4. Mitigation of Solar Photovoltaic Production Variability with Geographical Aggregation** [[view paper](#)]
Mr. Bennet Thomas Krull (Illinois State University), Dr. Matthew Aldeman (Illinois State University), and Dr. Jin Ho Jo (Illinois State University)
- 5. The Scaled Omni-directional Solar Tracking Unit** [[view paper](#)]
Dr. Saeed Sean Monemi (California State Polytechnic University Pomona)

T316 · Technical Session 3: Energy and Multidisciplinary

Moderators: Dr. Matt Aldeman and Dr. Robert J Kerestes

- 1. Development of a Multidisciplinary Renewable Energy Laboratory for Research and Education** [[view paper](#)]
Prof. Jacques Belanger (California Polytechnic State University, San Luis Obispo), Dr. Andrew Davol (California Polytechnic State University, San Luis Obispo), Ms. Huy A Duong (California



Polytechnic State University, San Luis Obispo), and Trent Hamilton (Affiliation unknown)

2. **A Multidisciplinary Undergraduate Course in Energy Engineering** [[view paper](#)]

Dr. Radian G. Belu (Southern University and A&M College) and Dr. Fred Lacy (Southern University and A&M College)

3. **An Educational Tool to Optimize the Consumption of Primary Energy in Thermal-based Distributed Energy Systems** [[view paper](#)]

Dr. Joana Marques Melo (Purdue University, West Lafayette), Dr. Cynthia Howard-Reed (Pennsylvania State University, University Park), and Dr. Catherine G.P. Berdanier (Pennsylvania State University, University Park)

4. **Experimental Vehicles Program Improves Student Performance Through Energy Conversion and Conservation with Hands-on Learning** [[view paper](#)]

Dr. Saeed D. Foroudastan (Middle Tennessee State University)

5. **Implementation of the Question Formulation Technique as a Teaching Strategy in Renewable Energy Engineering Education** [[view paper](#)]

Dr. Claudia Torres Garibay (Oregon Institute of Technology), Jessica Kerby (Oregon Institute of Technology), and Mr. Andrew Powers Minigan (Right Question Institute)

W216 · Technical Session 4: Energy and Analysis

Moderators: Dr. Matt Aldeman and Dr. Sandip Das

1. **A Comparison of the Renewable Energy and Energy Storage Sectors in Germany and the United States, with Recommendations for Engineering Teaching Practices** [[view paper](#)]

Dr. Lisa Bosman (Purdue University, West Lafayette), Jennifer Brinker (Northeast Wisconsin Technical College), and Dr. Kenneth Walz (Madison Area Technical College)

2. **Relationship of the Industrial Assessment Center to the Land-grant Mission of Oklahoma State University** [[view paper](#)]

Dr. Hitesh D. Vora (Oklahoma State University), Ms. Pragma Niraula (Oklahoma State University), Amrit Sunil Chugani (Oklahoma State University), Mr. Nilesh Anil Baraskar (Oklahoma State University), Anusha Sunil Saraf (Oklahoma State University),

and Dr. Michael L. McCombs (Oklahoma State University)

3. **An Evaluation of Focused Outreach and Recruiting Efforts in a Nuclear-related Workforce Development Program** [[view paper](#)]

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

4. **Analysis and Field-based Learning of Energy Conservation Measures in an Engineering Thermodynamics Course** [[view paper](#)]

Dr. Arash Kialashaki (California State University, Chico)

W316 · Technical Session 5: Energy and Wind and Design

Moderators: Dr. Sandip Das and Dr. Ted Song

1. **Power Generation Through Small-scale Wind Turbine** [[view paper](#)]

Prof. Bala Maheswaran (Northeastern University), Ms. Alya Abd Aziz (Northeastern University), Mr. Evan Alexander (Northeastern University), Ms. Laura Brigandi (Northeastern University), and Cole Branagan (Northeastern University)

2. **Air-conditioning Unit Performance Analysis Equipped with a Shaded Condenser** [[view paper](#)]

Dr. Maher Shehadi (Purdue Polytechnic Institute)

3. **Mobile Renewable Response Trailer (MRRT) for Disaster Relief Efforts** [[view paper](#)]



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

4. **Hybrid Green Vessel Design** [[view paper](#)]

Joseph C. Rodriguez (United States Coast Guard Academy), Scott C. Pierce (United States Coast Guard Academy), Brennen McCulloch (Affiliation unknown), Mr. George McBurney (United States

Coast Guard Academy), and Dr. Tooran Emami (United States Coast Guard Academy)

5. **Sustainable Low-cost Household Energy Systems: Solar Photovoltaic and Shallow Geothermal Systems** [[view paper](#)]

Dr. Michael F. MacCarthy (Mercer University), Ms. Michelle E. Graham (Mercer University), Mr. Gabriel Xavier Ramirez (Mercer University), Alviez Aziz Chagan (Mercer University), and Miss Kyla T. Semmendinger (Cornell University)

F216 · Technical Session 6: Energy & Thermodynamics

Moderators: Dr. Lynn A. Albers and Dr. Maryam Younessi Sinaki

1. **BITES and TEST Web Tools to Enhance an Undergraduate Thermodynamics Course** [[view paper](#)]

Dr. Abhijit Nagchaudhuri (University of Maryland, Eastern Shore)

2. **Integration of Service Learning to Teaching Thermodynamics** [[view paper](#)]

Dr. Farshid Zabihian (California State University, Sacramento)

3. **Teaching Thermodynamics Online: Instructor and Student Perspectives** [[view paper](#)]

Dr. Farshid Zabihian (California State University, Sacramento)

4. **Graded Homework vs. Quizzes on Homework Material: Impacts on Student Performance in a Thermodynamics Course** [[view paper](#)]

Dr. John R. Reisel (University of Wisconsin, Milwaukee)

M416 · Panel: Innovations in Energy, Environment, and Engineering Education

Moderators: Dr. Siamak Farhad and Dr. Herbert L. Hess P.E.

Speakers:

1. Dr. Bala Maheswaran (Northeastern University)
2. Dr. Veera Gnanaswar Gude P.E. (Mississippi State University)
3. Dr. Tooran Emami (United States Coast Guard Academy)
4. Dr. Ramanitharan Kandiah P.E. (Central State University)

T416 · Panel: ECC and Manufacturing Divisions - NSF Guest Speaker Session

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

Guest Speaker:

Dr. Pushpa Ramakrishna
Program Director,
Division of Undergraduate Education
Directorate for Education and Human Resources
National Science Foundation



BEST PAPERS AWARDS

Congratulations to all of the Best Paper Award Winners!

1st Place and Best Paper:

"Enlightened Education: Solar Engineering Design to Energize School Facilities"

[\[View Abstract\]](#) [\[Download Paper\]](#)

Paper ID: Paper ID # 30133

Authors: Dr. Kenneth A. Walz (Madison Area Technical College), Mr. Joel B Shoemaker (Madison Area Technical College), Steven Michael Ansorge (Madison Area Technical College), Mr. Adam Gusse (Sunvest Solar Inc.), Nicholas J Hylla (Midwest Renewable Energy Association).

2nd Best Paper:

"A comparison of the renewable energy and energy storage sectors in Germany and the United States, with recommendations for engineering teaching practices"

[\[View Abstract\]](#) [\[Download Paper\]](#)

Paper ID: Paper ID # 29546

Authors: Dr. Lisa Bosman (Purdue University–Main Campus), Jennifer Brinker (Northeast WI Technical College), Dr. Kenneth Walz (Madison Area Technical College).

3rd Best Paper:

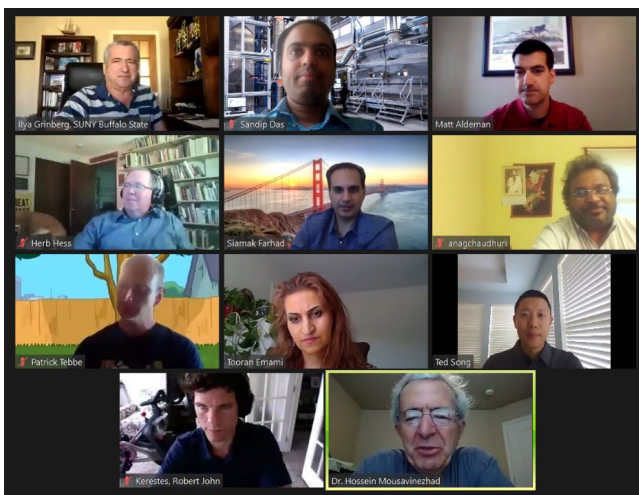
"Graded Homework vs. Quizzes on Homework Material: Impacts on Student Performance in a Thermodynamics Course"

[\[View Abstract\]](#) [\[Download Paper\]](#)

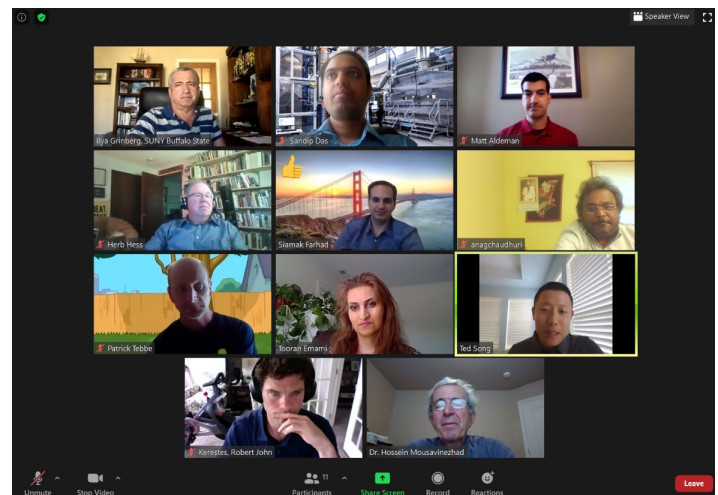
Paper ID: Paper ID # 28540

Author: Dr. John R. Reisel (University of Wisconsin, Milwaukee).

PHOTOS OF SOCIAL EVENTS, PANELS AND BUSINESS MEETING



Dr. Hossein Mousavinezhad, previous Division Chair (2019-2020) hosting the virtual (online) ECCD Business Meeting (June 26, 2020).



Dr. Ted Song, new Division Chair (2020-2021) addressing the officers during the virtual (online) ECCD Business Meeting (June 26, 2020).





ECCD members at the 2019 ASEE Annual Conference in Tampa, FL (June 2019).

ENERGY CONVERSION AND CONSERVATION DIVISION

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