



National Centre for Photovoltaic Research and Education (NCPRE)

Two day CEP course on
Perovskite Solar Cells

15th – 16th October, 2019

Venue:

VMCC, 1st Floor, Room No. 14,
IIT Bombay



Indian Institute of Technology, Bombay (IITB)

Perovskite Solar Cells

Day 1

15 th October 2019	
08:00 – 8:30	Registration
08:30 – 9:00	<i>Breakfast</i>
09:00 – 09:15	Welcome by Prof. B. G. Fernandes (PI, NCPRE)
09:15 – 09:30	Introduction of the workshop (DG and DK)
09:30 – 10:30	“Introduction to thin film solar cells” Topics: General introduction to thin film solar cells and performance characteristics; Various thin film PV technologies: a-Si, CIGS, CdTe, CZTS, Organic, and perovskite; Tandem cells of thin film PV and Is technologies. (Prof. Balasubramaniam Kavaipatti, Dept. of Energy Science)
10:30 – 11:00	<i>Tea</i>
11:00 – 12:00	“Optical Properties of Halide Perovskite Semiconductors” Correlating the structural and thin-film stoichiometry with exotic optical studies of these defect tolerant semiconductors will be discussed. Some of the striking results like dynamic vs static disorder, exciton vs free carriers on optical excitation, double emission peak, positive temperature coefficient of bandgap etc will be discussed to unravel the underline semiconductor physics. (Prof. Dinesh Kabra, Dept. of Physics)
12:00 – 13:00	“Manufacturing aspects in perovskite solar cell fabrication” The transition from ‘lab to fab’ is an important aspect in commercialization of perovskite solar cells. This talk would thus cover different large area and large volume fabrication technologies, issues and challenges in manufacturing and current status wrt fabrication and performance output. (Prof. Dipti Gupta, Dept. of Metallurgical Engg and Materials Science)
13:00 – 14:00	<i>Lunch</i>
14:00 – 17:00	1. Perovskite Solar Cell Fabrication (HSC Lab) 2. Perovskite Solar Cell Characterization (IPCE, Dark and Light IV), AFM/XRD/Inkjet Printing (MEMS dept.), 3. NCPRE Labs visit (Fab Lab, PE Lab, Student's Fab Lab, Module Lab, Char Lab, Metallization Lab and FESEM)
17:00 – 17:30	<i>Tea</i>
17:30 – 18:00	Introduction about PUMP program (Dr. Diksha Makwani)

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Day 2

16 th October 2019	
08:30 – 9:00	<i>Breakfast</i>
09:00 – 10:30	<p>“Perovskite solar cells: Materials Synthesis and Characterization” Topics covered will be Introduction to the perovskite solar cells, different materials used in perovskite solar cells, synthesis of the materials and characterization. (Prof. Aswani Yella, Dept. of Metallurgical Engg and Materials Science)</p>
10:30 – 11:00	<i>Tea</i>
11:00 – 12:00	<p>“Modelling of Perovskite solar cells” The rapid improvement in the efficiency of perovskite solar cells has resulted in ever increasing research efforts on multiple aspects like new materials, novel architectures, and stability. While experimental efforts are exciting, corresponding theoretical analysis and modelling capability often allows one to identify the functional dependence of performance on critical parameters. Here, we address the cell to module level efficiency estimation for perovskite solar cells and the associated stability issues. (Prof. Pradeep Nair, Dept. of Electrical Engg)</p>
12:00 – 13:00	<p>“Making of High Efficiency Solar Cells” An overview on current research trends in halide perovskite optoelectronic activities will be discussed in the perspective of previous talks. What are the experimental lab hurdles and solution to them to achieve state-of-art high performance single junction and Tandem solar cells will be covered. Scalability and reliability aspects will be discussed. Experimental techniques to characterize these devices to get a diagnosis of possible faults and remedy to heel will be covered. (Prof. Dinesh Kabra, Dept. of Physics)</p>
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