

About the Speaker:



Dr. Kuppuswamy Kalyanasundaram

Dr. K. Kalyanasundaram completed his B.Sc. and M.Sc. in Chemistry from University of Madras in 1969 and 1971 respectively. He received his Ph.D. in Physical Chemistry from University of Notre Dame in 1976. Following a two-year post-doctoral stay at the Royal Institution of London, UK, he joined the teaching and research staff of the Chemistry Department at Swiss Federal Institute of Technology, Switzerland. He has held visiting faculty appointments at California Institute of Technology, Pasadena, CA, USA, University of North Carolina at Chapel Hill, USA, Indian Institute of Science, Bangalore, India and VIT University, Vellore, India. He also holds appointment as Overseas Visiting Professor at Anna University, Chennai, Tamil Nadu, India. Kalyanasundaram has authored over 150 research papers in international journals and 5 research monographs on his photochemistry research. His research papers are well cited (over 24,000 citations with a h-index 49, placing him amongst the top chemists of Switzerland).

Research Interests (Professional):

- * Photochemical Conversion and Storage of Solar Energy; Solar Cells;
- * Photophysics and Photochemistry of Transition Metal Complexes;
- * Photochemistry in Microheterogeneous Systems;
- * Inorganic Photochemistry; Photoelectrochemistry; Photocatalysis

Selected Bibliography

1. Photochemistry in Microheterogeneous Systems, K. Kalyanasundaram, Academic Press, New York, ISBN 978-0-12-394995-0
2. Photochemistry of Polypyridine and Porphyrin Complexes, K. Kalyanasundaram, Academic Press, London, 625 pages, 1992, ISBN 978-0123949929
3. Dye Sensitized Solar Cells. K. Kalyanasundaram, EPFL Press; CRC Press, Florida, USA, 2010, 604 pages, ISBN 9781439808665
4. Photosensitization and Photocatalysis using Coordination Compounds, K. Kalyanasundaram and M. Grätzel, editors, Kluwer Academic Publishers, Dordrecht, 1993, 468 pages, ISBN 978-94-017-2626-9



CSIR-NIIST

Two Day Workshop & Training Session

on

Wet Chemical Routes to High Efficiency Third-Generation Solar Cells

by

Dr. K. Kalyanasundaram

**Laboratory for Photonics & Interfaces (LPI)
Swiss Federal Institute of Technology
(Ecole Polytechnique Fédérale de Lausanne)
EPFL, Switzerland**

Date: April 23-24, 2018

Venue: CSIR-NIIST, Trivandrum

Programme:

The objective of this two day workshop is to provide a forum for researchers, students, faculty members and experts to discuss the recent advances in solar photovoltaics. It involves comprehensive tutorials on the evolution of solar photovoltaics, covering fundamentals, applications and future perspectives. Special emphasis will be given on third generation thin film solar technologies.

The workshop also includes hands-on sessions, which explain the design of Solar Photovoltaic Power Systems for small (W) to larger (kW and MW) installations, portable solar powering devices and Do-it-yourself fabrication of small devices for solar powering of mobile phones, LED lights and small battery chargers.

Day 1 (23rd April, 2018)

Venue: Board Room, CSIR-NIIST

- 8.30-9.15: **Registration**
- 9.15-9.30: **Opening remarks by Dr. A. Ajayaghosh, Director, CSIR-NIIST**
- 9.30-10.45: **Fundamentals of solar energy harvesting:**
(Approaches to solar energy conversion and storage; design of solar cells; efficiency limits for energy conversion)

- 10.45-11.15: **Tea Break**
- 11.15-12.30: **Basics of first generation (wafer-based) and second generation (thin film) solar cells:**
(Operation of p-n junction, importance of depletion layers, minority carrier and shunt, sheet resistances in controlling the charge carrier generation and transport dynamics on power conversion efficiency)
- 12.30-13.30: **Lunch Break**
- 13.30-14.45: **Overview of dye-sensitized solar cells: liquid electrolyte and solid state versions.**
- 14.45-16.00: **Overview of perovskite based solar cells**
- 16.00-16.30: **Tea Break**
- 16.30-17.30: **Discussion, hands-on session**

Day 2 (24th April, 2018)

Venue: Seminar Hall, CSIR-NIIST

- 9.30-10.45: **Overview of quantum dot based solar cells**
- 10.45-11.15: **Tea Break**
- 11.15-12.30: **Overview of polymer organic solar cells**

- 12.30-13.30: **Lunch Break**
- 13.30-14.45: **Mechanistic aspects of third generation solar cells: time-resolved optical, electrochemical and impedance spectroscopic studies**
- 14.45-16.00: **Scaling up of small lab cells to modules, packaging issues and commercial production of solar cells.**
- 16.00-16.30: **Tea Break**
- 16.30-17.30: **Discussion, hands-on session**

Link for online registration:

<https://goo.gl/forms/MR8CVtXEaswAWI82>

Closing Date for online registration:

April 19, 2018

Contact Details:

Dr. K. N. Narayanan Unni
Principal Scientist & Head,
Photosciences & Photonics, CSIR-NIIST
Mob: 9745300436
E-mail: unni@niist.res.in