REPORT

On

DST Sponsored

"Synergistic Training program Utilizing the scientific and Technological Infrastructure"
(STUTI)
Organized at

(SPOKE)
Department of Physics
University of Calicut
CALICUT (KERALA)

in collaboration with

Aligarh Muslim University, Aligarh (U.P.)
(HUB)

20th - 26th September, 2022

REPORT

The DST sponsored **"Synergistic Training program Utilizing the scientific and Technological Infrastructure (STUTI)"** organized by **Department of Physics, University of Calicut, Calicut, Kerala (Spoke) in collaboration with Aligarh Muslim University, Aligarh (Hub)** was held during 20th September to 26th September, 2022.

The program was inaugurated by the Vice Chancellor, Prof. M. K. Jayaraj, University of Calicut at Aryabatta Hall, Science Block, University of Calicut. Prof. Jayaraj mentioned that the program is intended to create human resource and its capacity building through open access to S&T Infrastructure across the country. It envisions hands-on training and sensitization of the state-of-the-art equipment as well as towards sharing while ensuring transparent access of S&T facilities. Prof. M. M Musthafa welcomed the guests, registered participants and research scholars, and the Chairman of the program, Prof. C. D. Ravikumar, Department of Physics shared his opening remarks. The chairman said that the program will enable the budding researchers and the professionals to develop better understanding and familiarization with the available resources/scientific equipment supported by the Govt of India. It will also provide the participants with the knowledge of cutting-edge research in the fields of materials science and nuclear physics. The training programme will introduce and demonstrate the participants with the qualitative and quantitative characterization tools needed in designing and implementing appropriate strategies for research work, to provide the participants with a comprehensive knowledge of the various tools and techniques needed to characterize the materials and to equip the participants with skills required to operate sophisticated analytical instruments which are imperative for scientific research. The felicitation was given by Prof. Yahya from the department ofChemistry. The vote of thanks was given by Dr. Muhammed Shan Department of Radiation Physics. Prof M. K Jayaraj, the Vice Chancellor delivered a key note address and conducted a special tutorial session.

Key Note address by Prof. M. K. Jayaraj, the Vice Chancellor, Calicut University in the inaugural function

After the inaugural function, the session was handled by Dr. P. P Pradyumnan, Senior Professor, Department of Physics, University of Calicut on the topic "XRD-determining the crystal structure: Principle detection and analysis". In the afternoon session, the hands-on training on "Measurement of energy loss of alpha particles and other charged particles"; the ion source development and XRD as a proof for elemental analysis was carried out.

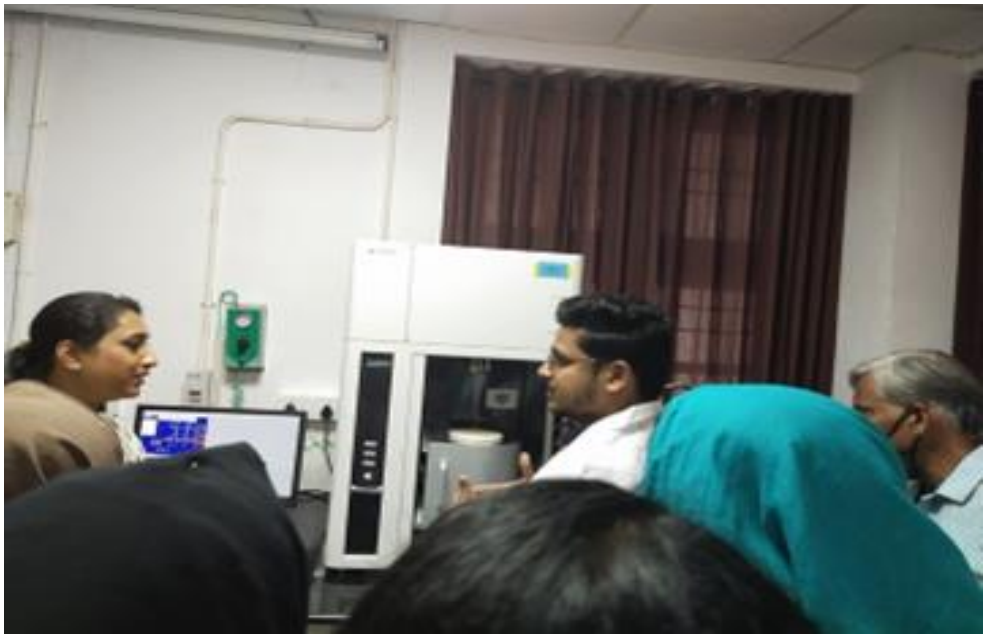
On the second day of the program, i.e., on 21st September 2022, in the morning session, Dr. Fazalurahman K, Department of Chemistry delivered a very informative talk on "UV-Vis Spectroscopy". In the second session Prof. Mohammed Shahin Thayyil, Department of Physics explained the topic of "Differential scanning calorimetry". In the afternoon session hands on training was given for "UV spectroscopy and Dielectric measurement techniques". Participants carried out the measurements by their own hands.

Expert talk by Dr. Fazalurahman K about "UV-Vis Spectroscopy

Hands on session on the X-ray fluorescence set up

The third day of program, i.e., on 22 September 2022, started by a talk from Dr Kishore Sridharan, Department of Nanoscience and Technology. Dr Sridharan explained in details the principle and working of "Scanning Electron Microscopy" and how it may be used for material characterization. Prof P. P. Pradyumnan, Department of Physics delivered a talk on "FTIR Imaging: Techniques and Analysis". The hands-on training on X-ray Fluorescence (XRF), X-ray Diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR) and thermogravimetric Analysis (TGA) were given to the participants by using instrumentation facility in Central Sophisticated Instrumentation Facility (CSIF).

Hands on session on UV Vis spectrophotometer



Hands on session on BET surface area analysis instrument

Expert talk by Dr. Sibu E . S. on principle and application of fluorescence spectroscopy and microscopy.

Hands on training session

Prof. Antony Joseph, Department of Physics delivered a talk on “Nuclear reaction Techniques for material analysis” in the first session on the fourth day of the training programme. Prof. Shibu E S, Department of Nanoscience and Technology delivered a talk on “Principle and Application of Fluorescence spectroscopy and microscopy” in the second session. The hands on training was given for Brunauer-Emmett-Teller (BET), Field emission scanning electron microscopy (FESM), Inductively coupled plasma mass spectrometry (ICPMS), Atomic Force Microscope (AFM) techniques. On the fifth day of the program, i.e., 24th September 2022, Prof. M. M Musthafa, Department of Physics delivered a talk on “XRF and PIXE: Principles, techniques and analysis”. In the second session, Dr Libu K Alexander, Department of Physics explained the “Microraman spectroscopy: Principle, technique and analysis”. After noon session was devoted to the hands on training given for micro-Raman spectrometer.

Expert talk by Dr. Mohammed Shahin Thayyil about "Differential scanning calorimetry"

Hands on session on Inductively Coupled Plasma-Mass-Spectrometry (ICPMS)

On the sixth day of the program (25th September 2022), the first talk was delivered by Dr. Muhammed Shan P. T., on the topic of "Measurement of energy loss of alpha particles and other charged particles. The second session was handled by Dr. Antony Joseph, Department of Physics on the topic of "Micro analysis with ion beam with other radiation". In the afternoon session the hands-on training was given for dielectric measurements.

On the last and seventh day of the program, Prof. Mohammed

Shahin Thayyil, Department of Physics delivered a talk on the topic “Dielectric measurements, techniques and analysis” and Dr M. M. Musthafa, Professor Department of Physics delivered talk on the topic “FTIR Imaging”.

Valedictory session; From Left Dr. C. D. Ravikumar, Professor, Department of Physics, Dr. M. M Musthafa, Professor, Department of Physics, Dr K P Santhosh, Emeritus scientist, Department of Physics, Dr P. P. Pradyumnan, Professor, Department of Physics

Certificate distribution to participants

Group photograph of the participants after the valedictory session

The valedictory session held after the examination and the evaluation and certificates were presented to the participants. The participants appreciated the excellent arrangement and support including the technical sessions organized. The invited talks were quite informative and will be useful in terms of their research work. On behalf of all the participants, in the feedback session Mr. Musunuru G. V. Sankaracharyulu appreciated the efforts put in by organizing committee in the systematic and smooth organization of the training programme. The group photograph was taken after the valedictory session was over.

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