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BANARAS HINDU UNIVERSITY

AMITY UNIVERSITY

TECHNIQUES OF ADVANCED MATERIAL CHARACTERIZATION & SPECTROSCOPY

Organized by:- **SATHI, Banaras Hindu University, Varanasi**

24 November - 30 November 2022

REGISTER: https://bit.ly/3ruKdwc

(Last date for Registration: 24th October, 2022

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DEPARTMENT OF **SCIENCE & TECHNOLOGY**

Under

SYNERGISTIC TRAINING PROGRAM UTILIZING THE SCIENTIFIC AND TECHNOLOGICAL INFRASTRUCTURE (STUTI)

Registration QR | For More Information

+91 9289394650 | dststuti@amity.edu

PATRONS

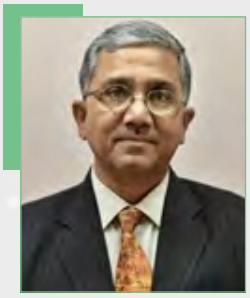
Prof. Sudhir K. Jain
Vice Chancellor,
Banaras Hindu University

Dr. W. Selvamurthy
President - Amity Science, Technology & Innovation Foundation (ASTIF),
Director General - Amity Directorate of Science & Innovation Chancellor,
Amity University Chhattisgarh, and Chair Professor for Life Sciences

Prof. Rakesh Bhatnagar
Vice-Chancellor / President
Amity University Rajasthan

ADVISORS

Prof Vijay Kumar Shukla
FCWCS, FNAMS,
Rector,
Banaras Hindu University



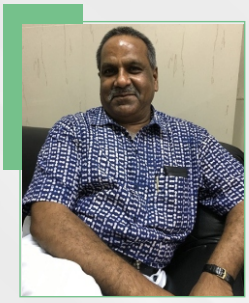
Prof Anil Kumar Tripathi
FNA, FASc, FNASc, FNAAS,
JC Bose National Fellow,
Director, Institute of Science,
Coordinator, SATHI-BHU,
Banaras Hindu University

Prof. A. Chakraborty
Officiating Director General,
Amity Foundation for Science,
Technology & Innovation Alliances
(AFSTIA), (Former Outstanding Scientist
(Sct H), CSIR . Founding Director, Indo-
German S&T Centre-IGSTC
Former Science Counsellor of India in
Germany

Dr. Neeraj Sharma
Lifetime Fellow ISAE, Deputy Director
General, Amity Foundation for Science,
Technology & Innovation Alliances
(AFSTIA), (Former Secretary, Technology
Development Board & Advisor
Department of Science and Technology,
GOI Member, Technology Mission for
Indian Railways

Professor (Dr) Bhudev C. Das
FNASc, FASc, FAMS, FNA & Formerly
J.C. Bose National Fellow Chairman &
H. G. Khorana Chair Professor, Amity
Institute of Molecular Medicine &
Stem Cell Research (AIMMSCR)
DEAN, Health & Allied Sciences
Vice President, Amity Science,
Technology & Innovation
Foundation(ASTIF)

Prof Madhoolika Agrawal
FNA, FNASc, FNAAS,
JC Bose National Fellow,
Dean, Institute of Science,
Banaras Hindu University

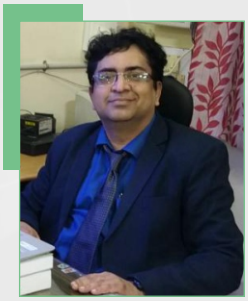


Prof. Maya Shankar Singh
FNA, FASc, FNASc,
JC Bose National Fellow,
CNR Rao Rotating Chair Professor,
Coordinator, Central Discovery Centre,
Banaras Hindu University

ORGANIZING COMMITTEE

Prof. J K Roy
Department of Zoology,
Institute of Science
Banaras Hindu University

Prof. D. S. Pandey
Professor,
Department of Chemistry,
Institute of Science
Banaras Hindu University

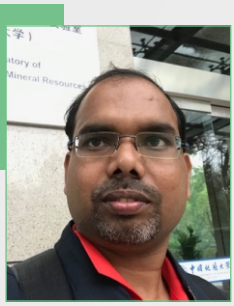


Prof. N.V. Chalapathi Rao
Professor,
Department of Geology,
Institute of Sciences,
Banaras Hindu University

Prof. S. P. Rai
Professor,
Department of Geology,
Institute of Sciences,
Banaras Hindu University

Prof. Anchal Srivastava
Professor,
Department of Physics,
Institute of Science,
Banaras Hindu University

Dr. Manasi Ghosh
Assitanat Professor,
Department of Physics, MMV
Institute of Science,
Banaras Hindu University



Dr. Kripa Ram
Assistant Professor,
Institute of Environment and
Sustainable Development (IESD),
Banaras Hindu University

Dr. Shailendra Pratap Singh
Assistant Professor,
Department of Botany,
Institute of Science,
Banaras Hindu University

Dr. Chandan Kumar Singh
Assistant Professor,
Department of Biochemistry,
Institute of Sciences,
Banaras Hindu University

Mr. Saikat Sen
Chief Operating Officer,
SATHI-BHU,
Central Discovery Centre,
Banaras Hindu University

SATHI-BHU
STUTI TEAM

Dr. Pubali Adikary,
Principal Project Associate,
SATHI-BHU,
Central Discovery Centre,
Banaras Hindu University

Dr. Vivek Kumar Pandey
Principal Project Associate,
SATHI-BHU,
Central Discovery Centre,
Banaras Hindu University

Mr. Adarsh Kumar Pandey
Senior Project Associate,
SATHI-BHU,
Central Discovery Centre,
Banaras Hindu University

Dr. Vivek Kumar Maurya
Senior Project Associate,
SATHI-BHU,
Central Discovery Centre
Banaras Hindu University

AMITY UNIVERSITY
PROJECT MANAGMENT UNIT

STUTI - COORDINATOR

Brig. R K Sharma
Director
Amity Institute of Training
& Development

Shafali Kashyap
Assistant Director
Amity Foundation for
Science Technology
and Innovation Alliances
Research Associate

AMITY PMU- PROJECT TEAM

Avinash Chauhan
Research Associate

Harjinder Kaur
Project Assistant

ORGANIZERS

BANARAS HINDU UNIVERSITY (BHU) – Partner Institution

Banaras Hindu University (BHU), formerly Central Hindu College, is a central and research university located in Varanasi, Uttar Pradesh. It was established in 1916 jointly by Pandit Madan Mohan Malaviya, the Maharaja of Darbhanga Rameshwar Singh, Maharaja of Banaras Prabhu Narayan Singh, Sunder Lal and British Theosophist and Home Rule League founder Annie Besant. With over 30,000 students residing on campus, it is one of the largest residential university in Asia. The university is one of the ten public universities declared as an Institute of Eminence.

BHU is organized into six institutes, 14 faculties (streams) and about 140 departments many centers of advanced studies, 05 interdisciplinary schools with a vast knowledgebase. As of 2020, the total student enrolment at the university is 30,698 coming from 48 countries. It has over 65 hostels for resident students. Several of its faculties and institutes include Arts, Social Sciences, Commerce, Management Studies, Science, Performing Arts, Law, Agricultural Science, Medical Science, and Environment and Sustainable Development along with departments of Linguistics, Journalism & Mass Communication, among others. The university's engineering institute was designated as an Indian Institute of Technology in June 2012, and henceforth is Indian Institute of Technology (BHU) .

Sophisticated Analytical and Technical Help Institute (SATHI-BHU) is a professionally managed facility Which provides quantum leap to its innovative and translational research outputs and to cater the needs of Indian industry by providing globally acceptable analytical services related to drug discovery, and testing of food, nutraceuticals, drugs, biologicals and materials under GLP certification and NABL accreditation. It is the major node of an interdependent ecosystem in the state-of-art Central Discovery Centre (CDC) (a six floor building) to nurture innovation, entrepreneurship and start-ups under one roof. This centre provide centralized facilities, guidance and hand-holding support for promoting innovation at BHU, and to motivate and train researchers of other institutions of the region to make use of the facilities of the Centre. This initiative brings an opportunity to the researchers and science based entrepreneurs of the region to team together to develop and deploy new technologies, and to provide high quality analytical services for which Indian industry depends on institutions abroad. The revenue generated through quality services will be used for running the facilities in a self-sustaining manner.

SATHI-BHU organize awareness and training programs to sensitize the potential users of the facility and will encourage them to use the facility. It also connects potential users with BHU experts related to each equipment. It will also initiate a degree and diploma course on instrumentation to develop skilled manpower for the operation of high-end equipments in the country.

Research & Innovation Driven University

AMITY UNIVERSITY

Project Management Unit

Amity University Uttar Pradesh (AUUP) has been awarded the STUTI program as a Project Management Unit (PMU) by the Department of Science & Technology (DST) to conduct 07 days of residential hands-on training on the state-of-the-art equipment, fully sponsored by DST.

Amity Education Group is India's largest education group having 12 Indian Universities and 14 international campuses with a strong focus on research & innovation in the diverse areas of Science & Technology. Amity University aims to become the ideal platform for scientists, researchers, and academicians to transform their ideas into success and develop their potential. Bringing together this vast community of scholars for cutting-edge research, Amity University is committed to impacting the development and global image of India in research and innovation.

Amity education group has more than 3000 strong distinguished faculty members trained in reputed National & International research Institutes. We have more than 30 brilliant Scientists from diverse places across the globe who have received various prestigious fellowships like DBT/India Alliance Wellcome Trust Early Career Fellowship, DBT Ramalingaswami Fellowship, SERB-Ramanujan Fellowship, DST-Inspire Faculty Fellowship to name a few. These highly qualified Bright Brains are mentoring more than 100 blooming brains who are pursuing their Ph.D. with prestigious fellowships.

Amity research ecosystem includes world-class research infrastructures with high computing facilities and Scanning Electron Microscope, FT-IR, High-Performance Liquid Chromatograph, Gas Chromatograph, Fermenter, etc. funded by various national and international grants. Centres of Excellence have been established in niche areas of Science & Technology. In addition, more than 12 research clusters in areas of great national and international importance are effectively functioning to act as a force multiplier in the Amity Group.

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DEPARTMENT OF SCIENCE & TECHNOLOGY

SYNERGISTIC TRAINING PROGRAM UTILIZING THE SCIENTIFIC AND TECHNOLOGICAL INFRASTRUCTURE

DST – STUTI SCHEME

The Scheme 'Synergistic Training program Utilizing the Scientific and Technological Infrastructure' (STUTI) is intended to build human resource and knowledge capacity through open access to S&T Infrastructure across the country. As a complement to the various schemes of DST funding for expansion of R&D Infrastructure at academic institutions, the STUTI scheme envisions a hands-on training program and sensitization of the state-of-the-art equipment as well as towards sharing, while ensuring transparent access to S&T facilities.

HIGHLIGHTS OF THE PROGRAMME

The aim of this 7-day training is to equip participants with the basic knowledge and skills set required to function in High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) whare participants will undertand about multiple peripherals which include Dual Inlet, Gas Bench, Gas Chromatography, Flash Elemental Analyzer, and Femto-Laser System. Electrochemical studies related to Solar Cell, Fuel Cell, Corrosion, Battery & Super capacitor etc. And studies related to Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy and its applications in research.

The objective of the training program is to acquaint the researchers / teachers with the know how of sophisticated state-of-the-art instruments along with basics of magnetic resonance and expose them to the state-of-the-art NMR Spectroscopy, High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS), Solar Simulator, Fuel Cell and Electrochemical related studies with thier applications. During this training program, attendees will have the opportunity to visit Banars Hindu University (BHU) which harbour most advanced and sophisticated state-of-the-art instruments. Additionally, the attendees will have an opportunity to closely interact with eminent scientists from this field.

OBJECTIVE OF TRAINING

To build human resource and its knowledge capacity through open access to S & T Infrastructure across the country through hands-on training programs by:

- Organising short term courses.
- Enhancing awareness of use and application of state-of-the-art equipment's.
- Sharing while ensuring transparent access of S&T facilities funded by DST

WHO SHOULD ATTEND?

The training is organized to enhance the practical skills of Post Graduate Students, Research Scholars, Faculty Members from Universities/Colleges, Scientists, and Post-Doctoral Researchers who are working in multidisciplinary/ transdisciplinary and translational research in various organizations.

Eligibility:

a. Person of Indian origin.

b. Minimum qualification – Post Graduate (Science/Technology)

c. Teaching faculty up to the level of Assistant Professor / Associate Professor/Scientist C / Post-Doctoral Fellows/Ph.D. Students with 3 years of experience/Industry persons who are actively involved in research and development

d. All the applicants are required to provide following essential details,

   I. A write up of 200 words about candidate's ongoing research program.

   II. How the proposed training (NMR) Spectroscopy, (HR-IRMS) and Solar Simulator, Fuel Cell and Electrochemical System will enable the participant in his ongoing or future research program.

   III. Publication if any reflecting use of referred equipment by the applicant.

WHY SHOULD YOU ATTEND?

Discover state of the art R&D infrastructure and facilities funded by DST and held by various R&D institutions / Universities in the country.

- Gain hands-on experience of research through latest S&T equipment and facilities.
- Design experiments by selecting appropriate/ alternate equipment for the various experiments.
- Connect with the R&D Organisations / Universities / Private Sector facilities / Start-ups/ MSMEs involved in research & development.

COST OF THE PROGRAM

This training is sponsored by DST STUTI program and registration is free.

For domestic travel of participants and faculty, the reimbursement **for third class A/C train ticket or Deluxe Bus (only for outstation candidates/faculty) will be provided.**

Depending upon the availability in the BHU, accommodation would be provided on single/double occupancy basis.

Accommodation request should be made at least 10 days before the commencement of the training program.

ABOUT
R&D INFRASTRUCTURE

NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY (NMR) SPECTROSCOPY

The participants will experience hands-on training on handling of the Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy - With the development of powerful superconducting magnets, fast Fourier transform technique and computerization, NMR is now routinely used by chemists as well as biologist to solve the structures of molecules. The program is intended for PH.D. and Post-Doc students in chemistry and biology, young faculty members of colleges/ university departments and research scholars in chemistry/biology who use NMR in their research and in their course.

The schedule will consist of a lecture to start each day followed by hands-on learning sessions where participants will get the opportunity to collect and process NMR data. Experts from NMR will lead the lectures.

This program focuses on the theory, instrumentation and applications of NMR starting from fundamentals to advanced levels and provides valuable experience to participants.

The participants will learn about the followings:

- How an NMR spectrometer works
- NMR Magnet Safety
- Preparation of NMR Samples
- Set up of 1D 1H and 13C NMR Experiments
- Processing and Presentation of NMR Data

ABOUT
R&D INFRASTRUCTURE

HIGH RESOLUTION – ISOTOPE RATIO MASS SPECTROMETRY (HR-IRMS)

High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) facility at SATHI-BHU is equipped with multiple peripherals which include Dual Inlet, Gas Bench, Gas Chromatography, Flash Elemental Analyzer, and Femto-Laser System. After completing the training program, participants are expected to:

- Acquire good knowledge and deep understanding of the basic principle, working, and applications of HR-IRMS.
- Learn the operational procedure for analysis of stable isotopes (C, N, O & H) for tracking of the physical, chemical, and biological reactions of diverse fields.
- Understand the utility of HR-IRMS for analyzing samples from diverse fields of Earth Sciences, biological sciences, food sciences etc.
- Understand the well-established procedure to identify the sources of the groundwater, aquifer recharge, and discharge.
- Understand some of the industrial applications such as identifying adulteration in food and aroma industries.

ABOUT
R&D INFRASTRUCTURE

SOLAR SIMULATOR, FUEL CELL AND ELECTROCHEMICAL SYSTEMS

- Solar Cell, Fuel Cell Electrochemical Workstation Instrument understanding Its application in electrochemical studies related to Solar Cell / Fuel Cell, Battery & Super capacitor etc.
- Learn the operational procedure for analysis of IV curve.
- Learn the operational procedure for analysis of Electrochemical Impedance Spectroscopy (EIS) technique for the characterization of electrochemical systems.
- Learn the operational procedure for analysis of Cyclic Voltammetry

REGISTRATION/APPLICATION

Participants are required to apply for the training program online at **https://bit.ly/3ruKdwc** or scan the QR code provided at the end. The application deadline is **October 24, 2022.**
To submit essential details please use the below link: **https://forms.gle/dz1v6Hyr8uxr1i1t5**

SELECTION OF THE PARTICIPANTS

The applications will be scrutinized by the STUTI training program selection committee and the decision of the committee will be final. Selected candidates will be informed through e-mail. The seats in the training program are limited.

TENTATIVE TRAINING PROGRAM SCHEDULE

Day I (24-11-2022), Thursday

10:30 AM	11:30 AM	Registration and Inauguration
11:30 AM	11:45 AM	Tea Break
11:45 AM	12:45 PM	Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy: Principles, types, and applications
12:45 PM	1:45 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS): Principles, types, and applications
1:45 PM	2:15 PM	Lunch
2:15 PM	3:30 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 1
2:15 PM	3:30 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 2
3:30 PM	3:45 PM	Tea Break
3:45 PM	5:15 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 2
3:45 PM	5:15 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 1

Day II (25-11-2022), Friday

10:30 AM	12:00 PM	Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy: Advance Applications
12:00 PM	12:15 PM	Tea Break
12:15 PM	1:45 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS): Advance Applications
1:45 PM	2:15 PM	Lunch
2:15 PM	3:30 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 1
2:15 PM	3:30 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 2
3:30 PM	3:45 PM	Tea Break
3:45 PM	5:15 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 2
3:45 PM	5:15 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 1

TENTATIVE TRAINING PROGRAM SCHEDULE

Day III (26-11-2022), Saturday

10:30 AM	12:00 PM	Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy: Advance Applications
12:00 PM	12:15 PM	Tea Break
12:15 PM	1:45 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS): Advance Applications
1:45 PM	2:15 PM	Lunch
2:15 PM	3:30 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 1
2:15 PM	3:30 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 2
3:30 PM	3:45 PM	Tea Break
3:45 PM	5:15 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 2
3:45 PM	5:15 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 1

Day IV (27-11-2022), Sunday

10:30 AM	12:00 PM	Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy: Advance Applications
12:00 PM	12:15 PM	Tea Break
12:15 PM	1:45 PMHigh	Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS): Advance Applications
1:45 PM	2:15 PM	Lunch
2:15 PM	3:30 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 1
2:15 PM	3:30 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 2
3:30 PM	3:45 PM	Tea Break
3:45 PM	5:15 PM	High Resolution – Isotope Ratio Mass Spectrometry (HR-IRMS) Group 1
3:45 PM	5:15 PM	Hands on Nuclear Magnetic Resonance Spectroscopy (NMR) Spectroscopy Group 2

TENTATIVE TRAINING PROGRAM SCHEDULE

Day V (28-11-2022), Monday

10:30 AM	12:00 PM	Fuel Cell Principles, types, and applications
12:00 PM	12:15 PM	Tea Break
12:15 PM	1:45 PM	Solar Cell Principles, types, and applications
1:45 PM	2:15 PM	Lunch
2:15 PM	3:30 PM	Hands on Fuel Cell Workstation
3:30 PM	3:45 PM	Tea Break
3:45 PM	5:15 PM	Hands on Solar Simulator Workstation

Day VI (29-11-2022), Tuesday

10:30 AM	12:00 PM	Electrochemical Systems Principles, types, and applications
12:00 PM	12:15 PM	Tea Break
12:15 PM	1:45 PM	Hands on Electrochemical Workstation / Fuel Cell Workstation / Solar Simulator Workstation
1:45 PM	2:15 PM	Lunch
2:15 PM	3:30 PM	Hands on Electrochemical Workstation / Fuel Cell Workstation / Solar Simulator Workstation
3:30 PM	3:45 PM	Tea Break
3:45 PM	5:15 PM	Hands on Electrochemical Workstation / Fuel Cell Workstation / Solar Simulator Workstation

Day VII (30-11-2022), Wednesday

10:30 AM	12:00 PM	Field/Lab Visit
12:00 PM	12:15 PM	Tea Break
12:15 PM	1:45 PM	Field/Lab Visit
1:45 PM	2:15 PM	Lunch
2:15 PM	3:30 PM	BHU User Interaction with the participants
3:30 PM	3:45 PM	Tea Break
3:45 PM	5:15 PM	Valedictory Session and Certificate Distribution

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For More details and Queries about the Programme

Contact Number: **+919289394650**

Email Id: **dststuti@amity.edu**

For More details about the R&D facility at
BHU (Details of the person assign from BHU for coordination.)

Name: **Mr. Shailendra Kumar**

Email: **shailendrak@bhu.ac.in**

Mob: **9838005212**

Registration QR

For More Information