



## SFERA III

# 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: Solar Facilities for the European Research Area

<https://sfera3.sollab.eu/>

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.



# 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

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 24<sup>th</sup>, 2019 on a first-come, first-serve basis. Class size is limited to 15 participants. Eligible candidates will be informed until May 31<sup>st</sup>, 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)  
Tel.: +34 950273198, email: [daniel.benitez@dlr.de](mailto:daniel.benitez@dlr.de)

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](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](mailto: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 13<sup>th</sup> July evening.*

**SFERA-III:** Solar Facilities for the European Research Area

<https://sfera3.sollab.eu>

*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.*