

Report of The International Symposium On Nanomaterials for Clean Energy and Health Applications (ISNCHA 2017)



*Organized jointly by Coimbatore Institute of Technology, India, and
Western Norway University of Applied Sciences, Norway*



held at Coimbatore Institute of Technology, India from December 6-8, 2017

INAUGURAL FUNCTION

The Inaugural Function was held in the Conference Hall of the Library Block of the Coimbatore Institute of Technology (CIT), India, which comprised of the Presidential Address (Dr. S.R.K. Prasad, Correspondent of CIT), Felicitations Address (Shri. S. Rajiv Rangasamy, Director of CIT), Special Address (Professor Dhayalan Velauthapillai of Western Norway University) and the Address of the Chief Guest (Mr. MeeNilankco Theivetharan, Senior Advisor to the Norwegian Embassy of Sri Lanka). During these Addresses the Commitment to Research and Development Sector in Clean Energy and Health in terms of Nanotechnological Applications has been remarkably expressed. Devotion of the Norwegian Embassy of Sri Lanka towards joint R & D activities in Norway, India and Sri Lanka has been highlighted and highly appreciated.

PLENARY PRESENTATIONS

There were Twelve Plenary Presentations highlighting Applications of Nanomaterials in Various Sectors of Clean Energy Generation and in the Health Sector. Plenary presentations started with a Talk of an Eminent Scientist Professor P. Ravirajan of University of Jaffna, Sri Lanka where he discussed the Role of Interface Modifiers on Enhancing the Performance of Hybrid Nanocrystalline Metal oxide/Polymer Solar Cells. The topic is nourished with the presentation of publications made in high impact indexed journals in collaboration with the scientists of the Imperial College of Science, Technology and Medicine, London, United Kingdom. Dr. M.D. Kannan of University of Oslo, Norway, talked about Quest for Si-based Multi-function Solar Cells Covering the Entire Spectrum in the Plenary Talk II. Graded silicon technology to cover entire solar spectrum to have highly improved performance in solar cells was emphasised. Third Plenary Talk was by Professor R.M.G. Rajapakse, Senior Professor, University of Peradeniya, Sri Lanka, who talked about Nanomaterials Derived from Sri Lankan Minerals for Green Energy and Health Applications. In this presentation, nanomaterials derived from cheap and mundane minerals for applications in solar cells, fuel cells, super capacitors and batteries as well as in the health sector including custom-made prostheses for orthopaedic transplants, targeted delivery and slow release of drugs, antimicrobial textiles and gloves and in combating severe health problems such as Chronic Kidney Disease of

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Uncertain Aetiology (CKDu) have been discussed. Fourth plenary presentation was by Dr. P. Vajeeston of University of Oslo, Norway where he addressed Computational Design of Materials for Energy Harvesting and Storage. This gave glimpses on perfect designing of materials using the advantages of Computer Simulation. Professor A.A. Christy of University of Agde, Norway, presented Plenary Talk V on Applications of Near Infrared Spectroscopy in Material Science where he highlighted Analysis of Hydroxyl Groups on Surfaces of Oxide Materials including those used in Solar Cell Applications. Plenary Talk VI was by Professor Talal Rahman of Western Norway University of Applied Sciences. Dr. Smagul Karazhanov of Institute of Energy Technology, Norway, gave Plenary Talk VII where he discussed Thin Films of Oxidized Yttrium Hydride.

Switching into Biological and Health Applications of Nanomaterials Professor Alvhild Alette Bjørkum talked on Human Blood Serum Proteome Changes After Sleep Deprivation which attracted a great deal of attention of the audience. In Plenary Talk IX Professor Yngve Lamo of Western Norway University of Applied Sciences addressed the question as to 'How can Nano-Materials and Biosensors Influence Patient-centric Care'. This was a wonderful presentation giving insights into novel and cutting edge applications of nanomaterials in developing sensors for patient-care. Plenary Talk X was by Dr. R. Vidya of Anna University, India. She highlighted the Density-functional Theory-based Studies on Materials for Energy and Medical Applications which covered both themes of the conference.

There were two more Plenary Presentations: Plenary Talk XI which was done by Dr. Sudharkar Chandran of IIT Madras, India where he discussed on Pushing to Power Conversion Efficiency Up in DSSC and QDSSC Devices by Tailoring the Light Scattering Properties of Photoanodes. This is an important aspect to catch photons which were escaped without being absorbed by the dye molecules and quantum dots. Final plenary Presentation; Plenary XII, was by an eminent Practical Scientist Professor G.R.A. Kumara of the National Institute of Fundamental Studies, Sri Lanka where he took us in a voyage through his *hitherto* unbelievable discoveries and developments. The presentation was accompanied with practical demonstration of a working Dye-sensitized Solar Cell Module he fabricated several years ago.

TECHNICAL SESSIONS

There were three slots of parallel technical sessions which were chaired by Senior Academics and Scientists distributed to the two days. All these presentations were of very high quality cutting edge R&D activities of particularly young and emerging scientists who were by no means second to senior academics and researchers when it comes to demonstrating their skills in scientific presentations. The Conference gave them further strength by boosting with research ideas and giving very important suggestions to improving their R&D work by the Senior Scientists. Although, due to time constraints, the oral presentations were held in parallel sessions, it would have been much better if single sessions could have been organized

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by extending the conference duration by one more day. However, both the Senior Academics and the Emerging Researchers also had various other academic involvements on the 9th of December thus not allowing to do so.

Poster Presentations were held from 16.00 to 17.00 h on the 7th of December though the Posters were on Display throughout. The Posters also reflected high calibre R&D activities of students. The respective presenters were available on this time slot to defend their posters which they did with remarkable accuracy and confidence. As usual, the Senior Academics have given further insights into improving their R&D activities. There were 184 Oral and Poster Presentations and Abstracts of which are given in the Abstract Proceedings of the International Symposium on Nanomaterials for Clean Energy and Health Applications (ISNCHA 2017). We hope to publish Full Papers in Materials Letters after peer-reviewing.

HANDS-ON TRAINING

Unique feature of this Conference was the Hands-on Training Programme where a very large crowd attended to gain hands-on experience in fabricating working dye-sensitized solar cells. The Programme was chaired by Dr. C.P. Yoganand, Dr. P. Suresh and Dr. P. Balraju who have already done the necessary ground work to have some components ready-made for demonstrations. Professor Dhayalan, Professor Ravirajan and Professor Kumara were a team of distinguished and highly experienced DSC researchers who contributed immensely to this workshop. There were requests from many Universities, Research Institutes and Private Sector Companies but unfortunately all of them could not be entertained due to exceedingly large numbers. Where possible at least a limited crowd from each sector were given the opportunity hoping that well trained individuals are in a position to keep on training others in sequential manner so as to develop workforce needed to develop low-cost solar energy conversion technologies for electricity generation.

SOCIAL EVENTS

The Conference was a Great Success in terms of Both Academic Expansions as well as Social Integrity of Participants from Various Countries including Norway, Germany, India, Sri Lanka, Sweden, Chile and Brazil. All the lunch and refreshment were full of taste of Traditional Indian Foods which were enjoyed exceedingly by everyone particularly by foreigners. Another uniqueness of this Conference was TWO Conference Dinners which gave tremendous opportunity to interact with each other very freely so as to initiate academic, research and social activities.

As the Conference Organizers we take tremendous pleasure in thanking all those who have given fullest support to make this event a great success. We wish to have several of such events and the next one would be in Sri Lanka to which we would like to make an Open Invitation to High Calibre Scientists from the Entire Globe! We take this opportunity to express

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our sincere gratitude to Norwegian Centre for International Cooperation in Education (SIU) under 'Higher Education and Research collaboration on Nanomaterials for Clean Energy Technologies (HRNCET)' project for providing the financial assistance to participate and present our work at the conference.

Signed

Prof.R.M.G.Rajapakshe, Senior Professor in Chemistry, University of Peradeniya
On behalf of Sri Lankan team attended the conference



Sri Lankan Team with Professor Dhayalan and Conference Convenor and Secretary

Team from Sri Lanka

Name	Affiliation	Designation
Prof.R.M.G Rajapakshe	University of Peradeniya	Senior Professor in Chemistry
Prof. G.R.A. Kumara	Institute Fund. Studies	Research Professor
Prof.P.Ravirajan	University of Jaffna	Professor in Physics
Dr. K. Ahilan	University of Jaffna	Senior Lecturer in Elect. Eng.
Dr.T.Pathmathas	University of Jaffna	Senior Lecturer in Physics
Dr.A.Thevakaran	University of Jaffna	Senior Lecturer in Physics
Mr.K.Balashangar	Eastern University	Lecturer in Physical Science



OFFICIAL PHOTOGRAPH OF THE CONFERENCE

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