

A BRIEF REPORT ON THE DST-STUTI SPONSORED SEVEN DAYS WORKSHOP  
ON “COMMON SPECTROSCOPIC TECHNIQUES AND DATA ANALYSIS ” HELD  
FROM 9<sup>TH</sup> TO 15<sup>TH</sup> DECEMBER, 2022



विज्ञान एवं प्रौद्योगिकी विभाग  
DEPARTMENT OF  
SCIENCE & TECHNOLOGY

Workshop on  
**Common Spectroscopic Techniques and Data Analysis**

Under the scheme of  
**Synergistic Training Program Utilizing the Scientific and  
Technological Infrastructure (STUTI)**

An Initiative by  
**Department of Science and Technology (DST), Govt. of India**

Organized by  
**Department of Chemistry, Christian College Chengannur**

In Collaboration with  
**Jamia Hamdard (Deemed to be University), New Delhi**

**Focus**

Principles, hands on training / demo and data analysis of IR, UV-Vis, NMR and Fluorescence spectroscopies, XPS, P-XRD and Mass spectrometry

**Date & Venue**

9<sup>th</sup> to 15<sup>th</sup> Dec 2022  
Christian College,  
Chengannur, Kerala

**Participants**

**30**

Accommodation and food will be provided for free. No registration fee required. Candidates will be selected according to eligibility

**Eligibility**

Post Graduate Students, Early Career Faculty Members, Scientists, Ph.D Students and Post-Doc Fellows who are Indian citizens. Selected candidates will receive confirmation via email

**Deadline**

Apply on or before  
24<sup>th</sup> November 2022

**Patron**

Rt. Rev. Thomas Mar Timotheos Episcopa  
Manager, Christian College

**Chairman**

Dr. Johnson Baby  
Principal, Christian College

**Co-ordinator**

Prof. Dr. Suhel Parvez  
Jamia Hamdard PMU

**Convenor**

Dr. Rani Abraham  
HOD, Chemistry, Christian College

**Organizing Secretary**

Dr. Prinson P. Samuel

**Organizing Committee**

Ms. Roshni Thomas  
Ms. Rekha Unni  
Dr. Sujesh Baby  
Dr. Teena Lis Luke  
Dr. Manoj C. Raj  
Dr. Rinu Elizabeth Roy

**Advisory Committee**

Dr. Vinoy Thomas  
Dr. Binu Ramachandran  
Dr. R. Jayakrishnan

**Contact**

9605586290

9447439962, 9446963119

prinsonpsamuel@christiancollege.ac.in

<https://www.christiancollege.in/chemistry/>

**Registration link**

<https://forms.gle/TR85pT8smtkmHgpv6>

Click button to register

click



Scan to register

The Department of Science & Technology under the aegis of Synergistic Training Programme Utilizing the Scientific & Technological Infrastructure (DST-STUTI), sanctioned the support and conduct of a one-week long workshop on "Common spectroscopic techniques and data analysis". The programme was organized from 9<sup>th</sup> to 15<sup>th</sup> December-2022, by the Department of Chemistry (DST-FIST) of Christian College, Chengannur, Kerala in collaboration with Jamia Hamdard Deemed to be University, New Delhi as a project management unit (PMU). The DST-STUTI Scheme envisioned imparting of training to human resource and its capacity building through open access to science and technology infrastructure across the country in departments funded under various DST schemes like DST-FIST, PURSE, SATHI. Aimed at providing hands-on training and sensitization of the state-of-the-art equipment and as well ensuring transparent access of science and technology facilities it is hoped that the scheme will enable the budding researchers and professionals to develop better understanding and familiarization with the available resources/scientific equipment supported by the Govt. of India. The workshop was attended by a large number of graduate, post-graduate, research scholars and faculty members from across departments of the college along with the select participants.

Organizing committee for the workshop comprised of the manager of Christian College, Rt. Rev. Thomas Mar Timotheos Episcopa as the Patron, Principal of the college, Dr. Johnson Baby as Chairman, Prof. Dr. Suhel Parvez of Jamia Hamdard and DST-STUTI PMU coordinator as Co-Patron and Coordinator, Dr. Rani Abraham, Head of the Department of Chemistry at Christian College as Convenor, Dr. Prinson P. Samuel of the same department as the Organizing Secretary and all other faculty members of the Department Ms. Roshni Thomas, Ms. Rekha Unnu, Dr. Sujesh Baby, Dr. Teena Lis Luke, Dr. Manoj C. Raj, Dr. Rinu Elizabeth Roy and Ms. Anna Abraham as committee members in charge of each subcommittee. An advisory committee was also functional with Dr. Vinoy Thomas, Head of the Department of Physics of the college, Dr. Binu Ramachandran, Asst. Professor, University of Calicut and Dr. Jayakrishnan, Associate Professor, Department of Physics, University of Kerala, Hon. Director, University Astronomical observatory as members.

The primary objective of the workshop was to impart both theoretical and practical knowledge of the analytical techniques employed for understanding the chemical structure and nature of materials and thereby ascertaining their potential for application in different fields. The different techniques of spectroscopy including FTIR, fluorescence and NMR were dealt with in the programme focussing on the basic principles, hands on training/demo and most importantly on how the spectral data could be analysed. Similar sessions on XPS, powder XRD and mass spectrometric techniques were also held. Here too great emphasis was put on interpretation of the results.

All the techniques selected and all sessions delivered were relevant to the needs of the participants who comprised of researchers from biology, chemistry, materials science and physics. There were 14 resource person who introduced the participants to the different aspects of the techniques and could handle and clarify their queries and doubts quite efficiently. The participants were also taken to the DST-SAIF and AMMRC facilities at the

nearby Mahatma Gandhi University Campus, Kottayam to demonstrate and sensitize state-of-the-art equipment of NMR, Mass, XPS, and XRD.

### Inaugural ceremony

An inaugural ceremony to mark starting of the workshop took place on 9<sup>th</sup> December 2022 at the seminar hall of the college at Chengannur. The day began with the registration and reporting of the selected participants. A brief inaugural session was held in the Seminar Hall of the College on 9<sup>th</sup> morning December 2022. The meeting was presided over by the Principal of the College, Dr. Johnson Baby. Dr. Rani Abraham, Head of the Department of Chemistry welcomed the guests and participants. She thanked the DST and PMU at Jamia Hamdard for giving the opportunity to organize the workshop and expressed hope that workshop would immensely benefit the participants who had come from different parts of the country. Dr. Johnson Baby in his presidential address emphasized the significance of trainings of this kind in the progress of one's research and congratulated the department for coming forward to organize the program.



The workshop was declared inaugurated by the Hon. Vice Chancellor of the University of Kerala Prof. Dr. Mohan Kunnumel in virtual mode. In his inaugural address he highlighted the importance of spectroscopy in science citing the example of how MRI is helpful in the determination of tissue structure and diagnosis and how the developmental studies took us forward in the fight against Covid-19. The chief guest of the function was Prof. Dr. Suhel Parvez. He explained the DST-STUTI programme and efforts put in by the government to take our research forward in the right direction by assisting the researchers in every possible manner. He urged the participants to make maximum use of the programme. Prof. Mohd

Akram, from Jamia Hamdard University (PMU) as the guest of honour addressed the audience and briefed then on the role of Jamia Hamdard as project management unit in attaining the objectives of DST-STUTI program. Felicitations were also made by Dr. Binu Ramachandra and Vinoy Thomas, both of them being members of the advisory committee. The session closed following the developments in connection with the organizing, selection of resource persons and participants as well. The inaugural session ended with a vote of thanks offered by the organizing secretary Dr. Prinson P. Samuel followed by a 10-minute tea break.

### **Scientific sessions**

The inaugural meeting was followed by the given below scientific sessions. Sessions 2,3 and 4 on Day 1 were introduced as special talks.-

The vast arrays of topics covered by the different invited speakers from the Day 1 to the Day 7 of the workshop include:

- **Theory of Optical absorption and emission processes** by Prof. Dr. R. Jayakrishnan, University of Kerala (Session 1), **Research Avenues in Complementary and Alternative Medicine: Exploring Biochemical Molecules** by Prof. Dr. Mohammad Akram, Jamia Hamdard, New Delhi (Session 2), **Modern Techniques in Translational Sciences** by Prof. Dr. Suhel Parvez, Jamia Hamdard, New Delhi (Session 3) and **Instrumental methods in Neuroscience Research** by Dr. Binu Ramachandran, University of Calicut on Day 1.
- **Instrumentation and practising of optical absorption and fluorescence spectroscopy (Laboratory)** by Prof. Dr. R. Jayakrishnan, Dept. of Physics, University of Kerala (Session 1), **Mass Spectrometry: Basic Principles** (Session 2) and **Mass Spectrometry: Data generation and interpretation (Data Analysis – Session 3)** by Prof. Dr. Sudarshil S, Amrita Vishwa Vidyapeetham, Kollam on Day 2
- **NMR Spectroscopy: Basic Principles (Session 1) NMR Spectroscopy: Signal processing and applications (Session 2 -Data Analysis)** by Prof. Dr. Vinesh Vijayan, IISER Thiruvananthapuram on Day 3
- **LC triple quadrupole mass spec equipment demo for multiple analysis modes** (Lab Session 1) Shiny Thomas, DST-SAIF, MG University, Kottayam and **Demonstration of powder x-ray diffractometer** (Lab Session 2) by Dr. Geethi P Gopalan, MG University, Kottayam followed by Field Visit DST-SAIF and IIRBS facilities of MG University, Kottayam; Alappuzha Beach on Day 4
- **Powder X-ray diffraction** (Session 1) by Prof. Dr. V L Joseph Joly, St. Thomas College Thrissur and **Photoelectron Spectroscopy and applications to solid surfaces** (Session 2) - Prof Dr. Thomas Mathew, St. John's College, Anchal on Day 5

- **IR and UV-Vis spectroscopy: Principles and instrumentation** (Session 1) and **Demonstration of IR spectroscopy (Lab- Session 2)** by Dr. Devendiran M, Perkin Elmer (India) Pvt Ltd on Day 6
- **Laser Spectroscopy: A Versatile Tool for Material Science** (Session 1) Prof. Dr. Manoj P, St. Michael's College, Cherthala, **NMR Spectroscopy of organic molecules – Data Analysis** (Session 2) - Prof. Dr. Suju C Joseph, Mar Ivanios College, Trivandrum and **UV-Vis spectroscopy: Sample analysis** (Session 3-Lab) - Prof. Dr. Sujesh Baby, Christian College Chengannur on Day 7

The details of the sessions are explained below.

## Day 1

The invited speakers for the Day 2 were **Prof. R Jayakrishnan, Department of Physics, University of Kerala, Prof Mohammed Akram, Jamia Hamdard, New Delhi, Prof Suhail Parvez, Jamia Hamdard, New Delhi, and Prof. Binu Ramachandran, Department of Zoology, University of Calicut.**

The first speaker **Prof. R Jayakrishnan**, delivered a talk on the topic **Theory of Optical Absorption and Emission Processes**. He started his talk from the fundamentals of absorption-emission phenomena and explained how it has been merged into powerful spectroscopic techniques for characterization of materials and molecules. He enlightened the delegates with the growing impact of optical absorption techniques. Prof. Jayakrishnan explained how emerging technologies are enabling optical absorption occur on a large scale, and he explained the two types of fluorescence- Excitation and Emission spectra.

Second speaker, **Prof Mohammed Akram**, presented a very informative lecture on **Research Avenues in Complementary and Alternative Medicines: Exploring Biochemical Molecules**. His talk focused on the clinical trials investigating complementary and alternative medicine. He explained the different aspects and methodologies in Unani medicine Prof Akram suggested strong commitment is required from the research community to provide information about complementary and alternative medicines to the public and health professionals. He pointed out how Unani medicine is being based on the classical four humours: phlegm (balgham), blood (dam), yellow bile (safrā) and black bile (saudā'), and it has penetrated into the Indian traditional systems of medicine.

Third Speaker **Prof Suhail Parvez**, delivered a lecture on **Modern Techniques in Translational Sciences**. He explained the scientific process of turning observations in the laboratory, clinic, and community into interventions that improve the health of individuals and the public — from diagnostics and therapeutics to medical procedures and behavioural changes. His talk stressed on the mission of translational science to bring productivity and efficiency to the development and dissemination of interventions that improve human health. He proposed that translational science is in many ways an even greater challenge, and its realization will require the same sustained bold vision and execution.

The first day was concluded with an interactive session by **Prof. Binu Ramachandran** on **Instrumental methods in Neuroscience Research**. He explained the participants on the recording of experimental memory from hippocampus in vitro.



## Day 2

The invited speakers for the Day 2 were **Prof. R Jayakrishnan**, Department of Physics, University of Kerala and **Prof Sudarslal S**, Amrita Vishwa Vidyapeetham, Kollam.

In session 1 **Prof. R Jayakrishnan**, Department of Physics, University of Kerala conducted the training (laboratory) on fluorescence spectrometer with a talk on the topic **Instrumentation and Practising of Optical Absorption and Fluorescence Spectroscopy**. Participants were trained how to prepare the sample, measure and interpret the fluorescence spectra using the fluorescence spectrometer facility available in the college.



In session 2, **Prof Sudarslal S**, Amrita Vishwa Vidyapeetham, Kollam discussed the **Basic Principles of Mass Spectrometry**. He delved upon the Mass spectrometry (MS) as an

analytical technique that separates ionized particles such as atoms, molecules, and clusters by using differences in the ratios of their charges to their respective masses (mass/charge;  $m/z$ ). His talk emphasized how mass spectral techniques are applicable not only to the small molecules but also to molecules of life such as proteins. The different techniques used for different purposes of measurements depending on the analyte nature were elaborately discussed. He continued for session 3 (data analysis) of the day in the afternoon on "**Mass spectrometry: Data generation and interpretation**"

### Day 3,

The invited speaker for the Day 3 was **Prof Vinesh Vijayan, IISER, Thiruvananthapuram**. He handled both FN and AN sessions.

In session 1, **Prof Vinesh Vijayan**, delivered a talk on "**Nuclear Magnetic Resonance Spectroscopy: Basic Principles, Signal Processing and Applications.**". He elaborated on the interaction of nuclei with magnetic field, coupling of nuclei, spin-spin splitting, relaxation process, measurement of relaxation time etc . He continued for session 2 in the afternoon on the topic "**NMR: Signal Processing and Applications.**" This session gave the information on how to interpret and process the NMR data using Bruker Top Spin Software.



## Day 4,

On the day 4 the entire STUTI team visited **SAIF, Mahatma Gandhi University, Kottayam**. Two training sessions were conducted for participants on **Mass spectrometry** and **P-XRD**. The participants were divided into smaller groups and each group were given demonstration on the above mentioned techniques. **Ms. Shiny Thomas**, DST-SAIF, Mahatma Gandhi University, Kottayam explained the LC Triple Quadruple Mass Spec equipment and **Dr. Geethi P. Goplalan** handled the training sessions on powder X-ray Diffractometer.

On the way back to Christian College, the participants visited Alappuzha Beach and enjoyed the scenic beauty of God's own country.



## Day 5

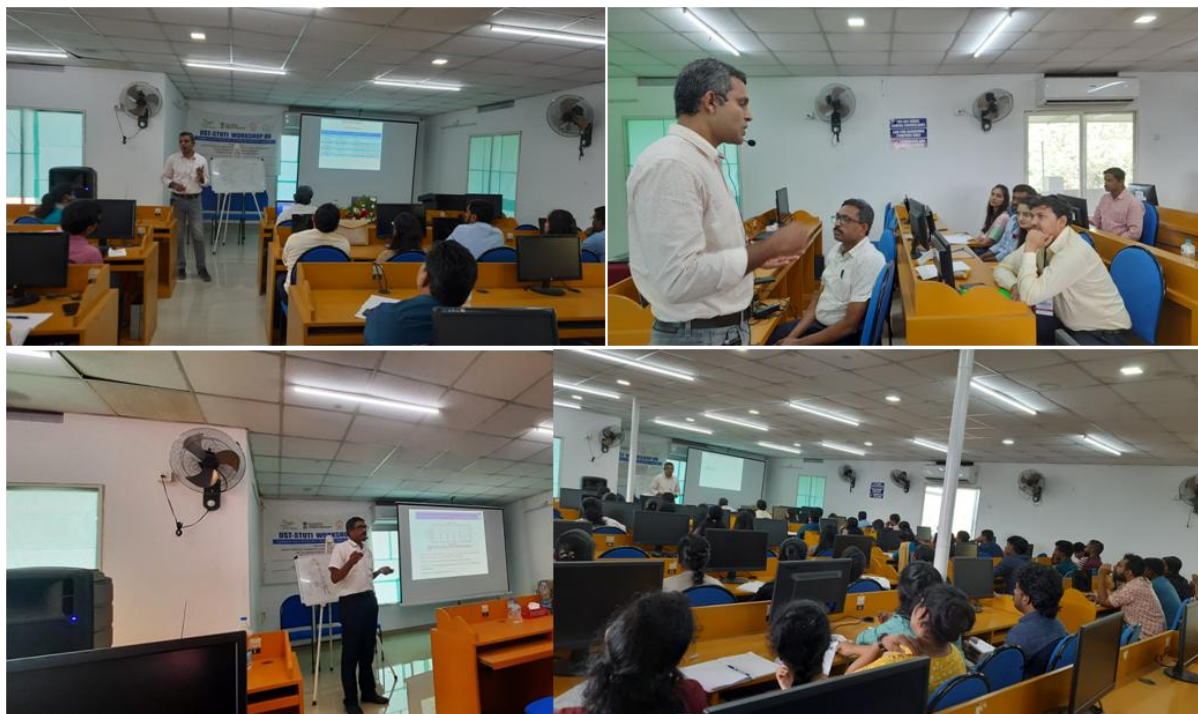
The invited speakers for the Day 5 were **Prof. V L Joseph Joly, St. Thomas College, Thrissur** and **Prof. Thomas Mathew, St. Johns College, Anchal**.

In session 1, **Prof. V L Joseph Joly, St. Thomas College, Thrissur** delivered a detailed lecture on **Powder X-ray Diffraction**. He explained how the the purity of a sample can be determined from its diffraction pattern, as well as the composition of any impurities present. The lecture stressed on the theoretical interpretation on how materials generate X.ray diffraction pattern. The participants were familiarized with how such a diffraction data can be analysed to get important information on the properties of the material samples.

In session 2, **Prof. Thomas Mathew, St.Johns College, Anchal** delivered a detailed lecture on **“Photoelectron Spectroscopy and Applications to Solid Surfaces”**. He discussed on



different PES techniques and emphasized the difference between PES and AES. The lecture detailed on the information obtained from XPS by taking the example of  $Al_{10-x}Cu_xO_y$ . Prof. Mathew also familiarized the participants with different web resources available for obtaining XPS database. The lecture covered the methods involved in data acquisition, survey spectra, BE correction etc. The spin-orbit coupling, shake-up satellite features, multiplet splitting, quantitative analysis and instrumentation were also discussed.



## Day 6,

The invited speaker for the Day 6 was **Dr. Devendiran M, Perkin Elmer India, Pvt Ltd.**

In session 1 (FN), **Dr. Devendiran M**, delivered a lecture on title **IR and UV-Vis spectroscopy: Principles and Instrumentation**. In the discussion on UV-Vis spectroscopy, he detailed on the interaction of radiation with molecules, different types of electronic transitions, Jablonsky energy diagram, terms used in UV-Vis spectroscopy, factors affecting electronic transitions, instrumentations and accessories of a spectrometer, softwares used, different types of cells used and applications of the technique.



In the discussion on IR spectroscopy, he detailed on the basics of IR absorption by samples, properties of IR spectrum, types of vibrations in molecules, criteria for infrared spectroscopy, IR spectra in transmission and absorption mode, IR active bonds, shapes of IR bands, factors affecting IR frequency, regions of IR spectrum. IR instrumentation and applications.

In session 2 (AN) he have training to participants on IR spectrometer available in the college.

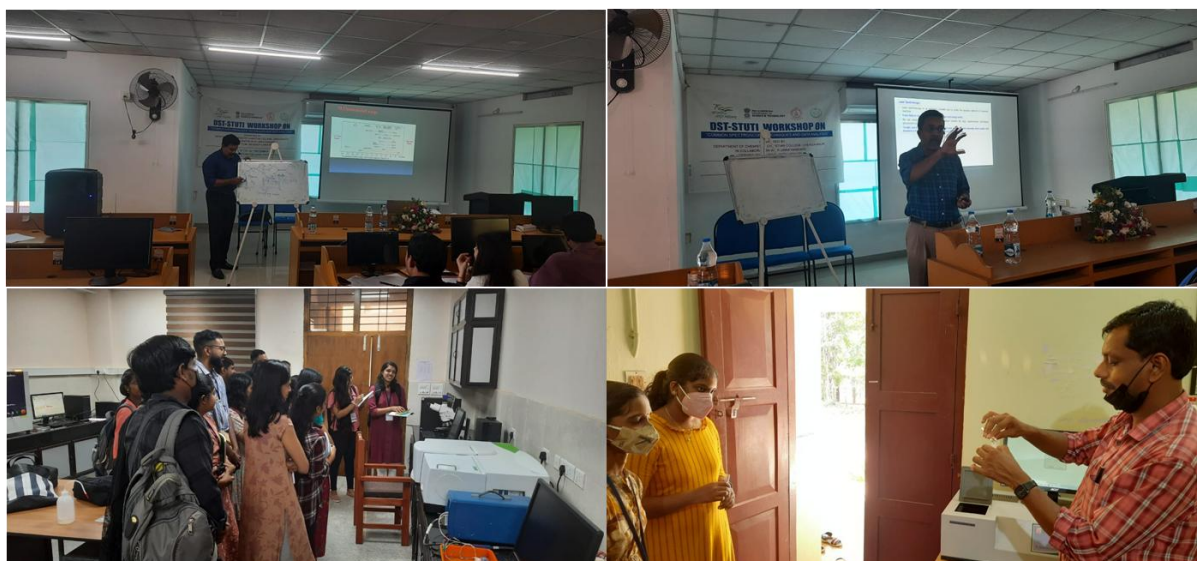
### Day 7,

The resource persons were **Prof Manoj P, St. Michael's Cherthala, Prof. Suju C Joseph, Mar Ivanios College, Trivandrum and Prof. Sujesh Baby, Christian College, Chengannur.**

In session 1 **Prof Manoj P** discussed on the topic entitled **LASER Spectroscopy: A Versatile Tool for Material Science**. He emphasised that Laser spectroscopy provides chemists with an extremely versatile tool for analytical spectrochemistry, for probing the dynamic behaviour of chemical reactions, and for determining molecular structure and energy levels. One significant application made possible by lasers is the technique of picosecond and subpicosecond spectroscopy, which is used to study ultrafast kinetics of chemical reactions.

In session 2 (Data analysis), **Prof. Suju C Joseph** explained the **NMR Spectroscopy of organic molecules**. The session covered how to interpret the NMR spectra given by organic molecules and drug molecules. The discussion went in deep to the concepts of chemical shift, spin-spin splitting and coupling constants and explained how they are useful in identifying the molecule.

In session 3 **Prof. Sujesh Baby** gave training to the participants on the sample analysis using UV-Vis spectrometer available in the college.



Each session was followed by active discussions, presenting mementos to the resource person and vote of thanks. Materials provided by the resource person on the theory and practice of the session were shared with the participants at the end of each day.

The workshop was attended by 30 participants which included Assistant professors and research scholars from different institutions across the country including Jamia Millia Islamia, New Delhi; Kumaun University, Uttarakhand; Sharda University, Noida; Amity University, UP; Bharathiar University, Tamilnad; NIT, Bhopal; Central University of Tamilnad; and from colleges affiliated to different universities in Maharashtra and Kerala. The participants were accommodated in different hotels in the nearby areas and were transported to and fro the venue of workshop using taxi services. Food was provided either in the hotels or by third party food caterers as entrusted by the organizing committee.

### **The valedictory function**

The valedictory session was arranged at 3 pm on 15<sup>th</sup> of December 2022 with Dr. K.S. Anilkumar, Hon. Registrar of the University of Kerala as chief guest. The registrar spoke to the audience on the salient features of the educational policy and how the university was trying to implement it in a laudable manner. A brief report of the activities right from day 1 to day 7 was presented by Dr. Manoj C. Raj. Certificate of participation was handed over to the participants by the Registrar and the Principal of the college during the valedictory function. Dr. Jaypal Subrmaniam, Mr. Paramjit Singh, Ms. Arathy Sreenikethan and Ms. Neha Varma from among the participants shared the feedback of the workshop in the function. Their positive comments and their briefing on how the sessions benefitted them was a matter of satisfaction for the organizers. The meeting came to an end at 4 pm.



At the end of the workshop, questionnaires were distributed to the participants to get their feedback of the training methodology, training materials and to get views on how to improve

workshop in future. Overall, the participants were positive in their feedback and opined that objectives of the workshop were met. The participants considered the schedule of the workshop and technical arrangement of the practical sessions to be well organized. Their enthusiasm and interest were apparent from their 100% attendance on all days, presence throughout the long working hours. Their constant interactions and eagerness to know more was appreciated by all the resource persons. Even the refreshment break and lunch provided on all days was enjoyed by them. In their conversations they expressed the desire to attend more workshops on several topics to master the skills for becoming good researchers. They enjoyed their visit to the Alappuzha beach on the day of field visit and also relished the comfortable stay they had in the small town of Chengannur.

**Media Reports**

The reports of the DST STUTI programme at Christian College appeared three times at two leading news papers: Malayala Manorama and The Hindu

**മലയാള മനോരമ**  
9 Dec 2022

# ക്രിസ്ത്യൻ കോളജിൽ ദേശീയ ശിൽപശാല

ചെങ്ങന്നൂർ • ക്രിസ്ത്യൻ കോളജ് രസതന്ത്ര വിഭാഗവും ഡൽഹി ജാമിയ ഹമ്ദാദ് കൽപിത സർവകലാശാലയും സംയുക്തമായി കേന്ദ്ര ശാസ്ത്ര സാങ്കേതിക വകുപ്പിന്റെ സഹായത്തോടെ ദേശീയ രസതന്ത്ര ശിൽപശാല ഇന്നു മുതൽ 15 വരെ കോളജിൽ സംഘടിപ്പിക്കുന്നു.

കേരള സർവകലാശാല വൈസ് ചാൻസലർ ഡോ. മോഹനൻ കുറുപ്പമ്മൽ ഉദ്ഘാടനം ചെയ്യും. ചടങ്ങിൽ ജാമിയ ഹമ്ദാദ് സർവകലാശാലയിൽ നിന്നുള്ള

പ്രഫ. സുഹൈൽ പർവേസ്, ഡോ. മുഹമ്മദ് അക്രം എന്നിവർ പ്രഭാഷണം നടത്തും. ഇന്ത്യയിലെ വിവിധ സർവകലാശാലകളിൽ നിന്നും തിരഞ്ഞെടുക്കപ്പെട്ട വിദ്യാർത്ഥികൾക്ക് ശാസ്ത്ര ഗവേഷണങ്ങൾക്ക് അനിവാര്യമായ നൂതനവും സങ്കീർണ്ണവുമായ സാങ്കേതിക വിദ്യ പരിചയപ്പെടുത്തുന്നതിനോടൊപ്പം അവയുടെ അപഗ്രഥന രീതികളിൽ ഹാൻഡ്സ് ഓൺ ട്രെയിനിങ്ങും ശിൽപശാലയുടെ ഭാഗമായി ക്രമീകരിച്ചിട്ടുണ്ട്.

# ചെങ്ങന്നൂർ ക്രിസ്ത്യൻ കോളജിൽ ദേശീയ ശിൽപശാല

ചെങ്ങന്നൂർ • ക്രിസ്ത്യൻ കോളജ് രസതന്ത്ര വിഭാഗം, ജാമിയ ഹംദാദ് കൽപിത സർവകലാശാല എന്നിവയുടെ നേതൃത്വത്തിൽ ഒരാഴ്ച നീണ്ടു നിൽക്കുന്ന ശിൽപശാലയ്ക്കു തുടക്കമായി. സ്വെക്ട്രോസ്കോപ്പിലെ നൂതന സാങ്കേതിക വിദ്യകളെ പരിചയപ്പെടുത്തുന്ന ശിൽപശാല കേരള സർവകലാശാല വൈസ് ചാൻസലർ ഡോ.മോഹനൻ കുന്നുമ്മൽ ഉദ്ഘാടനം ചെയ്തു.

ജാമിയ ഹംദാദ് ടോക്സിക്കോളജി വിഭാഗം തലവൻ പ്രഫ.

ഡോ. സുഖേൽ പർവേസ്, ജാമിയ ഹംദാദ് സർവകലാശാലയിൽ നിന്നുള്ള ഡിപ്പാർട്ട്മെന്റ് ഓഫ് പ്രിവന്റിവ് ആൻഡ് സോഷ്യൽ മെഡിസിൻ വിഭാഗം അധ്യാപകൻ ഡോ. മുഹമ്മദ് അക്രം, കാലിക്കറ്റ് യൂണിവേഴ്സിറ്റി ജന്തു ശാസ്ത്രവിഭാഗം അധ്യാപകൻ ഡോ.ബിനു രാമചന്ദ്രൻ, കോളജ് പ്രിൻസിപ്പൽ ഡോ. ജോൺസൺ ബേബി, ഡോ. രാണി ഏബ്രഹാം, ഡോ.വിനോയ് തോമസ്, ഡോ.പ്രിൻസൺ പി. സാമുവൽ എന്നിവർ പ്രസംഗിച്ചു.



## Training on spectroscopic methods at Christian College

The department of Chemistry of Christian College, Chengannur, is organising a seven-day workshop on common spectroscopic techniques and data analysis in collaboration with Jamia-Hamdard (deemed-to-be university), New Delhi. The workshop is supported by the Department of Science and Technology. Select thirty participants, including faculty members, PhD scholars and post-doctoral fellows from different research areas of chemical, physical and life sciences are participating in the workshop that will conclude on December 15.



The DST STUTI Team



A picture from the DST STUTI lecture at Christian College



Participants taking lunch



Participants during a bus travel



Certificate of participation

Jamia Hamdard PMU  
**DST-STUTI TRAINING FORM**  
FEEDBACK FORM

Topic: Workshop on 'Common Spectroscopic Techniques and Data Analysis'  
Date and Duration of Training: 09-15 December 2022  
Organized by: Department of Chemistry, Christian College, Chengannur  
Name of the Institute Visited:

Please rate the program components on a scale of 10 to 1 (10 indicates 'Excellent/Moderate/Effective' and 1 indicates 'Poor/Least Effective') wherever necessary

No.	Contents	Rating									
		1	2	3	4	5	6	7	8	9	10
1	The overall grading of the program with reference to the relevance of the course/module/content, etc.										✓
2	The overall grading of the facilities provided by the institute ie, Hostel, Mess, Class, Rooms, Transport/infrastructure, etc.										✓
3	The overall grading of the faculty members conducting the training										✓
4	How do you rate the overall training methodology?									✓	
5	How far the field visit is relevant and related to your research study?									✓	
6	The usefulness of training in your current role									✓	
7	The usefulness of this training in future work/job you may handle									✓	
8	How far have you benefitted from interaction with fellow participants of training?									✓	
9	How far is the course material supplied relevantly related to the training curriculum?									✓	
10	The overall grading of the process of training									✓	
11	Your recommendation to your peers/colleagues for the training program									✓	

Other suggestions/Observations if any-

Name of the participant : Paranjit Singh  
 Course : Ph.D.  
 University/Institute : Jamia Millia Islamia  
 Email id : singhparan10@gmail.com  
 Phone no. : 9319142875

Feedback given by participants