International Conference on Nanomaterials for Frontier Applications and Indo-Norwegian Workshop for Solar Cell Applications
10 – 12, July 2013

Report

The International Conference on Nanomaterials for Frontier Applications and Indo-Norwegian Workshop for Solar Cell Applications jointly organized by Coimbatore Institute of Technology, India and Bergen University College of Applied Sciences, Norway was inaugurated by Håvard Hugås, Counsellor (Energy and Climate), Royal Norwegian Embassy, New Delhi on 10th July 2013. The first invited talk was by Dr. Liliana Sendler of Germany and she presented about how the MicroNano-Broker, European Union may be used to find new partners from industry and research institutions, in order to build up international cooperation projects and combine scientific and technical information and make collaboration between industry and science more efficient. The next speaker was István A. Szabó, of University of Debrecen, Hungary and he discussed the characteristics of nanoscale diffusion and its role in the formation and degradation of nanostructures, light sensitive materials and solar cells.

The first day after-noon session was the solar cell workshop session, in which five eminent speakers working in the area of solar cells, S. Zh. Karazhanov, Institute for Energy Technology, Norway, Dr. Alla Chebotareva, Lomonosov Moscow State University, Russian Federation, Dr.V.Venkatachalapathy, University of Oslo, Norway, Prof. Jatin Rath, Utrecht University, The Netherlands and Dr. P.K. Singh, Head, Photovoltaic Group, National Physical Laboratory, India presented a detailed view about the different type of solar cell materials. The speakers of the workshop discussed about the behaviour of nanocrystalline silicon and its potential for solar cell applications: nanocrystalline silicon: past, present and future. The workshop also had interesting presentations on ZnO and TiO_2 based dye sensitized and quantum dot sensitized solar cells and also on multiple quantum well (MQW) structures for solar cell applications. In the solar energy workshop some participants also presented some of their interesting works related to third and fourth generation solar cells.

The second day started with a talk on nanophase aspects of hydrogen storage materials – a theoretical study by Dr.P.Vajeeston of University of Oslo, Norway, which was followed by an interesting presentation by A. Galeckas, University of Oslo, Norway about

the depth-resolved carrier transport properties of step and linearly graded band gap $ZnCd_xO$ structures. The photovoltaic properties of Al-doped ZnO/n-type semiconductor/p-type Cu_2O heterojunction solar cells was discussed in the next session by Toshihiro Miyata of Kanazawa Institute of Technology, Japan. The next talk was by Dr.V.Venkatachalapathy, University of Oslo, Norway, about the synthesis and characteristics of transparent conduction oxide thin and thick films: An overview of indium tin oxide films. The second day ended with a cultural programme presented by the students of Coimbatore Institute of Technology, Coimbatore, India the host institution.

The third day of the conference started with the talk on Helium Atoms: The NEeutral helium MIcroscope NEMI by Dr. Sabrina D. Eder, of University of Bergen, Norway, in which she described in detail the concept and design of a new type of a matter wave microscope called as NEMI. The next talk was about silver nanoparticles decorated reduced graphene oxide nanosheets: A promising SERS substrate for selective detection of uranyl ion by Professor Tarasankar Pal of Indian Institute of Technology, Kharagpur, India. In the next session challenges in the growth of metallic multilayers using molecular beam epitaxy was discussed by Dr.S.Sundar Manoharan of Indian Institute of Technology, Kanpur, India. The last invited talk of the conference was about thin film electrode processing for microbatteries by Dr.G.Mohan Rao of Indian Institute of Science, Bangalore, India in which he explained in length about the development of thin film batteries with well known materials like $LiCoO_2$, LiPON and metal anodes. In addition to the invited talks, 236 papers were presented in the conference by the participants which were from different areas of nanotechnology, covering the nanomaterial preparation aspects, characterization techniques and application of nanomaterials in the field of solar energy, dilute magnetic semiconductors, water purification, medicine, space applications and quantum computing. The presentation sessions were carefully planned for maximum participation and optimal use of time by having three parallel oral presentation sessions on the second day morning and afternoon and two parallel presentation sessions on the third day morning of the conference totalling to eight oral presentation sessions. There were also two poster presentation sessions. The feedback received from the participants and delegates of the conference stated that it was an excellent conference arranged in a meticulous way and the conference provided sound information about the technological components and technical progress taking place in the field of nanoscience and nanotechnology and solar cells.