SCIENCE ACADEMIES LECTURE WORKSHOP ON
“SELECTED TOPICS IN PURE AND APPLIED PHYSICS”
February 06 – 08, 2015

Final Technical Report
Submitted to

The Co-ordinator
Joint Science Education Panel
Indian Academy of Sciences
CV Raman Avenue
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Submitted by

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&

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K. S. RANGASAMY COLLEGE OF TECHNOLOGY (AUTONOMOUS)
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NAMAKKAL (DT.), TAMIL NADU

FINAL TECHNICAL REPORT

FOR SCIENCE ACADEMIES LECTURE WORKSHOP ON

“SELECTED TOPICS IN PURE AND APPLIED PHYSICS”

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DAY 1: Feb 6, 2015

INAUGURATION

Science Academies Lecture Workshop on “Selected Topics in Pure and Applied Physics” was inaugurated by Prof. M. Lakshmanan, Convener, Professor of Eminence, Bharathidasan University, Tiruchirapalli at 9.30 a.m. in Cyberdome Hall, K. S. Rangasamy College of Technology followed by participant registration. A total 136 students and 15 faculties from different institutions of Tamil Nadu were registered for this workshop. Dr. K. Thyagarajah, Principal, K. S. Rangasamy College of Technology gave welcome address. Dr. V. Rajendran, Co-ordinator of the workshop highlighted about the importance of conducting the lecture workshop. Prof. Lakshmanan, during his inaugural address, spoke about the significance of physics in understanding animate and inanimate objects of the world and how powerful the lectures will reach the students than reading books. Felicitation address was given by Resource persons such as Prof. E.S.R. Gopal, Professor Emeritus, Department of Physics, Indian Institute of Science, Bangalore, Prof. A. Subrahmanyam, Department of Physics, IIT Madras, Chennai, Prof. M. N. Ponnuwamy, Professor Emeritus, Crystallography and Biophysics, University of Madras, Chennai.
Technical Sessions I to IV

The technical session started with the lecture of Prof. A. Subrahmanyam, Department of Physics, IIT Madras, Chennai. He delivered a lecture of the role of thin films in biomedical engineering in which he has highlighted few interesting and important findings of his research group and the role of thin film in medical devices. He also elaborately put forth the real time applications of thin films in modern biomedical devices for saving life threatening diseases such as heart failure, stroke and lung failure. The session concluded with a lot of interactions and discussions on the above topic.
**Prof. E.S.R. Gopal**, Professor Emeritus, Department of Physics, Indian Institute of Science, Bangalore successively presented lectures on two important titles 1) ‘Throwing light on illumination and 2) Global Warming: A Scientist Looks at Scenario’. In his first lecture, he spoke about the evolution of illumination sources since the oldest days to present scenario. In his second session, he brought out the consequences of environmental pollution made by humans causing irreversible damages to the earth and global warming. His talk pointed out the increase in environmental hazards by the modernization leading to uncontrollable disasters in the earth. His lectures gave a platform to think about tackling the issues through modern scientific approaches.

*Prof. E.S.R. Gopal delivering his lecture on Global warming*

**DAY 2: Feb 7, 2015**

**Technical Sessions V to VIII**

The second day of the lecture workshop was continued by the technical session of **Prof. M. Lakshmanan**, Professor of Eminence, Bharathidasan University, Tiruchirapalli with two lectures. He derived his own innovations on theoretical physics especially highlighted Non-Linear Physics and Nano Ferromagnetism. He has solved important equations by deriving theoretical formulae to bring out the potential magnetic materials with desirable properties for advanced electronic applications. Participants got motivated to conceive the idea of doing research in theoretical physics especially in Non-Linear Physics. Prof. Lakshmanan’s lectures clearly indicated that Non-Linear physics is one of the interesting areas of research which can be pursued by physicists.
Two successive sessions of the day were occupied by **Prof. G. Baskaran**, The Institute of Mathematical Sciences, Chennai. He delivered two lectures entitled ‘Role of Quantum Mechanics in Material Science’ and ‘Search for Novel Room Temperature Quantum Matter’. During his lectures, he highlighted the crucial role of quantum effects in Material science and engineering based on the observed theoretical concepts. In addition, he pointed out few important properties. He gave an inspiration by describing about the life of key persons like Noble Laureates involved in the discovery and inventions of quantum mechanics.
DAY 3: Feb 8, 2015

Technical Sessions IX to XII

The technical sessions of the third day of the workshop was continued by two resource persons, namely **Prof. M. N. Ponnumswamy**, Professor Emeritus, Crystallography and Biophysics, University of Madras, Chennai and **Prof. V. Rajendran**, Professor and Director, Centre for Nano Science and Technology, K. S. Rangasamy College of Technology.

**Prof. M. N. Ponnumswamy**’s lectures were on the topics entitled “**Crystal Structure of Hemoglobins Derived from Mammalian and Avian Species**” and “**Structural and Functional Analysis of Some Regulatory Proteins**”. He explained about the crystallization of Hemoglobin and the important findings on its structure and genetic variations in different species with scientific evidence. This talk was helpful to the participants to appreciate the physics behind the biomolecules like proteins. The successive lectures delivered by him highlighted the elucidation of functional properties of regulatory proteins involved in transcription of DNA of different mammalian species.
Similarly, Prof. V. Rajendran has delivered two talks on the title of ‘Nanoscience and Technology and its Important Applications’ in which he presented the fundamental concepts of physics for the evolution of nanotechnology and highlighted interesting applications of nanoparticles in diversified fields. The potential applications of nanoparticles for real time practices were really impressive to the participants. In addition, he updated the commercialized technologies using nanoparticles in different industries for wide range of applications. He motivated the students to pursue research in the emerging areas like nanotechnology using the existing physics concepts.
VALEDICTORY FUNCTION

The valedictory function of the Science Academies lecture workshop on “Selected Topics in Pure and Applied Physics” was held on Feb 8, 2015 at 4.00 PM. During the function, Prof. M. N. Ponnuwamy, Professor Emeritus, Crystallography and Biophysics, University of Madras, Chennai delivered his valedictory address. He demanded the young minds to do wonders in Physics by learning theoretical concepts.

Then, the feedback from the students, scholars and faculties from different educational institutions was given. The following are the few feedbacks given during the workshop:

“The lectures given by all the resources persons were so useful to us. I have been attending such workshop often. This workshop is one of the best and interesting” – Mr. Ravi Shankar, A.P.

“Arrangements and information given by out Professors are very nice. Thank you for the wonderful opportunity provided to me” – Ms. M. Kanimozhi, AVS College of Arts and Science, Salem.

“This workshop has been related to new technology and invention of new field in a suitable manner” – Mr. V. Karthikeyan, Annamalai University.

“I really feel proud to be a part of the workshop at your institutions” – Mr. K. Chandiran, Arignar Anna Govt. College, Namakkal.

“Very nice arrangements for all sessions. Give few more sessions for other topics” – Mr. V. Senthil Kumar, Chikkanna Govt. Arts and Science College, Tirupur.
“It will be more useful if you provide detailed information about the synthesis and characterisation of nanomaterials” – Mr. N. Arumugasamy, The M.D.T Hindu College, Tirunelveli.

The concluding remarks of the workshop were made by Prof. V. Rajendran, Coordinator of the Science Academies lecture workshop. Finally, the function has ended with the National Anthem.

Feedback given by the participants during valedictory function