

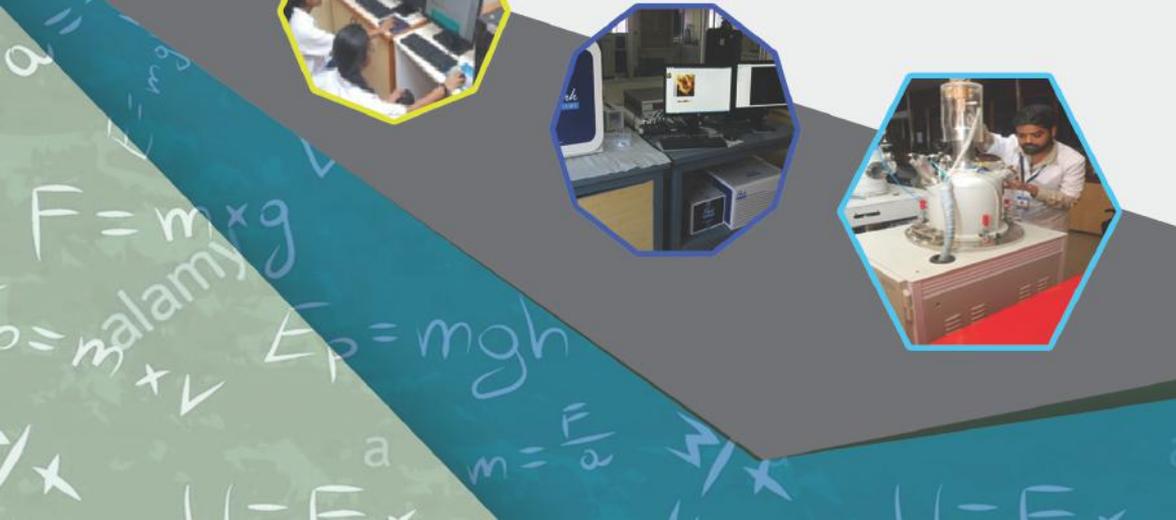


SRM

INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

DEPARTMENT OF PHYSICS & NANOTECHNOLOGY

Supported by DST-FIST (Govt. of India)



Physics is hopefully simple, Physicists are not

Edward Teller

VISION

To emerge as a hub of world-class research that creates and disseminates knowledge with the highest standards for instruction in Science, Engineering and Technology

MISSION

To provide world-class teaching and state-of-the-art research environment to highly talented young minds to pursue a career in advanced areas of Science and Technology that leads to the development of innovative products for societal benefits

OVERVIEW OF THE DEPARTMENT

Physics and Nanotechnology at SRMIST is an integrated department comprises the committed staff, students, faculty coupled with the revisited academics. Firstly, the department started at the functioning in 1985 with a batch of few students and two or more technical staffs. This was done JUST-IN-TIME for it to be part of the pioneering revolution that was about to start in the field of physics and has a long tradition at this University. The department empowers the faculty to perform at their best, engage with their practical solutions and make the commonest difference amongst others. Moreover the department strives the young minds to tackle the challenges facing society, but this structural advantage has been tempered by the contemporary strength of earlier building resources. With the commitment of faculty' right support, it expects to unlock their full potential towards the next-step.

THE DEPARTMENT'S HISTORY

The origin goes back to 1985 and it had been functioning with a batch of few students and two or more technical staff. Over the years, the office remained relatively small, and was operating under minor pilot projects. The successful launch of Nanotechnology in 2009 has spurred national/international visibilities concern that led to enhanced aid for science education and outreach programs. Currently the department holds the promising future of budget 19.8 Crores INR and has employees more than 65 as faculty strength and 20 as non-teaching staff. Furthermore, the department has its prides on holding the awardees of 39 doctorates along with good practices on reflective partitioning. Nowadays, the department has a synergetic program in both educational and research endeavors.

ACADEMIC ENVIRONMENT

Physics in any form could provide a platform to the students/learners with the following self-analytical thoughts

- *To explore basic underlying laws and to relate with contemporary ideas*
- *To assess the true nature of things; how and why works*
- *To correlate the fundamental laws of physics with the nature*

Flexible and dynamic curriculum, exciting research, global connections are the key features that set the department to higher standards. Physics in SRMIST covers theoretical and experimental studies of various PHYSICAL principles underlying the fascinating topics such as properties of matter/sound, electromagnetism and microwaves, optics, crystal physics, cryogenics, semiconductor physics, biophysics, broad concepts of relevance of NANO SCIENCE and the list goes on and on. This learning center thwarts the students/researchers/faculty to face the CRITICAL challenges of ever-changing technology by imparting the effective training/modern aids.

PROGRAMMES OFFERED

Brief knowledge of Mathematical/Numerical Methods of Physics, Classical Mechanics, Modern Physics, and fundamentals of science are the pre-requisites. The fullest details of both the undergraduate and graduate degree programs may be found elsewhere on our website under the appropriate links.

The curriculum has been designed into several segments and the selective details are as follows;

Undergraduate: -

A. B.Sc. Physics

This undergraduate program helps the students to know the fundamentals of matter, and its motion through space/time along with its relevant concepts of such study. The department encourages the students to undergo mini-projects on their choice of selectivity.

B. B.Tech. (Nanotechnology)

This is truly a Bottom-Up science-based nanoscale engineering program, with unique advantages that allow the students to have deeper insights in the field of NanoEngineering, whilst encompassing them to adopt a more than conventional engineering discipline as their choice of selectivity. The four year programme is designed to help prepare students from a broad range of disciplines for careers or graduate study in fields involving nanotechnology. The nascent fields cover a wide range of medicine (drug delivery) and catalysis to surface/bulk chemistry, and controlling even at the atomic/molecular scale to quantum computing. The students have been consistently encouraged to develop this interdisciplinary approach to science and engineering disciplines.

C. B.Tech (Courses offered for other programs)

With the adoption of flexible curriculum, the department offers several courses to the engineering and science students from other departments of SRMIST. Those are as follows;

- 18PYB 101J-Physics: Electromagnetic Theory, Quantum Mechanics, Waves & Optics
- 18PYB 102J-Physics: Mechanics & Mechanics of Solids
- 18PYB 103J-Physics: Semiconductor Physics
- 18CHS202T- Materials Science
- BASLP (Bachelors in Audiology & Speech Language Pathology)
- BAS17105 -Electronics and Acoustics
- BAS15206 - Technology & Amplification Devices for Person With Hearing Impairment
- BPT (Bachelors of Physiotherapy) BPT301 –Electrophysics
- B.Optom– OPT1325 - Physical Optics

Postgraduate: -

D. M.Sc. Physics: The two year program is to build an aspirational destination for students and faculty, to push the design and nature of studies, especially the nature learning program that are more focused on scientific and mathematical subjects. As per UGC Regulation 2016 (Credit Framework for Online Learning Courses through SWAYAM), SRMIST strongly encourages the use of SWAYAM (Study Web of Active Learning by Young and Aspiring Minds) platform. Since the graduate program is research oriented, the department encourages the students to pursue higher studies or research oriented jobs.

E. M.Tech. (Nanotechnology):

The program imparts several courses in Material Science, Thermodynamics, Mathematical physics, Quantum Physics, Nanochemistry initially. Later on, it provides the basic aspects of Instrumentation techniques and the advanced courses such as Thin Film Technology and Nanophotonics. The curriculum is designed to provide rigorous training to students at various advanced in-house laboratories (such as, Micro/nano Fabrication, Nanoscale imaging and analysis, workshop practice, Electronics and Instrumentation, nanoscale chemistry, Polymer and Nanocomposite manufacturing, Nanoelectronics Simulations, NanoBiotechnology, etc.) internships and industrial visits.

The students are expected to do a well-qualified project before they complete their graduation. This program is intended to enable the students' interests and to provide the novelties in both theoretical and experimental aspects.

Doctoral

The students who adopted into for achieving doctorate programs are given sufficient financial support during the tenure of three years. The support is in the form of teaching assistants (TA), which include the assisting the undergraduates in the laboratories, and other supporting works. The average time duration to complete Ph.D will be 3 years.

F. PhD (Part time/Full time):

The department offers both part time and full time PhD programs and provides training and research opportunities for University graduates. This programme enables the graduates to deepen their knowledge of their chosen area of specialization. It offers a wide range of experimental and theoretical topics. The experimental laboratory work forms the main basis of the PhD course. As a complement to the laboratory work, many scientific activities have to be organized regularly within the framework of the PhD program, in particular seminars, short-term training courses and organizing conferences either locally or globally. The ample goal of the department is to train the students to face the challenges of ever-changing technology and to equip the faculty him/herself. The faculty members therefore make use of modern teaching aids to impart effective training to students.

G. Ph.D Dual Degree Program

Yesteryear, the Joint-PhD program was implemented with the collaboration of Shizouka University, Japan. Starting with the simplest, the pre-defined project that is supposed to be mutually agreed at two distinct institutions, along with the formal agreement will be proffered.

HUMAN RESOURCES

By appointing young and internationally respected researchers, distinct research areas of physics complement the well-established fields. Nearly 85 % of the department profile has Ph.D holders in different aspects of Science and remaining 15 % of the faculty are pursuing. Alumni of faculty and other staffs play a considerable role in the department activities.

Itemize	No	Total
Faculty with Ph.D	56	67
Faculty pursuing Ph.D	11	67
No. of Non-Teaching staff	16	16

INFRASTRUCTURE

Over the past two decades, the department has been striving to maintain a high standard of teaching/research excellence. Well equipped laboratories to the UG/PG candidates and modernized facilities (Wi-Fi, good networking facilities, and others) highlight the department activities. The students based equipments such as Atomic force microscopy (AFM), Scanning Electron Microscopy (SEM), X-ray Diffraction measurement unit, Four Probe set up, Hall Effect measurement, Electrochemical Work Station, Fourier Transform Infrared Absorption Spectroscopy (FTIR), Atomic Absorption Spectroscopy (AAS), Ultraviolet Visible Spectrometer (UV-Vis), Electron Beam Physical Vapor deposition (E-beam PVD) technique, Integrated Glove box set up, FTIR Spectrophotometer, Nanoelectronics computational Engine, Handheld Sunphotometer, Aethalometer and Net Radiometer, Multiwavelength Radiometer, ERDAS Imagine, LIDAR and so on play vital roles in the department activities. Irrespective of the above, the department has a close link with Nanotechnology Research Center (NRC) & Research Institute located

adjacent to the physics learning center and able to access the high resolution sophisticated techniques.

The selective features of the available equipments have been tabulated;

Name of the Equipment and Make	Details/Specifications	Equipment
<p>High vacuum PVD & Glove box work station DST-FIST (Govt.of India)</p> <p>(Vacuum Technologies Pvt Ltd)</p>	<p>High vacuum PVD Rotary Pump: Make: Vacuum Techniques. Ultimate vacuum: 1x10⁻³mbar. Turbo Pump with Controller: Make: Varian, Ultimate vacuum: 5 x 10⁻¹⁰ mbar. Substrate heater upto 400 degree C with PID.</p> <p>Glove Box Chamber Size: 1000x800x7000 mm, Ante-Chamber: 360x600mm. Pressure range: 10⁻² m. bar range. Trace oxygen analyzer and controller: in ppm level</p>	
<p>DESKTOP Mini-SEM with EDS (SNE- 3200M, SEC)</p>	<p>Max. 30,000x Magnification BSE Detector (Solid State Type – 4 Channel), Resolution (SE): ~ 15.0nm@30kV, Resolution (BSE): ~ 20.0nm @30Kv, 5kV to 30kV Variable Accelerating Voltage, Multi-Vacuum Mode – Standard / Charge Up Reduction, Image Observation Ready within 3 min., 3-axis Strokes – X, Y, R (Option - X, Y, T), Options – EDX System, Cooling Stage</p>	
<p>Spray Pyrolysis Technique (Custom Made)</p>	<p>Spray Pyrolysis Unit For Preparation Nanostructured Materials Temperature (100- 600 oC) Spray nozzle to substrate distance 40 degree angle (30 cm), spray nozzle diameter = 0.5mm</p>	 <p>Spray Pyrolysis technique (SPT)</p> <ul style="list-style-type: none"> ➤ Spray gun ➤ Substrate ➤ Heating stage ➤ Spraying solution ➤ Nitrogen flow controller ➤ Thermocouple ➤ Air compressor ➤ Mechanical assembly for spray nozzle

**Classic linepulverisette 5
(Fritsch)**

Planetary Mill classic line PULVERISETTE 5 instrument without grinding bowls and balls, incl. Safe-Lock clamping system with 2 grinding bowl fasteners for 100-120/200-240 V/1~, 50-60 Hz, 250Watt Voltage, indicated by customer is set Hard metal tungsten carbide, with steel casing. Grinding bowls 80 ml volume. Adapter for grinding bowl of 80 ml volume. Hard metal tungsten carbide 10 mm balls. Replacement seal ring PTFE 90/75 mm dia. for all other bowls of 80 ml volume (spare)



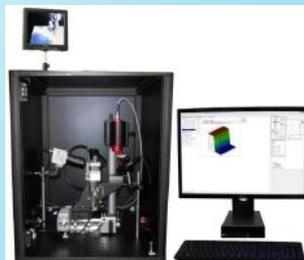
**KEITHLEY System Source
meter –
Dual Channel**

200V: LOW CURRENT Dual Channel, 6-1/2 digits display, 60 Watts, Current Max / Min: 10A pulse / 0.1fA, Voltage Max / Min: 200V / 100nV, GPIB, LAN (LXI), RS-232, USB, Digital I/O



**Scanning Kelvin Probe
System**

Manufacturer: KP Technology, Model No.: SKP 5050, Tip diameter: 50 μm, Work function resolution: 1 mV, Surface photovoltage Add on: Yes, Optical system: Color camera with zoom lens and TFT display, Digital TFT Oscilloscope



**Data Acquisition unit
34972A - LXI Compliant Data
Acquisition unit**

Digits of resolution: digits (22 bits), Measurements include: DC Volts, AC Volts, Thermocouple, Thermistor, RTD Temperature, measurements, 2- and 4-wire resistance, AC Current, DC Current, Frequency Channels: 20 IO interface (USB, LAN, GPIB): Yes



<p>anning Probe Microscope (Park Systems)</p>	<p>XY Scanner-Scan range: 50 m x 50 m; 10 m x 10 m, Motorized Z Stage, Direct On-Axis Optical Microscope, High Resolution Digital CCD Camera with Digital Zoom, Manual Focus Stage for On-Axis Optics, Motorized Z Stage, Software-XEP for data acquisition and optical view, XEI for image processing, analysis, and presentation. Standard Imaging (AFM Modes): True Non-Contact AFM, Basic Contact AFM, Lateral Force Microscopy (LFM), Phase Imaging. Intermittent (tapping) AFM-Scanning Tunneling Microscopy, Conductive AFM, Nanolithography, Magnetic Force Microscopy, Nano indentation</p>	
<p>X' pert powder XRD system (Panalytical)</p>	<p>Radiation-Co K ,Goniometer Type: Vertical, Range of 2 : 0-150°.Detector Type: High speed solid-state X'Celerator ; Optics: Divergence and antiscattering slits. Sample holders:Flat Silicon ZBH Cut parallel to Si (510), Back-fill holder</p>	
<p>UV-Visible Spectroscopy UV 3000+ (LABINDIA)</p>	<p>Double beam optics (Czerny-Turner mounting), Wavelength range: 190 to 1100nm.Spectral bandwidth: variable 0.5,1,2,5 nm. Wavelength accuracy: ±0.3nm.Photometric accuracy: ±0.002 Abs at 0.5 Abs. Photometric repeatability: ±0.001 Automatic 8 cell changer. Tungsten and deuterium lamp. Microprocessor based UV-VIS Spectrophotometer with high resolution. LCD display and soft keypad for operation on 220V/50Hz</p>	

<p>Photocatalytic Reactor (Custom Made)</p>	<p>Wooden Chamber dimension: Length - 60 cm, Breadth - 30 cm, Height - 60 cm Reactor core: Double layer quartz tube container Height - 32 cm, Inner dia -3.5 cm, Outer dia - 5 cm Lamp: UV 8 W (362 nm) Visible 150 W (more than 400 nm)</p>	
<p>Hot Air Oven- I Indfurr Superheat Furnace</p>	<p>Maximum temperature - 250°C Inner chamber dimension: Length - 50 cm, Breadth - 50 cm, Height - 50 cm</p>	
<p>ElectroSpinning Unit (Physics Equipments)</p>	<p>Syringe Dispenser with Plate & Drum ,Collector PC control Only – PC to be provided by you. Only infusion, Can dispense from 1 no. of standard 2, 5, or 10ml syringe, Programmable Volume Control, Will stop when syringe reached end, Manufactured using insulated material</p>	
<p>Virtual Nanolab with Quantumwise Toolkit for Nanotechnology Simulation (24X7) DST-FIST (Govt.of India) (Integrated Microsystems)</p>	<p>Software for simulation and analysis of atomic scale properties of nanoscale devices. MASTER AND MASTER 1 SERVER SYSTEMS WITH NODES (Parallel Computing up to three nodes) LICENSE CONFIGURATION INSTALLED VNL- Quantumwise 12.8.2-2 Licenses Electronics structure and electron transport. Calculations on molecules, periodic systems and two probe systems. Ab initio DFT methods. Quantumwise toolkit capable of modeling electrical properties of nanostructured systems coupled to semi-infinite electrodes. Calculate transmission spectrum and current-voltage characteristics. Visualize atomic geometries and calculate physical quantities in 3D.Mulliken population analysis .Parallelized code (MPICH), specifically optimized for transport calculations (k point sampling on energy integrals plus matrix element evaluation).</p>	<p>Quantum Wise </p>  

<p style="text-align: center;">Gaussian single system (scube scientific software solution)</p>	<p>Simulation tool for molecular structure analysis SOFTWARE INSTALLED Windows 7, Open Babel LICENSE CONFIGURATION INSTALLED Gaussian 03 and Gauss View 03 Gaussian 03 Simulation Tool Competence Starting from the basic laws of quantum mechanics, Gaussian predicts energies, molecular structures and vibrational frequencies of molecular systems along with numerous molecular properties derived from these basic computation types. Gaussian 03 is used by physicists, chemists, chemical engineers, biochemists and others for research. GaussView 03 Simulation Tool Competence GaussView supports all Gaussian 03 features, and it includes graphical facilities for generating keywords and options, molecule specifications and other input sections for even the most advanced calculation types</p>	 
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STUDENTS'/FACULTY KEY ACTIVITIES & ACHIEVEMENTS

a) Noteworthy achievements: -

Almost 100 % of the students have been actively involved in academic activities and other training courses. The department has the consistent record in maintaining ≥ 90 pass % and looking for the way to the further enhancement in terms of forecasting.

b) Placement highlights: -

The graduation rate has been INCREASING rapidly since 2005. Many of the reputed faculty have been playing a major role in training the effective education and impart the placement globally too.

c) Student seminars:-

The center provides the weekly scheduled opportunity to present their views along with the brief discussion. Fullest appreciations paid to their motivations too.

d) Industrial Visits/Training programs: -

B.Tech and MS Students have been recently activated through various short-term industrial visits since 2008

e) Illustrious alumni:-

More than 55% of programs (B.Tech./M.Tech./M.Sc.) have been associated for higher studies in various top ranking universities in abroad and India. The department encourages the alumni to pursue higher studies or in decent jobs and allow them gradually emerging as good academicians/industrialists. To represent a few, the students have joined in leading institutes/ universities like Cornell University, USA; Carnegie Mellon University, Pennsylvania, USA; Arizona State University, USA; Rice University, Texas, USA; John Hopking University, USA; North Carolina State University, USA; National University of Singapore, Singapore; Nanyang Technological University, Singapore; University of California, Irvine, USA; Leeds University, UK; Karlsruhe Institute of Technology, Germany. Furthermore, faculty and staff have ever been the presence in the institute to facilitate their orientation programmes, seminars, conferences, placements and have contributed even as mentors/teachers.

Name of the Alumni	Company/Institution	Position
Dr. Devesh Dadhich Shreeram	Micron Technology, Inc., Idaho, United States	R&D Process development Engineer
Dr Prasanth Gupta	GNS Science, New Zealand	Research Scientist
Dr. R. Vinoth	King Abdullah University of Science and Technology, Saudi Arabia	Research Scientist
Mr. Jamal Jeelani	Speed Box	Manager, Business Development
Dr. Naresh Chandrasekaran	Monash university, Australia/IIT Bombay	Research Scientist
Dr. Md Azimul Haque	King Abdullah University of Science and Technology, Saudi Arabia	Research Scientist
Ms. Aditi Chaturvedi	Indian Police services (IPS)	Superintendent of Police (SP)

f) Awards/Fellowships

Following is a partial list of honours' recently received by students and Sciences faculty members of the department. It continues to receive national and international recognitions. Here's a quick look at some of our most recent and notable accomplishments.

- Associate of Indian Academy of Sciences
- Associate Fellow of Andhra Pradesh Academia of Sciences
- Ramanujam Fellowship
- JSPS Fellowship, Japan

- UTSIP-2017 , University of Tokyo
- KGSP fellowship KAIST university, South Korea
- EPSRC Internship Fellow UK

Resources	National	International
Faculty	05	23
Students	14	21

RESEARCH CENTER & RESEARCH LABORATORIES

Academic, discipline-based research is a key to SRMIST's mission. Based on faculty's interests and in response to the requirements of internal funding resources around a particular facility or service for the benefit of the scientific community, a center with the sub-units and the research laboratories were established.

CENTRE FOR MATERIALS SCIENCE AND NANODEVICES

- Functional Materials and Energy Devices Research Laboratory
- Molecular Electronics Simulation Laboratory
- Hydrogen Storage Materials and Nanosensors Laboratory
- Advanced Material Research Laboratory
- 2D Materials Laboratory

RESEARCH LABORATORIES

- Futuristic Materials Research Center for Planetary Exploration Laboratory
- Laboratory for Sensors, Energy and Electronic devices
- Thin films Laboratory
- Nanophotonics laboratory
- Atmospheric Science research Laboratory

RESEARCH COLLABORATIONS

As a pre-requisite, the department encourages the faculty to engage themselves in a productive and well-established formal relationship between individuals or institutions are important in initiating successful research collaboration. As research initiatives, the department has a close link with these kinds of institutions;

- Shizuoka University, Japan
- National Chiao Tung University, Taiwan
- Flinders University, Australia
- Okayama University, Japan
- Illinois Institute of Technology, USA
- The University of Edinburgh, UK



INTERNATIONAL COLLABORATIVE PROGRAMS

- Sakura Exchange program (Japan)
- SSSV program, Shizouka University (Japan)
- Flinders University Exchange Program (Australia)
- Okayama University (Japan)
- TEEP Program, National Chiao Tung University (Taiwan)
- Semester Abroad Program (SAP)



RESEARCH/ACADEMIC PUBLICATIONS

The publications in the department are cumulative in itself and the details are as follows;

• SCOPUS/SCI indexed journal papers -	840
• H-Index	25
• Highest I.F	12.71
• Total Scitation Index	3700
• Conference (Inter/Nat)	462
• Book /Chapter	05
• Patent	05 (filed)

FUNDED PROJECTS

The center has always the aims to get aids from the various agencies and therefore encourages the faculty regularly. Great appreciations to the SRMISTs funded pilot project titled “Computational study of electron transport through single molecule(s)” 2009. As a joint or individual, the funded projects for the entire span of different areas of topics with 32 projects along with the total outlay of 19.8 crores are from;

Agencies: -

- DST- FIST - Department of Science and Technology (DST) - Funded for Improvement of S&T Infrastructure (FIST)
- ISRO- ARFI - Indian Space Research Organization (ISRO) - Acoustic Radiation Force Impulse (ARFI)
- ISRO – RESPOND - Indian Space Research Organization (ISRO) - Sponsored Research (RESPOND)
- DST- Fast Track - Department of Science and Technology (DST)
- MOES - Ministry of Earth Science (MOES)
- DST- SERB - Department of Science and Technology (DST) - Science and Engineering Research Board (SERB)
- MNRE - Ministry of New and Renewable Energy (MNRE)

GOOD PRACTICES

The department organizes (on a regular basis) conferences, workshops and short-term courses for knowledge uplift of staff & students, community activation of socially ignored through cultural practices - in coordination with local organizations (Community Radio FM, ISCA Chennai Chapter). Furthermore, students based activities such as Project Day: Feynman Fusion, TechKnow, SciConnect, DST-INSPIRE programs, & weekly scheduled Research colloquiums have added the features significantly.

DST INSPIRE SCIENCE CAMP



FACULTY DEVELOPMENT PROGRAM



Weekly Research Colloquium



INTERNATIONAL CONFERENCE ON NANOSCIENCE AND NANOTECHNOLOGY





INSTITUTE -INDUSTRY INTERACTION ACTIVITIES

To develop and maintain state-of-the-art quality, the department is constantly creating Government-Academy-Industry collaborations, with other private R&D institutions/organizations. The center has close link with the industry and government agencies such as DST, DRDO, BRNS (DAE), and IGCAR etc. To condition and hone the technical/personal and analytical skills of the faculty, the center encourages the faculty to participate and organize the seminars/workshops/other academic activities via industrial/institute links. Recently, under the scheme of Faculty Industry Immersion Program (areas of optics, photonics and opto-mechatronics including spectroscopy, microscopy), a few faculty have been benefitted



LINES-OF-ACTIONS

A well-balanced mixture between a top-down and bottom-up process will be chosen as short as possible, to sharpen the faculty' profile, accompanied by an internal reorganization and a valid faculty development plan with the resource model based on its redefining/strengthening “Unique Selling Points” (USPs). This ensures the faculty will gain highest International Visibility, and establish a compelling competition amongst the schools/universities by providing an excellent education and guarantee for the alumni to reach the best winning streaks.

Category (Since 2012)	Present Size 2018	Target size 2023 (Expected)
Faculty (Ph.D %)	85	100
Research Grants (in Crores)	19	30
Research Publications	540	1150
Patents	05	15
Extension Activities	03	06

“INFRASTRUCTURE AS A SERVICE”: INVESTMENT PLAN AND STRATEGY

The preamble goal of this plan is to facilitate multilateral initiatives for the betterment and development of infrastructure, at national, regional and global standards. Our strategy supports the following **specific objectives**:

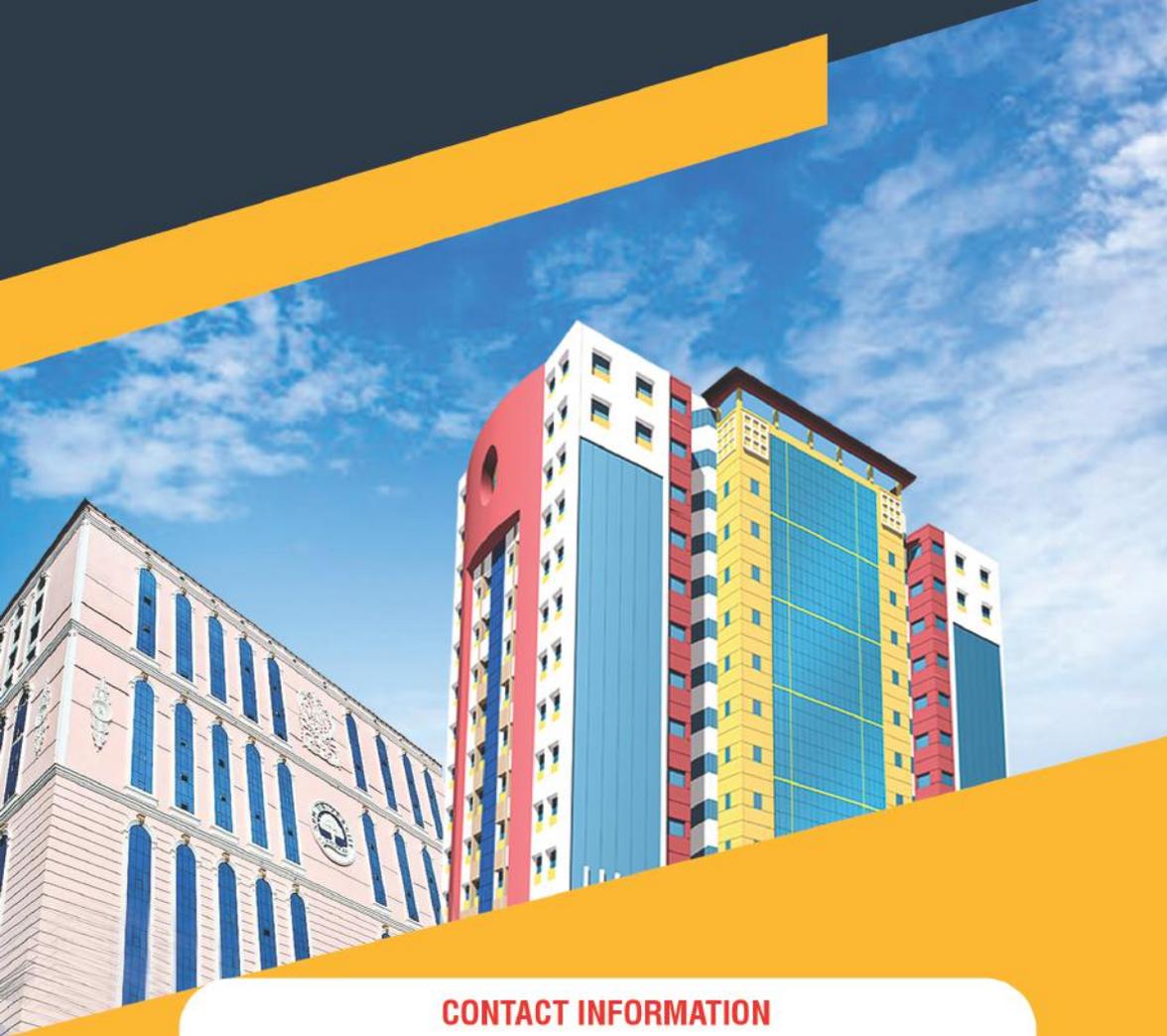
- To meet the substantial requirements of HOST institution
- Support in the growth of institute's FUNCTIONALITY in all endeavors;
- Controlling and monitoring USING “Infrastructure as a Service”
- Effective measures to assess the true nature of overall academic performance and provide

enhanced learning curves to modulate the KEY PERFORMANCE INDICATOR (KPI) of individual faculty, coordinating team, and the society of Faculty of Physics and Nanotechnology (FPN).

RESEARCH ROADMAP

The center is one of the leading academic/research units at SRMIST. To represent a few, and the highlight of near future of the research roadmap's increasing level of material expertise is as follows:

Fields of Interest	Key Studies & Applications	
Experimental Condensed Matter Physics	Correlated quantum materials, Low-temperature physics, Phase transformations, Soft condensed matter physics, Optoelectronics and Photonics	Energy production, storage and transport applications.
	Understanding light-matter interaction and electron transport behavior at nanoscale	
High Energy Physics	Fundamental aspects and phenomenological applications of flavor physics.	New physics beyond the standard Models
	Heavy Hadrons and Neutrino physics	
Functional Nanomaterials	Development of Catalytic Nanostructures for Environmental Remediation Magnetolectric and Multiferroic Materials	Toxicity studies of nanomaterials
Computational Materials Science	Computational Analysis of Nanomaterials for Energy Generation, Storage and Drug Delivery Applications	Modeling and Performance, Analysis of Spintronics and Photonic Nano devices
	Device and Simulation of Novel Molecular Electronic Devices and Semiconducting Nano Electronic Devices	
Atmospheric Science	New particle formationGrowth and wet scavenging processes of atmospheric aerosols	Aerosols modeling for monsoons and air pollution



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department-physics-and-nanotechnology/about-the-department](http://www.srmuniv.ac.in/engineering/school-of-basic-sciences/department-physics-and-nanotechnology/about-the-department)**