Scientific Report

Science Academies’ Refresher Course on Thin films and Nanoscience
(4th May, 2015 to 18th May, 2015)

a) No of application received: within due date – 133; after due date: 16; Total: 149

b) Selected: 30

c) Actual participants: 24

Table 1: Names of the resource persons and numbers of lectures / tutorial delivered by them:

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<tr>
<th>Sl. No</th>
<th>Name of Resource Person</th>
<th>No of class taken</th>
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<tr>
<td>1</td>
<td>Prof. Mushahid Husain</td>
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<td>2</td>
<td>Prof. A. Rahman</td>
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<td>3</td>
<td>Dr. Mrinal Pal</td>
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<td>6</td>
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<td>Prof. Tanusri Saha-Dasgupta</td>
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<td>Prof. Barin Kumar De</td>
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d) Title of the lectures / tutorials / demonstrations delivered by different resource persons:

1. LECTURES (Total 26 classes):

i) Prof. Mushahid Husain

Lecture 1: Recent Advances in Conducting Polymers
Lecture 2: Recent Developments in Nanoscience and Nanotechnology
Lecture 3: Recent developments in High Temperature Superconductivity
Lecture 4: Synthesis and Characterization of Carbon Nanotubes
ii) Prof. A. Rahman

Lecture 5: Thin Film Deposition
Lecture 6: Thin Film Characterization
Lecture 7: Thin Film Junctions and Their Characterization
Lecture 8: Thin Magnetic Films and Their Characterization

iii) Dr. Mrinal Pal

Lecture 9: THE NANO AGE: The next big thing is really very small – I
Lecture 10: THE NANO AGE: The next big thing is really very small – II
Lecture 11: Magnetic nanoparticles: Advance materials for modern technology – I
Lecture 12: Magnetic nanoparticles: Advance materials for modern technology – II

iv) Prof. Barin Kumar De

Lecture 13: Studying the Role of and Measuring Nano-particles in Earth’s Atmosphere - I
Lecture 14: Studying the Role of and Measuring Nano-particles in Earth’s Atmosphere – II

v) Prof. Gautam Buddha Talapatra

Lecture 15: An Introduction to Nanoscience and Nanotechnology
Lecture 16: Some instruments for characterization & manipulation in nanoworld
Lecture 17: Langmuir-Blodgett Technique: Useful Tool for Nano-Biotechnology Research

vi) Dr. Syed Arshad Hussain

Lecture 18: Nano dimensional organo-clay hybrid films with improved functionality

vii) Prof. D. K. Aswal

Lecture 19: Preparation of thin films and nanostructures for gas sensors
Lecture 20: Overview of characterization techniques for thin films and nanostructures
Lecture 21: Chemiresistive sensors based on thin films of metal-oxide and organic semiconductors

viii) Prof. D. Bhattacharjee

Lecture 22: Langmuir-Blodgett Film deposition technology: Basics & applications

ix) Prof. Tanusri Saha-Dasgupta

Lecture 23: First principle study of structural stability and electronic structure of nanomaterials
Lecture 24: Hybridization Effects at Nano-scale
ix) Prof. Surajit Sengupta

Lecture 25: A brief introduction to Elasticity and Diffusion
Lecture 26: Elasticity and Diffusion in Nano Structures

2. DEMONSTRATIONS (Total 24 classes):

i) Dr. Syed Arshad Hussain (12 classes)

A. Thin film preparation techniques: (a) Spin coating (b) vacuum deposition techniques.

B. Morphological characterizations: (a) Fluorescence imaging microscopy and (b) Atomic Force Microscopy.

C. Electrical characterizations: I-V characteristics

ii) Prof. D. Bhattacharjee (12 classes)


D. Photophysical characterizations: (a) UV-Vis absorption (b) Steady state fluorescence and (c) FTIR spectroscopy

Study material provided to the participants:

Soft copy of the following e-books:


3. Nano-Surface Chemistry Editor: Morton Rosoff Publisher: Marcel Dekker Inc (  

This refresher course provided scopes to the young teachers especially from this remote state to interact with the experts in the area of thin films and nanoscience. This helped to motivate the teachers towards the latest advances in thin films and nanoscience. Practical demonstration and tutorials provided an opportunity to the participants to have idea about different thin film formation techniques as well as their characterizations. Mutual interaction among the participants and the resource persons provided an opportunity for future collaborative research works. As a whole this refresher course helped to inculcate the art of learning, teaching as well as research among the young teachers through interaction with the experts.

(Dr. Syed Arshad Hussain)
Co-ordinator
Refresher Course on Thin Films and Nanoscience
Final program schedule (4th May, 2015 to 18th May, 2015)
Science Academies’ Refresher Course on Thin films and Nanoscience

Inauguration:
Date: 04.05.2015: Time: 9.00-9.30 AM
Venue: Seminar Hall, Department of Physics, Tripura University

Prof. Anjan Mukherjee, Honourable Pro-Vice Chancellor, Tripura University has presided over the inauguration function. Prof. Mushahid Husain, Hon’ble Vice Chancellor, M.J.P. Rohilkhand University, Bareilly and Formerly, Director, Centre for Nanoscience and Nanotechnology, Jamia Millia Islamia, New Delhi was the Chief Guest during the inauguration function. Prof. Barin Kumar De, Head, Department of Physics, was also present during the inauguration function.

Valedictory Session:
Date: 18.05.2015: Time: 2.00 PM onwards
Venue: Seminar Hall, Department of Physics, Tripura University

Prof. Sangram Sinha, Dean, Faculty of Science, Tripura University has presided over the valedictory session. Prof. Prof. Tanusree Saha-Dasgupta, Course Director of this Refresher Course was present during the inauguration function.
Prof. Barin Kumar De, Head, Department of Physics, was also present during the inauguration function.

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Tut – tutorial and Dem - demonstration
Total class 50 (26 lecture + 24 tutorial / demonstration)

Prof. Mushahid Husain (MH); Prof. A. Rahman (AR); Dr. Mrinal Pal (MP); Prof. Gautam Buddha Talapatra (GBT);
Prof. D. K. Aswal (DKA); Prof. Surajit Sengupta (SS); Prof. Tanusri Saha-Dasgupta (TSD); Dr. Syed Arshad Hussain (SAH);
Prof. D. Bhattacharjee (DB); Prof. Barin Kumar De (BKD)

Excursion: All participants along with Course Director (Prof. T. S. Dasgupta), Course Coordinator (Dr. S. A. Hussain) and one resource person (Prof. Surajit Sengupta) visited the following places:
i) Nirmahal (a lake palace 45 Km away from Tripura University); ii) 726.6 MW CCGT thermal power project at Palatana in Tripura (50 Km away from Tripura University) and iii) Tripureswari Temple (a heritage temple 47 Km away from Tripura University)
Course Director:

Prof. Tanusri Saha-Dasgupta, FNASc
SN Bose National Centre for Basic Sciences
Kolkata 700 098
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http://www.bose.res.in/~tanusri/

Course Coordinator:

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Name and address of Resource Persons / Speakers:

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Homi Bhabha National Institute &
Head, Thin Films Devices Section
Technical Physics Division
Bhabha Atomic Research Center
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List of participants:

Science Academies' Refresher Course on
"Thin films and Nanoscience"

#

04 MAY 2015 to 18 MAY 2015

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<thead>
<tr>
<th>SL No</th>
<th>App Id</th>
<th>Name and address</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>1</td>
<td>RCTNT3</td>
<td>DR. BANTI GANGULY CHAKRABORTY mam <a href="mailto:hon.0123@gmail.com">hon.0123@gmail.com</a></td>
<td>Dept. of Chemistry, Dasaratha Deb Memorial College, Khowai</td>
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<tr>
<td>2</td>
<td>RCTNT4</td>
<td>DR KARTICK LAL BHOWMIK <a href="mailto:karticklalb@gmail.com">karticklalb@gmail.com</a></td>
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<td>3</td>
<td>RCTNT11</td>
<td>Dr. BIJAN DEB <a href="mailto:DEBBIJAN@GMAIL.COM">DEBBIJAN@GMAIL.COM</a></td>
<td>DEPTT. OF PHYSICS, AMBEDKAR COLLEGE, FATIKROY, TRIPURA</td>
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<tr>
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<td>RCTNT14</td>
<td>Dr. UTPAL CHANDRA DE <a href="mailto:ucd1972@tripurauniv.in">ucd1972@tripurauniv.in</a></td>
<td>Department of Chemistry Tripura University</td>
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<td>RCTNT16</td>
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<td>RCTNT22</td>
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<td>Dept. of Physics, Women's College</td>
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<td>10</td>
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<td>No-18 SARATHA STREET CHITHAMBARAM ASARI LAYOUT SOODAMANIPURAM</td>
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<td>BAISHALI DEVI <a href="mailto:devibashaishali05@gmail.com">devibashaishali05@gmail.com</a></td>
<td>Ramkrishna Mahavidyalay Kailashahar</td>
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<td>RCTNT32</td>
<td>MIHIR PAL <a href="mailto:mihir_tu@yahoo.co.in">mihir_tu@yahoo.co.in</a></td>
<td>Dept. Of Physics Ramthakur College Agartala</td>
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<td>23</td>
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<td>Dr. Somen Chanda</td>
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<td>C/O DR VIMAL KUMAR, ROOM NO-314, IIT Ropar Nangal Road</td>
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Dr. S. A. Hussain, Co-ordinator; Prof. S. Sinha, Dean, Faculty of Science, Tripura University; Prof. Tanusri Saha Das-Gupta, Course Director; Prof. B. K. De, Head, Department of Physics, Tripura University along with the participants after the valedictory session.

Dr. S. A. Hussain, Co-ordinator; Prof. S. Sinha, Dean, Faculty of Science, Tripura University; Prof. Tanusri Saha Das-Gupta, Course Director; Prof. B. K. De, Head, Department of Physics, Tripura University during the valedictory session.
Demonstration on Atomic Force Microscopy during refresher course on Thin Films & Nanoscience at Tripura University.

Prof. A. Rahman, Guwahati University, Guwahati delivering lecture during the Refresher Course on Thin Films & Nanoscience.