



Short-term Training for technical staff and scientists

Dynamic Control and Automation of Heliostat Fields for Solar Fuels Production

Location: IMDEA Energía Instituto IMDEA Energía, Avenida Ramón de la Sagra 3, 28935 Móstoles, Madrid, SPAIN

Date: 20th September 2023 in person

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

Course Language: English

Trainers: Scientists and Specialists from IMDEA Energy and external parties

Objective: This course focuses on dynamic control and automation of heliostat fields for solar fuels production. The training consists of both theoretical and practical modules.

The training will include visits to the Very-High Concentration Solar Tower (VHCST) and the laboratory facilities at IMDEA Energy, theoretical and experimental training covering the following topics:

- Concentrated solar power: overview and technologies;
- Compact and very high concentration heliostat fields;
- Solar thermochemical fuel production;
- Dynamic control and automation of heliostat field;
- Control of heliostat fields: Instruction to Supervisory Control And Data Acquisition (SCADA) systems;
- Visit to the research facilities and VHCST at IMDEA Energy;
- Demonstration of the VHCST facility and practical cases.

Application: The **registration deadline is August 18th, 2023**. Eligible candidates will be informed until August 31st, 2022.

Fees: No course fee is applicable. Accommodation and travel costs shall be covered by the participant. Lunch is offered by IMDEA Energy.

Contact: José González-Aguilar (IMDEA Energy), Tel.: +34 917 371 136, E-mail: jose.gonzalez@imdea.org

Participation: To apply, please fill out the application form [here](#) found on SFERA-III website and send it to: jose.gonzalez@imdea.org



About the Lab & Test Field

The [VHCST](#) (Very High Concentration Solar Tower) is located at the premises of IMDEA Energy in Móstoles, Madrid, Spain. The facility was built in 2016 within the framework of the European project H2020 S2L (Sun-to-Liquid) and it has 169 3m² single-facet heliostats, a nominal thermal power of 250 kW, and is able to achieve peak heat fluxes above 4,000 kW/m². Such high solar concentration is possible thanks to the small focal distance of its heliostats, 20 or 30 meters depending on its position in the field, as well as the high packing factor of the field, around 47%. From its commissioning, the facility has been continuously improved incorporating additional equipment and software developments.

Unique optical capabilities and flexible and reliable operation provide this facility to fulfil the high-demanding experimental conditions required in solar fuels production by means of high-temperature solar processes.








Agenda

08:30 – 09:00	Arrival - Welcome coffee at IMDEA Energy and registration	IMDEA Energy	30 min
09:00 – 09:15	Welcome to IMDEA Energy Introduction and goals	J. González-Aguilar (IMDEA Energy)	15 min
9:15 – 10:00	Heliostat fields for high-temperature concentrated solar thermal applications	J. González-Aguilar (IMDEA Energy)	45 min
10:00 – 10:45	Introduction to the very high concentration heliostat field of IMDEA Energy (Sun-To-Liquid)	M. Romero (IMDEA Energy)	45 min
10:45 – 11:00	--- Coffee break ---		15 min
11:00 – 11:30	Heliostat calibrations: current procedures and community advances	C.-A. Asselineau (IMDEA Energy)	30 min
11:30 – 12:15	Control and automation in central receiver plants: overview and state of the art	L. Yebra (CIEMAT/PSA)	45 min
12:15 – 13:00	Control of heliostat fields: Introduction to Supervisory Control And Data Acquisition (SCADA) systems	L. Yebra (CIEMAT/PSA)	45 min
13:00 – 14:00	--- Lunch break ---		60 min
14:00 – 16:30	Visit to the solar field of IMDEA Energy and practical cases	R. Conceição (IMDEA Energy)	150 min
16:30 – 16:45	Closing remarks	J. González-Aguilar (IMDEA Energy)	15 min

MEETING PLACE & ACCOMMODATION

Training place	IMDEA Energy Institute
Address Training Location:	Avenida Ramón de la Sagra, 3. 28935 Móstoles, Madrid, Spain
How to get to the Training place from the airport	<p>In case you would prefer staying in Madrid downtown, you will be able to easily reach IMDEA Energy either by metro or by train (see information below). Please count with about 30 minutes journey each way. The city of Móstoles is located in the South West of Madrid and the Airport Madrid-Barajas is in the North East of the city.</p> <div style="text-align: center;">  </div> <p>IMDEA Energy premises are about 15 to 20 minutes walking distance from the regional train station Móstoles El Soto. It is recommended to follow a path via the Rey Juan Carlos University Campus as shown on the right map above.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div>

	<p>By taxi</p> <ul style="list-style-type: none"> - From the airport to IMDEA Energy or Hotel Ciudad de Móstoles: count with 30 minutes and between 50-60€ - From Madrid centre to IMDEA Energy or Hotel Ciudad de Móstoles: count with 25 minutes and between 25-30€ <p>By public transport</p> <ul style="list-style-type: none"> - From the airport, it is recommended to take the regional train called “Cercanias” and departing from terminal 4 at Madrid Barajas. There is a bus connection between terminal 2 and terminal 4. - In terminal 4, you will have to buy a train ticket to Móstoles El Soto. - From the terminal 4, take the line C1 heading to Atocha Railway Station and get off at Atocha Station. - From Atocha Station, take the line C5 heading to Móstoles EL Soto, which is the final station. Get off there. - It will take you ca. 1:10 hour and cost around 2.70 €. The line C1 to Atocha departs every 30 minutes and the line C5 to Móstoles El Soto departs every 10 minutes. - Timetables for regional train can be consulted here. <p>Alternative route:</p> <ul style="list-style-type: none"> - Atocha Station can be reached with the Express bus airport departing from the airport every 15-20 minutes. The journey to Atocha Station by bus takes ca. 30 minutes depending on the traffic. You will need to purchase separate ticket for the train and the regional train. - Further information on the Express bus airport can be found here. - From Atocha Station to Móstoles El Soto, please follow instructions above.
<p>Accommodation</p>	<p>IMDEA Energy recommends the following hotels:</p> <p><u>Hotel Ciudad de Móstoles (Closest hotel)</u></p> <p>Ctra. Móstoles-Villaviciosa de Odón Km. 0,200; 28931, Móstoles, Madrid Tel: +34 916 140 669, Email: recepcion@h-ciudadmostoles.com http://www.hotelciudadmostoles.es/en</p> <p>Hotel is 10 minutes walk away from IMDEA Energy premises, 8 minutes walk from the train station El Soto and 20 minutes walk from the metro station Universidad Rey Juan Carlos (see map below).</p> <p>Booking can be made by phone or per e-mail. Please provide the booking reference IMDEA Energy to benefit from IMDEA Energy reduced rates:65€ for a single room, breakfast and VAT included 75€ for a double room, breakfast and VAT included</p>

	<p><u>Sercotel Spa La Princesa</u> Carretera M-506 Km. 9, salida Móstoles centro, 28922 Móstoles, Spain https://www.laprincesa.com/ Hotel is about 1.9 km from the train station renfe Mostoles central. From there you may take a train to Mostoles El Soto station to IMDEA Energy. Price about 65 euro per night (breakfast not included)</p> <p><u>Hotel Ibis budget Madrid Alcorcón Móstoles (cheapest option)</u> Travesía de Móstoles nº3 N 40°20'2.75"W 3°51' 14.60, 28921, Alcorcón, Spain http://www.ibis.com/gb/hotel-3201-ibis-budget-madrid-alcorcon-mostoles/index.shtml Hotel is about 1.2 km from train Station of Mostoles Central. From there you may take a train to Mostoles El Soto station to visit IMDEA Energy. Price about 43 Euro per night (breakfast not included)</p> <p><u>Hotel NH Alcorcon (another option)</u> Edificio A, Av. de Europa, 2, 28922 Alcorcón, Madrid, Spain Hotel website : HotelnhAlcorcon From hotel you can take metro at station “Parque Oeste” and get out at the next stop “Universidad Rey Juan Carlos”. From University just cross the campus and the bridge to IMDEA Energy. Prices between 60-80 Euro per night.</p>
<p>Contacts for the Training</p>	<p>José Gonzalez Aguilar (IMDEA Energy) Tel.: +34 917371136 E-mail: jose.gonzalez@imdea.org</p>
<p>Participation confirmation for the Training</p>	<p>SFERA III website : https://sfera3.sollab.eu/events/list/</p>