A

Five-Day Workshop

Advances in Solar Photovoltaic-Emerging Materials and Technologies

16th to 20th Feb, 2022

(Sponsored by DST, New Delhi)

AIM OF THE WORKSHOP

The motivation to develop solar cells dates back to the inception of photovoltaics. The idea is to achieve truly low-cost photovoltaics appropriate for mass production of green energy. The key to the idea is the use of pennies worth of active materials. Since sunlight has relatively little energy density in comparison with combustion-based energy sources, photovoltaic solar-cell modules must be cheap and efficient to produce energy. Competitively thin-film solar cells and hybrid solar cells are presumed to meet the low-cost requirement. After establishing reasonable long-term cost, performance and reliability goals for solar cells, the question arises: Can today's solar photovoltaic technology meet these goals? Perhaps the primary goal to quantify is the performance goal. Novel solar cells involve several innovative designs, drawing on our ability to grow organized structures on a nanometric scale and implementing new materials and design with full control of structural and morphological properties.

In this workshop, we will review the semiconductor materials for photovoltaic application and compound semiconductor devices. In addition, experts shall present the methods of deposition and characterization of thin films, a brief overview of the application of nano-structures in photovoltaics, and nano-structures to enhance the conversion efficiency of thin film solar cells. The lectures will be supplemented by brief sessions on the device modelling using two computer-aided design software: LUMERICAL and COMSOL.

RESOURCE PERSONS

Special Guest Lecture by

Prof. Akhlesh Lakhtakia

Evan Pugh University Professor and Charles Godfrey Binder Professor of Engineering Science and Mechanics Professor, Department of Engineering Science and Mechanics, Penn State University, USA.

Research Interests: Scattering and propagation of electromagnetic; Acoustic and electromagnetic waves; Numerical techniques; Fractal structures; Composite materials; Chiral Materials; Anisotropic and bi-anisotropic materials; Sculptured thin films; Negative refractive index; Carbon–nanotube electromagnetics; Complex medium-electromagnetics; Nano-photonics; Surface multi-plasmonic; Bio-replication; Forensic science, Bone repair.

Prof. Subhananda Chakrabarti

Affiliation: Department of Electrical Engineering, Indian Institute of Technology – Bombay, INDIA.

Research Interests: Molecular beam epitaxy (MBE) of compound (III-V and II-VI) semiconductor materials; Optoelectronic devices such as quantum dot photodetectors and solar cells; III-V device integration on germanium; II-VI optoelectronic materials and devices.

Dr. Ritu Sharma

Affiliation: Department of Electronics & Communication Engg., Malaviya National Institute of Technology – Jaipur, INDIA.

Research Interests: Optics; Fabrication and characterization of nano-electronic and nanophotonic devices based on low-cost materials; Nanomaterials for nano-optoelectronic & nano-piezoelectric devices;

Optoelectronics and photonics; Solar cell; biophysics; MEMS and nano-electronic devices; Optoelectronics; Pattern recognition.

Dr. Srinivasa Rao Nelamarri

Affiliation: Department of Physics, Malaviya National Institute of Technology – Jaipur, INDIA.

Research Interests: Nano-structured thin films; Synthesis, characterization and modification of semiconductor nanostructures; Growth and modification of high K oxides; Applications of metal and semiconductor nanocrystals; Synthesis of nano-particles.

Dr. Amitesh Kumar

Affiliation: Department of Electrical Engineering, National Institute of Technology – Patna, INDIA.

Research Interests: Power electronics; Artificial intelligence in power systems; Renewable Energy, Bio-medical instrument design; Fabrication and modelling of semiconductor devices; Neuromorphic computing; Non-volatile memory devices; Fabrication of resistive switching devices.

Dr. Gaurav Kumar Bharti

Affiliation: Department of Electrical Engineering Chandigarh University, Gharuan, Mohali (Punjab), INDIA.

Research Interests: Optics; Optical sensors; Photonics; Energy engineering; Renewable energy; Nonlinear optics; Nano-photonics; Solar energy; Bio-photonics; Silicon photonics; Sustainable energy.

Prof. Himani Goyal Sharma

Affiliation: Department of Electrical Engineering Chandigarh University, Gharuan, Mohali (Punjab), INDIA.

Research Interests: Nanotechnology; Renewable Energy; Hydro-power; Mathematical modelling; Artificial intelligence; Fuzzy logic; Adaptive filtering techniques.

ABOUT MNIT - JAIPUR

The college was established in 1963 with its name as Malaviya Regional Engineering College, Jaipur as a joint venture of the Government of India and the Government of Rajasthan, Subsequently; on June 26, 2002 the college was given the status of National Institute of Technology. On 15 August 2007, it was proclaimed an Institute of National Importance through Act of Parliament. The Institute is fully funded by Ministry of Education (Shiksha Mantralaya), Government of India. More than 12,000 students have already been graduated since its establishment.

ABOUT BIAS - BHIMTAL

The saga of Birla Institute of Applied Sciences (BIAS) began in 1969 with the establishment of the Birla Institute of Scientific Research (BISR) by Shri B. M. Birla, a renowned industrialist, in the newly developing Bhimtal Industrial area. The aim was to provide basic workshop facilities and testing grounds for entrepreneurs to set up industrial units in the region. With the backing of leading educational institutions such as Birla Institute of Technology, Mesra, Ranchi and B. M. Birla Science & Technology Centre, Jaipur, an academic institution was established in the same campus, expanding the horizons for professional education. The Institute started professional engineering programme from the year 2000 with a mission to deliver quality over quantity in academics.

TARGET AUDIENCE

Faculty members of engineering Institutions and Universities, Ph.D. research scholars and PG scholars, participants from Industry and Research and Development organizations.

CONVENER

Prof. Vijay Janyani
(Professor)
Head, Department of Electronics & Communication Engineering, Malaviya National Institute of Technology – Jaipur.
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FACULTY CO-ORDINATOR

Mr. Abhinav Bhatnagar
(Assistant Professor)
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JOINTLY ORGANIZED BY

Department of Electronics & Communication Engineering,
Malaviya National Institute of Technology – Jaipur (Rajasthan), INDIA.

Department of Electronics & Communication Engineering,
Birla Institute of Applied Sciences – Bhimtal (Uttarakhand), INDIA.

REGISTRATION

- Mode: Online, Registration **free.**
- Registration link is given below: https://forms.gle/KETjPc4yEEet4y799
- Last date of registration is 10th Feb 2022.
- Ph.D. and PG scholars must submit approval form signed by their supervisor.

CONTACT

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