

TALK

Speaker: Dr. Upendra Kumar Pandey

Department: Centre for Energy Research at the Indian Institute of Science

Title: Organic Semiconductors in Electronics: From Columnar Mesophases to Organic/Organic Inorganic Photovoltaics.

Date: 31st MAY 2017

Time: 11:00AM - 12PM

Place: Samtel Centre Seminar Room (access from ground level)

Abstract: The field of organic electronics has evolved impressively over the last two decades and the first device generation based on organic semiconductors such as organic light-emitting diodes (OLEDs) already reached the market along with realization of efficient prototypes of OFETs, solar cells, or sensors. Additionally organic materials can provide large area, light weight and flexible devices due to their low cost low temperature processability over inorganic counterparts. The major contribution advancing this field has been associated to the development of newer organic semiconductors exhibiting high charge carrier mobility.

Solar energy, which provides a clean, economical and green energy, seems to be an alternative solution, for current and future energy needs. The unrivaled potential of Organic / Organic-Inorganic absorber materials to achieve high power conversion efficiency (PCE) using the effective ways of fabrication have captured tremendous attention and are of the current research interests. However, their efficiency and stability seems to be a major concern for industrialization. In the first part of the presentation, high hole mobility in discotic liquid crystals will be discussed. Latter part of the presentation will focus on organic and perovskite solar cells in the quest of higher efficiency, stability and cheaper hole and electron transporting materials for perovskite.

About Speaker: Upendra was born in Kushinagar in India. He received M.Sc. Electronics from DDU Gorakhpur University Gorakhpur and an M.Tech. in Opto-electronics from Shri GS Institute of Tech. & Science. Indore, Madhya Pradesh India. More than 3 years he has worked as an Engineer, at Quantalase Ent. Pvt. Ltd. Indore, a laser based industry. He followed his passion towards organic electronics and did Ph.D. in Science and Technology of Mesophase and Molecular Materials with the supervision of Prof. Attilio Golemme, University of Calabria, Italy. In January 2013 he joined the Organic Semiconductor Optoelectronics group as a research fellow to work on different novel organic semiconductors to improve solar cell performance. Since October 2013, Upendra is working on Organic and Perovskite solar cells at Interdisciplinary Centre for Energy Research at the Indian Institute of Science as DST Inspire fellow.