Brief Report on "SCIENCE ACADEMIES' LECTURE WORKSHOP ON 'RECENT DEVELOPMENTS IN PHYSICS'"

We conducted the two days "SCIENCE ACADEMIES' LECTURE WORKSHOP ON 'RECENT DEVELOPMENTS IN PHYSICS" (sponsored by Indian Science Academies’) during 30th and 31st January, 2013 at Government Arts College, Melur.

The invited resource persons (6 numbers) participated and delivered lectures in their field of specialization except Dr. Vijayamohan Pillai due to some very urgent meeting in New Delhi. Instead of him, he debuted the other scientist, Dr. P. Murugan from CECRI. The number of participants was above our earlier expectation (100 numbers) and it was 141 numbers (including our students) during the lecture workshop on both these days.

On 30th January, 2013, the registration was started at 9:30 am. The inaugural session was started at 10:00 am and Dr. A. John Peter, Head of the Department of Physics and Organizer of the lecture workshop, welcomed the gathering. Dr. M. BALASUNADARAM (Principal, Government Arts College, Melur) presided over the function. Dr. G. Baskaran (Convener of the Lecture Workshop and the Senior Professor, Institute of Mathematical Sciences, Taramani, Chennai) delivered the inaugural address. In his address, he elaborated the role physics in interdisciplinary researches which are vital for the sustainable developments of the society and explained the three science academies for the spreading of scientific knowledge in India. In addition, he appreciated the Government Arts College, Melur for getting financial support from the science academies’ and wished the college to be success in the course of time by conducting similar programmes for the benefit of scientific community and hence society. During the inaugural session, the senior professors, Dr. Ponnu (Head, Dept of History) and Dr. Periyathambi (Head, Dept of Botany) and other Faculty members from Government Arts College, Melur were present along with the participants from various colleges, research institutions and universities in the southern region of Tamil Nadu. The inaugural session came to an end with the vote of thanks by Dr. R. V. Jeba Rajasekhar, the other organizer who specially thanked the science academies’ for not only having considered our application for conducting the lecture workshop but also providing financial support in time.

The technical session was started at 10.00 am and Dr. G. Baskaran (Senior Professor, Institute of Mathematical Sciences, Taramani, Chennai) delivered the talk on ‘Richness of
Material Science' with the start of role of teachers in the society. The lecture covered topics like variety of materials, bio materials, explanation for the award of Noble Prize for growing crystals of Ribosome- crystallography in Ribosome- Thin film preparation & characterization of Graphene,. The discussion also high lighted the importance of Bio-Physics. It was awesome, amazing on the explanation of magnetotatic bacteria. The session came to an end at 11:30 am. After a tea break, the second session was started at 11:45 am and it was continued until 01:15 pm. Dr P. Murugan (Scientist, CECRI) delivered the lecture on ‘Challenges & opportunities in computational Materials Science’. He explained the simulation is more realistic as compared to theory. The lecture gave a clear explanation on the types of computer simulations, Monte Carlo simulations, Molecular dynamic simulations, structure of bimetallic clusters, significance of Quantum mechanics, various softwares used in simulation. The talk extended to explain the need for Parallel computation, Li-ion batteries, nanocomposites of Li, C60, Mo & Ti.

After the lunch break, Professor K. PORSEZIAN (Professor, Pondicherry University,) delivered a talk on Supercontinuum generation in Photonic crystal Fibers. He started with all basic theory and illustrative explanation of optical fibre communication. The discussion included vivid explanation of linear & nonlinear science, extreme nonlinear optics, nanophotonics, second order non-linearities, optical solitons, soliton propagation, photonic crystal fiber, & fiber spool. Down came the curtains with an illustrative explanation on the source, generation & applications of Supercontinuum.

On the second day, the pre lunch session was handled by Dr. S.Arumugam (Professor, Bharathidasan University, Trichy) at 10 am. His talk was on “Pressure effect on Superconductors and lasted for one and half hour. He started its history, growth and recent developments. He has brought out the role and importance of High Pressure in research in physics. He has also projected the laboratory facilities at the centre. His lecture brought the “strong correlations” in the properties in electronic systems. He has shown beautiful pictures of the various pressures from the pressure at the tip of a shoe to the pressure in planets. He has given wide applications in the synthesis of the crystals using high pressure and high temperatures. “Diamond anvil cell” - a revolutionary tool in high pressure techniques has been clearly explained with various applications. It’s a surprise that 53 elements in the periodic table become superconductor under high pressure.. Then, we had a break for tea for 15 min.
Prof. M. Mangalraj (Head & Co-ordinator, Nanoscience & Technology, Bharathiar University, Coimbatore) continued the session with his talk on ‘Nanostructured metal oxide semiconductors for gas sensing’. His freelance way of lecture was to motivate the students shown in kindling research in the youth. Professor's simple methods with ordinary materials to synthesize several nano-particles were thought provoking. He has emphasized the need to understand the “Formation Mechanism” more than growing nano-particles for good research. His research work on sensors show that “a good sensor must have a good response time.”

Then, for the post lunch session, was handled by Dr. Ivan Cole (Professor, CEIRO, Australia) on ‘The Cutting Edge of Materials Science – Embedded Intelligence and Computational Design’. The role computers to aid in designing non-toxic inhibitors as corrosion preventive materials had been pointed out. It was interesting to see that “intelligent materials” adjust to nature’s corrosive effect. The new paradigm shift in designing intelligent materials useful on the coatings of vehicles and buildings preserving the surface were wonderful. He pointed out the ultrafast system to collect rich data for analyzing, designing and re-designing new materials. The slides with rich data explain the multiscale modeling to suit the pollutants that were carried by fine aerosol around coastal Australia. Prof. has thrown light on his work with Quantum Dot Sensor in neural networks. All the talks were informative and useful for the audiences. The workshop ended with the valedictory function. It ended up by thanking all the participants for their kind support and co-operation to run this function successfully.

**Agenda**

**Invocation**

*Welcome address*: Dr. A. JOHN PETER

*Presidential address*: Dr. M. BALASUNADARAM
Principal,
Government Arts College
Melur 625 106.

*Inaugural address*: Prof. G. BASKARAN
Institute of Mathematical Sciences,
Taramani, Chennai.

**Felicitations**:
1. Dr. Ponnu
Head, Dept of History,
Govt. Arts College, Melur
2. Dr. Periyathambl
Head, Dept of Botany,  
Govt. Arts College, Melur

*Vote of thanks : Dr. R. V. JEBA RAJASEKHAR

### Time Table for the Resource Persons

#### I-Day (30.01.2013)

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Name</th>
<th>Timing</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Professor G. BASKARAN</td>
<td>10:00 am - 11:30 am</td>
<td>Richness of Material Science</td>
</tr>
<tr>
<td>2</td>
<td>Break for tea</td>
<td>11.30 am - 11.45 am</td>
<td>----</td>
</tr>
<tr>
<td>3</td>
<td>Dr P MURUGAN</td>
<td>11.45 am - 1.15 pm</td>
<td>Challenges &amp; opportunities in computational Materials Science</td>
</tr>
<tr>
<td>4</td>
<td>Lunch</td>
<td>1:15 pm - 2:15 pm</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Professor K. PORSEZIAN</td>
<td>02:15 pm - 03:45pm</td>
<td>Supercontinuum generation in Photonic crystal Fibers</td>
</tr>
<tr>
<td>6</td>
<td>Break for tea</td>
<td>3:45 pm - 4:00 pm</td>
<td>----</td>
</tr>
<tr>
<td>7</td>
<td>Discussion - Professor G. BASKARAN</td>
<td>04:00 pm - 05:00 pm</td>
<td>----</td>
</tr>
</tbody>
</table>

#### II-Day (31.01.2013)

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Name</th>
<th>Timing</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Professor S. ARUMUGAM</td>
<td>10:00 am - 11:30 am</td>
<td>Pressure effect on Superconductors</td>
</tr>
<tr>
<td>2</td>
<td>Break for tea</td>
<td>11:30 am - 11:45 am</td>
<td>----</td>
</tr>
<tr>
<td>3</td>
<td>Professor D. MANGALARAJ</td>
<td>11:45 am - 01:15 pm</td>
<td>Metal Oxide Semiconductors for Biological Applications'</td>
</tr>
<tr>
<td>4</td>
<td>Lunch</td>
<td>1:15 pm - 02:15 pm</td>
<td>----</td>
</tr>
<tr>
<td>5</td>
<td>Professor IVAN COLE</td>
<td>02:15 pm - 03:45 pm</td>
<td>The Cutting Edge of Materials Science Embedded Intelligence and Computational Design</td>
</tr>
<tr>
<td>6</td>
<td>Break for tea</td>
<td>03:45 pm - 04:00 pm</td>
<td>----</td>
</tr>
<tr>
<td>7</td>
<td>Valedictory function</td>
<td>04:00 pm to 04:30 pm</td>
<td>----</td>
</tr>
</tbody>
</table>
WELCOME ALL
To
TWO DAYS WORKSHOP
ON
RECENT DEVELOPMENTS IN PHYSICS
Organised by
DEPARTMENT OF PHYSICS
01.01.2013 (WED) & 31.01.2013 (THU)
WELCOME ALL
To
TWO DAYS WORKSHOP ON
RECENT DEVELOPMENTS IN PHYSICS
Organised by
DEPARTMENT OF PHYSICS
30.01.2013 (WED) & 31.01.2013 (THU)