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### Room 1: Conference Welcome - Thomas Coolbear, Executive Director/CEO, ASME (Pre-recorded)

### Room 1: Women in Engineering Panel - Moderator, Nesrin Ozalp, Purdue University Northwest
Panelists: Margot Gerritsen, Stanford University, Erin Stanton, Henningsen, Durham and Richardson, Inc., Ying Sun, National Science Foundation, Evelyn Wang, Massachusetts Institute of Technology, Sophia Haussemer, Swiss Federal Institute of Technology Lausanne Chemical Processes for Energy Storage

### Room 1: Plenary 1 - Dr. James Klausner, UAE University - Introduction by Justin Lapp and Nesrin Ozalp
High Temperature Thermochromic Processes for Energy Storage

### Session Chair: Pei Ding, George Mason University Session Co-Chairs: Jian Zhang, University of Wisconsin-Green Bay; Yang Chen, Oak Ridge National Laboratory
**Technical Paper Publication: ES2021-62790 - Fuel Economy Benefits of Electric Engine Tuning for Steady Speed and Drive Cycle Operation**
Authors: James Carl F. Satero - UP Diliman, Edah E. Quinno - University of the Philippines, Joseph Gabriel E. Mercado - UP Diliman, Paul L. Rodgers - UP Diliman

**Session Chair: Yeoseom Yoon, North Carolina State University Session Co-Chair: Dongsu Kim, Hanbat National University**
**Technical Paper Publication: ES2021-62799 - Energy Storage Versus Demand Side Management for Peak-Demand Reduction at the Hawaii Ocean Science and Technology Park**
Authors: Alexander Readay - University of Memphis, Yogeet Maroohan - University of Memphis, Laurenza Sembardar - National Energy Laboratory of Hawaii Authority, Keth Chion - National Energy Laboratory of Hawaii Authority, Benjamin Schrekenlen - Sandia National Laboratories

**Technical Paper Publication: ES2021-62800 - Bypass Inference for Incidence Factor of the Thermal Bridge Using In-Situ Measurement Infrared Thermography**
Authors: Eunho Kang - Hanbat National University, Hyunam Lee - Hanbat National University, Jongho Yoon - Hanbat National University, Dongso Kim - Hanbat National University

**Technical Paper Publication: ES2021-62801 - Optimal Control of Condenser Water Temperature Set-Point**
Authors: Alon Lidor - ETH Zurich, Yves Achuchudan - ETH Zurich, Jirme Haeld - ETH Zurich, Philipp Hauser - ETH Zurich, Aldo Stiefelli - ETH Zurich

### Session Chair: Brendan Buffle, ETH Zurich
**Technical Presentation Only: ES2021-69577 - Coupled Heat and Mass Transfer in Anisotropic Heterogeneous Porous Media Applied in Solar Thermochromically Processed Hydrogen and Syngas**
Authors: Song Yoon - Ecole Polytechnique Federale De Lausanne, Sophia Haussemer - Ecole Polytechnique Federale De Lausanne

**Technical Presentation Only: ES2021-69895 - Electromechanical Mitigation of Corrosion in Molten Chloride Salts During CSP Plant Operation**

### Session Chair: Peter Loutzenheiser, Georgia Institute of Technology
**Technical Paper Publication: ES2021-62802 - Effect of Train Energy Consumption on the Wear of Railroad Catenary Contact Conductors**
Authors: Ejlid Hingmeyama - Addis Ababa University, Celestine Neumondja - Addis Ababa University

**Technical Presentation Only: ES2021-62803 - Sustainability Indicators for Selected Greenhouse Production Facilities in North America**
Authors: James Thissen - University of British Columbia UBC, Paul Davidson - University of British Columbia UBC

**Technical Presentation Only: ES2021-70870 - Design of Net-Zero Energy Attached Housing**
Authors: Lani Nelson - Mississippi State University, Jacob Lyle - Mississippi State University, Luke Murray - Mississippi State University, Colby Freeman - Mississippi State University, Jonathan Cimino - Mississippi State University

Authors: Meng Lin - Southern University of Science and Technology, Song Yang - Southern University of Science and Technology, Wendong Liu - Shanghai University

**Technical Presentation Only: ES2021-74422 - Solar Fuel Production From Ambient Air in a Modular Solar Concentrator-Reactor System**
Authors: Remo Schipani - ETH Zurich, Philipp Hauser - ETH Zurich, Philipp Purkar - Swissheal SA, Aldo Stiefelli - ETH Zurich

### Session Chair: Yeobeom Yoon, North Carolina State University Session Co-Chair: Dongsu Kim, Hanbat National University
**Technical Paper Publication: ES2021-62797 - Chemical Processes for Energy Storage**
Panelists: Margot Gerritsen, Stanford University, Evelyn Wang, Massachusetts Institute of Technology, Sophia Haussemer, Swiss Federal Institute of Technology Lausanne Chemical Processes for Energy Storage

### Session Chair: Alexander Headley - University of Memphis, Yogesh Manoharan - University of Memphis, Jonathan Cimino - Mississippi State University, Luke Murray - Mississippi State University, Colby Freeman - Mississippi State University
**Technical Presentation Only: ES2021-70867 - Design of Net-Zero Energy Attached Housing**
Authors: Lani Nelson - Mississippi State University, Jacob Lyle - Mississippi State University, Luke Murray - Mississippi State University, Colby Freeman - Mississippi State University, Jonathan Cimino - Mississippi State University

**Technical Presentation Only: ES2021-70868 - Design of Net-Zero Energy Attached Housing**
Authors: Lani Nelson - Mississippi State University, Jacob Lyle - Mississippi State University, Luke Murray - Mississippi State University, Colby Freeman - Mississippi State University, Jonathan Cimino - Mississippi State University

**Technical Presentation Only: ES2021-70869 - Design of Net-Zero Energy Attached Housing**
Authors: Lani Nelson - Mississippi State University, Jacob Lyle - Mississippi State University, Luke Murray - Mississippi State University, Colby Freeman - Mississippi State University, Jonathan Cimino - Mississippi State University

## Session 3: Energy Storage
### Session Chair: Kelvin Randhir, Michigan State University
**Technical Paper Publication: ES2021-63138 - Using Molding to Fabricate Stable Salt Structures for Thermochromic Energy Storage**
Authors: Adam Gladen - North Dakota State University, Fardad Azarmi - Stable Salt Structures for Thermochemical Energy Storage

**Technical Paper Publication: ES2021-63139 - Artificial Neural Network Based Optimized Control of Condenser Water Temperature Set-Point**
Authors: Tae Young Kim - Korea University, Jong Min Lee - Korea University, Yong Ho Hong - Korea University

**Technical Paper Publication: ES2021-63140 - Corrosion in Molten Chloride Salts During CSP Plant Operation**
Authors: Keren Reepsl - Georgia Institute of Technology, Shaker Alasal - King Saud University, Sheldon Jeter - Georgia Institute of Technology, Han Ali Ansari - King Saud University, Ryan Young - Georgia Institute of Technology, Muhammad Safir - Georgia Institute of Technology
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**Session Chair: Joonsik Hwang, Mississippi State University**

**Session Chair: Chin Jin, National Renewable Energy Laboratory**

**Session Chair: Liang Zhang, National Renewable Energy Laboratory**

**Session Chair: Andrey Gunawan, Georgia Institute of Technology**

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**Technical Paper Publication: ES2021-62817 - Sustainability Assessment of Invacuum Fuel Blends**

Authors: Cherie Gambino - Arizona State University, Agenti Reddy - Arizona State University

**Technical Paper Publication: ES2021-62478 - Flexibility Analysis of Refueling Infrastructure for Compressed Renewable Natural Gas Long-Haul, Heavy-Duty Trucks in Canada**

Authors: Walha Yasi - Natural Resources Canada/CarmetENERG, Michel Longo - Politecnico di Milano/Department of Energy

**Technical Paper Publication: ES2021-62479 - Flexibility Study of Refueling Infrastructure for Hydrogen Long, Heavy-Duty Trucks in Canada**

Authors: Walha Yasi - Natural Resources Canada/CarmetENERG, Michel Longo - Politecnico di Milano/Department of Energy

**Technical Paper Publication: ES2021-62480 - Flexibility Study of Refueling Infrastructure for Hydrogen Long, Heavy-Duty Trucks in Canada**

Authors: Walha Yasi - Natural Resources Canada/CarmetENERG, Michel Longo - Politecnico di Milano/Department of Energy

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Authors: Buda Lee - Hanyang National University, Jongsu Yoon - Hanyang National University, Donggu Lee - Hanyang National University, Hyunwoo Lee - Hanyang National University

**Technical Paper: ES2021-62491 - A Study of Cost-Savings Potential of Load Flexibility Measures in Grid-Interactive Multi-Family Buildings**

Authors: Chris Caravella - National Renewable Energy Laboratory, Michael Koch, Colorado Energy Research Institute, Singh-Dan Amin, National Renewable Energy Laboratory

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**Technical Paper Publication: ES2021-62385 - Optimal Design and Operation of a Domestic Hot Water System**


**Technical Presentation: ES2021-63461 - Simulating Steady-State Characteristics of Solar Cells Using Thirumps andおよび**

Authors: Jau-Wei Gong - Penn State Behrend

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**Technical Paper: ES2021-63350 - Preliminary Technical-Economic Optimization of 1.3 MWt Particle Receiver Based CSP Power Tower Plant for the Mena Region**

Authors: Shakir Shakoor Khatti - Georgia Institute of Technology, Hany Ali Ansary - King Saud University, Sheetal Iyer - Georgia Institute of Technology

**Technical Presentation Only: ES2021-63165 - A Novel Composite Material of Mg2+-Doped Caco3 / Peg Composites**

Authors: Jason Woods - National Renewable Energy Laboratory, Waleed Alnooni - National Renewable Energy Laboratory, Alex Bulk - National Renewable Energy Laboratory

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**Technical Paper: ES2021-62529 - Proposed Design and Integration of 1.3 MWt Pre-Commercial Demonstrator Particle Heating Receiver Based Concentrating Solar Power Plant**

Authors: Muhammad Saifur - Georgia Institute of Technology, Sheldon Iyer - Georgia Institute of Technology, Ryan Young - Georgia Institute of Technology, Hany Ali Ansary - King Saud University, Kento Repeco - Georgia Institute of Technology, Shaker Al-Awd - King Saud University, Mahdi Qaisi - National Laboratories, Bradley Miller - Sandy National Laboratories, Richard D. Ho - Sandy National Laboratories

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**Technical Paper: ES2021-62597 - Maximizing Wind Turbine Efficiency by Using Switching Multiple-Model Predictive Control**

Authors: Abhishek Mehta-Desai - HST University, Arvind Famani - HST University, Demas De Kooning - HST University, Guillaume Crevecoeur - HST University

**Technical Paper: ES2021-62605 - Sensitivity Analysis of the Levelized Cost of Electricity for a Particle-Based CSP System**

Authors: Luis F. Gonzalez-Portillo - Universidad Politecnica de Madrid, Kevin Albrecht - Sandy National Laboratories, Jeremy Sones - Sandy National Laboratories, Cray Beltran - Sandy National Laboratories, Clifford K. Ho - Sandy National Laboratories

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Authors: Taekyoung Kim - University of Wisconsin-Green Bay, Kiwon Kwon - National Renewable Energy Laboratory, Dongsu Kim - Hanbat National University, Byeongho Yu - Mississippi State University, Xin Shi - Lehigh University, John Shingledecker - Electric Power Research Institute, Michael Keller - The University of Texas, Todd Chorzak - The University of Texas


Authors: Sang Hun Yeon - Korea University, Won Hee Kang - Korea University, Johnathan Perez - Sandia National Laboratories, Hohyun Lee - Santa Clara University, Michael Maxey - Sandia National Laboratories, Ryan Yeung - Georgia Institute of Technology, Kenzo Konishi - The University of Tokyo, Michael Reiner - Georgia Institute of Technology, Philipp Böhm - Sandia National Laboratories

**Technical Presentation Only: ES2021-63161 - Corrosion Mitigation of Stainless Steel Alloys in Molten Chloride Salt Blend for Concentrated Solar Power Applications**

Authors: Animesh Kundra - Lehigh University, Sreyda Duta - Dynalene, Inc.
DAY 2 - THURSDAY, JUNE 17

Room 1: National Lab Panel - Moderator, Mike Wagner, University of Wisconsin-Madison
Panelists: Dr. Mark Messner, Aronne National Laboratory, Dr. Judith Vidal, National Renewable Energy Laboratory, Dr. Paul Talbot, Idaho National Laboratory, Dr. Kenneth Armijo, Sandia National Laboratory

Room 2: Keynote - Dr. Jenny Yan, Royal Institute of Technology (KTH) and Mälardalen University (MDH), Sweden - Introduction by Heejin Cho
Energy Transition Towards Carbon Neutrality: Challenge and Opportunities

Session Chair: John Shigley, Electric Power Research Institute
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<tr>
<td>Authors: Yang Chen - Oak Ridge National Laboratory, Ahmad Abu-Hebba - Oak Ridge National Laboratories, Saiti Kowsar - University of Tennessee, Knoxville, Cheng Liu - Oklahoma State University, Guodong Liu - Oak Ridge National Laboratory, Michael Sturin - Oak Ridge National Laboratory, Brennan Smith - Oak Ridge National Laboratory, Ayoush Moemen - Oak Ridge National Laboratory</td>
<td>Authors: A. H. Tarrad - University of Lorraine</td>
<td>Authors: Abdulrahman Shaik - Khafalia University, Ali Al-Ash - Khafalia University, Saeed Alahmash - Khafalia University</td>
<td>Authors: Nathan Schreuder - Sandia National Labs, Hendrik Lautscher - Sandia National Labs, Clifford Ho - Sandia National Labs, Bradley Mills - Sandia National Labs</td>
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<td>Authors: Anders Carlson - Washington University</td>
<td>Authors: Robert Garber-Schlagt - National Renewable Energy Laboratory</td>
<td>Authors: R. U. Roy - North Dakota State University, Adam Glad - North Dakota State University, Sarah Lavalle - North Dakota State University, Jeremy Kienz - South Dakota Game, Fish, and Parks</td>
<td>Authors: Jesse Ortega - University of New Mexico, Guillermo Ana - University of New Mexico, Peter Vossbiff - University of New Mexico, Clifford Ho - Sandia National Labs, Gaurahm Mohan - University of New Mexico</td>
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<td>Authors: Grant Bunter - National Renewable Energy Laboratory, Nicole Tavorna National Renewable Energy Laboratory, Michael Rassol - National Renewable Energy Laboratory, Lea Huggins - National Renewable Energy Laboratory, Jim Wann - National Renewable Energy Laboratory, Paoli Bratich - Upflow, Andrea Blair - Upflow</td>
<td>Authors: Terence Muho - West Virginia University, Daniel Hard - Sustainable Engineering LLC, Roy Min - Minn GeoHydro Inc, Nigal Clark - West Virginia University</td>
<td>Authors: Jesse Ortega - University of New Mexico, Clifford Ho - Sandia National Labs, Guillermo Ana - University of New Mexico, Peter Vossbiff - University of New Mexico, Goaahm Mohan - University of New Mexico</td>
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<td>Authors: Wei Huang - Mississippi State University, Eric Milton - Mississippi State University, Kevin Randhir - Michigan State University, Joes Petrich - Michigan State University, James Klassen - Michigan State University, Nick Huyoung - Oregon State University, Sile Li - Mississippi State University</td>
<td>Authors: Markus Rechert - German Aerospace Center - Institute of Solar Research, Martha Heinzl-Von Puttkamer - German Aerospace Center - Institute of Solar Research, Reinhard Back - German Aerospace Center - Institute of Solar Research, Robert Pitz-Paal - German Aerospace Center - Institute of Solar Research</td>
<td>Authors: Terence Muho - West Virginia University, Daniel Hard - Sustainable Engineering LLC, Roy Min - Minn GeoHydro Inc, Nigal Clark - West Virginia University</td>
<td>Authors: Michael Wagner - University of Wisconsin-Madison, Jacob Serkhoff - University of Wisconsin-Madison</td>
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Room 1: ES Awards - Moderators: Heejin Cho and Nesrin Ozalp