SolarPACES 2021 Online Conference Program *All times are shown in UTC!*

Wednesday, September 29

10:30 WED-1A: Receivers and Heat Transfer Media and Transport: Point Focus Systems

Chair: Wesley Stein, CSIRO

10:30 Innovative 3D-Shaped Structures as Volumetric Absorbers
Robin Tim Broeske, German Aerospace Center, Institute of Solar Research

10:45 MW-Scale Fluidized Particles-in-Tube Solar Loop at Themis Tower. Implementation and Commissioning
Gilles Flamant, CNRS

11:00 A Non-Intrusive Optical (NIO) Method to Measure Optical Errors of in-situ Heliostats in Utility-Scale Power Tower Plants: Characterizing Utility-Scale Power Plants
Tucker Farrell, National Renewable Energy Laboratory

11:15 VoCoRec - a Novel Two-Stage Volumetric Conical Receiver
Matthias Offergeld, German Aerospace Center (DLR), Institute of Solar Resarch

10:30 WED-1B: Advanced Materials, Manufacturing, and Components

Chair: Cristina Prieto (University of Seville)

10:30 Mitigation of Fabrication Risks in a Micro-Pin Supercritical Carbon Dioxide Solar Receiver
Bryan Siefering, Oregon State University

10:45 Mitigation of Stress Relaxation Cracking in Hot Thermal Energy Storage Tank Welds
Timothy Pickle, Colorado School of Mines

11:00 Performance of A High-Temperature Particle-Based Shell-And-Tube Crossflow Heat Exchanger Suitable for CSP Power Generation Application
Hany Al-Ansary, King Saud University

11:15 The Potential of Refractory Alloys for Solar Applications
Ludovic Charpentier, PROMES-CNRS

11:30 Properties of Silicon Carbide Fiber Composite Receiver Tubes Manufactured by PIP Process
Farhad Mohammadi-Koumleh, Ceramic Tubular Products

11:45 Secondary Reflectors Tested at High Temperatures and High Radiation Intensities
Sophie Gledhill, Fraunhofer Institute for Solar Energy Systems

10:30 WED-1C: Analysis and Simulation of CSP and Hybridized Systems

Chair: Giampaolo Manzolini (Politecnico di Milano)

10:30 Accelerating Raytracers for Central Receiver Systems using a GPU
Pascal Richter, RWTH Aachen University

10:45 Aim Point Management System
Laurin Oberkirsch, Institute of Solar Research, German Aerospace Center (DLR)

11:00 Towards a Neural Network Based Flux Density Prediction – Using Generative Models to Enhance CSP Raytracing
Max Pargmann, German Aerospace Center

11:15 Static Optimal Control: A Closed-Loop Control Strategy for Heliostat Aiming in Solar Power Towers
David Zanger, German Aerospace Center (DLR)

10:30 WED-1D: Receivers and Heat Transfer Media and Transport: Linear Systems

Chair: Eduardo Zarza (Plataforma Solar de Almeria)

10:30 Development of an Equivalent Porous Medium Model for a Tubular Receiver Equipped with Raschig Rings
Hossein Ebadi, Dipartimento Energia "Galileo Ferraris"

10:45 Heat Capacity of Molten Solar Salt
Christian Jung, DLR

11:00 Hydrogen Mitigation Performance at Nevada Solar One
Greg Glatzmaier, National Renewable Energy Laboratory

11:15 Jumbo-Reflectors: A Solution for Further Reduction of LCOE for Parabolic Trough Collectors
Francisco Torres Sartori, Fraunhofer Institute for Solar Energy Systems ISE

11:30 Numerical Investigation of a Trapezoidal Cavity Multi-tube Receiver for a Linear Fresnel Collector
Sergio Alcalde-Morales, CIEMAT - Plataforma Solar de Almería

12:30 *Break - Visit our Sponsors*

13:00 Plenary: Heat Transfer Fluids

Chair: Athanasios Konstandopoulos, Aristotle University

1 Progress in the Development of Molten Salt
Thomas Bauer, German Aerospace Center

2 Silicone-based Heat Transfer Fluids - Overcoming the Thermal Limits of Parabolic Trough Plants with Bankable Systems
Erich Schaffer, Wacker Chemie AG

3 Particle-Based CSP: A Step Closer to Commercialization
Hany Al-Ansary, King Saud University

4 Sodium HTF - driving deployment by unlocking modular tower CSP, and future-proofed for high temperature applications
Craig Wood, Vast Solar

5 Development of SCO2 Power Cycles and Its Relevance to CSP
Jeff Moore, Southwest Research Institute

15:00 *Break - Visit our Sponsors*

15:30 WED-2A: Receivers and Heat Transfer Media and Transport: Point Focus Systems

Chair: Clifford Ho (Sandia National Laboratories)

15:30 Lessons Learnt from Permitting Process of the HiFlex Project
Miriam Ebert, DLR

15:45 A Numerical Radiation Model for Centrifugal Particle Solar Receiver
Serdar Hicdurmaz, DLR Institute of Solar Research

16:00 Numerical Simulation of Convective Heat Transfer Coefficient in Wire Mesh Absorbers with 0.1 mm wire diameter
Daniel Sanchez-Señoran, CIEMAT-PSA

16:15 Thermal Performance Analysis of a Scaled-up Suspension Flow Receiver for Generation of Industrial Process Heat: A Computational Study
Daniel Ang, The University of Adelaide

15:30 WED-2B: Thermal Energy Storage Materials, Media, and Systems

Chair: Nicolas Calvet (Masdar Institute)

15:30 Numerical Analysis and Design Optimization of an Innovative Radial Flow Packed Bed Thermal Energy Storage
Silvia Trevisan, KTH Royal Institute of Technology

15:45 Progress on Molten Nitrate Salt Storage Above 600 °C
Alexander Bonk, German Aerospace Center (DLR)

16:00 A Simply Method to Determine the Thermal Capacity of Fillers for Sensible Heat Thermal Storage Under Operating Conditions
Elisa Alonso, CIEMAT-PSA

16:15 Steady & Transient Heating & Cooling Analysis for High-Temperature Chloride Molten Salt Storage Tanks
Kenneth Armijo, Sandia National Labs

15:30 WED-2C: Analysis and Simulation of CSP and Hybridized Systems

Chair: Marco Binotti (Politecnico di Milano)

15:30 A Comparison Between Model Predictive and PID-Based Control of a Molten Salt Solar Tower Receiver
Rudolf Popp, Institute of Automatic Control, RWTH Aachen University

15:45 Model Predictive Assistance for Operational Decision Making in Molten Salt Receiver Systems
Christian Schwager, Solar-Institut Jülich, FH Aachen University of Applied Sciences

16:00 Fast Heuristics for Receiver Life Estimation and Design
Bipul Barua, Argonne National Laboratory

16:15 Evaluating the Thermal Efficiency of Multistage Falling Particle Receiver Subject to Wind
Jae Bok Lee, Sandia National Laboratories

16:30 Model Validation of Falling Particle Receivers with On-sun Experiments
Brantley Mills, Sandia National Laboratories

16:45 Sensitivity Analysis of Moving Packed Bed Heat Exchanger Models
Christopher Bowen, Sandia National Laboratories

15:30 WED-2D: Measurement Systems, Devices, and Procedures

Chair: Marc Röger (German Aerospace Center / DLR)

15:30 Automated Optical Analysis of Parabolic Trough Concentrating Solar Collectors Using Deep Learning and Computer Vision
Devon Kesseli, National Renewable Energy Laboratory

15:45 Distortion Effects in CSP Mirror Reflections
Randy Brost, Sandia National Laboratories

16:00 A Non-Intrusive Optical (NIO) Method to Measure Optical Errors of in-situ Heliostats in Utility-Scale Power Tower Plants: Overall Progress and Field Test
Guangdong Zhu, National Renewable Energy Laboratory

16:15 Rapid In-situ Metrology of a Heliostat Field using Starlight
Roger Angel, Steward Observatory, University of Arizona

17:30 Poster Session 3

L - Solar Fuels and Chemical Commodities | M - Solar Industrial Process Heat and Thermal Desalination | N - Solar Resource Assessment | O - Thermal Energy Storage Materials, Media, and Systems

L-01 Effect of Heating Rate on Thermochemical Pyrolysis of Spent Coffee Ground in a Windowed Internally-Circulating Fluidized Bed Reactor
Nobuyuki Gokon, Niigata University

L-02 Temperature Impacts on Reactivity of La0.7A0.3Mn0.9Cr0.1O3 of Perovskite Oxides in a Thermochemical Two-step H2O/CO2 Splitting
Nobuyuki Gokon, Niigata University

L-03 Thermochemical Two-step H2O/CO2 Splitting Using La0.7Sr0.3XO3 of Perovskite Oxides for Solar Fuel Production
Nobuyuki Gokon, Niigata University

L-04 Thermal Study of a Liquid Metal Reactor for Methane Cracking
Angel Martínez-Rodríguez, Universidad Politécnica de Madrid

L-05 A New Hybrid Solar/Electric Reactor for Gas or Liquid Media Methane Pyrolysis
Malek Msheik, PROMES/CNRS

L-06 Development Of An Accelerated Ageing Method For Solar Receiver' Materials In Solar Chemical Reactors
Alfonso Vidal, CIEMAT-PSA

M-01 Numerical Study on Multi-effect and Multi-stage NH3/H2O Absorption Chillers for Negative Cooling in SHIP Systems
Fabio Aste, CEA - Atomic Energy and Alternative Energies Commission

M-02 Thermal Losses Characterization for the Receiver of the SunDial, the Rotary Fresnel Collector
Antonio J Rovira, Universidad Nacional de Educación a Distancia (UNED)

M-03 Dynamic Analysis of the SunDial, the Rotatory Fresnel Collector
Magdalena Barnetche, Universidad Politécnica de Madrid

M-04 Feasibility Analysis of an Industrial Turbocharged Solar Air Heater Using Linear Fresnel Collectors
Antonio Famiglietti, Universidad Carlos III de Madrid

M-05 Design and Integration of a Solar Heat System Based on the SunDial Collector for Industrial processes
Mercedes Ibarra, Universidad Nacional de Educación a Distancia (UNED)

M-06 Effect of Solar Field Thermal Energy Variability on the Output of a Multiple Effect Desalination System Coupled with Thermal Storage
Kranthi Jonnalagadda, Cranfield University

N-01 Validation of HelioClim-3-derived Solar Radiation Products in Arid Desert Conditions
Dunia Bachour, QEERI

N-02 Comparison between Measured and Calculated DNI for Various Cities in Saudi Arabia
Abdelrahman Elleathy, King Saud University

N-03 Performance Comparison of Direct Solar Radiation Separation Model in South Korea
Myeongchan Oh, Korea Institute of Energy Research

O-01 Experimental Investigation of an Air-Tight Thermal Storage Tank Design Suitable for Particle-Based CSP Systems
Hany Al-Ansary, King Saud University

O-02 Thermodynamics of Fe-doped magnesium manganate for thermochemical energy storage
Alicia Bayon, Arizona State University

O-03 Optimization of an Innovative Thermal Energy Storage System based on the Combination of Latent and Sensible Heat Storage for Molten Salts CSP Plants
Fritz Zaversky, CENER

O-04 Thermo-Fluid-Dynamic Modelling and Optimization of an Indirect Molten-Salt Thermocline Energy Storage System
Mattia Cagnoli, Politecnico di Torino

O-06 Energy Evaluation of Different Materials with Low Melting Point for Solar Thermal Storage
Mauro Henriquez, Universidad de Antofagasta, Centro de Desarrollo Energético

O-07 Evaluation of Thermal Storage Technologies for the Use of Electrical Energy Discharges in the Northern Macrozone of Chile
Mauro Henriquez, Universidad de Antofagasta, Centro de Desarrollo Energético

O-08 Defining a Business Model for Utility-Scale Thermal Energy Storage – Value Proposition, Needs, and Opportunities
Hendrik Laubscher, Sandia National Laboratories

O-09 Thermal Hydraulic Static Operation of a Chloride Molten Salt Shut-Off Valve
Dimitri Madden, Sandia National Laboratories

O-10 New Material Solutions from Saint-Gobain for Thermal Energy Storage
Samuel Marlin, Saint-Gobain CREE

O-11 Transient System Analysis of a Gen3 Particle-Based CSP Plant with Spatially Resolved Thermal Storage Charging and Discharging
Kaden Plewe, The University of Texas at Austin

O-12 Thermal Water-Steam Storage for CSP: Modeling and Identification of Liquid Level Fluctuations during Unloading Phases
Edouard Butaye, PROMES-CNRS

O-13 Carbonation Reaction of the CaO-Mayenite System: Kinetic Analysis at Different CO2 Partial Pressures
Luca Turchetti, ENEA

O-14 Nanofluids Specific Heat Capacity: a Sampling Study.
Adela Svobodova-Sedlackova, Universitat de Barcelona

O-15 Experimental Study of the Impact of Fluid Distribution on Thermocline Storage Performance
Ségolène Vannerem, PROMES-CNRS

O-16 Design and Development of a Cold Prototype Pressurized Fluidized Bed Heat Exchanger for Discharging Thermal Energy in a Long-Duration Particle Thermal Energy Storage System
Xingchao Wang, Colorado School of Mines and National Renewable Energy Laboratory