Free training course for CSP professionals on

Central receivers: optics of heliostats fields

Announcement and call for applications

**Location:** Font Romeu Odeillo, France – CNRS

**Date:** July 8-12th, 2019

**Target group:** The course is for engineers, researchers and representatives from European CSP industry and companies who want to be trained on real CSP hardware. Language: English

**Objective:** This course focuses on central receivers plants and their optics. The training consists of both theoretical and practical modules.

**Trainers:** Scientists and specialists from CNRS-PROMES, Fraunhofer ISE, and DLR.

The course will include theoretical and practical modules covering the following topics:

- **Central receivers technologies and qualification:** Typical thermodynamic processes for electricity and material production; storage technologies for solar tower; metrology of their power measurement; infrared receiver temperature measurement using UAV (drones).

- **Heliostats fields design and operation:** Heliostat field design optimisation techniques and constraints such as latitude influence; raytracing software and design tools for heliostats fields; training with the free Solstice raytracing software; practical test case: visit of the wireless field of the solar tower Thémis at Targassonne; practical test case: visit of the wired field of the Solar Furnace at Odeillo.

- **Characterisation of heliostats fields:** Optical quality determination techniques (photogrammetry, deflectometry); demonstration of the optical calibration of solar tower heliostats; power distribution and aiming characterisation techniques.
SFERA-III: Training on Central receivers

**Detailed Agenda (provisional)**

**Monday, 8 July 2019**

Welcome dinner between participants and trainers offered by CNRS.

**Tuesday, 9 July 2019**

Morning:
- Presentation of the SFERA-III programme
  D. Benitez from DLR and E. Guillot from CNRS
- Processes and Storage for Central Receivers Systems
  G. Flamant CNRS

Afternoon:
- Metrology and uncertainties
  E. Guillot CNRS
- Flux measurements
  E. Guillot and B. Grange CNRS
- Design aspects of future hybrid plants: PV, gas…
  A. Heimsath Fraunhofer

**Wednesday, 10 July 2019**

Morning:
- Raytracing software and design tools for heliostats fields
  First part: DLR. Second part: A. Heimsath Fraunhofer
- Heliostats fields, understanding the influence of latitude: surrounding versus north fields
  A. Heimsath Fraunhofer

Afternoon:
- Infrared temperature measurements from a flying drone
  A. Legal CNRS
- Training with Solstice Raytracing software
  C. Caliot CNRS

**Thursday, 11 July 2019**

SFERA-III: Solar Facilities for the European Research Area

The EU-funded research project - SFERA - aims to boost scientific collaboration among the leading European research institutions in solar concentrating systems, offering European research and industry access to the best research and test infrastructures and creating a virtual European laboratory. Grant agreement 823802, funded under H2020-INFRAIA-2018-1.

https://sfera3.sollab.eu/
Morning at Themis solar tower site (Y. Volut & al CNRS):

- Visit of the facility.
- Demonstration of the heliostats field operation.
- Demonstration of heliostats optical measurement. 
  A. Heimsath Fraunhofer
- Heliostat and facility maintenance overview.

Afternoon at Odeillo big solar furnace site (E. Guillot & al CNRS):

- Visit of all the solar facilities: small solar furnaces, parabolic trough.
- Demonstration of the heliostats field operation.
- Heliostat and facility maintenance overview.

Friday, 12 July 2019

Goodbye coffee at the big solar furnace, last questions and week closeup.
You can start your trip around 10:00.

Application Deadline:

The registration deadline is May 24th, 2019 on a first-come, first-serve basis. Class size is limited to 15 participants. Eligible candidates will be informed until May 31st, 2019. The maximum number of participants per company is two.

Fees:

No course fee is requested. Accommodation, meals and travel costs shall be covered by the participant.

We suggest booking in one of the following hotels in Font-Romeu-Odeillo-Via: Grand Tetras Hotel (40 min. walking distance) or Hotel l'Oustalet (10 min. walking distance).

All lunches are proposed at the laboratory’s restaurant (14,12 € including drinks).

Contact:

For further information, please contact: Daniel Benitez (DLR)  
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To apply, please fill out the application form found in https://sfera3.sollab.eu/wp-content/uploads/2019/04/Application_Form_for_Training_Course_Registration_2019-1.pdf and send it to: anja.kruschinski@dlr.de

For information: the CNRS-PROMES laboratory invites you to the 50 years of the Big Solar Furnace, starting by fireworks and a sound and light show on Saturday 13th July evening.