Cranfield UNIVERSITY

Short course

Concentrating Solar Power (CSP)

26 - 28 March 2014

www.cranfield.ac.uk/sas/solar

Introduction

Cranfield University offers this three-day short course providing an overview of Concentrating Solar Power (CSP) technology with an emphasis on solar collectors, measurement, characterization, and manufacturing. Of the few renewable resources currently available to address the concerns of climate change and the drive for low carbon power generation, decision makers and energy providers are showing greater attention to solar thermal power. Scientists and engineers who are currently engaged in energy and power generation need to be aware of recent global expansion in the building of CSP plants. This offers opportunities for the entire CSP supply chain, including component manufacturing. To meet this need for increased knowledge and understanding of CSP, Cranfield University has organised this specialist training course aimed to provide both theoretical and practical expertise in this rapidly growing technology and its applications.

Course overview

Delivered through a combination of lectures, practical sessions and a group exercise, the course will allow delegates to broaden their knowledge of solar collector designs and solar coating technology, and will provide an overview of all aspects of concentrating solar power technology. It will also encompass CSP applications, giving delegates an awareness of its use for electrical power generation, heating and cooling, water desalination, the provision of industrial process heat, as well as off-grid medium and small scale cooking and water purification for remote regions of the world.

Location and fees

The course takes place in Mitchell Hall on the Cranfield campus. The non-residential fee for the course that includes tuition charges, lecture notes, use of laboratory tools and materials, refreshments, lunches and a course dinner, is £900. Discounts are available.

Who should attend?

The course will be of particular interest to scientists, engineers, managers, technologists, and postgraduate researchers from the energy sector. It will also be valuable to manufacturing and engineering companies, policy makers, investors, research academics, technical professionals, technical staff and non-specialists who wish to gain a better understanding of CSP technology, its opportunities, and its applications.

Course timetable

Day 1 Wednesday	Day 2 Thursday	Day 3 Friday
9.30 - 9.10 Registration	**9.15 - 10.00** Lecture 4: Small and medium scale CSP	**9.15 - 10.15** Lecture 8: Performance measurements and evaluation of CSP power plants
10.00 - 10.30 Introduction	**10.00 - 10.45** Lecture 5: Receiver Tube technology	**10.15 - 11.00** Lecture 9: CSP applications
10.30 - 11.00 Lecture 1: Parabolic trough CSP	**10.45 - 11.15** Break	**11.00 - 11.30** Break
11.00 - 11.15 Break	**11.15 - 12.00** Lecture 6: Thermal storage and power generation	**11.30 - 13.00** Group project: Practical assignment
11.15 - 12.00 Lecture 2: Parabolic Trough -collector characterisation	**12.00 - 13.00** Lecture 7: Solar coatings technology	**13.00 - 14.00** Lunch
12.00 - 13.00 Lecture 3: Heliostats and central receiver systems for CSP	**13.00 - 14.00** Lunch	**14.00 - 16.00** Group project presentation
13.00 - 14.30 Opening of the" Global CSP Laboratory", the UK Centre for Concentrating Solar Thermal Manufacturing	**14.00 - 17.00** Practical session: Parabolic trough collector characterisation	
14.30 - 16.00 14.30-16.00 CSP Lab and Cranfield University Energy Facilities tours	**19.00** Course Dinner	**16.00** Close

Speakers

Dr Christopher Sansom is an internationally recognised authority on CSP, whose current projects include concentrating solar power for electrical power generation, solar collector characterisation and ageing evaluation, polymer films for solar power plant heliostats and line-focus solar collectors, linear Fresnel community scale CSP, heliostat design and manufacture, solar thermal heating and cooling, solar driven desalination and water purification, thermal storage, and nanostructured thermo-electric devices for energy harvesting. Chris is a Member of the International Solar Energy Society (ISES) and the sole UK member of the EERA - CSP Joint Programme.

Dr Peter Turner is the former Head of CSP Technologies at E.ON. He was responsible for the development of technical competency in Concentrated Solar Power plant across E.ON New Build and Technology, including E.ON's CSP R&D and the management of technical support for CSP project development and in supporting engineering operational issues at E.ON's 2x50MW CSP plants. Peter has over 30 years' experience in the power industry and broad experience in Power Engineering and Renewable Energy, Wind and Marine, with specialist knowledge of Concentrated Solar Power, Electrical Machines and Electro-magnetics.

Dr Debabrata Bhattacharyya is leading research in infrared optics and thin film sensing coatings technology. He is currently engaged in developing next generation of "Solar collector coatings based on thermal barrier coatings (TBCs) materials" that addresses the current limitations on high temperature spectral selectivity and solar collector efficiency..

Dr Paul Comley is a Senior Research Fellow in the Precision Engineering Institute at Cranfield. Current research activities include the characterisation of CSP parabolic mirrors, the processing of high power laser optics, and manufacturing technologies for metre-scale optics. Areas of key expertise are metrology, precision machine tools, and cutting/abrasive material removal mechanisms.

Dr Kumar Patchigolla is a Lecturer in Carbon Capture and Storage. His research interests are in advanced carbon capture and storage technologies and thermo-chemical energy conversion for power applications. Dr Patchigolla is responsible for a wide range of energy process facilities, including pilot scale plants for gasification and carbon capture, as well as high pressure flow loop CO2 transport systems.

Dr Xavier Tonnellier is a Research Fellow in Precision Engineering at Cranfield. His current research interests focus on large scale ultra precision surfaces technologies and process development, advanced optical fabrication for space and astronomy, high precision grinding technology, robotic polishing technology and CSP technologies - solar tubes coating technology.

Dr Heather Almond is a Research Fellow in the Precision Engineering Institute at Cranfield. She is currently increasingly involved in CSP, working mainly on sand erosion of the solar collector surfaces. Her previous research experience (over a period of 20 years) has mainly been in the area of advanced manufacturing techniques, including rapid prototyping and manufacture, micro-electro-discharge machining, photochemical machining, electrolytic etching and various micro-engineering projects.

Further information

For details on course content:

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For location and accommodation:

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