# **Proceedings**









# ONE WEEK TRAINING PROGRAM ON R&D EQUIPMENT

Material Processing & Advanced Functional Material Characterization Techniques

(Atmanirbhar Bharat Abhiyan) Under Synergistic Technological Training Program

Utilizing the Scientific and Infrastructure (STUTI)

May 30 – June 5, 2022 Organized By



**Department of Physics (FIST Supported)** 

&

Central Research Facility Centre (CRFC) National Institute Of Technology Srinagar

IN ASSOCITATION WITH SOPHISTICATED ANALYTICAL INSTRUMENTATION FACILITY PANJAB UNIVERSITY, CHANDIGARH

Dr. Vijay Kumar

STUTI Training Program Coordinator, NIT Srinagar **Prof. G.R. Chaudhary** Director, SAIF/CIL Coordinator-PMU PANJAB UNIVERSITY, CHANDIGARH

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# **ORGANIZING COMMITTEE**

<b>Prof. Rakesh Sehgal</b> Chief-Patron Chairman BOG & Director National Institute of Technology Srinagar (J&K)	
<b>Prof. Kaiser Bukhari</b> Patron Registrar National Institute of Technology Srinagar (J&K)	
<b>Prof. M. F. Wani</b> Patron Dean Research & Consultancy National Institute of Technology Srinagar (J&K)	
<b>Prof. G.R. Chaudhary</b> Professor, Department of Chemistry Director, SAIF/CIL Coordinator, STUTI Program-Panjab University Panjab University, Chandigarh	
<b>Dr. Vijay Kumar</b> Coordinator - STUTI Training Program Assistant Professor, Department of Physics, National Institute of Technology Srinagar (J&K)	
<b>Dr. M. A. Shah</b> Chairman - STUTI Training Program Head, Department of Physics National Institute of Technology Srinagar (J&K)	
<b>Prof. Seemin Rubab</b> Secretary - STUTI Training Program Department of Physics, National Institute of Technology Srinagar (J&K)	
<b>Dr. Prince A Ganai</b> Secretary - STUTI Training Program Department of Physics National Institute of Technology Srinagar (J&K)	

**Dr. Mohd Zubair Ansari** Convenor - STUTI Training Program Assistant Professor, Department of Physics National Institute of Technology Srinagar (J&K)

**Dr. Harkirat Singh** Convenor - STUTI Training Program Assistant Professor, Department of Physics National Institute of Technology Srinagar (J&K)





### **ABOUT THE STUTI TRAINING PROGRAM**

Synergistic Technological 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 as well as hands on experience with various instruments, supported by DST. The uniqueness of the program includes minimum four hours' theory and remaining 50% of the duration is on practical training on the equipment. Effort would be made for hands-on use of equipment for demonstration/ characterization by each participant. The program's aim is to promote the research collaborations to the maximum extent. The program will be open to a broad audience interested in acquiring in-depth knowledge on the ideas and advancements in areas of SEM, XRD, AFM, UV Visible spectroscopy, FTIR, Raman, TGA/DSC, etc. After completion of the workshop, participants can appreciate how these techniques help in understanding materials, correlating structure-property relation and eventually for 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, with talks by eminent people in the field.

### **ABOUT NIT SRINAGAR**

National Institute of Technology, Srinagar is one of the premier Educational Institutes in the Northern Regions of the country. It was established in 1960 and has been one of the eighteen Regional Engineering Colleges sponsored by the Govt. of India during the 2nd Plan. The Institute acquired the status of National Institute of Technology with deemed to be University status during August, 2003 and attained full autonomy in its Academics. The Institute is situated at the banks of world-famous Dal Lake, with the far-famed Hazratbal Shrine on other side of the campus. NIT Srinagar is a residential Institute with accommodation facility in Hostels and Staff-Quarters. There

are four Boys and one Girls hostel which swallops about 1500 boys and 200 girls. Besides running the B. Tech Programme the Institute also offers M. Tech programme in many streams. In addition to that a large number of students are registered for M.Phil. and Ph.D. Programmes.

Facilities and amenities are available at the institution such as NCC, NSS, Bank, Consumer cum Society, Shopping Complex, Recreational Centre, Dispensary with Ambulance, Guest House, Students Activity Centre, Gymnasium, Internet Centre, Telephone Booths, Fax Services, Diesel Generator, Bus Facility. The Institution has an Industry Interaction cell which was established in 1989 with the aim to remain at the fore-front on the Scientific and Technological development and to share its experience with industries in utilizing. Man-power and other resources are available at the institute effectively with the assistance of the participating industries. The Institute has one of the best technical library in J&K State.

### **ABOUT DEPARTMENT OF PHYSICS**

Since its inception, the Department of Physics is offering the General Physics course Engineering Physics for all branches of B. Tech. students during first and second semesters, respectively. In addition, the department offers several electives to various branches. In 2015, the Department has started P.G Programme in Applied Physics and the programme has received many accolades across the country. In this programme, we have offered intrinsically challenging and didactically inspiring courses. The Department has full-fledged laboratories for P.G Students, Research Scholars and offers Ph.D. program in Solid state physics, Materials science, Nanotechnology, Nuclear physics and in renewable energy sectors. Presently, the department has (07) faculty members. Department has been supported under DST Nano Mission, TEQIP III -World Bank Assisted Project and DST FIST. In order to inculcate the academic culture, the department regularly organizes lecture/quiz competitions and invited talks by the eminent scientists under the title, "Beyond the Class Room Lecture Series". So far the department has produced maximum M. Phil. and Ph. D. scholars in the Institutes.

### **ABOUT CENTRAL RESEARCH FACILTY**

Central Research Facility Centre (CRFC) has started functioning since 2012. Various Research facilities have been created for the research & consultancy work. These include Field Emission Scanning Electron Microscope (Carl Zeiss), Multi Target

Sputtering System (Moorfield Nanotechnolgy), Wavelength Dispersive X-ray Fluorescence Spectrometer (Rigaku), 3-Axis Laser System for Surface Texturing (Markolaser), SEM/EDS (Hitachi 3600N), Nanomechanical system (Hysitron TI Premier), SmartLab X-Ray Diffractometer (Rigaku), Litesizer<sup>™</sup> 500 Particle Analyzer, MCR 102 Rheometer, Planetary – Mill pulverisette 5, TGA/DSC, Raman Spectroscope (Renishaw), CHNS Analyzer, ShakeTable. In addition to this, AFM is under purchase process.



Nanoindenter Hysitron TI Premier



**X-Ray Diffractometer** 



Multi Target Sputtering System

Raman Spectrophotometer Particle Size Analyzer

Field Emission Scanning Electron Microscopes (FESEM)

Rheometer TGA/DSC

### **ABOUT PANJAB UNIVERSITY CHANDIGARH**

Since its inception in 1882 at Lahore (now in Pakistan), the magnificent traditions of the Panjab University have been a source of inspiration for the current generations of the faculty and students to st accomplish and stand out in their academic endeavors. This University now ranks 1 among Universities th of India and 38 in Asia according to Times Higher Education Asian University rankings 2015. It has been ranked number one university in India and in the bracket 276-300 internationally in the Times Higher th Education World University Rankings, 2014-2015 powered by Thomson Reuters and it is also ranked 39 by the Times Higher Education among BRICS & Emerging Economies.

Panjab University is located in Sector 14 and Sector 25 of Chandigarh, spreading across an area of almost 550 acres. The Panjab University Campus at Chandigarh has 73 teaching and research departments/institutes /centres besides four independent Chairs for research. Furthermore, the university has 189 affiliated/constituent colleges spread over Punjab and Chandigarh besides Regional Centres at Muktsar, Ludhiana, Hoshiarpur and Kauni. In addition, there is the Vishveshavaranand Vishwa Bandhu Institute of Sanskrit and Indological Studies at Hoshiarpur.

Panjab University has maintained its streak of Grade 'A' status by NAAC (A-grade) in 2004, 2009 and later in 2014. The University has been recognized by the UGC as the "University with Potential for Excellence in Biomedical Sciences" with facilities for Stem Cell Research and Drug Development. During the 11th Five Year Plan (2007-2012), it was awarded the two Centres of Excellence by the UGC under the Scheme of Centre with Potential for Excellence in a Particular Area (CPEPA). Also, the Department of Science and Technology (DST) has selected Panjab University as one among the 14 top universities of India for funding under the Promotion of University Research and Scientific Excellence (DST-PURSE) Programme from 2015-2020. The university takes pride for being involved in Chandigarh Region Innovation and Knowledge Cluster (CRIKC) Programme.

The University is participating in various prestigious International High Energy Research Programmes at Fermilab (USA), KEK (Japan) and CERN (Switzerland). At present, the University is involved in CMS and ALICE Experiments at CERN (European Organization for Nuclear Research) Switzerland and Neutrino Programme at Fermilab, USA, The University recently signed MoUs with various international

universities and institutes such as University of Nottingham (UK), University of Birmingham (UK), Nottingham Trent University (UK) and University of Western Sydney (Australia). PU also has collaborations with National Science Technology and Development Agency, Thailand; University of Missouri, USA and Universidade de Aveiro, Portugal; International Crops Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad; International Centre for Agricultural Research in Dry Areas (ICARDA).

### SAIF/CIL

SAIF/CIL formerly known as RSIC at Panjab University, Chandigarh was incepted in the earlier years of the 6<sup>th</sup> plan. The complete facilities of USIC, CIL, SAIF and RSIC are working in unison in the service of research and also for imparting practical training to the students through workshops. The Centre also undertakes the design, fabrication and repair of electronic instruments required by students and teachers from the University and the colleges around. It also runs training programmes in technical skills for the benefit of scientific community and associated laboratory staff from different institutions.

The Centre houses the following Sophisticated Instruments: Transmission Electron Microscope (TEM) Hitachi (H-7500), Scanning Transmission Electron Microscope (SEM) Model JSM6100 (Jeol) with Image Analyser, Elemental Analyser for CHN (Thermo Scientific), FT-NMR Cryo-magnet Spectrometer 400 MHz (Bruker), X-ray Diffractometer (Powder Method). Panalytical.s X.Pert Pro, LC-MS Spectrometer Model Q-ToF (Micro Waters), Liquid Nitrogen Plant Stirling (StirLIN-1), FTIR Spectrophotometer Model RZX (Perkin Elmer), UV-VIS-NIR Spectrophoto-meter Model Lambda 750 (Perkin Elmer), WD-XRF Spectrometer Model-S8 (TIGER Bruker).

### **TOPICS COVERED**

The main theme of this training program is to aware the participants regarding the sophisticated instruments SEM, XRD, AFM, UV Visible spectroscopy, FTIR, Raman, TGA/DSC, etc. The training program includes theory lectures as well as demonstration/Hands on Training sessions on the sophisticated instruments.



# One Week Training Program on R&D Equipment Material Processing & Advanced Functional Material Characterization Techniques

Under

Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI)

*May 30 – June 5, 2022* [Venue: High-Tech 5]



# Sponsored by: Department of Science & Technology

Organized by

Department of Physics and Central Research Facility Centre, National Institute of Technology Srinagar in association with Sophisticated Analytical Instrumentation Facility Panjab University, Chandigarh

Inauguration Program ** [Day 1 Monday, May 30, 2022]				
Time (IST)	Event			
09:00AM - 10:00AM	REGISTRATION [Entrance High-Tech 5]			
10:00AM - 10:05AM	Introduction about the Programme by Dr. Vijay Kumar			
10:05AM – 10:15AM	Felicitation of Guests			
10:15AM - 10:20AM	Welcome Address by HOD Physics, Dr. M. A. Shah			
10:20AM - 10:25AM	Address by STUTI Coordinator – PMU Prof. G.R. Chaudhary, Director, SAIF/CIL, Panjab University			
10:25AM - 10:30AM	Address by Guest of Honor Prof. M.F. Wani, Dean R&C, NIT Srinagar			
10:30AM - 10:35AM	Address by Guest of Honor Prof. S. K. Bukhari, Hon'ble Registrar, NIT Srinagar			
10:35AM - 10:40AM	Address by Special Guest Prof. Yogendra Kr. Mishra, University of Southern Denmark			
10:40AM - 10:50AM	Address by Chief Guest Prof. Rakesh Sehgal, Hon'ble Director, NIT Srinagar			
10:50AM - 11:00AM	Vote of Thanks by Prof. Seemin Rubab			
11:00AM - 11:30AM	Tea Break			

# **One Week STUTI Training Program on R&D Equipment [Technical Program]**

Day/Date	Session -1		Session -2		Session-3 (Hands on Training)	
	09.30 am to 11.00 am		11.30 pm to 1.00 pm		2:00 pm to 5.30 pm	
Day 1	Inaugural Session **		Lecture - 1		Demo & Q&A Session: 1	
May 30, 2022	(Separate Program)		Prof. Yogendra Kumar Mishra		Prof. Yogendra Kumar Mishra/ Dr.	
(Monday)			Mads Clausen Institute, University		Mohd Nadeem Bhat/ Er. Adil Nazir	
			of Southern Denmark		Group 1- FESEM	
			Title: Tetrapods based Smart		Group 2- X-ray Diffraction	
			Materials for Advanced		Group 3- Nanomechincal system	
			Technologies	-	Group 4- Multi Target Sputtering system	
Day 2	Lecture – 2		Lecture - 3		Demo & Q&A Session: 2	
May 31, 2022	Prof. Sandeep Kumar		Dr. Rajeev Kumar		Prof. M. F. Wani Dr. Mohd Nadeem	
(Tuesday)	Guru Jambheshwar University of		Department of Environment		Bhat/ Er. Adil Nazir/ Er. Nayeem	
	Science & Technology, Hisar		Studies, Panjab University		Group 1- X-ray Diffraction	
	Title: Advanced Functional		Chandigarh		Group 2- Nanomechincal system	
	Material Characterization using		Title:Multiscalestructural	Lunch	Group 3- Multi Target Sputtering system	
	Electron and Probe Microscopy		characterization of	break	Group 4- FESEM	
	with Recent Advancements		Nanomaterials			
Day 3	Lecture – 4	Tea	Lecture - 5		Demo & Q&A Session: 3	
<b>June 01, 2022</b>	Prof. Rakesh Sehgal	break	Prof. M. F. Wani		Prof. Sandeep Kumar/ Dr. Mohd	
(Wednesday)	Director, National Institute of		Dean Research & Consultancy,		Nadeem Bhat/ Er. Adil Nazir	
	Technology Srinagar		National Institute of Technology		Group 1- Nanomechincal system	
	Title: Biomaterials for societal		Srinagar		Group 2- Multi Target Sputtering system	
	needs		Title: Fabrication and mechanical		Group 3- FESEM	
			characterization of smart MMMCs		Group 4- X-ray Diffraction	
D (	•		and CMCs			
Day 4	Lecture - 6				Demo & Q&A Session: 4	
June 02, 2022	Prof. M. F. Wani		Dr. Vishal Sharma		Dr. Harkirat Singh/ Dr. Mohd Nadeem	
(Thursday)	Dean Research & Consultancy,		Institute of Forensic Science &		Bhat/ Er. Adil Nazir/ Er. Nayeem	
	NIT Srinagar		Criminology, Panjab University		Group 1- Multi Target Sputtering system	
	<b>Title:</b> New lubrication of		Chandigarh Title: Changementing Based		Group 2- FESEM	
	mechanical system – A path to		Title: Chemometrics-Based		Group 3- X-ray Diffraction	
	sustainability		Analytical Method Group 4- Nanomechincal system		Group 4- Nanomechincal system	

# **One Week STUTI Training Program on R&D Equipment [Technical Program]**

Date	Session -1 09:30 am to 11:00 am		Session -2 11:30 pm to 1:00 pm			nds on Training) to 5:30 pm
Day 5 June 03, 2022 (Friday )	Lecture – 8 Dr. M. A. Shah Department of Physics, National Institute of Technology Srinagar <i>Title: Microscopy a versatile tool</i>	ar University of Kashmir, J&K,			Demo & Q&A Session: 5 Dr. Saifullah Lone/ Dr. Mohd N Bhat/ Er. Adil Nazir/ Er. Nayeem Z Er. Mufti Taseer Group 1- WDXRF Group 2- UV-Vis/TGA Group 3- Rehometer & Particle size analy Group 4- 3 Axis Laser Texturing	
Day 6 June 04, 2022 (Saturday)	Lecture - 10 Prof. Pawan Kumar Kulriya School of Physical Sciences, Jawaharlal Nehru University, New Delhi <i>Title:</i> What can we learn from X- ray diffraction?	Tea break	Lecture 11 Dr. Harkirat Singh Department of Physics, National Institute of Technology Srinagar Title: Low temperature and STM	Lunch break	Group 4- 3 Axis Laser TexturingDemo & Q&A Session: 6Dr. Vijay Kumar/ Dr. Mohd NadeemBhat/ Er. Adil Nazir/ Er. Nayeem Zahoor/Er. Mufti TaseerGroup 1- UV-Vis/TGAGroup 2- Rehometer & Particle size analyzerGroup 3- 3 Axis Laser TexturingGroup 4- WDXRF	
Day 7 June 05, 2022 (Sunday)	Lecture - 12 Prof. Pawan Kumar Kulriya School of Physical Sciences, Jawaharlal Nehru University, New Delhi Title: What can we learn from X- ray diffraction? Part 2		Lecture – 13 Dr. Saifullah Lone Ramanujan Fellow, Department of Chemistry, National Institute of Technology Srinagar <i>Title: Thermal Techniques</i>		Lecture – 14 2:00 pm to 3.30 pm Dr. Jigneshkumar V. Rohit Title: Use of nanomaterials in spectroscopic analysis	Valedictory Session Feedback/ Farewell/Felicitation [3:30 pm to 4.30 pm]

S. No.	State/Country	Institutes	No. of Registered Participants
		University of Kashmir	03
		Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu	01
1.	Jammu & Kashmir	Central University of Kashmir	02
		Islamic University of Science and Technology	01
		Govt. Medical College Srinagar	02
2.	Himachal Pradesh	Govt. Degree College Barsar, Hamirpur	01
3.	Uttar Pradesh	Aligarh Muslim University	03
		National Physics Laboratory, Delhi	03
4.	New Delhi	Jamia Millia Islamia	01
5.	Haryana Kurukshetra University		03
	Panjab	G.N. College, Ludhiana, Punjab	02
6.		CT University, Jalandhar	02
7.	Chandigarh	Panjab University Chandigarh	03
0	Gujrat	Saurashtra University, Rajkot	01
8.		Central University Gujarat	02
		30	



# **LOGO OF PARTICIPATING INSTITUTES**



**University of Kashmir** 



**SKUAST Jammu** 



Central University of Kashmir



**Aligarh Muslin University** 



Islamic University of Science and Technology



**CSIR-NPL** 



Govt. Medical College Srinagar



Jamia Millia Islamia



CT University Jalandhar



Govt. Degree College Barsar

Hamirpur

Kurukshetra University



Panjab University Chandigarh



G.N. College, Ludhiana, Punjab



Saurashtra University Rajkot



Central University Gujarat

# **LIST OF PARTICIPANTS**

S. No.	Name of Participants	Institute Name	Designation
1	Mohd Asif	National Physical Laboratory	PhD Scholar
2	Manisha	National Physical Laboratory	PhD Scholar
3	Dr. Virender Pratap Singh	Govt. Degree College Barsar, Hamirpur, Himachal Pradesh	Assistant Professor
4	Nayankumar A. Chondagar	Saurashtra University - Rajkot	PhD Scholar
5	Dr. Rafiq Ahmad	Jamia Millia Islamia	Ramalingaswami Fellow
6	Chitra	National Physical Laboratory	PhD Scholar
7	Mehar Singh	Panjab University Chandigarh	PhD Scholar
8	Arti Jangra	Kurukshetra University	PhD Scholar
9	Kibriya Farooq	CT University Ludhiana	PhD Scholar
10	Dr. Jagmeet Singh	G.N. College Ludhiana, Punjab	Assistant Professor
11	Mohd Abushad	Aligarh Muslim University Aligarh	PhD Scholar
12	Ishfaq Ahmad Parray	Aligarh Muslim University Aligarh	PhD Scholar
13	Priyanka Mankotia	Panjab University Chandigarh	PhD Scholar
14	Renju	Central University of Gujarat	PhD Scholar
15	K. Sushma Verma	Central University of Gujarat	PhD Scholar
16	Dr. Gurjit Singh	G.N. College, Ludhiana, Punjab	Assistant Professor
17	Kajal Samdhyan	Kurukshetra University	PhD Scholar

18	Jai Kumar	Kurukshetra University	PhD Scholar
19	Shabnum Saleem	CT University, Ludhiana	PhD Scholar
20	Mohammad Arshad	Aligarh Muslim University	PhD Scholar
21	Urmila Chakraborty	Panjab University Chandigarh	PhD Scholar
22	Dr. Faheem Arjamend	University of Kashmir	Assistant Professor
23	Dr. Ayushi Sawhney	Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu	PhD Scholar
24	Asifa Jan	Islamic University of Science and Technology	PhD Scholar
25	Rufeen Ahmad	Central University of Kashmir	PhD Scholar
26	Suhail Shafi Lone	Govt. Medical College Srinagar	PhD Scholar
27	Mudasir Rashid Rather	Central University of Kashmir	PhD Scholar
28	Iqra Farooq	Govt. Medical College Srinagar	PhD Scholar
29	Urba Afnan	University of Kashmir	MSc. Student
30	Basia Tariq	University of Kashmir	MSc. Student

### **ORGANIZERS REPORT**

One Week Training Program on R&D Equipment Material Processing & Advanced Functional Material Characterization Techniques May 30 – June 5, 2022

# Coordinators

Dr. Vijay Kumar, Prof. G.R. Chaudhary

Convener

### Dr. Mohd Zubair Ansari, Dr. Harkirat Singh

### **BACKGROUND**

Department of Physics and Central Research Facility Centre, National Institute of Technology Srinagar in association with Sophisticated Analytical Instrumentation Facility Panjab University, Chandigarh has successfully organized One Week Training Program on Material Characterization Techniques under Synergistic Technological Training Program Utilizing the Scientific and Infrastructure (STUTI). The training program, which was sponsored by Department of Science & Technology, GoI was coordinated by Dr. Vijay Kumar, and Prof. G.R. Chaudhary. Resource Persons for the training program were exceptionally experienced faculty members from reputed Indian Institutes and aborad. The content of the invited talks reflects the wide variety of sophisticated instruments such as SEM, XRD, Nanomechincal system, Multi-Target Sputtering system, WDXRF, Rheometer, Particle size analyzer, Axis Laser Texturing UV Visible, FTIR, Raman, TGA/DSC, etc. There were around 30 participants from India and abroad. The scientific sessions were highly useful for the budding researchers who participated in the training program. This training program was for a range of academics like faculties, scientists, Post-Doc Fellows, Ph.D. scholars and industrialists who are actively involved in R&D and seek knowledge of various characterization techniques. The course also stands to help researchers and students in the present state of the discipline.

### WELCOME AND OPENING ADDRESSES

Dr. Vijay Kumar, Coordinator - STUTI Training Program, Assistant Professor, Department of Physics, NIT Srinagar welcomed Chief Guest Prof. Rakesh Sehgal, Hon'ble Director, NIT Srinagar, Special Guest Prof. Yogendra Kumar Mishra,

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University of Southern Denmark., Guest of Honor Prof. S. K. Bukhari, Hon'ble Registrar, NIT Srinagar, Prof. M. F. Wani, Dean R&C, NIT Srinagar, STUTI Coordinator – PMU Prof. G.R. Chaudhary, Director, SAIF/CIL, Panjab University, HOD Physics Dr. M. A. Shah, Faculty Members of the Physics Department and all the Participants. Dr. Vijay Kumar also highlighted the key points of the STUTI training program, its schedule and emphasized on the importance of the training program. 'More than 150 participants had registered for the program and only 35 were selected from 15 institutes across the country. Research persons from top institutions will deliver their lectures during the workshop," Dr. Kumar said.



In his key speech, Prof. Yogendra said this program is unique and it enables the researchers and students to acquire knowledge about the various state-of-the-art equipment and learn about their usage. "I will be very happy to host students and

researchers of NIT Srinagar as visiting students to our laboratories at Southern Denmark University. We are ready to collaborate with NIT Srinagar on different aspects of material development. Our university will act as a vibrant platform for NIT Students," he said. He also congratulated Director NIT Prof. Sehgal, Head Physics Dr. MA Shah,



and Dr. Vijay Kumar for successfully organizing this program. We are going to look forward to different types of materials development strategies and characterization avenues," he said. "I am really happy that Dr. Vijay Kumar is visiting the University of Southern Denmark under the SERB, SIRE Scheme," Prof. Yogendra said. He said participants of this workshop are the ambassadors and we need to pass the right knowledge to the younger generation so there will be more focus on science and technology.

Director NIT, Prof. Rakesh Sehgal said availability and accessibility is very important. We must be thankful to our policymakers at the central level that imparting this kind of training program to the people who were deprived of such facilities," he said. "Research and technology are



the need of the hour. Both NIT Srinagar and the University of Southern Denmark will work in joint collaboration of research projects in future," he said. Prof. Sehgal said research and innovation are essential to increase the abilities of young minds. We need to develop and test solutions; predict outcomes and mitigate harm and make informed policy decisions, he said.

Institute's Registrar, Prof. Syed Kaiser Bukhari said such programs would go a long way in developing our students, and research scholars. It would act as great significance to our R&D programs, he said. "We at NIT Srinagar across all departments have a growing R&D sector. With the help of such programs, we will be featured among top research institutes in the country," he said. Prof. Bukhari congratulated Dr. Shah HoD Physics and Dr. Vijay Kumar for initiating such programs in the department. The role of Science and Technology is pivotal for the evolution of mankind, he said.



On the occasion, Dean Research and Consultancy, Prof. MF Wani said NIT Srinagar has developed state of the art for facilities for the research facilities and will continue to expand its activities. The essence of this program is to improve the teaching ability of the participants and enable learners

to learn, he said.

STUTI Coordinator - PMU and SAIF/CIL. Director. Panjab University Prof. G.R. Chaudhary said this program is designed for the participants of various institutes across the country. They will be given hands-on training on high-end sophisticated, analytical instrumentation in addition to expert lectures from the eminent scientists,



**One Week Training Program on Material Characterization Techniques under STUTI** 



he said. "The idea of STUTI is to impart hands-on training and access to science and technology infrastructure present with DST supported institutes. The researchers who are deprived of such facilities will get a deeper insight of principle, working, analysis and interpretation of results of processed materials by analytical tools or faculties," he said.

Dr. Sandeep- GJU-SNT (Hisar) and Dr. Rajeev Kumar from Panjab University share that the participants will not get only exposure to high-end techniques but will also know the capabilities of different tools that they can use in their research activities.



In his welcome address, HOD Physics Dr. MA Shah said Department is taking a lead **21** | P a g e

One Week Training Program on Material Characterization Techniques under STUTI



role in organizing scientific summits under the leadership of Prof. Sehgal and his team. We promise to continue it for the benefit of students and young faculty, he said. "We



can't ignore to learn the operation of sophisticated equipment; we all witness they are an integral part of our new challenges. These initiatives will spread the spirit of the collaboration and cooperation among the R&D community, taking us further along to innovation, prosperity, and well-being," he said.

Director SAIF Kolhapur University, Prof. Sonkawade said, "I am happy to see such programs are being organized by NIT Srinagar. We are expecting another collaboration soon," he said.

Convener of the workshop, Dr. Vijay Kumar said the program consists of both theory and as well as hands-on experience with various instruments, supported by DST. The uniqueness of the program includes a minimum of four hours of theory and remaining 50% of the duration is on practical training on the equipment, he said.

A formal vote of thanks was presented by Prof. Seemin Rubab. She expressed her 22 | P a g e

gratitude to DST, New Delhi, Panjab University, Director NIT Srinagar, Prof. Yogendra, Registrar, Head Physics, resource person, and participants for making the inaugural event a grand success.



### <u>DAY 1</u>

The First session of the training program started with the invited lecture by distinguished speaker Prof. Yogendra Kumar Mishra from Mads Clausen Institute, the University of Southern Denmark who refined the knowledge of the audience on Tetrapods-based Smart Materials for Advanced Technologies. This talk briefly introduced the importance of complex-shaped nanostructures toward smart 3D nanomaterials structuring. He mainly focused on a simple flame-based single-step approach developed for synthesizing zinc oxide tetrapods which demonstrated many applications in different technologies. "These tetrapods have been used as building blocks to construct highly porous interconnected 3D Nano networks in form of flexible ceramics which

offer further new application avenues.

Additionally, these 3D networks have been utilized as sacrificial templates to



develop hollow Tetrapodal 3D networks from almost any desired material, carbons, nitrides, oxides, polymers, hydrogels, etc. The sacrificial template-based strategy offers new and unique opportunities in the direction of 3D nanomaterials engineering and accordingly advanced technological applications." he said.

In part of the training program, a Lab tour is one of the major events for the participants to give wider exposure to the various synthesis and characterization techniques available at the NIT Srinagar. During the training, participants had an opportunity to visit the Central Research Facility Lab labs at NIT Srinagar. All the participants were divided into four groups. The participants were given a brief demonstration of several characterization techniques like WDXRF, UV-Vis/TGA,



Rehometer & Particle size analyzer, and Axis Laser Texturing. We are very much sure that this exposure to several characterizations is very much helpful for them to improve their knowledge and pursue their research with higher quality. The first day of the training program was a great success and the organizers look forward to six more days to make this workshop a better platform for budding researchers to know about various characterization techniques.

# <u>DAY 2</u>

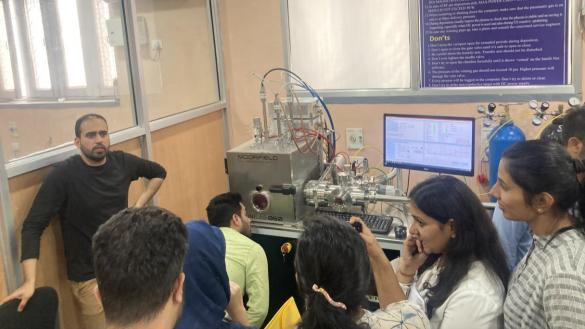
The second day starts with the talk of Prof. Sandeep Kumar, Department of Bio and Nano Technology, Guru Jambheshwar University of Science and Technology, Hisar. He delivered a very important and informative talk on Advanced Functional Material Characterization using Electron and Probe Microscopy with Recent Advancements. He discussed in detailed the Electron and Probe Microscopy. The talk also gave



introduction to primitive microscope (optical based), its properties (optics) and limitations (in terms of poor resolution, brightness of the source, etc.) and then taken to the needs of higher end microscopy (electron based). For electron microscopy, fundamental of electron-matter interactions and generation of various rays are explained. This is followed by complete utilization of scanning electron microscopy (SEM): starting from sample preparation, electron gun types, SEM scanning methods in terms of raster; signals generations and their capturing in terms of energy and placements with various examples (secondary electron imaging, backscatter electron imaging and diffraction, channeling contrast imaging, elemental analysis mapping through energy dispersive spectroscopy and wavelength dispersive spectroscopy, electron beam induced current). He further focused on the application of electron microscopy in characterizing biological and non-biological specimens and their use in various fields of science and technology. He also emphasized on the need of exploring electron microscopy techniques for materials science and nanotechnology as well as biomaterials. He also explained the difference between SEM and TEM in a very nice manner and by giving various examples. Next talk of the training program on second day was delivered by Dr. Rajeev Kumar, Department of Environment Studies, Panjab University Chandigarh. He talked on Multiscale structural characterization of Metallic Materials. All the participants have shown their satisfaction in respect of the content,

Last session ended with the demo on X-ray Diffraction, Nanomechincal system, Multi Target Sputtering system and FESEM. Demonstration session were appreciated by all the participants.





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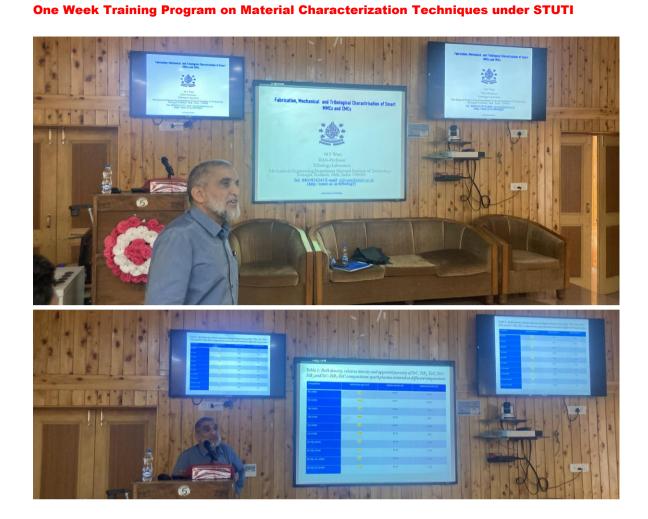
delivery, and presentations of all the topics covered during the presentation.

# <u>DAY 3</u>

The third day started with an invited talk of Prof. Rakesh Sehgal, Director, National Institute of Technology Srinagar. He talked about Biomaterials for societal needs. He talked about biomaterials for orthopedic/dental devices and discussed common clinical challenges, bacterial infection and poor osseointegration in detail. Bio-inspired multi-bio functional biomaterials along with the preparation of 3D porous scaffolds was quite interesting. He also covered state-of-the-art facilities available at NIT Srinagar. He encouraged all the participants for future collaboration.



The second lecture of the second day was delivered by Prof. M.F. Wani, Dean Research and Consultancy, National Institute of Technology Srinagar on Fabrication and Mechanical Characterization of smart MMMCs and CMCs. He emphasized on Tribology, Tribology of advanced ceramics & Nano Ceramics, and Life Cycle Engineering. He also shared his journey as a researcher with participants and how he managed to create a state-of-art-facility at NIT Srinagar. He motivated the participants and urged that to work hard to solve social problems.



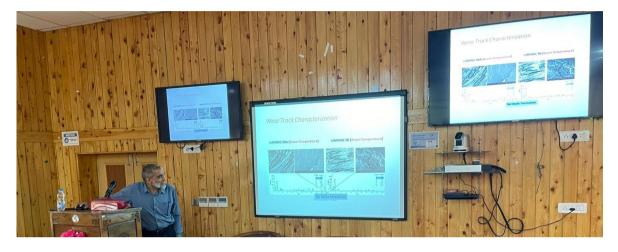
The participants were given demonstration cum hands-on experience on Nanomechincal system, Multi Target Sputtering system, FESEM and X-ray Diffraction.

# <u>DAY 4</u>

The day began with an invited talk by Prof. M.F. Wani on the new lubrication of mechanical systems- a path to sustainability where he said that the initiative is aimed at bringing together the researchers, scientists, technocrats, and practicing engineers to discuss and address the issues related to the sustainable development of mechanical systems and its future need for the benefit of humanity. He also pointed out that it is clear that a number of tribological problems could be put under the umbrella of sustainable tribology and are of mutual benefit to one another. He focused on how tribological development in terms of advanced materials, coatings, nano-coatings, solid lubricants, nano-lubricants, bio-tribology, and sustainable design has tremendous potential to enhance sustainability of mechanical systems.

The second lecture was given by Dr. Vishal Sharma, Institute of Forensic Science &

Criminology, Panjab University Chandigarh on Chemometrics- Based Analytical Method where he explained how the chemometrics methods are used for adulteration detection and Spectroscopy-Based Pharmaceutical Analysis. He gave a brief overview of the different chemometric approaches applicable in the context of spectroscopy-based pharmaceutical analysis, discussing both the unsupervised exploration of the collected data and the possibility of building predictive models for both quantitative (calibration) and qualitative (classification) responses.









### <u>DAY 5</u>

The first lecture of day 5 was delivered by Dr. M.A. Shah on Microscopy - a versatile tool. He pointed out there that Science and technology ever seek to build structures of progressively smaller sizes. This effort at miniaturization has finally reached the point where structures and materials can be built through "atom-by-atom" engineering. He said: "The telescope transformed our view of the universe, leading to cosmological theories that derive support from experiments involving elementary particles. But microscopes have been equally important by helping us to understand both inanimate matter and living objects at their elementary level." There he focused on Energy Dispersive X-ray analysis, Transmission Electron Microscope Scanning Tunneling Microscope. As per the talk Characterization and manipulation of individual nanostructures require not only extreme sensitivity and accuracy but also atomic level resolution. It, therefore, leads to various microscopy that will play a central role in the characterization and measurement of nanostructured materials and nanostructures.





The second session of the day was delivered by Dr. Khalid Sultan, Department of Physics, Central University Kashmir on the Effect of Iron Irradiation on Properties of Metals. There he explained about Self-ion irradiation effects on mechanical properties of nanocrystalline zirconium films. He also gave an overview of how its experimental results support the hypothesis that grain boundaries in nanocrystalline metals act as very effective defect sinks and focused on the application potentials of nanocrystalline materials. All the participants have shown their satisfaction in respect of the content, delivery, and presentations of all the topics covered during the presentation.







### <u>DAY 6</u>

The sixth day started with an invited lecture by Prof. Pawan Kumar Kulriya, School of Physical Sciences, Jawaharlal Nehru University, New Delhi. He delivered a talk on What can we learn from X-ray diffraction? He gave an elaborative talk on Structure property relationship in molecular solids by using XRD. He discussed in details the importance of X-ray Diffraction and also provided information about the internal lattice of crystalline substances, including unit cell dimensions, bond-lengths, bond-angles, and details of site-ordering. He also explained the difference between the single crystal XRD and powder XRD.



The second lecture of the day started with a talk by Dr. Harkirat Singh, Department of Physics, National Institute of Technology Srinagar on Low temperature and STM. He covered the very basics of magnetic materials and also presented research-level data in a very down-to-earth manner and his lecture was enjoyed and liked by all the 33 | P a g e

participants.

## <u>DAY 7</u>

The first talk of the las day of training program was delivered again by Prof. Pawan Kumar Kulriya, School of Physical Sciences, Jawaharlal Nehru University, New Delhi. The second session of the Day was started by Dr. Saifullah Lone on Thermal Techniques of Material Characterization where he explained briefly thermogravimetry, differential thermal analysis, and differential scanning calorimetry. He also explained the macroscopic properties of materials, including Mechanical testing, including tensile, compressive, torsional, creep, fatigue, toughness and hardness testing. Last talk of the training program was delivered by Dr. Jigneshkumar V. Rohit, Department of Chemistry, NIT Srinagar's. He talked about Use of nanomaterials in spectroscopic analysis. Spectroscopy techniques are a vital part of the characterization of nanomaterials, as well as other materials and molecules. He elaborated UV visible spectroscopic technique for nano material characterizations.



# VALDICTORY SESSION

Valedictory Program [Monday, July 05, 2022 @ 3:30 PM - 5:00 PM]				
Time (IST)	Event			
03:30PM - 03:35PM	Complete report of the Program by Dr. Vijay Kumar			
03:35PM - 03:40PM	Felicitation of Guests			
03:40PM - 03:45PM	Welcome Address by HOD Physics Dr. M. A. Shah			
03:45PM - 03:50PM	Address by Guest of Honor Chairman NLCO, Manzoor Ahmad Wangnoo			
03:50PM - 03:55PM	Address by Special Guest Mohd. Shafi Pandit, former Chairman, J&K Public Service Commission			
03:55PM - 04:10PM	Feedback by Participants			
04:10PM - 04:20PM	Address by Chief Guest Prof. G A Harmain (Former Dean (R&C)			
04:20PM - 04:30PM	Certificate Distribution by Hon'ble Guests			
04:30PM - 04:35PM	Vote of Thanks			
04:35PM –	High Tea			

The weeklong training program on R&D equipment, 'Material Processing and advanced functional material characterization techniques under STUTI concluded on 5<sup>th</sup> June 2022 at National Institute of Technology (NIT) Srinagar. The workshop is being organized by the Department of Physics and Central Research Facility Centre, NIT Srinagar in association with Sophisticated Analytical Instrumentation Facility Panjab University, Chandigarh. Dr. Vijay Kumar was the local coordinator of the workshop.

The valedictory session of the workshop was presided over by Prof. G A Harmain (Former Dean (R&C) and he was the chief guest on the occasion. Guest of Honor of the program was Chairman NLCO, Manzoor Ahmad Wangnoo and Special Guest of the program was Mohd. Shafi Pandit, former Chairman, J&K Public Service Commission. On the occasion, Prof. Harmain said conducting workshops on relevant themes is the need of the hour. NIT Srinagar will act as a platform for providing relevant knowledge to people who are involved in research activities. He also expressed his gratitude to HOD Physics Dr. MA Shah and Dr. Vijay Kumar and the entire team of the department for organizing a successful workshop.

The 7th-day session began with the lecture of Prof. Pawan Kumar Kulriya, School of Physical Sciences, Jawaharlal Nehru University, New Delhi delivered his lecture on What can we learn from X-ray diffraction? Dr. Kulriya provided detailed insight about the XRD sample preparation, data analysis, and refinement. It was followed by another lecture by Dr. Saifullah Lone Ramanujan Fellow, Department of Chemistry; NIT Srinagar delivered a lecture on "Bioinspired nano/water interface". While Dr. Jigneshkumar V. Rohit delivered a lecture on "Use of nano-materials in spectroscopic analysis.

STUTI Coordinator – PMU and Director, SAIF/CIL, Panjab University Prof. G.R. Chaudhary said the workshop was designed for the participants of various institutes across the country. "Participants were given hands-on training on high-end sophisticated, analytical instrumentation, and expert from various fields delivered their lectures," he said. Prof. Chaudhary said the idea of STUTI is to impart hands-on training and access to science and technology infrastructure present in DST-supported institutes.

In his message, Dr. Sandeep- GJU-SNT (Hisar) and Dr. Rajeev Kumar from Panjab University said such workshops will continue to be organized in upcoming years also.

"In future NIT Srinagar can collaborate with other institutions so that we can gain from each other's experience. We can have a mutual understanding of learning on different technical aspects," they said.

HOD Physics Dr. MA Shah said Department is taking a lead role in organizing scientific summits under the leadership of Prof. Sehgal and his team. We promise to continue it for the benefit of students and young faculty, he said.

Dr. Vijay Kumar presented a detailed report of the 7-day STUTI training program. He mentioned that total of 30 participants from 11 different institutes, and universities have participated in this training program representing 8 States/UTs. "13 eminent speakers delivered the lectures during the 7-day training program to impart participants with the basic knowledge and skills regarding latest research processes and techniques," he said. Kumar said the participants were provided hands-on training on sophisticated instruments present in the CRFC (XRD, FE-SEM, Nano Mechanical system, Multi-target sputtering system, WDXRF, Rheometer, Particle size analyzer, and Axis Laser Texturing). "After this training program, the participants were satisfied and felt highly motivated. The participants provided very positive feedback regarding

### **One Week Training Program on Material Characterization Techniques under STUTI**

the training program. They were enthusiastic about utilizing the knowledge and training gained during this program in their future research endeavors," he said. Dr. Kumar thanked all the resource persons for accepting to share their experiences with the participants and appreciated the contribution of Prof. Yogendra Kr. Mishra, the University of Southern Denmark for taking an initiative for conducting a week-long course on such an important and relevant topic. He expressed his gratitude to special thanks to Irfan Ayoub, Nisar, Umer, Aparna Kashyap, Samiksha Gautam, Shabnam, Kibriya.







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**One Week Training Program on Material Characterization Techniques under STUTI** 



### **PLAN**

Encouraged by the response and feedback received from the participants, we would like to continue conducting such type of training programs with further improvements in near future. Their feedback motivates us to come with similar initiative in future.

### **ACKNOWLEDGEMENTS**

The Department of Science and Technology (DST) New Delhi has sanctioned a project under Synergistic Training Program Utilizing the Scientific & Technological Infrastructure (STUTI) program to Panjab University Chandigarh. The Programme is supported on a Hub and Spoke model and the National Institute of Technology Srinagar is chosen as a Spoke institute under the Programme by Prof. G.R. Chaudhary. Special thanks goes to Panjab University Chandigarh and especially to Prof. G.R. Chaudhary for selecting NIT Srinagar as a Spoke institute. We would also like to thank DST for liberal funding. Support from departmental Ph.D. students is highly appreciated. The CRFC team along with departmental research scholars were very instrumental in facilitating program. This training program would not have been successful without their constant and active support. This also motivates us to conduct more program in the near future. The presence of the Honorable Director, despite his extremely busy schedule, is a reflection his commitment in the growth of the institute. We also acknowledge Prof. M. F. Wani, Head, CRFC, and his office for the smooth conduct and his support in every matter of the training program along with the access

### **One Week Training Program on Material Characterization Techniques under STUTI**

to central facilities. Any academic function in the department cannot be organized without the support of the student volunteers. Thank you, dear students, for your contributions and enthusiasm in each and every aspect of the event. Last but not least thank you all administrative and support staff and everyone who has contributed to making this training program a grand success.

### **OUTCOME**

This course received an awesome response from institutes/universities of J&K and neighboring states. Teachers and students from different field of interest including physics, chemistry, food technology, material science, nanotechnology, mechanical, and chemical engineering registered in this course. The course inspired participants to boost their research by introducing various information about recent advances in nanoscience and nanotechnology along with advancements in various characterization techniques and gave them an idea of what more can be done/needs to be done to further improve their research work. The invited lectures gave participants a deeper learning experience in this training program. Participants were introduced to various synthesis and characterization techniques available in the NIT campus.

### **FEEDBACK**

The course was well-received by the participants as clear from the feedback received through the Feedback form filled by the participants.



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### **NEWS COVERAGE**

NIT Srinagar, Southern Denmark University will collaborate on research, other projects: Prof. Yogendra



#### May 30, 2022 | BK News Service

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The weeklong training program on R&D equipment, 'Material Processing and advanced functional material characterization techniques under STUTI on Monday began at National Institute of Technology (NIT) Srinagar. The workshop is being organized by the Department of Physics and Central Research Facility Centre, National Institute of Technology Srinagar in association with Sophisticated Analytical Instrumentation Facility Panjab University, Chandigarh. Dr. Vijay Kumar is the convener of the workshop.

The event was presided over by Director NIT Srinagar, Prof. (Dr.) Rakesh Sehgal while Prof. Yogendra Kr. Mishra, University of Southern Denmark was the special guest during the inaugural session.



## NIT Srinagar, Southern Denmark University will collaborate on research, other projects: Prof. Yogendra

Weeklong training program on R&D equipment begins at NIT Srinagar

Posted on May 31, 2022 | Author RK News



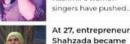


TRENDING



Meet Srinagar boy who played young Amir Khan's role in... He had previously worked in various.

The singer who stood against all odds Kashmir's women



At 27, entrepreneur Shahzada became 'dairy-queen' of ... Heckled by poverty, Shahzada, who once...



save Dal Lake: Ghazala Abdullah (GA): It was 2001 when J&K...



"Where I am today is because of my parent ...



My priority is to bring academic reform: Prof. Rakes... Currently serving as a Director of NIT,.



Weeklong training program on R&D equipment begins at NIT Srinagar

SRIMCAR, MAY 30: The weeklong training program on R&D equipment Material Processing and advanced techniques under STUTIon Monday began at National Institute began at National Institute The workshop is being organized by the Department of Physics and Certral Research Facility Cent Southern Demnark under SRBSIRE Southern State States and States and States and States and States by the Department of Physics and Southern Demnark under SRBSIRE Southern States and States Southern Demnark under SRBSIRE Southern States and States Southern Demnark under SRBSIRE Southern Demnark under Strates wert was presided over by are very important for overall overoing Strates and the central southern Demnark under southern Demnark under

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part of our new challenges. These initiatives will spread the spirit of the collaboration and cooperation among the R&D community, taking us further along to innovation, prosperity, and well-being," he said. Director SAK Kholapur University, Prof. RC Sonkawade said, "amhappy to see such programs are being organized by NIT Srinagar. We are executing another collaboration soon."

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### NIT Sgr, Southern Denmark University to collaborate on research, other projects: Prof Yogendra

Weeklong training program on R&D equipment begins at NIT Srinagar

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In his key speech, Prof.



Yogendra said this program is unique and it enables the researchers and students to acquire knowledge about various state-of-the-art equipment and learn about their usage.

"I will be very happy to host students and researchers of NIT Srinagar as visiting students to our laboratories at Southern Denmark University. We are ready to col-laborate with NIT Srinagar

on different aspects of material development. Our university will act as vibrant platform for NIT Students," he said. He also congratulat-

ed Director NIT Prof. Sehgal, Head Physics Dr. MA Shah, and Dr. Vijay Kumar for successfully organizing this program. We are going to look forward to different types of materials development strategies and character-

ization avenues," he said. "I am really happy that Dr. Vijay Kumar is visiting the University of Southern Denmark under SERB SIRE Scheme," Prof. Yogendra said.

He said participants of this workshop are the ambassadors and we need to pass the right knowledge to the younger generation so there will be more focus on science and technology.

Director NIT, Prof. (Dr.) Rakesh Sehgal said availability and accessibility are very important for overall development. We must be thankful to our policymakers at the central level that imparting this kind of training program to the people who were deprived of such facilities," he said.

"Research and technoloare need of the hour. Both NIT Srinagar and University of Southern Denmark will work in joint collaboration of research projects in future, he said.

Prof. Sehgal said research and innovation are essential to increase the abilities of young minds. We need to develop and test solutions; predict outcomes and mitigate harm and make informed policy decisions, he said

#### News Details

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collaboration of research projects in future," he said. Prof. Sehgal said research and innovation are essential to increase the abilities of young minds. We need to develop and test solutions, predict outcomes and mitigate harm and make informed policy decisions, he said. Institute's Registrar, Prof. Syed Kalser Bukhari said such programs would go a long way in developing our students, and research scholars. It would act as great significance to our R&D programs, he said. "We at NIT Srinagar across all departments have a growing R&D sector. With the help of such programs, we will be featured means the research is developed by the sector.

We at NT Stragar across all departments have a growing R&D sector. With the help of such programs, we will be featured among top research institutes in the country, he said. Prof. Bukhari congratulated Dr. Shah HoD Physics and Dr. Vijay Kumar for initiating such programs in the department. The role of Science and Technology is pivotal for the evolution of mankind, he said. On the occasion, Guest of Honor, Dean Research and Consultance, Prof. MF Wani said NIT Srinagar has developed state of the art for facilities for the research facilities and will continue to expand its activities. The essence of this program is to improve

art for facilities for the research facilities and will continue to expand its activities. The essence of this program is to improve the teaching ability of the participants and enable learners to learn, he said. STUTI Coordinator – PMU and Director, SAIF/CIL, Panjab University Prof. G.R. Chaudhary said this program is designed for the participants of various institutes across the country. They will be given hands-on training on high-end sophisticated, analytical instrumentation in addition to expert lectures from the eminent scientists, he said. "The idea of STUTI is to impart hands-on training and access to science and technology infrastructure present with DST supported institutes. The researchers who are deprived of such facilities will get a deeper insight of principle, working, analysis and interpretation of results of processed materials by analytical tools or faculties," he said. Dr. Sandeep- GJU-SNT (Hisar) and Dr. Rajeev Kumar from Panjab University share that the participants will not get only exposure to high-end techniques but will also know the capabilities of different tools that they can use in their research activities.

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In his welcome address, HOD Physics Dr. MA Shah said Department is taking a lead role in organizing scientific summits under the leadership of Prof. Sehgal and his team. We promise to continue it for the benefit of students and young faculty, he said. "We carit ignore to learn the operation of sophisticated equipment, we all witness they are an integral part of our new challenges. These initiatives will spread the spirit of the collaboration and cooperation among the R&D community, taking us further along to innovation, prosperity, and well-being," he said. Director SAIF Kholapur University, Prof. R G Sonkawade said, "I am happy to see such programs are being organized by NIT Srinagar. We are expecting another collaboration soon," he said. Convener of the workshop, Dr. Vijay Kumar said the program consists of both theory and as well as hands-on experience with various instruments, supported by DST. The uniqueness of the program includes a minimum of four hours of theory and remaining 50% of the duration is on practical training on the equipment, he said. More than 150 participants had registered for the program and only 35 were selected from 15 institutes across the country. Research persons from top institutions will deliver their lectures during the workshop," Dr. Kumar said. A formal vote of thanks was presented by Prof. Seemin Rubab. She expressed his gratitude to Director NIT Srinagar, Prof. Yogendra, Registrar, Head Physics, resource person, and participants for making the inaugural event a grand success. The PG students, research scholars, and staff of the department wholeheartedly contributed in organizing this program.



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## NIT Srinagar, Southern Denmark University will collaborate on research, other projects: Prof. Yogendra

By KR Desk on 12:27 am May 31, 2022 · No Comment



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## Weeklong training program on R&D equipment begins at NIT Srinagar

Srinagar: The weeklong training program on R&D equipment, 'Material Processing and advanced functional material characterization techniques under STUTI on Monday began at National Institute of Technology (NIT) Srinagar.

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The event was presided over by Director NIT Srinagar, Prof. (Dr.) Rakesh Sehgal while Prof. Yogendra Kr. Mishra, University of Southern Denmark was the special guest during the inaugural session \*IOB OPPORTUNITY\* Role: Stewards/ Waiters For Fine Dining Restaurant. Location: \*Bangalore\* \*Total vacancies: 7\* Experience required: Minimum 1 year. Oualification: No bar. Criteria: Hospitality background (preferred, but not mandatory). Excellent verbal and written communication skills. Good interpersonal and relationship management skills. Good computer literacy (basic computer skills, word, excel, email, Internet). · Must be dedicated, organised, process and result oriented. Must be willing to work on weekends. \*Salary: Negotiable (Rs 12,000-18,000)\* Perks: Food and Accommodation. Contract: 1 year. \*Kashmiris will be given preference\* For more details, kindly contact: 8296517651 and send your CVs at: info@manzargroup.com \*Shortlisted candidates will have to go through a round of Zoom interviews\*

# BET INDIA

### — NIT Srinagar, Southern Denmark University will collaborate on research, other projects: Prof. Yogendra

Online Editor 🕓 May 30, 2022

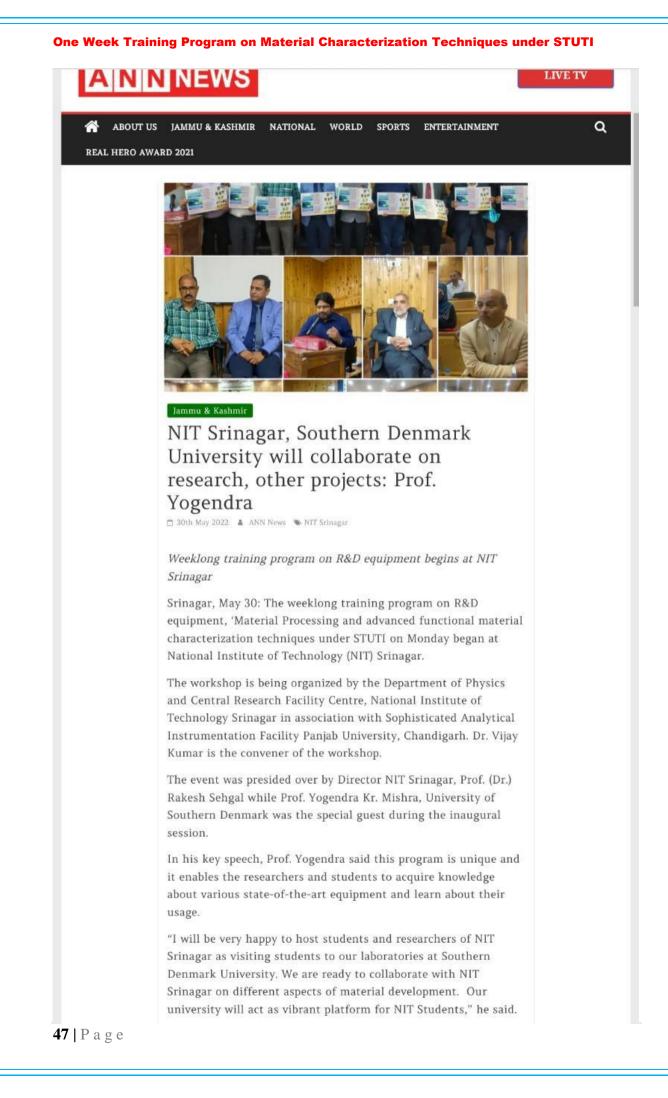


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## The Dispatch

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### Etcetera

# NIT Srinagar, Southern Denmark University to collaborate on research and other projects

🕑 May 30, 2022 🛛 🛔 The Dispatch Staff

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## NIT, Denmark University will collaborate on research, other projects: Prof. Yogendra

#### GMK NEWS NETWORK

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The workshop is being organized by the Department of Physics and Central Research Facility Centre, National Institute of Technology Srinagar in association with Sophisticated Analytical Instrumentation Facility Panjab University, Chandigarh. Dr. Vijay Kumar is the convener of the workshop.

The event was presided over by Director NIT Srinagar, Prof. (Dr.) Rakesh Sehgal while Prof. Yogendra Kr. Mishra, University of Southern Denmark was the special guest during the inaugural session.

In his key speech, Prof. Yogendra said this program is unique and it enables the researchers and students to acquire knowledge about various state-of-the-art equipment and learn about their usage.

"I will be very happy to host students and researchers of NIT Srinagar as visiting students to our laboratories at Southern Denmark University. We are ready to collaborate with NIT Srinagar on different aspects of material development. Our university will act as vibrant platform for NIT Students." he said.

He also congratulated Director NIT Prof. Sehgal, Head Physics Dr. MA Shah. and Dr. Vijav Kumar for successfully organizing this program. We are going to look forward to different types of materials development strategies and characterization avenues," he said.

"I am really happy that Dr. Vijay Kumar is visiting the University of Southern Denmark under SERB SIRE Scheme," Prof. Yogendra said.

He said participants of this workshop are the ambassadors and we need to pass the right knowledge to the younger generation so there will be more focus on science and technology

Rakesh Sehgal said avail- he said. ability and accessibility are very important for overall development. We must be thankful to our policymakers at the central level that imparting this kind of training program to the people who were deprived of such facilities," he said.

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Prof. Sehgal said research and innovation are essential to increase the abilities of young minds. We need to develop and test solutions; predict outcomes and mitigate harm and make informed policy decisions, he said.

Institute's Registrar, Prof. Syed Kaiser Bukhari said such programs would go a long way in developing our students, and research scholars. It would act as great significance to our R&D programs, he said.

"We at NIT Srinagar across all departments have a growing R&D sector. With the help of such programs, we will be featured among top research institutes in the country," he said. Prof. Bukhari congratu-

lated Dr. Shah HoD Physics and Dr. Vijay Kumar for initiating such programs in the department. The role of Science and Technology is pivotal for the evolution of mankind, he said.

On the occasion, Guest of Honor, Dean Research and Consultancy, Prof. MF Wani said NIT Srinagar has developed state of the art for facilities for the research facilities and will continue to expand its activities. The essence of this program is to improve the teaching ability of the participants and enable learners to learn, he said.

STUTI Coordinator PMU and Director, SAIF/ CIL, Panjab University Prof. G.R. Chaudhary said this program is designed for the participants of various institutes across the country. They will be given hands-on training on high-end sophisticated, analytical instrumentation in addition to expert lectures Director NIT, Prof. (Dr.) from the eminent scientists,

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A formal vote of thanks was presented by Prof. Seemin Rubab. She expressed his gratitude to Director NIT Srinagar, Prof. Yogendra, Registrar, Head Physics, resource person, and participants for making the inaugural event a grand success.

The PG students, research cholars, and staff of the department wholeheartedly contributed in organizing this program.

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## NIT Srinagar, Southern Denmark University will collaborate on research, other projects: Prof. Yogendra

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by SO NEWS Desk — May 30, 2022 in Kashmir, Latest

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"I am really happy that Dr. Vijay Kumar is visiting the University of Southern Denmark under SERB SIRE Scheme," Prof. Yogendra said. He said participants of this workshop are the ambassadors and we need to pass the right knowledge to the younger generation so there will be more focus on science and technology

Director NIT, Prof. (Dr.) Rakesh Sehgal said availability and accessibility are very important for overall development. We must be thankful to our policymakers at the central level that imparting this kind of training program to the people who were deprived of such facilities," he said.

"Research and technology are need of the hour. Both NIT Srinagar and University of Southern Denmark will work in joint collaboration of research projects in future," he said.

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NEWS

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It would act as great significance to our R&D programs, he said. "We at NIT Srinagar across all "We at NIT Srinagar across all departments have a growing R&D sector. With the help of such programs, we will be featured among top research institutes in the country," he said. Prof. Bukhari congratulated Dr. Shah HoD Physics and Dr. Vijay Kumar

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In his key speech, Prof. Yogendra said this program is unique and it enables the researchers and students to acquire knowledge about various state-of-the-art equipment and learn about their usage.



"I will be very happy to host students and researchers of NIT Srinagar as visiting students to our laboratories at Southern Denmark University. We are ready to collaborate with NIT Srinagar on different aspects of material development. Our university will act as vibrant platform for

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Weeklong training Prog on R&D equipment begins at NIT Srinagar

#### K H News Service

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Director NIT, Prof. (Dr.) Rakesh Sehgal said availability and accessibility are very important for overall development. We must be thankful to our policymakers at the central level that imparting this kind of training program to the people who were deprived of such facilities," he said.

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"We at NIT Srinagar across all departments have a growing R&D sector. With the help of such programs, we will be featured among top research institutes in the country," he said. Prof.Bukhari congratulated Dr.

Shah HoD Physics and Dr. Vijay Kumar for initiating such programs in the department. The role of Science and Technology is pivotal for the evolution of mankind, he said.On the occasion, Guest of Honor, Dean Research and Consultancy, Prof. MF Wani said NIT Srinagar has developed state of the art for facilities for the research facilities and will continue to expand its activities. The essence of this program is to improve the teaching ability of the participants and enable learners to learn, he said.STUTI Coordinator PMU and Director, SAIF/CIL, Panjab University Prof. G.R. Chaudhary said this program is designed for the participants of various institutes across the country. They will be given hands-on training on highend sophisticated, analytical instrumentation in addition to expert lectures from the eminent scientists, he said."The idea of STUTI is to impart hands-on training and access to science and technology infrastructure present with DST supported institutes. The researchers who are deprived of such facilities will get a deeper insight of principle, working, analysis and interpretation of results of processed materials by analytical tools or faculties," he said.Dr. Sandeep- GJU-SNT (Hisar) and Dr. Rajeev Kumar from Panjab University share that the participants will not get only exposure to high-end techniques but will also know the capabilities of different tools that they can use in their research activities.

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More than 150 participants had registered for the program and only 35 were selected from 15 institutes across the country. Research persons from top institutions will deliver their lectures during the workshop," Dr. Kumar said.

A formal vote of thanks was presented by Prof.SeeminRubab. She expressed his gratitude to Director NIT Srinagar, Prof. Yogendra, Registrar, Head Physics, resource person, and participants for making the inaugural event a grand success.

The PG students, research scholars, and staff of the department whole heartedly contributed in organizing this program.



## NIT Sgr, Southern Denmark University will collaborate on research, other projects: Prof. Yogendra

#### TNN BUREAU

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## Weeklong STUTI training workshop on R&D equipment concludes at NIT Srinagar

### Students should take benefit of such training programs: Director

Srinagar, June 05: The weeklong training program on R&D equipment, Material Processing and advanced functional material characterization techniques under STUTI concluded Sunday at National Institute of Technology (NIT) Srinagar.

The workshop is being organized by the Department of Physics and Central Research Facility Centre, NIT Srinagar in association with Sophisticated Analytical Instrumentation Facility Panjab University, Chandigarh. Dr. Vijay Kumar was the convener of the workshop.

The valedictory session of the workshop was presided over by the Director NIT Srinagar, Prof. (Dr.) Rakesh Sehgal and was the chief guest on the occasion.

On the occasion, he said conducting workshops on relevant themes is the need of the hour. NIT Srinagar will act as a platform for providing relevant knowledge to people who are involved in research activities.

He also expressed his gratitude to HOD Physics Dr. MA Shah and Dr. Vijay Kumar and the entire team of the department



for organizing a success ful workshop.

Institute's Registrar, Prof. Syed Kaiser Bukhari said all sessions of the workshop were an eye-opener for all participants and NIT Srinagar will be organizing such workshops in the future also so that students can get benefited from these initiatives. The 7th-day session be-

gan with the lecture of Prof. Pawan Kumar Kulriya, School of Physical Sciences, Jawaharlal Nehru University, New Delhi delivered his lecture on What can we learn from X-ray diffraction? Dr. Kulriya provided detailed insight about the XRD sample preparation, data analysis, and refinement. It was followed by another lecture by Dr. Saifullah Lone Ramanujan Fellow, Department of Chemistry; NIT Srinagar delivered a lecture on "Bioinspired nano/ water interface". While Dr. Jigneshkumar V. Rohit delivered a lecture on "Use of nano-materials in spectroscopic analysis.

STUTI Coordinator – PMU and Director, SAIF/ CIL, Panjab University Prof. G.R. Chaudhary said the workshop was designed for the participants of various institutes across the country.

"Participants were given hands-on training on

high-end sophisticated, analytical instrumentation, and expert from various fields delivered their lectures," he said.

Prof. Chaudhary said the idea of STUTI is to impart hands-on training and access to the science and technology infrastructure present in DST-supported institutes.

In his message, Dr. Sandeep- GJU-SNT (Hisar) and Dr. Rajeev Kumar from Panjab University said such workshops will continue to be organized in upcoming years also.

"In future NIT Srinagar can collaborate with other institutions so that we can gain from each other's experience. We can have a mutual understanding of learning on different technical aspects," they said.

HOD Physics Dr. MA Shah said Department is taking a lead role in organizing scientific summits under the leadership of Prof. Sehgal and his team. We promise to continue it for the benefit of students and young faculty, he said.

Dr. Vijay Kumar presented a detailed report of the 7-day STUTI training program. He mentioned that total of 30 participants from 11 different institutes, and universities participated in the training program representing 8 States/UTs.

"13 eminent speakers delivered the lectures during the 7-day training program to impart participants with the basic knowledge and skills regarding latest research processes and techniques," he said.

Kumar said the participants were provided hands-on training on sophisticated instruments present in the CRFC (XRD, FE-SEM, Nano Mechanical system, Multi-target sputtering system, WDX-RF, Rheometer, Partice size analyzer, and Axis laser Texturing).

He thanked all the resource persons for accepting to share their experiences with the participants. Dr. Kumar appreciated the contribution of Prof. Yogendra Kr. Mishra, the University of Southern Denmark for taking an initiative for conducting a week-long course on such an important and relevant topic.

He also expressed his gratitude to Irfan Ayoub, Nisar, Umer, Aparna Kashyap, Samiksha Gautam, Shabnam, and Kibri-

## Weeklong STUTI training workshop on R&D equipment concludes at NIT Srinagar

#### BK NEWS SERVICE

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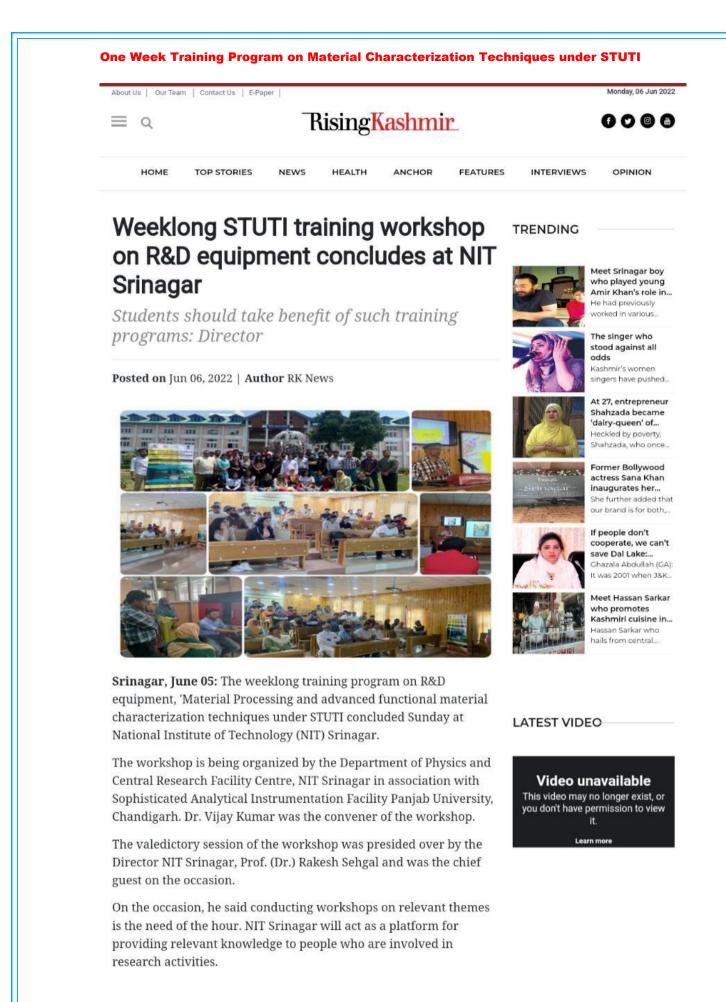
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### With regards

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