



## **NATIONAL CENTRE FOR PHOTOVOLTAIC RESEARCH AND EDUCATION**

Continuing Education Program 2-Day Short-Term Course on

### **“Perovskite Solar Cells”**

#### **Introduction:**

Organic – inorganic hybrid perovskite semiconductors have recently revolutionized the field of low cost, solution-processed photovoltaics. It has garnered world-wide interest due to the tremendously high efficiency numbers in an extremely short time span in comparison to the progress seen in other PV materials. In just 4 years of research, these materials have enabled a rapid progression of solar cell efficiency from 4 to over 22 %, making this technology competitive with traditional silicon solar cells. The materials are also suitable for use in solution -processed lasers and light emitting diodes, which satisfy important criterion “good absorbers are good emitters”. The success of this remarkable class of materials lies in its combination of unique optoelectronic properties. Candidates of this course will be exposed to the understanding of the physics underlying perovskite optoelectronic devices: from material properties to device physics. Useful experimental techniques will be described, and a strong emphasis placed on experimental results from the literature to reflect the rapidly evolving nature of this field. The use of the cells based on perovskites in a tandem architecture with the well-established Si and thin film technologies, along with the challenges and possible solution will be discussed. The concerns of large area and stability, which these materials are plagued with, will also be one of the main highlight of this course.

#### **Course Contents:**

- General Background on PVs
- Introduction to Perovskites Semiconductors
- Charge Generation in Perovskite Semiconductors
- Perovskite as Sensitizer and thin-film material in Solar Cells
- Materials Processing for Perovskite Solar cells
- Characterization Techniques (Basics to advance)
- Design Optimization of Perovskite PVs

- Si-Perovskite Tandem Solar Cells
- Light Emitting Applications
- Summary and Future Outlook

**Hands on sessions:** Hands on sessions will be provided in order to give exposure to advanced methods in materials characterization for their morphological, elemental, optical and electrical properties along with device fabrication and characterization methods.

**Course Coordinator:** Prof. Dipti Gupta and Prof. Dinesh Kabra, NCPRE, IIT Bombay

**Date:** October 15<sup>th</sup> – 16<sup>th</sup>, 2019

**Venue (Revised):** Lecture hall no. 14, 1<sup>st</sup> floor, VMCC, IIT Bombay, Mumbai

**Registration Details:** There are limited numbers of seats for the course. Please fill the online registration form available on our website. Once your profile has been approved by the course coordinators, (you will receive a mail regarding the same).

Participants are required to register for the course online at the following portal:

[https://portal.iitb.ac.in/ceqipapp/courseDetails.jsp?c\\_id=2663](https://portal.iitb.ac.in/ceqipapp/courseDetails.jsp?c_id=2663)

**The course fee per participant will be as follows:**

PARTICIPANTS	FEES
Overseas/ Foreign National	25000/- *
Industry	18000/- *
Academia/NGO/ Govt. Organization	12000/ - *
Student (Full time)	6000/ - *

\* Fees inclusive of 18% GST. The fee includes course material, lunch and refreshments. Limited accommodation may be available for academic participants, but is not included in the above fee.

**Contact for more info:**

Ms. Jessie Velusamy  
 NCPRE, Room No. 312,  
 3rd floor, Transit building,  
 Near Power house, Hillside area,  
 IIT Bombay, Powai, Mumbai-400076  
 +91-022-25764476

[cepncre@ee.iitb.ac.in](mailto:cepncre@ee.iitb.ac.in)

[jessie.velusamy@iitb.ac.in](mailto:jessie.velusamy@iitb.ac.in)

For the information of other courses please visit following portal:

<http://www.ncpre.iitb.ac.in/ncpre/pages/events.html>