

סמינר - SEMINAR

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 24.05.2021 בשעה 14:30 באמצעות הזום: <https://technion.zoom.us/j/98619566279>

מרצה:

Miguel Angel Reyes Belmonte, PhD

Department of Chemical and Energy Technology
Rey Juan Carlos University, Madrid

על הנושא:

The role of Concentrating Solar Energy in the renewable energy transition

The seminar will be delivered in English

להלן תקציר ההרצאה:

The important cost reduction, seen for renewable energy technologies, together with the improved conversion efficiency based on new components and materials advances and the appearance of smart-grid technologies has led to a revolution in the energy paradigm. This new energy scenario has caused an inflated penetration of non-dispatchable renewable energy sources (solar photovoltaics and wind power) into the generation mix. In that context, concentrating solar energy can pave the way to the renewable energy transition while meeting user demands of the lowest electricity cost.

This presentation will provide an overview of the concentrating solar energy solutions for future energy systems. Highly efficient options for electricity power generation (e.g. supercritical power cycles, high temperature Brayton cycles, Combined Cycles) will be discussed. The latest findings and simulation results on high temperature particle receiver technologies for solar receiver applications will be presented along with our recent research activities in solar power plant flexible dispatch operation and polygeneration applications. The implementation of 850 °C dense particle suspension as the primary thermal energy source and storage medium for 150 MWe solar combined cycle was successfully modelled. The higher working temperature of particles novel heat transfer fluid allows for more efficient thermodynamic cycles for power generation. We showed that dense particle suspensions can replace natural gas for state-of-the-art integrated solar combined cycle or traditional molten salts for medium temperature Rankine solar power cycles. Besides, particles can provide to a full power dispatch control by decoupling the intermittent and unpredictable solar energy harvesting to the desirable grid power demand.

The optimal solar power plant sizing and operating conditions selection (e.g., receiver sizing, storage strategy, turbomachinery selection) for medium and low power demonstrators need to be further investigated. A detailed outline of the proposed research activities on polygeneration solar energy systems for cooling, heating and power for the next generation of solar power plants will be provided.

מארח: פרופ' מיכאל שפירא

בברכה,

פרופ' איתי סאס

מרכז הסמינרים