Nanomaterials Based Light Harvesting Systems for Potential Applications

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Abstract

Here, we will discuss the current status of challenging light harvesting nanomaterials such as semiconducting quantum dots (QDs), metal nanoparticles, semiconductor-metal heterostructures, π-conjugated semiconductor nanoparticles, organic-inorganic heterostructures, and porphyrin based nanostructures.[1-7] The fundamental knowledge of these photophysical processes is crucial for the development of efficient light harvesting systems like, photocatalytic, and photovoltaic. We will discuss about the charge transfer process in polymer-GO hybrid structures by ultrafast spectroscopy. The influence of size of QD in hole transfer process in QD-polymer composite will be illustrated. Finally, we will demonstrate the design of CdTeSe−porphyrin−graphene composite for photoinduced electron transfer and photocurrent generation.

References

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About Speaker: Professor Amitava Patra is currently a Senior Professor and Dean at the Indian Association for the Cultivation of Science, Kolkata, India. He is a Fellow of the Indian Academy of Sciences (FASc), India, the National Academy of Sciences (FNASc), India and the Fellow of Royal Society of Chemistry (FRSC). He is a recipient of the C.N.R. Rao National Prize for Chemical Research, DAE-SRC Outstanding Investigator Award, the A.V. Rama Rao Foundation Prize in Chemistry, the AsiaNANO 2010 Award, the CRSI Bronze Medal, the Ramanujan Fellowship, and the MRSI Medal. He is and was Editorial advisory board member in J. Phys. Chem., Nanoscale, ChemPhysChem, etc. He is an author or co-author of more than 206 scientific papers, 5 book chapters and 2 Indian patents. His research interests include decay dynamics, energy transfer, and electron transfer of quantum dots, Au nanoparticles, organic nanoparticles and upconverted nanoparticles for light harvesting. His research papers have been cited more than 8100 times by peers (h-index= 50).