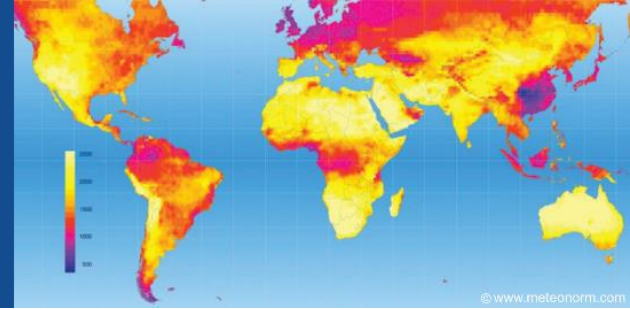


September 27 - October 1, 2021
Online Event

27th SolarPACES Conference



SolarPACES 2021 Online Conference Program

All times are shown in UTC!

Thursday, September 30

10:30 THU-1A: Solar Collector Systems

Chair: Gerhard Weinrebe (sbp sonne gmbh)

10:30 Design and Optimisation of A Particle-based Concentrating Solar Power System with A Cascaded Multi-aperture Receiver

Ye Wang, Australian National University

10:45 Heliostat Edge-Mounted Devices for Wind Load Reduction

Matthew Emes, The University of Adelaide

11:00 Quantification of Canting Errors: Technique Combining Camera Vision with Theoretical Modeling

Alberto Sánchez-González, Universidad Carlos III de Madrid

11:15 Reduction of Operating and Stow Wind Loads on Heliostats Using Fences

Azadeh Jafari, University of Adelaide

11:30 Solar Mirrors Coatings Contribution Under Arid Climate and Different Exposure Conditions

Sara Lakhoul, Moroccan Foundation for Advanced Science, Innovation and Research

11:45 A Non-Intrusive Optical (NIO) Method to Measure Optical Errors of in-situ Heliostats in Utility-Scale Power Tower Plants: Calculating Two-Dimensional Slope Error of Heliostats

Rebecca Mitchell, NREL

10:30 THU-1B: Measurement Systems, Devices, and Procedures

Chair: Marc Röger (German Aerospace Center / DLR)

10:30 High-Speed In-Situ Optical Scanning of Heliostat Fields

Randy Brost, Sandia National Laboratories

10:45 Validation of a Heliostat Characterization System Based on Cameras and Light Detectors to Measure the Heliostat's Beam and its Surface Error

Iñigo Les, CENER

11:00 Proof of Concept: Real-time Flux Density Monitoring System on external Tube Receivers for Optimized Solar Field Operation

Cristian Raeder, German Aerospace Center (DLR), Institute of Solar Research

11:15 Segregation of Influences on Flexible Pipe Connectors (REPA) Force under Field Operation Condition for Parabolic Trough Collector Plants

Guillaume Saliou, CIEMAT - Line-focus Concentrating Solar Thermal Technologies Unit

11:30 Testing of concentrating tracking solar thermal collectors

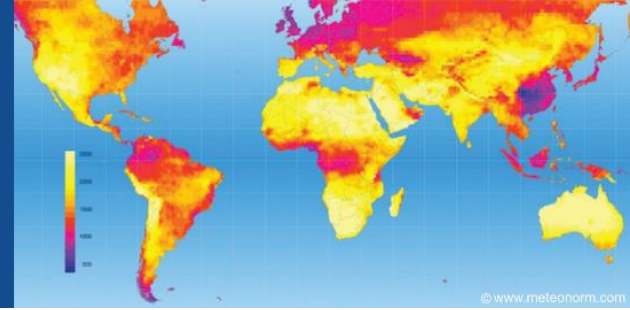
Fabienne Sallaberry, CENER

11:45 Comparison of Different Testing Methods for a Fresnel Linear Reflector Collector according to Standard Draft IEC PT 62862-5-2

Fabienne Sallaberry, National Renewable Energy Centre

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

Chair: Giampaolo Manzoloni (Politecnico di Milano)

- 10:30 Optimisation of Particle-based CSP Peaker Plant Configuration with Optimal Dispatch Strategy
Philipe Gunawan Gan, The Australian National University
- 10:45 Heat Loss Quantification in the First Integrated Gas-Turbine Particle-Based Power Tower Facility at King Saud University
Hany Al-Ansary, King Saud University
- 11:00 Techno-Economic Performance Analysis of a CSP-Driven CCGT with Stratified TES at Various DNI Levels and Demand Conditions Based on Transient Simulation
Shahab Rohani, Fraunhofer Institute for Solar Energy Systems ISE
- 11:15 Techno-economic Analysis of an Air-driven Concentrating Solar Power Plant with Particle storage and supercritical CO₂ Power Block
Salvatore Guccione, KTH Royal Institute of Technology
- 11:30 Thermodynamic Analysis of a Hybrid PV-Particle Based sCO₂ Concentrating Solar Power Plant
Salvatore Guccione, KTH Royal Institute of Technology

10:30 THU-1D: Operations, Maintenance, and Component Reliability

Chair: Luca Imponenti (Solar Dynamics)

- 10:30 Anomaly Detection for Parabolic Trough Power Plants with Density-based Outlierness
Josua Braun, DLR - Institute of Solar Research
- 10:45 Artificial Soiling Method and Test-Rig for Solar Power related Research
Herbert Merkle, Cranfield University
- 11:00 Geometric Optimization of an Electrochemical Purification Cell to Prevent Corrosion in CSP Plants During Operation
Kerry Rippy, National Renewable Energy Laboratory
- 11:15 Heliostat Drift Correction by Parametrized Analysis
Alejandro Martinez Hernandez, IMDEA Energy
- 11:30 Identification of Soiling Properties for Different Minerals on Solar Mirrors via Artificial Aging Setup
Florian Wiesinger, DLR
- 11:45 Plasma Treatment for Anti-Soiling and Increased Washing Efficiency for Water Consumption Reduction in Concentrating Solar Power Applications
Katherine Gobey, Cranfield University

12:30 *Break - Visit our Sponsors*

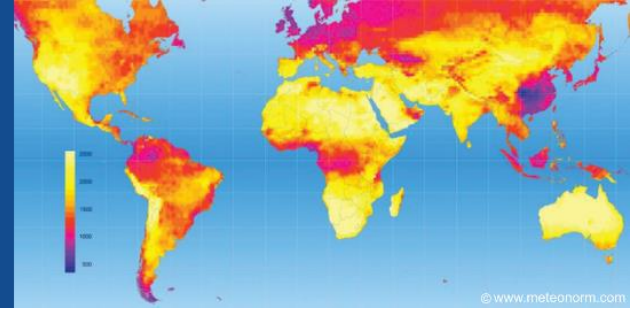
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SolarPACES
Solar Power & Chemical Energy Systems



13:00 Plenary: Solar Field Optimization

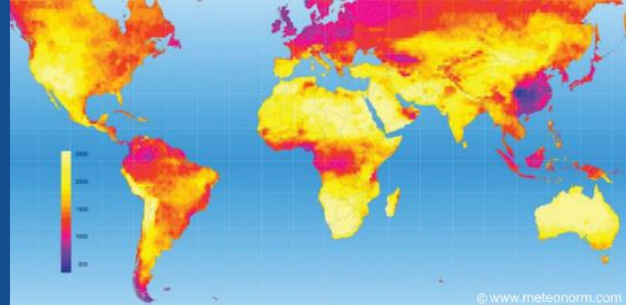
Chair: Joe Coventry (Australian National University)

- 1 Designing the first commercial Stellio heliostat field - some considerations on field layout, optimization and control
Fabian Gross, sbp sonne
- 2 HelioCon: US Heliostat Consortium to advance low-cost, high-performance heliostat technologies with optimized operation and maintenance (OM)
Guangdong Zhu, NREL and Margaret Gordon, SANDIA
- 3 Control systems and optimization for obtaining a desired flux distribution in solar tower power plants
Jose Domingo Alvarez, University Almeria
- 4 Co-optimisation of heliostat field and receiver designs for the NREL/ASTRI Gen3 Liquids pathway
Charles-Alexis Asselineau, Australian National University

15:00 *Break - Visit our Sponsors*

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15:30 THU-2A: Solar Fuels and Chemical Commodities

Chair: Ellen Stechel (Arizona State University)

- 15:30 Comparative Performance Evaluation of Solar-Driven Methane Reforming with ZnO for Co-Production of Syngas and Metallic Zn
Srirat Chuayboon, King Mongkut's Institute of Technology Ladkrabang, Prince of Chumphon Campus
- 15:45 Regenerating Metal Fuels through the Carbothermal Reduction of Magnesia and Alumina using Concentrated Solar Energy
Youssef Berro, PROMES UPR 8521 CNRS
- 16:00 Rate Limiting Mechanism(s) Determination of $\text{SrFeO}_{3-\delta}$ and $(\text{Ba},\text{La})_{0.15}\text{Sr}_{0.85}\text{FeO}_{3-\delta}$ Perovskite Reduction/Oxidation Reactions for Air Separation via Two-step Solar Thermochemical Cycles
Nhu P. Nguyen, Georgia Institute of Technology
- 16:15 Economic Weekly/Seasonal Thermochemical and Chemical Energy Storage for Advanced Power Cycles: An Overview
Ellen B. Stechel, Arizona State University
- 16:30 Design and Operation of Reactors for Solar Thermochemical Air Separation for Ammonia Synthesis
H. Evan Bush, Sandia National Laboratories
- 16:45 Thermal Analysis of a Multi-Tubular Cavity Thermochemical Solar Reactor
Hernando Romero-Paredes Rubio, Universidad Autónoma Metropolitana Iztapalapa
- 17:00 Labyrinth Reactor: Next Generation Thermochemical Reactor for Continuous Flow Countercurrent Water/ CO_2 Splitting
Ivan Ermanoski, Arizona State University

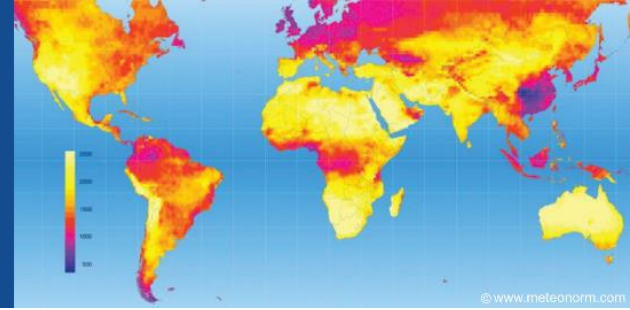
15:30 THU-2B: Power Cycles

Chair: Markus Haider (Technische Universität Wien)

- 15:30 Adoption of CO_2 Mixtures as Working Fluid for CSP Cycles with Linear Collectors and Molten Salts as HTF
Ettore Morosini, Politecnico di Milano
- 15:45 Polygeneration based on a Solar-Only Micro Gas Turbine with a Novel Power Management System
Francesco Rovense, Rey Juan Carlos University

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

Chair: Marco Binotti (Politecnico di Milano)

15:30 Optimization Design and Dynamic Simulation of Supercritical Carbon Dioxide Solar Thermal Power Generation System

Feng Hu, University of Chinese Academy of Sciences

15:45 PV-CSP Hybrid Power Plants: Least Cost Design and Cost Savings by Close Coupling

Jürgen Dersch, DLR Institute of Solar Research

16:00 CSP-PV Hybrid Plants: Multi-Objective Optimization of Plant Design

Felix Zimmermann, Suntrace GmbH

16:15 Small-Scale CSP Plants for Decentralized Power Production Using Piston Steam Engines

Aiko Bernehed, German Aerospace Center - Institute of Solar Research

16:30 The Role of the CSP in the Green Hydrogen and Ammonia Industry

Carlos Mata, Pacific Green Solar Technologies

16:45 Minimizing Water Consumption of a CSP Plant, by Using an Optimization Algorithm for Cooling Operation

Matthias Loevenich, Institute of solar research, German Aerospace Center (DLR)

15:30 THU-2D: Operations, Maintenance, and Component Reliability

Chair: Bruce Kelly (Solar Dynamics)

15:30 On-sun Experiments on Various Particulate Materials Flowing through Obstructed Particle Heating Receiver for Solar Power Tower Systems

Eldwin Djajadiwinata, King Saud University

15:45 In-field Analysis of Microscopic Degradation of Solar Reflectors

Johannes Wette, Ciemat-PSA

16:00 Particle Effect in a Very-High Concentration Solar Field

Ricardo Conceição, IMDEA Energy

16:15 Impact of Industrial Environments on Solar Reflectors Performance

Alejandro García-Segura, DLR

16:30 Real-time Heliostat Field Aiming Strategy Generation for Varying Cloud Shadowing using Deep Learning

Sipei Wu, Zhejiang University

16:45 Using All Sky Imager to Control the Solar Field of a Parabolic Trough Power Plant – Implementation Steps for Commercial Application

Tim Kotzab, DLR e. V.