

Report on short research trip to Department of Physics, University of Jaffna, Sri Lanka

Name: M.R. Venkatraman, Research Scholar, Department of Physics, Coimbatore Institute of Technology, Coimbatore.

Visit Duration: January 26, 2018 to February 05, 2018 (10 days)

Overseas guide in Jaffna: Prof. P. Ravirajan, Professor, Department of Physics, University of Jaffna, Sri Lanka.

During 10 days research stay at Department of Physics, Jaffna University under **Higher Education and Research collaboration on Nanomaterials for Clean Energy Technologies project (HRNCET)**. DSSC were fabricated using TiO₂ nano particles, Ag decorated TiO₂ nano particles (by photo deposition method) and Cu decorated TiO₂ nanoparticles as photo anodes. Also, TiO₂ compact layers prepared by compact spray method were used in DSSC as a recombination reduction layer and its performance in DSSC based on TiCl₄ treated TiO₂, SnO₂ active layers were analyzed (TiO₂ Compact layers were prepared in Department of Physics, UOJ, Sri Lanka and the DSSCs were fabricated in CIT, Coimbatore). Few undergraduate students were trained on fabrication and characterization of Dye Sensitized Solar cells.

Outcome: A co-authored paper based on compact spray method prepared TiO₂ thinfilms were used in DSSC as a recombination reduction layer, and its performance based TiO₂, SnO₂ active layers is under progress.

Future plans: To collaborate and work on Perovskite solar cells based on different Electron Transport layers and modification of perovskite active layer towards highly stable perovskite solar cells.

Presentation details:

Topic: Enhanced performance of Dye Sensitized Solar Cells using Metal Oxide based nanomaterials

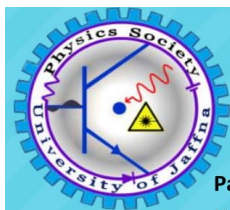
Date: 01.02.2018

Venue: Mini Auditorium, University of Jaffna, Jaffna, Sri Lanka

Short summary of the Talk:

In this talk different solar cell technologies, working and fabrication of DSSC were concentrated. Semi conductor Nanomaterials/nanostructures such as nanotubes, nano flakes etc., by different methods were synthesized and were used as different layers in DSSC such as active layer, nanostructures to improve electron transport, light scattering layers and its roles were discussed in the talk.

Details of the talk given in Department of Physics, University of Jaffna on DSSC (01.02.18)



PHYSICS SOCIETY

Department of Physics, University of Jaffna

Patron: Prof.P.Ravirajan

Head of the Department: Dr.K.Vignarooban

Senior Treasurer: Dr.A.Thevakaran

2018.01.29

**Executive committee of the Physics Society
invites you for the 30th talk of the
Physics Seminar Series**

**Enhanced performance of Dye sensitized Solar
Cells using metal oxide based nanomaterials**

by

M. R. Venkatraman

BSc, MSc (Physics, Bharathidasan), MPhil (Physics, Alagappa)

Final year PhD student in Physics, Coimbatore Institute of Technology, India

Abstract

Among the different generations of solar cells, third generation based solar cells have the advantages of low cost, flexibility, simple fabrication techniques and its ability to work under diffused light conditions among several other aspects. Important fundamental operation principle of dye sensitized solar cells (DSSC) is excitation of the dye, which is absorbed to the semiconductor surface by lifting an electron from valence to conduction band, the generated electron is further transferred to the conduction band of semiconductor and further it will go through the external load and regenerate electrolyte at the cathode surface, where the oxidised dye also was recompensed.

Among the various parts of the DSSC, photoanodes play an important role in dye adsorption and electron transport. As modifying the photoanodes using different materials has an impact on the performance of the cell. Here in this presentation we are concentrating on basics of DSSC and influence of metal oxide Nano particles and Nano structures in the performance of the cells.

Venue: Mini-Auditorium, Dept. of Physics (2nd floor)

Date and Time: February 01, 2018 (Thursday), 12:00 -12:45

President

Mr. V.Aeneas Jerron

Secretary

Ms.Y.Subathra

Junior Treasurer

Mr.M.Sajanthan

Vice-President

Mr.S.L.N.Senavirathna

Assistant Secretary

Ms.K.H.D.D.Kumari

Editor

Mr.K.Senthuran

Committee Members

Mr.B.Sudesh,Ms.M.Kajani,Mr.R.Risendralingam,Ms.N.Silwa,Mr.H.P.T.Stanly,Ms.P.Thusyanthini

Phone (Office): 021 - 222 5924

physocuo@gmail.com



