

## Institute Lecture

### Fascinations of semiconductor nanomaterials: Their extraordinary luminescent properties

**Professor D. D. Sarma**  
Indian Institute of Science, Bengaluru

17<sup>th</sup> November 2017, Time: 6:15 PM, Venue: LH-17



#### Abstract

One of the most spectacular aspect of semiconductor nanocrystals has been their photoluminescence properties, offering unprecedented tunability of the emitted light and a high degree of quantum efficiency, not usually achievable with corresponding bulk materials. In simple terms, it means that we can take a material that hardly gives out any glow and that too at most at a fixed colour and make it radiant at all colours of the visible spectrum just by making very small particles of the same material. There are two distinct classes of light-emitting nanocrystal materials. One class makes use of the band-gap emission; you can think of it as a pure material. The other route makes use of an impurity ion which receives some energy from the host nanocrystal and gives out colour of its own. Both approaches have some advantages and disadvantages. I shall introduce these ideas and give you a flavour of how to overcome the shortcomings of each approach in many clever ways, while sharing with you the excitement and secrets of brilliantly glowing nanocrystals.

#### About the speaker

Prof. D. D. Sarma obtained a Ph.D. Degree in 1982 from Indian Institute of Science (IISc), Bangalore. He worked in Kernforschungsanlage, Jülich, Germany, as a Visiting Scientist during 1984-1986. Since 1986, he has been a faculty member at Solid State and Structural Chemistry Unit and currently holds the J. N. Tata Chair of IISc. His research interest spans the science of strongly correlated electron systems, primarily based on transition metal compounds, and semiconductor nanocrystals using a wide range of experimental as well as theoretical tools. He has published more than 400 scientific papers and holds several patents. He is a Fellow of Indian Academy of Sciences, Indian National Science Academy, The National Academy of Sciences India, Indian National Academy of Engineering, The World Academy of Sciences (TWAS) and American Physical Society. He has received a large number of national and international awards and recognitions, including multiple Honoris Causa Doctorate degrees.

Tea at 6.00 PM

All interested are welcome.

S. Ganesh  
Dean of Research and Development, IIT Kanpur