

Proceedings

One Week Training Program on Research Instruments in

Condensed Matter and Nuclear Physics

September 19-25, 2022

Organized by

Department of Physics,
Aligarh Muslim University, Aligarh, India
under the STUTI Project

supported by

Department of Science and Technology,
New Delhi

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



**“One Week Training Program
on Research Instruments in Condensed Matter and Nuclear Physics”
(19th - 25th September 2022)**



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



Chief Patron
Prof. Tariq Mansoor
Vice Chancellor



Patron
Prof. Mohammad Gulrez
Pro Vice Chancellor



Co-Patron
Prof. Qamrul Hasan Ansari
Dean, Faculty of Science



Chief Guest & Keynote Speaker
Dr. Ashok M. Biradar
Ex-Director, CSIR-NPL, New Delhi

Organised by

ALIGARH MUSLIM UNIVERSITY, ALIGARH

supported by

Department of Science & Technology (DST), Government of India

SPEAKERS



Prof. B. P. Singh
AMU, Aligarh



Prof. S.K. Mandal
Delhi University



Prof. Shahid Husain
AMU, Aligarh



Dr. N. Madhavan
IUAC, New Delhi



Prof. S. Mukherjee
MIT, Manipal



Prof. M. K. Sharma
Lucknow University



Dr. R.S. Dhaka
IIT Delhi



Dr. K. Yadav
University of Allahabad



Dr. Anjana Dogra
CSIR-NPL, New Delhi



Dr. Wasi Khan
AMU, Aligarh



Dr. Jai Prakash
AMU, Aligarh

Dr. Wasi Khan
Convener

Dr. Jai Prakash
Convener

Prof. B.P. Singh
PMU Coordinator

**One Week Training Program on Research Instruments in Condensed Matter and Nuclear
Physics**

Contents

ORGANIZING COMMITTEE	4
SPEAKERS.....	5
ABOUT THE STUTI TRAINING PROGRAM.....	7
ABOUT ALIGARH MUSLIM UNIVERSITY.....	7
ABOUT THE DEPARTMENT OF PHYSICS.....	9
TOPICS COVERED.....	11
PROGRAMME SCHEDULE	12
PARTICIPATING INSTITUTES	15
ORGANIZERS REPORT.....	18
BACKGROUND	18
WELCOME AND OPENING ADDRESSES	19
DAY 1	25
DAY 2	33
DAY 3	40
DAY 4	45
DAY 5	51
DAY 6	56
DAY 7	62
VALDICTORY SESSION	67
PLAN	76
ACKNOWLEDGEMENTS	76
OUTCOME	77
FEEDBACK	78
NEWS COVERAGE	78
THANK YOU	78

**One Week Training Program on Research Instruments in Condensed Matter and Nuclear
Physics**

ORGANIZING COMMITTEE

<p>Prof. Tariq Mansoor Chief Patron Vice-Chancellor, Aligarh Muslim University, Aligarh (UP)</p>	
<p>Prof. Mohammad Gulrez Patron Pro-Vice Chancellor, Aligarh Muslim University, Aligarh (UP)</p>	
<p>Prof. Qamrul Hasan Ansari Co-Patron Dean, Faculty of Science, Aligarh Muslim University, Aligarh (UP)</p>	
<p>Dr. Ashok M. Biradar Chief Guest Ex-Director, CSIR-NPL, New Delhi</p>	
<p>Prof. B. P. Singh Chairperson, Department of Physics & PMU Coordinator – STUTI Project Aligarh Muslim University, Aligarh (UP)</p>	
<p>Prof. Shahid Husain Department of Physics Aligarh Muslim University, Aligarh (UP)</p>	
<p>Dr. M. Wasi Khan Convener - STUTI Training Program Associate Professor, Department of Physics, Aligarh Muslim University, Aligarh (UP)</p>	
<p>Dr. Jai Prakash Convener - STUTI Training Program Assistant Professor, Department of Physics, Aligarh Muslim University, Aligarh (UP)</p>	

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

SPEAKERS

<p>Prof. B. P. Singh Chairperson, Department of Physics & PMU Coordinator – STUTI Project Aligarh Muslim University, Aligarh (UP)</p>	
<p>Dr. Ashok M. Biradar Chief Guest Ex-Director, CSIR-NPL, New Delhi</p>	
<p>Prof. Shahid Husain Department of Physics Aligarh Muslim University, Aligarh (UP)</p>	
<p>Dr. Samit K. Mandal Delhi University, Delhi</p>	
<p>Dr. M. Wasi Khan Convener - STUTI Training Program Associate Professor, Department of Physics, Aligarh Muslim University, Aligarh (UP)</p>	
<p>Dr. N. Madhavan Inter-University Accelerator Centre (IUAC), New Delhi</p>	
<p>Prof. Surjit K. Mukherjee Manipal Institute of Technology, Manipal</p>	

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

<p>Dr. Jai Prakash Convener - STUTI Training Program Assistant Professor, Department of Physics, Aligarh Muslim University, Aligarh (UP)</p>	
<p>Prof. Manoj Kumar Sharma Lucknow University, Lucknow</p>	
<p>Dr. Rajendra S. Dhaka IIT Delhi, Delhi</p>	
<p>Dr. Kamlesh Yadav University of Allahabad</p>	
<p>Dr. Anjana Dogra CSIR-NPL, New Delhi</p>	

ABOUT THE STUTI TRAINING PROGRAM

Synergistic Training program Utilizing the Scientific and Infrastructure (STUTI) scheme is intended for the capacity building of human resources through open access to Science & Technological infrastructure across the country by organizing specialized training programs on DST-supported R&D equipment targeting Ph.D. Scholars, Post-Doctoral Fellows, Scientists, Faculty, etc. are actively involved in intensive research. The role of Science and Technology is pivotal for the evolution of mankind. The program is being organized as part of ***Azadi ka Amrit Mahotsav***. The program consists of both theory and hands on training on various research instruments, supported by DST. The uniqueness of the program includes a minimum of four hours theory, and the remaining 50% of the duration is on practical training on the equipment. Effort were made for the hands-on use of equipment for demonstration/ characterization by each participant. The program aims to promote the research collaborations to the maximum extent. The program is open to a broad audience interested in acquiring in-depth knowledge of analytical instruments such as XRD, TEM, SEM, EDX, NMR, UV-visible spectroscopy, FTIR spectroscopy, Raman spectroscopy, TGA/DSC, etc. After completion of the workshop, participants can appreciate how these techniques help in understanding materials, correlating structure properties and eventually elucidating the structure of existing and newly discovered materials. This will not only enable them to build up a fundamental thought process of characterization techniques but also help in interpreting their own research findings more efficiently. This training program provides a platform for interaction and exchange of innovative ideas on current trends in the fields of Science and Technology. Lectures / Training sessions have been delivered by the eminent subject experts/faculty members of the fields.

ABOUT ALIGARH MUSLIM UNIVERSITY

Aligarh Muslim University (AMU) is a public central university in Aligarh, Uttar Pradesh, India. AMU occupies a unique position amongst universities and institutions of higher learning in the country. It was established in 1920 and evolved out of the Mohammedan Anglo-Oriental (MAO), which was set up on 7 January 1877 by the great visionary and social reformer Sir Syed Ahmad Khan.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

From its inception, it has kept its door open to the members of all communities and from all corners of the country and the world. The Aligarh Muslim University is the realization of a vision that was broad, far-reaching, and realistic.

Spread over 467.6 hectares in the city of Aligarh, Uttar Pradesh, Aligarh Muslim University offers more than 300 courses in the traditional and modern branches of education. It draws students from all states in India and from different countries, especially Africa, West Asia and Southeast Asia. In some courses, seats are reserved for students from SAARC and Commonwealth Countries. The University is open to all irrespective of caste, creed, religion or gender. It ranks 8th among the top 20 research universities in India.

In spite of the establishment of a number of universities and institutions of higher learning all over the country, this University has been maintaining its national and international character as an institution of excellence. It has more than 37327 students, 1,686 teachers and some 5,610 non-teaching staff on its rolls. The University now has 13 faculties comprising 117 teaching departments, 3 academies and 21 centres and institutes. A unique feature of the University is its residential character with most of the staff and students residing on the campus. There are 19 halls of residence for students with 80 hostels.

Apart from the conventional Undergraduate and Postgraduate courses in Social Sciences, Sciences and Humanities, the University keeps pace with the nation's growth by offering facilities for specialized learning in areas of technical, vocational and interdisciplinary studies. It has the Zakir Hussain of Engineering and Technology, Jawaharlal Nehru Medical College, Dr. Ziauddin Dental College, Institute of Ophthalmology, Food Craft Institute, Interdisciplinary Biotechnology Unit, Centre of Advanced Study in History, Department of West Asian Studies, Centre of Wildlife, Centre for South African & Brazilian Studies, Department of Islamic Studies, Academic Staff , Women's College , Ajmal Khan Tibbiya College , Polytechnics separately for boys and girls and Computer Centre, etc.

On 24 May 1875, Sir Syed founded the Madarsatul Uloom in Aligarh and patterned the MAO after Oxford and Cambridge universities that he went on a trip to London. His objective was to build a university in line with the British education system but without compromising its Islamic values.

The University has opened three new centres of study outside Aligarh at

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

Murshidabad, West Bengal; Mallapuram, Kerala, and Kishanganj, Bihar.

The University maintains one primary, seven High schools (including one for the Visually Challenged), and two Senior Secondary schools for boys and girls. The University also offers courses in Indian, Oriental and Western Languages. The medium of instruction in the University is primarily English.

Games and sports have been distinctive features of the AMU. The Skating and Riding teams have excelled at the inter-University level. Perhaps this is the only University with a Riding Club. The General Education centre is the nucleus of most of the extra-curricular activities and caters to the cultural environment. This centre organizes these activities through its various clubs, viz., the AMU Literary Club, the Hindustani and western Club, the Literary Club and the Hobbies Workshop, etc. It is a proudly Islamic and proudly Indian institution: a living symbol of the composite culture of India and a bulwark of its secular principles.

ABOUT DEPARTMENT OF PHYSICS

The Physics Department of the Aligarh Muslim University, Aligarh was established in 1912. The Department has rich teaching and research traditions since its inception and the first Ph.D. in Physics was awarded in 1926. Eminent Scientists who at some point of time were the faculty member / student of the Department are Prof. Wali Mohammad,

Prof. Rudolf Samuel, Prof. P. S. Gill, Prof. R. K. Asundi, Prof. P. Venkateshwarlu, Prof. A. N. Mitra, Prof. H. S. Hans, Prof. Rais Ahmad, Prof. M. Z. R. Khan, Prof. M. L. Sehgal, Prof. P.I. John (Padam Shri), Prof. M.S.Z. Chaghtai, Prof. M. Shafi, Prof. Israr Ahmed, Prof. S. K. Singh, Prof. Tariq Aziz, Prof. R. Prasad, Prof. Siraj Hassan, Prof. M. Sami, etc. Presently there are 8 Professors, 8 Associate Professors, 14 Assistant Professors, 4 Guest Teachers and about 60 Research Scholars in the Department.

The Department offers six semesters undergraduate B.Sc. (Hons.) and four semesters postgraduate M.Sc. (Physics) courses. The intake for the undergraduate and post graduate programmes is 120 and 50 respectively. Besides these, the Department also offers Ph.D. program in various research areas of experimental and theoretical physics.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

Over the years, the growing international reputation of the Department has enabled it to join several international collaborations such as ALICE, CBM, PANDA etc., with Universities like University of Valencia, Spain; University of Tokyo, Japan; Universitat Erlangen, Germany etc. The faculty members are also involved in national collaborations, viz. India based Neutrino Observatory Project. Faculty members are also collaborating with the scientists working at TIFR Mumbai, BARC Mumbai, IUAC New Delhi, VECC Kolkata, IUCAA Pune, UGC-DAE-CSR Kolkata & Indore, JNU New Delhi, IIT-Kanpur, IIT-Bombay, IIT-Ropar, etc.

The Department's illustrious legacy and its continuous stride in academic excellence over many decades have been duly acknowledged by the University Grants Commission, New Delhi, India and Department of Science & Technology, New Delhi, India, resulting in the endowment of financial assistance through schemes such as DRS-SAP, DSA phases I, II & III, COSIST, FIST and PURSE. These grants have helped the Department in strengthening the infrastructure and the procurement of state-of-the-art instruments for research as well as undergraduate and postgraduate laboratories. Some of the important instruments in various laboratories are FTIR (Bruker) Spectrometer, X-ray Diffractometer (6100-Shimadzu), Scanning Microscope (DM 2500 M &

DM 6000 M), High Power Nd: YAG Laser (Brilliant B), Telescope (CGE Pro 14"), UV-VIS-NIR Spectrometer (Lambda 950, Perkin Elmer), Simultaneous Thermal Analyser (STA- 8000, Perkin Elmer), Andor Mechelle 5000 Monochromator with ICCD and Acton 0.5 Monochromator attached with PMT, Cryo-cooler for low temperature measurement, alpha, beta and gamma spectrometers, etc.

The Department has an excellent seminar library with more than 13,000 reference books and nearly 10,000 bound journals. The seminar library has seating capacity of one hundred persons and about 400 memberships of students and teachers.

Research in the Department is being pursued in many of the major contemporary areas of experimental and theoretical physics, viz, Nuclear Physics, High Energy Physics, Atomic and Molecular Physics, Condensed Matter Physics, Astrophysics, Photonics and Non-Linear Dynamics.

TOPICS COVERED

The Scientific talks on diverse topics were delivered by eminent scientists, and wherein they shared not only their knowledge but also their wisdom and their lifetime experiences giving real-life examples of the efforts they had put in their own areas of expertise. Some of the topics are:

- ✓ Structural Analysis of Materials Using X-ray Diffraction Technique
- ✓ Photoelectron Spectroscopy: A tool to study the electronic structure of materials
- ✓ Transmission Electron Microscopy Characterization of Nanomaterials
- ✓ Characterization Techniques to Investigate the Optical Properties
- ✓ Pulsed Laser Deposition technique for thin film growth
- ✓ Perovskite Nanomaterials for Supercapacitor Applications
- ✓ Liquid Crystal Materials and Displays Thereof
- ✓ Liquid Crystal Nanoscience: Challenges and Applications
- ✓ Nuclear Radiations and Their Interactions with Matter
- ✓ Radiation detection and activation analysis for the measurements of reaction cross sections of reactor materials
- ✓ Accelerators and Nuclear Techniques in Basic and Applied Research at IUAC, New Delhi

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

Programme Schedule

09:30AM - 10:00AM	REGISTRATION [Day 1 Monday, September 19, 2022]
Inauguration Session ** [Day 1 Monday, September 19, 2022 @ 10:00 AM - 11:35 AM]	
Time (IST)	Event
10:00-10:05 hrs	Recitation from the Holy Quran
10:05-10:15 hrs	Welcome Address by the Chairman & PMU Coordinator, Prof. B. P. Singh
10:15-10:25 hrs	Introduction to the STUTI program by Dr. M. Wasi Khan
10:25-10:35 hrs	Address by the Dean, Faculty of Science, Prof. Qamrul Hasan Ansari
10:35-10:45 hrs	Address by the Pro Vice Chancellor, Prof. Mohammad Gulrez
10:45-11:00 hrs	Address by the Chief Guest, Dr. Ashok M. Biradar
11:00-11:15 hrs	Presidential Address by the Vice Chancellor, Prof. Tariq Mansoor
11:15-11:20 hrs	Release of Brochure by the Vice Chancellor, Prof. Tariq Mansoor
11:20-11:25 hrs	Vote of Thanks by Dr. Jai Prakash
11:25-11:35 hrs	University Tarana & National Anthem

Date	Review Session 09:30-10:00 AM	Session - I 10:00 -11:30 AM	Tea Break	Session - II 12:00-1:30 PM	Lunch Break	Hands on Training		
						Session - III 2:30-4:00 PM	Session-IV 4:00-5:00 PM	
Sep 19, 2022 (Monday)	REGISTRATION	Inaugural function		TALK-1 Dr. A. M. Biradar		TALK-2 Prof. Shahid Husain	Participants Interaction & EQUIPMENT AVAILABILITY	Overview of the LABORATORY
Sep 20, 2022 (Tuesday)	ASSIGNMENT COLLECTION	TALK-3 Dr. Jai Prakash		TALK-4 Prof. B.P.Singh		GROUP-1 (NP LAB) GROUP-2(CMP LAB) GROUP-3(LC LAB)		
Sep 21, 2022 (Wednesday)	ASSIGNMENT COLLECTION	TALK-5 Dr. R. S. Dhaka		TALK-6 Dr. M. Wasi Khan		GROUP-2 (NP LAB) GROUP-3(CMP LAB) GROUP-1(LC LAB)		
Sep 22, 2022 (Thursday)	ASSIGNMENT COLLECTION	TALK-7 USIF visit		TALK-8 Prof. Shahid Husain		GROUP-3 (NP LAB) GROUP-1(CMP LAB) GROUP-2(LC LAB)		
Sep 23, 2022 (Friday)	TALK-9 Dr. Kamlesh Yadav (9:30-11:00 AM)	TALK-10 Dr. Samit Mandal (11:15 AM-12:45 PM)		Break		Participants may visit NP, CMP, & LC Labs as per their interest		
Sep 24, 2022 (Saturday)	ASSIGNMENT COLLECTION	TALK-11 Dr. Anjana Dogra		TALK-12 Dr. N. Madhavan		VISIT TO CAMPUS/LABS /LIBRARY/ MEETING FACULTY OF SCIENCE		MEETING WITH DEAN,
Sep 25, 2022 (Sunday)	TEST OF UNDERSTANDING	TALK-13 Prof. Surjit Mukherjee		TALK-14 Prof. M. K. Sharma		FEEDBACK SESSION	Valedictory Session	

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

S.No.	Talk No.	Speakers	Title of Talk/Activity
1.	Talk-1	Dr. A. M. Biradar National Physical Laboratory (NPL), New Delhi	<i>Liquid Crystal Materials and Displays Thereof</i>
2.	Talk-2	Prof. Shahid Husain AMU, Aligarh	<i>Structural Analysis of Materials Using X-ray Diffraction Technique</i>
3.	Talk-3	Dr. Jai Prakash AMU, Aligarh	<i>Liquid Crystal Nanoscience: Challenges and Applications</i>
4.	Talk-4	Prof. B.P. Singh AMU, Aligarh	<i>Nuclear Radiations and Their Interactions with Matter</i>
5.	Talk-5	Dr. R. S. Dhaka IIT, Delhi	<i>Photoelectron Spectroscopy: a tool to study electronic structure of materials</i>
6.	Talk-6	Dr. M. Wasi Khan AMU, Aligarh	<i>Transmission Electron Microscopy Characterization of Nanomaterials</i>
7.	Talk-7	Dr. M. Wasi Khan AMU, Aligarh	<i>Demonstration of Various Research Facilities at USIF, AMU</i>
8.	Talk-8	Prof. Shahid Husain AMU, Aligarh	<i>Characterization Techniques to Investigate the Optical Properties</i>
9.	Talk-9	Dr. Kamlesh Yadav Allahabad, Uttar Pradesh	<i>TMDs and Perovskite Nanomaterials for Supercapacitor Applications and as Electrocatalyst for Oxygen Evolution Reactions</i>
10.	Talk-10	Dr. Samit Mandal Delhi University, Delhi	<i>Gamma Ray Detector Array and Reaction Cross Section Measurements for Nuclear Astrophysics</i>
11.	Talk-11	Dr. Anjana Dogra NPL, New Delhi	<i>Thin films using Pulsed Laser Deposition with In-Situ RHEED</i>
12.	Talk-12	Dr. N. Madhavan Inter-University Accelerator Centre (IUAC), New Delhi	<i>Accelerators and Nuclear Techniques in Basic and Applied Research at IUAC, New Delhi</i>
13.	Talk-13	Prof. Surjit Mukherjee Manipal Institute of Technology, Manipal	<i>Radiation detection and activation analysis for the measurements of reaction cross sections of reactor materials</i>
14.	Talk-14	Prof. M. K. Sharma Lucknow University	<i>Low Energy Fusion Dynamics: A Study of Pre-compound Emission in Light and Heavy-Ion Reactions</i>

PARTICIPATING INSTITUTES

S. No.	State/Country	Institutes	No. of Registered Participants
1.	Uttar Pradesh	Aligarh Muslim University, Aligarh	05
		University of Allahabad	03
		Agra College, Agra	01
		IIT-BHU, Varanasi	02
		Balasaheb Bhimrao Ambedkar University, Lucknow	01
		IFTM University, Moradabad	01
		Institute of Engineering and Technology, Lucknow	01
2.	New Delhi	Ramjas College, Delhi University	01
		Jamia Millia Islamia	02
		Jawaharlal Nehru University	01
3.	Uttarakhand	Himalayiya University	01
		Kumaun University, Nainital	01
		M B Govt. P G College Haldwani, Nainital	01
		HNB Garhwal University, Srinagar Garhwal	01
4.	Kerela	MES Ponnani College (University of Calicut)	02
		TKM College of Arts and Science, Kollam	01
5.	Haryana	IIHS Kurukshetra University, Kurukshetra	02
6.	Gujarat	V.S. Patel College of Arts and Science, Surat	01
7.	Mizoram	National Institute of Technology	01
8.	Karnataka	SECABIET, Bijapur	01
TOTAL			30

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

PARTICIPATING INSTITUTES



NAAC ACCREDITED



One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



ORGANIZERS REPORT

on

**“One Week Training Program on
Research Instruments in Condensed
Matter and Nuclear Physics”**

September 19-25, 2022

Coordinator

Prof. B. P. Singh

Conveners

Dr. M. Wasi Khan & Dr. Jai Prakash

BACKGROUND

The week-long “ One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics” held during September 19 – 25, 2022 at the ALIGARH MUSLIM UNIVERSITY, ALIGARH, INDIA, under the “Synergistic Training program Utilizing the Scientific and Technological Infrastructure (STUTI)” supported by the Department of Science and Technology (DST), Government of India. The training program started with the inauguration program on 19.09.2022 in the Conference Hall of the Physics Department were culminated on 25.09.2022 as part of the “Azadi Ka Amrit Mahotsav” celebrations. In

the training program, scientific lectures, demonstrations and hands on training sessions were organized for the benefit of the faculty members/ research scholars/scientists of nearby colleges/universities on the DST-sponsored FIST equipment.

In the week-long awareness program, 30 participants from different disciplines from different parts of the country participated in the programme. Scientific talks on

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

diverse topics of research were delivered by Dr. A. M. Biradar from National Physical Laboratory (NPL), New Delhi, Dr. R. S. Dhaka from IIT Delhi, Dr. Kamlesh Yadav from University of Allahabad, Allahabad, Dr. Samit Mandal from Delhi University, Delhi, Dr. Anjana Dogra from NPL, New Delhi, Dr. N. Madhavan from Inter-University Accelerator Centre (IUAC), New Delhi, Prof. Surjit Mukherjee from Manipal Institute of Technology, Manipal, Prof. M. K. Sharma from Lucknow University, Lucknow, Prof. B.P. Singh, Prof. Shahid Husain, Dr. M. Wasi Khan and Dr. Jai Prakash from AMU, Aligarh.

WELCOME AND OPENING ADDRESSES

Prof. B. P. Singh, PMU Coordinator - STUTI Program & Chairperson, Department of Physics, Aligarh Muslim University, Aligarh welcomed the Chief Guest and all the faculty members as well as participants of the training program. At the very start of the program Prof. Singh highlighted the importance and usefulness of organizing training program. He also narrated the importance of scientific temperament and scientific spirit for the development of technological applications. Chairperson Prof. Singh also highlighted the achievements of the department during the last couple of years in terms of publications, etc.

Dr. Ashok M. Biradar, Ex-Director, CSIR-National Physical Laboratory, New Delhi, was the Chief Guest of the program. Dr. Biradar presented his valuable views on the occasion. He emphasized that such training programs are beneficial for those who don't have the research facilities at their institute. Vice Chancellor, Prof. Tariq Mansoor appreciated the achievement and long legacy of the Physics department in his presidential address. Honorable Vice Chancellor also released the brochure of the training programme. Pro Vice-Chancellor, Prof. Mohammad Gulrez expressed his valuable thoughts in his address. Prof. Qamrul Hasan Ansari, Dean Faculty of Science discussed that such training programmes are important in the context of growth of early career researchers. He congratulated Physics Department for getting STUTI Project by DST, New Delhi and organizing a week-long programme for youngsters. Dr. M. Wasi Khan introduced the STUTI initiative of DST to the audience and students and discussed its main features and

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

components. Dr. Jai Prakash, as one of the conveners, conducted the proceedings and the activities undertaken “One Week Training Program on DST Supported Advanced Research Instruments” in the department. He also presented vote of



thanks in the end of the inaugural function.

Inaugural function: (L to R) Dr. M. Wasi Khan (Co-PI STUTI), Prof. B. P. Singh (Coordinator-PMU STUTI, AMU), Dr. A. M Biradar (Chief Guest), Prof. Tariq Mansoor (Vice Chancellor, AMU), Prof. Mohammad Gulrez (PVC, AMU), Prof. Qamrul Hasan Ansari (Dean Faculty of Science) and Dr. Jai Prakash (Co-PI STUTI)

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Welcome address by Prof B. P. Singh (Chairperson) in the Inaugural function



Participants and audience attending the inaugural function of One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dr. M. Wasi Khan, Co-PI STUTI, Aligarh Muslim University while presenting a memento to Prof. Qamrul Hasan Ansari, Dean Faculty of Science, AMU



Prof. Qamrul Hasan Ansari, Dean, Faculty of Science, AMU while presenting a memento to Prof. Mohammad Gulrez, Pro Vice Chancellor, AMU

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. Tariq Mansoor, Vice Chancellor, Aligarh Muslim University, Aligarh, presenting a memento to Chief Guest Dr. A. M Biradar, Ex-Director, CSIR-NPL, New Delhi



Prof. B. P. Singh, Chairperson, Department of Physics, Aligarh Muslim University, Aligarh, while presenting a memento to Prof. Tariq Mansoor, Vice Chancellor, Aligarh Muslim University, Aligarh.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Release of the Brochure of One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



While Standing during National Anthem

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

DAY 1

The inaugural function of the program was conducted at the Department of Physics, Aligarh Muslim University, Aligarh on 19.09.22 at 10.00 AM in the conference hall of the department. Dr. Ashok M. Biradar, Ex-Director, CSIR-National Physical Laboratory, New Delhi was the Chief Guest of the program. Dr. Biradar presented his valuable views on the occasion. He highlighted the need for experimentation to complement the theoretical phenomena through the examples of several basic topics. He took the example of nanotechnology and described how it connects all science streams, such as physics, chemistry, biology, medical, etc. Dr. Biradar also mentioned that any research area continues if it shows some applications to society; otherwise, the particular research field saturates or loses the interest among the scientific community. He emphasized that such training programs are very useful for those who don't have the research facilities at their institute.



Dr. A. M Biradar, Chief Guest delivering a speech in the Inaugural function

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

Vice Chancellor, Prof. Tariq Mansoor appreciated the achievement and long legacy of the Physics department in his presidential address. He encouraged the participants to perform multi-disciplinary research. He also emphasized that the basic science is very important as all the advances in the medical field are based on basic sciences, particularly Physics. He also mentioned that without the basic sciences, we cannot move forward. He also ensured to provide all possible support by the University to the department for conducting quality research and organizing such science outreach activities.



Prof. Tariq Mansoor, Vice Chancellor, Aligarh Muslim University, Aligarh, delivering a speech in the Inaugural function

Pro Vice-Chancellor, Prof. Mohammad Gulrez expressed his valuable thoughts in his address. He mentioned that such programs encourage the indigenous science

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

research facilities. And such a training program for developing countries is very important as research resources are scarce. He emphasized that such type of training leads to research from the laboratory to society in the context of Govt. of India's initiative of Atma Nirbhar Bharat.



Prof. Mohammad Gulrez, Pro Vice Chancellor, Aligarh Muslim University, Aligarh, delivering a speech in the Inaugural function

Prof. Qamrul Hasan Ansari, Dean Faculty of Science discussed that such training programmes are important in the context of growth of early career researchers. He congratulated Physics Department for getting STUTI Project by DST, New Delhi and organizing a week-long programme for youngsters.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dean Faculty of Science, Aligarh Muslim University, Aligarh, Prof. Qamrul Hasan Ansari delivering a speech in the Inaugural function

Earlier, Prof. B. P. Singh, Chairperson, Physics Department, welcomed the Chief Guest and all the faculty members as well as participants of the training program. At the very start of the program Prof. Singh highlighted the importance and usefulness of organizing training program. He also narrated the importance of scientific temperament and scientific spirit for the development of technological applications. Chairperson, Prof. Singh also highlighted the achievements of the department during the last couple of years, in terms of publications, etc.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. B. P. Singh Chairperson, Department of Physics, Aligarh Muslim University, Aligarh, delivering his address in the Inaugural function

Dr. M. Wasi Khan introduced the STUTI initiative of DST to the audience and students and discussed its main features and components. Dr. Jai Prakash, as one of the conveners, conducted the proceedings and the activities undertaken "One Week Training Program on DST Supported Advanced Research Instruments" in the department. He also presented vote of thanks in the end of the inaugural function.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dr. M. Wasi Khan, Co-PI STUTI delivering a speech in the Inaugural function



Dr. Jai Prakash, Convener, while conducting the proceedings of inaugural function

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

The first lecture of the training program began in the second session after the successful completion of the opening ceremony, where Dr. A. M. Biradar delivered an outstanding lecture on "**Liquid Crystal Materials and Displays Thereof**". In his talk, he presented the basic and applied aspects of liquid crystal materials. He discussed that liquid crystal is very old, and these materials were invented more than a century ago. He said that in the year 1976, a new type of liquid crystal material was invented, called ferroelectric liquid crystals where their switching time was 1000 times faster than conventional liquid crystal displays. Secondly, these materials showed a memory effect. He also discussed the invention of Light Emitting Diodes (LED) in this century and said that presently, the LC based technology is ruling the display market such as in information technology. computers, mobile phones, etc.



Dr. A. M. Biradar, NPL, New Delhi while presenting his talk

The third session started post lunch, where Prof. Shahid Husain, Aligarh Muslim University delivered a scientific lecture on "Structural Analysis of Materials Using X-ray Diffraction Technique". He talked about the properties of X-ray diffraction and explained that X-ray diffraction is a versatile, non-destructive characterization technique that reveals detailed information about the chemical composition,

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

crystallographic and microscopic structure of all types of natural and manufactured materials. He elaborated that X-rays can yield unique fingerprints of Bragg reflections associated with the crystal structure. He also discussed the crystal structure which can be thought of as a formation of layers, or planes, with each layer acting as a semi-transparent mirror. He stated that X-rays with a wavelength similar to the distances between these planes can be reflected such that the angle of reflection is equal to the angle of incidence and one can determine the lattice parameters, unit cell volume, crystallite size and micro-strain with the help of this technique.



Prof. Shahid Husain, Aligarh Muslim University, Aligarh while presenting his talk

The fourth session was mainly devoted to interacting with the participants and giving them a brief overview of the equipment available in the Department of Physics, AMU. The objective was to make the participants comfortable with their colleagues coming from different parts of the country and to give them a comfortable environment in the

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

campus.



Prof. B. P. Singh, Chairperson, Department of Physics, Aligarh Muslim University, Aligarh, presenting a memento to Prof. Shahid Husain, Aligarh Muslim University, Aligarh

The day ended with High Tea where the students interacted with each other and discussed each other's research work. With the efforts of all the members of the organizing committee, the training program of the first day went smoothly and succeeded in its objective of providing systematic training to the students and hence was a great success.

DAY 2

The first session of the second day started with a very illuminating talk by Dr. Jai Prakash, Department of Physics, Aligarh Muslim University, Aligarh. He spoke on the topic "Liquid Crystal Nanoscience: Challenges and Applications". In his

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

speech, he discussed in depth the properties of Liquid Crystal (LCs) and their applications. He discussed that nanomaterials are used for their several unique features like surface to volume ratio, highly conductive nature and tendency to align according to the host matrix in presence of external constraints and told that combinations of liquid crystals and nanomaterials (confined in one, two and directions) referred as “Liquid Crystal Nanoscience”. He also discussed recent developments in areas ranging from liquid crystal-nanoparticle and dispersions of nanomaterials in LC phase. A critical outlook into the future of this fascinating field of liquid crystal research has been provided in his talk.



Dr. Jai Prakash, Aligarh Muslim University, Aligarh while presenting his talk

The second lecture of the day was delivered by Prof. B. P. Singh, Chairperson, Department of Physics, AMU on “Nuclear Radiations and Their Interactions with Matter”. He discussed about the detail of nuclear radiations and the various processes responsible for interaction of radiation with matter.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. B. P. Singh, Chairperson, Department of Physics, Aligarh Muslim University, Aligarh, presenting a memento to Dr. Jai Prakash, Aligarh Muslim University, Aligarh

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. B. P. Singh, Chairperson, Department of Physics, Aligarh Muslim University, Aligarh while presenting his talk

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dr. M. Wasi Khan, Aligarh Muslim University, Aligarh presenting a memento to Prof. B. P. Singh, Aligarh Muslim University, Aligarh

This was followed by the third the fourth session which is the most important part of the training program where the participants were given practical training with various high-quality and modern equipment available in various research labs of the Department of Physics, AMU. The participants were divided equally into three groups and they visited three laboratories group-wise: the Liquid Crystal Laboratory (LC), the Nuclear Physics Laboratory (NP) and the Condensed Matter Physics Laboratory (CMP). In the LC Lab, very sincere and senior researchers of the department Mr. Aakash Kumar and Mr. Deepanshu Varshney, demonstrated very well the working of “Polarizing Optical Microscope” and provided hands on training to the participants of liquid crystal cell fabrication process and dielectric measurement of liquid crystal materials. Also, the participants were encouraged to conduct the experiments to better understand the operation of the equipment. In the NP Lab, Dr. Mohammad Shoaib Khan and Mohmmad Shariq Asnain explained the working of LCR meters, Alpha, Beta and Gamma spectrometers in detail and

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

gave practical training of the instruments to the students. Lastly, the CMP Lab was conducted by Mohammad Arshad and Ms. Mehroosh Fatima. They introduced the participants to various characterization techniques such as synthesis of nanomaterials, X-ray diffractometer (XRD), Thermal Analysis (STA) system etc. that the participants learned to use on their own. On the second day, groups 1, 2 and 3 visited NP Lab, CMP Lab and LC Lab, respectively. Having explored various laboratories equipped with modern equipment, we are sure that the participants would have benefited from it and hope it would help them in carrying out their research work.



Participants attending the demonstrations at Nuclear Physics laboratory

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants attending the demonstrations at liquid crystal laboratory



Participants attending the demonstrations in XRD Laboratory during Hand

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

on training

The second day was also successfully conducted and the participants learned a lot of new things.

DAY 3

The third day started with a scientific talk by Dr. R. S. Dhaka, IIT Delhi on the topic "Photoelectron Spectroscopy: a tool to study electronic structure of materials". In his talk, he covered all the aspects of electronic structure of materials. He discussed the basic things about the X-ray Photoelectron Spectroscopic measurements and their applications.



Dr. R. S. Dhaka, IIT Delhi while presenting his talk

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. B. P. Singh, Aligarh Muslim University, Aligarh presenting a memento to Dr. R. S. Dhaka, IIT Delhi

The next speech of the day began in the second session, where Dr. M. Wasi Khan delivered an enlightening lecture on "Transmission Electron Microscopy Characterization of Nanomaterials". He discussed the widespread application of the microscopic technique, Transmission Electron Microscopy (TEM), for the complete characterization of nanomaterials and devices. He said that TEM plays a vital role in the characterization of specimens in diverse areas such as physical and life sciences and provides information about material structure and chemical composition through the interaction of electrons with the specimen. In his lecture, he introduced some of the historical developments in TEM and covered instrumentation, sample preparation, imaging and analytical microscopy. In addition, he also highlighted some of the specific drawbacks or limitations of TEM and discussed the interpretation of TEM images which would be useful for the research work of the participants.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dr. M. Wasi Khan, Aligarh Muslim University, Aligarh while presenting his talk

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. B. P. Singh, Aligarh Muslim University, Aligarh presenting a memento to Dr. M. Wasi Khan, Aligarh Muslim University, Aligarh

The third and fourth sessions were devoted to practical training of instruments in LC, CMP and NP laboratories. On the third day Group 1, 2 and 3 visited the LC, NP and CMP laboratory respectively.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants attending the demonstrations at liquid crystal laboratory on 3rd



day.

Participants attending the demonstrations in XRD Laboratory on 3rd day

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants attending the demonstrations at Nuclear Physics laboratory on 3rd day

DAY 4

On the fourth day, a very special visit has been planned for the participants, where Dr. M. Wasi Khan Demonstrated various research facilities at University Sophisticated Instruments Facility (USIF), AMU, Aligarh. The objective of this lecture cum demonstration was to make participants apprised of the various analysis methods in a straightforward way. He focused on the hands-on description of the most effective and widely used characterization techniques, such as TEM, SEM, Raman spectroscopy, single crystal XRD, etc., available at the University Sophisticated Instruments Facility (USIF). He also provided participants with a basic understanding of sophisticated research tools.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

Participants while visiting USIF, AMU, Aligarh

The second session began post tea break where Prof. Shahid Husain delivered a scientific lecture on "Characterization Techniques to Investigate the Optical Properties". He discussed several characterization tool to study the optical properties of materials.



Prof. Shahid Husain, Aligarh Muslim University, Aligarh while presenting his talk

The final session began after lunch where the students explored the research laboratories. Groups 1, 2 and 3 visited the CMP, LC and NP laboratories respectively on that day.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants visiting at Nuclear Physics laboratory on 4th day

Participants visiting at Liquid Crystal laboratory on 4th day

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

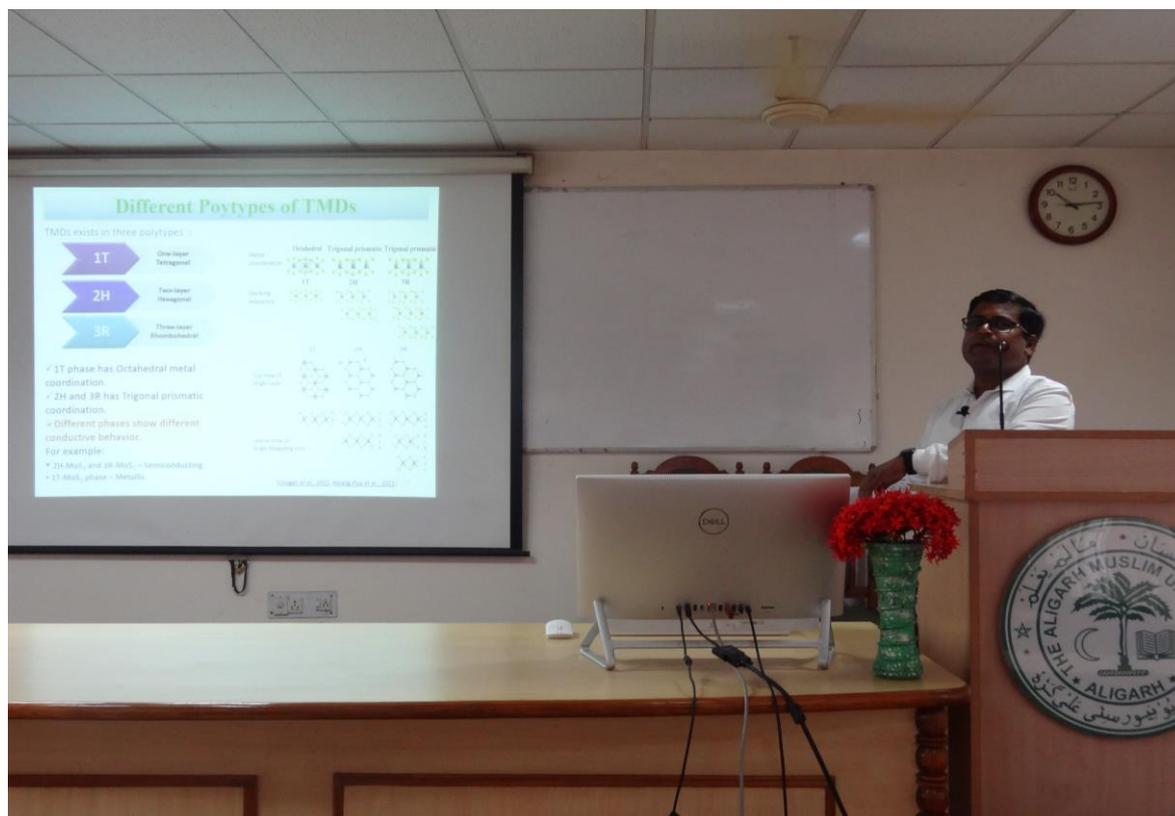


Participants visiting in condensed matter physics laboratory on 4th day

DAY 5

The first speech of the fifth day was given by Dr. Kamlesh Yadav. He lectured on "TMDs and Perovskite Nanomaterials for Supercapacitor Applications and as Electrocatalyst for Oxygen Evolution Reactions". In his talk, he presented the applications of Transition Metal Dichalcogenides (TMDs) in energy storage devices such as supercapacitors and the use of perovskite nanomaterials heterostructures to enhance the oxygen evolution reaction in water splitting. He suggested that the best alternative to reduce the burden on non-renewable energy sources is to maximize the use of renewable energy sources. He said that TMDs are an efficient material for supercapacitors because they show layered structure, high specific surface area, high theoretical capacitance and variable oxidation state. However, low conductivity and poor cyclic stability are the hurdles to using these materials in various applications. He discussed the engineering strategy

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



adopted by him to overcome the limitations.

Dr. Kamlesh Yadav, University of Allahabad while presenting his talk

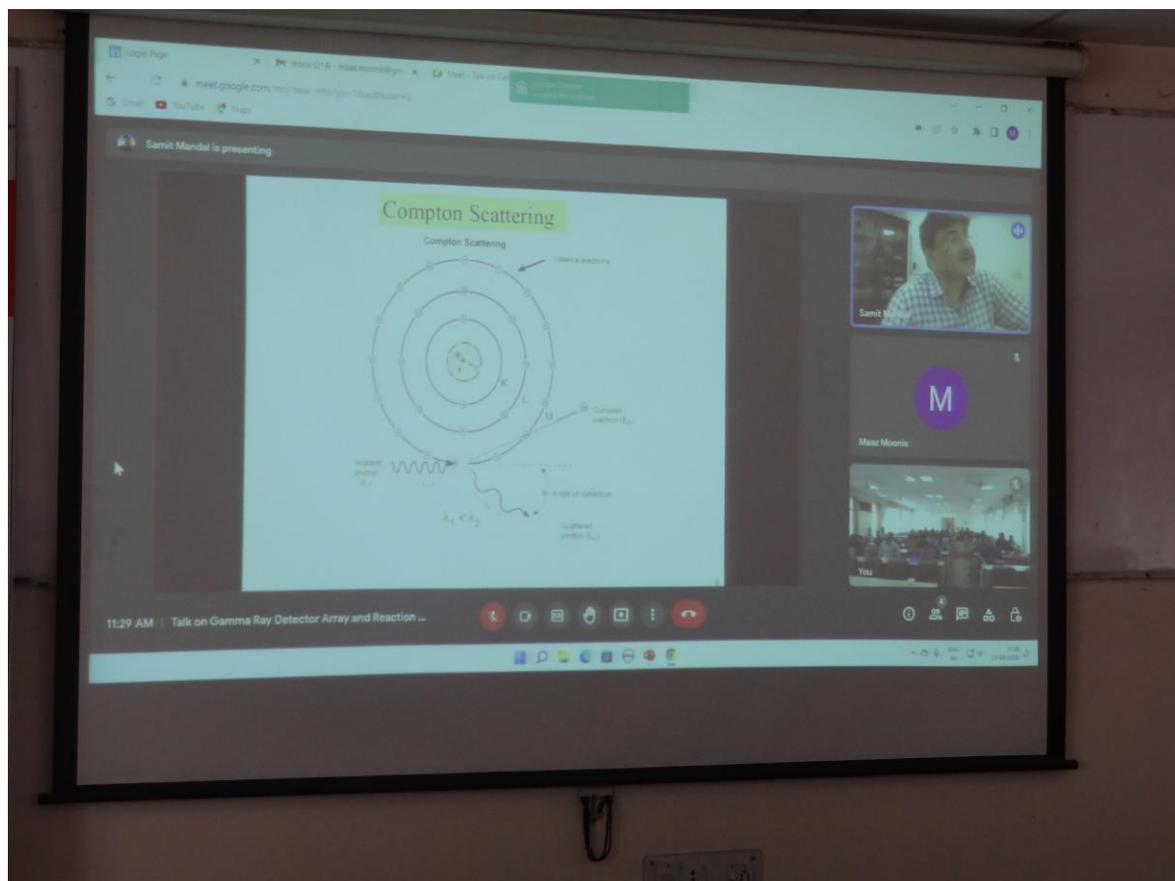
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Prof. B. P. Singh, AMU, Aligarh presenting a memento to Dr. Kamlesh Yadav

The second session of the day began with a prominent lecture by Dr. Samit Mandal, Delhi University on “Gamma Ray Detector Array and Reaction Cross Section Measurements for Nuclear Astrophysics”. He talked about several methods for measurement of reaction cross section and their use for nuclear astrophysics.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dr. Samit Mandal, Delhi University while presenting his talk

Post lunch, the third and fourth sessions began. Students were given the opportunity to visit NP, CMP and LC laboratories as per their choice and were encouraged to conduct experiments. Specifically, we focused on providing comprehensive information about various high-quality equipment to the participants and motivated them to make maximum use of the facilities available in the department.

Herewith, the fifth day ended smoothly and it was a very well-organized day of the training program. The participants were pleased with the arrangement to allow them to visit the laboratory of their preference.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants visiting in the Nuclear Physics Laboratory on 5th day

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

DAY 6

The sixth day of the program commenced with a very informative scientific lecture by Dr. Anjana Dogra, NPL, New Delhi. She delivered the lecture on “Thin films using Pulsed Laser Deposition with In-Situ RHEED”. He talked about the deposition of thin films using pulsed laser deposition technique.



Dr. Anjana Dogra, NPL, New Delhi while presenting her talk

The Second lecture of the day was initiated by Dr. N. Madhavan, IUAC, New Delhi on "Accelerators and Nuclear Techniques in Basic and Applied Research at IUAC, New Delhi". He discussed various facilities available at IUAC and how can they be used by other users? He also talked about the opportunities that IUAC provide to UG, PG and Ph.D. students.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. Shahid Husain, AMU, Aligarh presenting a memento to Dr. Anjana Dogra, NPL, New Delhi



One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. B. P. Singh, AMU, Aligarh presenting a memento to Dr. N. Madhavan, IUAC, New Delhi

Afterward, the participants were then taken for a tour of the university campus. There the participants got the opportunity to explore the rich heritage of AMU. The participants visited the Musa Dakri Museum located in the AMU campus, where they saw the ancient and medieval sculptures and archaeological antiquities located in the museum and were introduced to various aspects of Indian culture. Thereafter, the participants visited the Central Library of AMU, Maulana Azad Library, where they were introduced to the invaluable collection of manuscripts, rare books and artifacts. The students were introduced to the rich collection of 14 lakh volumes of books. There too, participants were taken to the fascinating museum of Library, where they were introduced to many valuable and informative ancient books and religious books that were originally written.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants while visiting University Museum

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Guide in the University Museum while explaining to participants



Participants' group photo after University Museum visit

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants while visiting University Library

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Participants' group photo after University Library visit

Thus, the day ended with an informative and engaging tour. The participants were very happy with such a thrilling tour and with the arrangements and efforts made by the organizers to provide them with a comfortable excursion. Hence the day was a complete success.

DAY 7

The first session of the concluding day started with a very illuminating talk by Prof. M. K. Sharma, Lucknow University. He spoke on the topic "Low Energy Fusion Dynamics: A Study of Pre-compound Emission in Light and Heavy-Ion Reactions". He discussed that Experimental studies of light and heavy ions induced reactions on several target nuclei indicate the pre-compound emission as an important de-excitation process even at energies as low as $\sim 4\text{-}5$ MeV/nucleon, where the compound nucleus process is likely to be dominant. He also discussed that role of surface nucleons and coulomb barrier are considerably important for an adequate description of the systematic behaviour of neutron emission in the pre-compound

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



process.

Prof. M. K. Sharma, Lucknow University while presenting his talk

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



**Prof. B. P. Singh, AMU, Aligarh presenting memento to Prof. M. K. Sharma,
Lucknow University, Lucknow**

This was followed by the next session of the day, where the final lecture of the training program was delivered by Prof. Surjit Mukherjee on "Radiation detection and activation analysis for the measurements of reaction cross sections of reactor materials". First, he covered very basics of radiation detection and then he covered nuclear activation analysis for reaction cross section measurements.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. Surjit Mukherjee, Manipal Institute of Technology, Manipal while presenting his talk

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Prof. B. P. Singh, AMU, Aligarh to Prof. Surjit Mukherjee, Manipal Institute of Technology, Manipal

Prior to the concluding session, participants shared their views and experiences during the training program. All the participants were happy with the excellence of the training program and the quality of the content and subject matter of the lectures covered during the training. The students were very satisfied with the practical training provided to them by the faculty members and research scholars and appreciated the facilities provided to them for conducting experiments in the laboratories. Also, the participants appreciated the organization of the visit to the University. All the participants appreciated the efforts made by the organizing team to make their stay comfortable and provide them with all the necessary support. He was appreciative of all the team members extending all possible help and was grateful for organizing this event. Having received such remarks, we believe that the training was successful in serving its purpose. We are quite sure that the participants gained immense knowledge of the subjects covered and learned a lot from the practical training. We believe that the training provided to them during the program will help them in conducting their research and will boost their research

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

career. It will be reflected in their research work.

VALDICTORY SESSION

Valedictory Program [Sunday, September 25, 2022 @ 12:30 PM - 2:00 PM]	
Time (IST)	Event
12:30PM –12:40PM	Complete report of the Program by Dr. Jai Prakash, coordinator
12:40PM –12:50PM	Felicitation of Guests
12:50PM –01:00PM	Welcome Address by Prof. B. P. Singh, Chairman, Department of Physics, AMU
01:00PM –01:10PM	Address by Coordinator of the program, Dr. M. Wasi Khan
01:10PM –01:25PM	Feedback by Participants
01:25PM –01:40PM	Address by Chief Guest Prof. A. K. Chaubey, Ex-Chairperson, Department of Physics, Aligarh Muslim University, Aligarh
01:40PM –01:50PM	Certificate Distribution by Hon'ble Guest
01:50PM –02:00PM	Vote of Thanks by Dr. Jai Prakash
02:00PM –	Lunch

“One Week Training Program on DST Supported Advanced Research Instruments” was organized by the Department of Physics, Aligarh Muslim University, Aligarh from September 19-25, 2022. The training program was sponsored by the Department of Science & Technology (DST) under the Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI).

The objective of conducting the training program was to disseminate maximum knowledge of the subject covered and to make the students comprehensive about the facilities and research tools available in the department. Specifically, the goal of the training program is to provide students with a comprehensive knowledge of research techniques and to train them in the equipment available in the

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



department so that they can use them extensively in their research work.

Closing Ceremony: (L to R) Dr. M. Wasi Khan (Co-PI STUTI), Prof. Surjit Mukherjee (Guest of Honour), Prof. B. P. Singh (Coordinator-PMU STUTI, AMU), Prof. A. K. Chaubey (Chief Guest), Dr. Jai Prakash (Co-PI STUTI)

The week-long training program ended on September 25, 2022. In the valedictory session, the chief guest, Prof. A. K. Chaubey, Ex-Chairperson, Department of Physics, Aligarh Muslim University, Aligarh and the guest of honour Prof. Surjit Mukherjee, Manipal Institute of Technology, Manipal graced the program with their presence. The session begins with a full report on the training program given by Dr. Jai Prakash. Where he elucidated complete information about the smooth running of the program starting from the first day to the concluding day. Thereafter, the head of the Physics Department of AMU, Prof. B. P. Singh took the stage and addressed the audience with his enlightening words. He explained to the students the importance of such training programs for them. He encouraged and motivated the students to participate in such training program in the future as well. Hereafter,

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

Dr. M. Wasi Khan, Co-PI STUTI explained how the Physics Department of AMU received the STUTI project and introduced the students to the purpose of the

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Prof. B. P. Singh (Chairperson, Department of Physics, AMU) while delivering his speech in the Closing Ceremony

After that, the Guest of Honour Prof. Surjit Mukherjee congratulated the

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

participants and the organizers for the successful completion of the training program and expressed his gratitude for inviting him as a special guest in the training program. He motivated the participants to participate in such programs in the future also and collaborate with fellow participants. He said this would help boost their research career and in their personality development.



Prof. B. P. Singh (Chairperson) while presenting a memento to Prof. Surjit Mukherjee (Guest of Honor)

In the Concluding speech, the Chief Guest of the program, Prof. A. K. Chaubey delivered his powerful speech. Prof. Chaubey appreciated the department for organizing such an event and providing an opportunity for the students to explore various informative and enlightening things. He congratulated the department for receiving the STUTI project and praised the organizers for good arrangements during the program. He inspired the students by telling them about his life experiences and struggles during his research career. He said that he was so passionate about doing research that even though the institute did not have the necessary facilities for research, he did not lose hope and did his research through

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

his efforts and collaboration with the colleges of other institutes. He also told the students that despite several health problems, he never stopped teaching and devoted his entire life to physics and technology. He urged to organize such events in the respective areas in the future also. In his concluding remarks, he was blessed to attend the event and witness the glory of the program. He was delighted to meet the participants from different parts of the country and from



different cultures.

Prof. A. K. Chaubey, Chief Guest while delivering his speech in the Closing

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Ceremony

Prof. B. P. Singh (Chairperson) while presenting a memento to Prof. A. K. Chaubey (Chief Guest)

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dr. M. Wasi Khan, Co-PI STUTI delivering a speech in the Closing function



One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Photographs of the Participants while receiving certificate and memento

In the end, Dr. Jai Prakash, coordinator of the program presented his closing remarks and vote of thanks. He thanked the Chief Guest for accepting the invitation to attend the program. He thanked all the faculty members, training program members, research scholars and participants for their cooperation in making this event a huge success.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Dr. Jai Prakash, Co-PI STUTI while delivering the closing remarks

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics



Group Photograph

PLAN

After receiving overwhelmingly positive feedback from the participants, we are very motivated to organize more such events with more features in the near future.

ACKNOWLEDGEMENTS

We express our sincere gratitude to the Department of Science and Technology (DST) for sanctioning a project under the Synergistic Training Program Utilizing the Scientific & Technological Infrastructure (STUTI) to the Department of Physics, Aligarh Muslim University, Aligarh. We thank Vice-Chancellor, Aligarh Muslim University Prof. Tariq Mansoor and Chief Guest, Dr. A. M. Biradar for accepting our invitation to attend the inaugural function and for making the event grand with their presence. We also thank Prof. Mohammad Gulrez, PVC, AMU and Prof.

One Week Training Program on Research Instruments in Condensed Matter and Nuclear Physics

Qamrul Hasan, Dean Faculty of Science, AMU for taking some time out of their extremely busy schedule to be present at the inaugural function. We are thankful to Prof. A. K. Chaubey for accepting our invitation as the Chief Guest of the Closing Ceremony and Prof. Surjit Mukherjee for attending the Closing Ceremony as the Guest of Honour. We are grateful to the coordinators of the program, Prof. B. P. Singh, Head of the Physics Department, AMU, Dr. M. Wasi Khan and Dr. Jai Prakash for their efforts in making the program a smooth run and a huge success. We acknowledge the use of the Research Laboratories of the Department of Physics, AMU during the training. Also, we are thankful for the experimental facilities provided at USIF and the support of the staff there. We extend our special thanks to the researchers, volunteers and STUTI team members for their immense hard work and support in making this event a grand success. It is crucial to mention here that without their cooperation, this program would not have been possible. Lastly, we would like to thank all the staff members of AMU, dear participants and all those who have supported in any way for the smooth conduct of the program.

OUTCOME

Participants from different parts of the country registered for the event and participated in it with great enthusiasm. The participants were from different streams of science like physics, chemistry, biology, nanotechnology, biochemistry, etc. The participants were introduced to various experimental techniques and were provided with information about various laboratories of the University, where they gained practical knowledge of various characterization techniques, synthesis etc., along with the practical training, the participants also learned a lot from the lectures on the chosen topic. Since 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 of S&T facilities, we primarily focused on giving participants a comprehensive exposure to practical knowledge. This will boost their research career. The training encouraged the participants to conduct their research work effectively and qualitatively by providing them with information about the recent developments in the field of science and technology. So, the training served its real purpose.

FEEDBACK

The program received positive response from the participants, as can be seen from the feedback form filled by them. All the participants expressed satisfaction and appreciated the training program.

NEWS COVERAGE

1. <https://www.facebook.com/164606300686618/posts/pfbid0VVuhyWkTxqqhX5uCey6NK9ESBVF1kkgeXvZM75voAZNTJWo4RN7DyV1oJkcfCN3l/?sfnsn=wiwspwa&extid=a>
2. https://m.facebook.com/story.php?story_fbid=pfbid0wsqVyuxQA2Bf4hsEAAAttXpHCGjZRMrewLnjLsABLGnLgWgLJvkmz23zP2Nsa7zX8l&id=100057533205390&sfnsn=wiwspwa&extid=a
3. <https://www.amu.ac.in/news/2022/09/19/week-long-training-programme-starts-at-dept-of-physics>
4. <https://www.amu.ac.in/hi/news/2022/09/19/week-long-training-programme-starts-at-dept-of-physics>
5. <https://www.amu.ac.in/ur/news/2022/09/19/week-long-training-programme-starts-at-dept-of-physics>

THANK YOU.

With regards

(Prof. B. P. Singh)
PMU, Coordinator

(Dr. M. Wasi Khan)
Conveners

(Dr. Jai Prakash)