

**NPC-2024 PROGRAMME SCHEDULE**  
**FEBRUARY 7-10, 2024, SRM INSTITUTE OF SCIENCE AND TECHNOLOGY (SRM IST), CHENNAI, INDIA**

**07-02-2024 Wednesday** **Venue: Dr. T. P. Ganesan Auditorium – Main Hall**

**09:30 -10:40** INAUGURAL FUNCTION  
**10:40-11:00** COFFEE BREAK AND GROUP PHOTO

**CONCLAVE TALKS [Dr. T. P. Ganesan Auditorium – Main Hall] CHAIR: Prof. G. Baskaran, IMSc, IITM and Perimeter Institute**

**11:00-11:25** **CONCLAVE TALK 1** Particle Physics a Decade After the Higgs Discovery, **'Padma Shri' Prof. Rohini Godbole**, IISc, Bangalore

**11:25-11:50** **CONCLAVE TALK 2** The Allure of Active Matter, **Prof. Sriram Ramaswamy**, IISc, Bangalore

**11:50-12:15** **CONCLAVE TALK 3** Materials for Quantum Technologies, **Prof. Arindam Ghosh**, IISc, Bangalore

**12.15-13.30** **PANEL DISCUSSION Physics and Technology Fusion: Shaping India's Innovation Landscape**  
**Moderator- Mr. Pallava Bagla, Science Journalist**  
**Panelists:**  
 Prof. G. Baskaran, The Institute of Mathematical Sciences, Chennai  
 'Padma Shri' Prof. Rohini Godbole, IISc, Bangalore  
 Prof. Annapurni Subramaniam, Director, Indian Institute of Astrophysics, Bangalore  
 Prof. Arindam Ghosh, IISc, Bangalore  
 Prof. Parameswaran Ajith, International Centre for Theoretical Sciences, Bangalore  
 Prof. Mayank Shrivastava, IISc, Bangalore  
 Dr. Sankalp Singh, Synopses India

**13.30 -14:15** **LUNCH BREAK**

**14:15-14:45** **CONCLAVE TALK 4** Comparing Probability Distributions in Quantum States of Light, **Prof. V. Balakrishnan**, IIT Madras **[CHAIR: Prof. Chandan Dasgupta, ICTS, Bangalore]**

Parallel Sessions	P1- High Energy Physics [RRP Hall]	P2-Nonlinear Dynamics & Systems [Mini Hall 2]	P3-Soft Matter Physics [Mini Hall 1]	P4- Condensed Matter Physics [TPG Main Hall/GNR Hall]
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	Chair Dr. Rohit Dhir, SRM IST Dr. Triparno Bandyopadhyay, SRM IST	Chair Dr. Chandan Kumar Ghosh, Jadavpur University Dr. Debabrata Sarkar, SRM IST	Chair Dr. Sunita Srivastava, IIT Bombay Dr. Bibhu Ranjan Sarangi, IIT Palakkad Dr. Shailendra K Saxena, SRM IST	Chair Dr. Seenipandiyan Ravi, IIT Guwahati Dr. Jaivardhan Sinha, SRM IST
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<b>14:50-15:15</b>	A Brief Ancestral History of the Higgs Boson <b>Prof. Gautam Bhattacharyya, Director, SINP, Kolkata</b>	Harnessing Chaos <b>Prof. Sudeshna Sinha, IISER Mohali, Mohali</b>	Living Active Matter at High Densities <b>Prof. Chandan Dasgupta, ICTS, Bangalore</b>	Quantum Spin Entanglement Near Room Temperature-Its Relevance in the Upcoming Quantum Technology <b>Prof. S. M. Yusuf, BARC, Mumbai</b>
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<b>15:15-15:40</b>	Strong Interaction Physics <b>Prof. V. Ravindran, Director, IMSc, Chennai</b>	Prof. Srikanth Sastry, JNCASR, Bangalore	Prof. Chandrabhas Narayana, Director, Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram	A Cloaked Griffiths phase in a low-dimensional superconductor <b>Prof. Rajesh Narayanan, IIT Madras, Chennai</b>
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<b>15:40-16:05</b>	The Universe Through Quantum Fields and Strings <b>Prof. Aninda Sinha, IISc, Bangalore</b>	Dynamics of a Classical Wave-Particle Entity: Walking Droplet in a Non-Smooth Potential <b>Prof. Soumitro Banerjee, Director, IISER Kolkata, Kolkata</b>	Active Role of Confinement on Quantum Characteristics of Molecular Systems <b>Prof. K. S. Narayan, JNCASR, Bangalore</b>	Quantum Phases of Matter <b>Prof. Subhro Bhattacharjee, ICTS, Bangalore</b>
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<b>16:05-16:30</b>	Neutrinos: The Pathways to explore Physics Beyond the Standard Model <b>Prof. Rukmani Mohanta, University of Hyderabad, Hyderabad</b>	Cooperative Kinetics of Living Liquid Crystals <b>Prof. Sanjay Puri, JNU, New Delhi</b>	The Physics of Cell Shape Variability in Epithelial Monolayers <b>Prof. Saroj Kumar Nandi, TIFR, Hyderabad</b>	Controlling Symmetries in Graphene <b>Prof. Aweek Bid, IISc, Bangalore</b>
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<b>16:30-16:55</b>	Understanding the Cosmic Whispers: The Present and Future of Gravitational Wave Astronomy <b>Prof. K. G. Arun, Chennai Mathematical Institute, Chennai</b>	Data to Dynamics <b>Prof. G. Ambika, IISER Thiruvananthapuram, Thiruvananthapuram</b>	Effect of the presence of pinned particles on the structural parameters of a liquid and correlation between structure and dynamics at the local level <b>Prof. Sarika Maitra Bhattacharyya, CSIR-NCL, Pune</b>	Unlocking the Potential of Plasmonic Hot Electrons: Black NanoGold for Sustainable Energy and Carbon Management <b>Prof. Vivek Polshettiwar, TIFR, Mumbai</b>
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<b>16:55-17:20</b>	Gravitational Lensing of Gravitational Waves: A New Frontier <b>Prof. Parameswaran Ajith, ICTS, Bangalore</b>	Soliton and Chaos in Nonlinear Physics <b>Prof. M. Lakshmanan, Bharathidasan University, Tiruchirappalli</b>	Nanoscale and Microscale Experiments to Probe Structure & Function in Biological Systems <b>Dr. Gautam Vivek Soni, RRI, Bangalore</b>	Nanoscale Hybrid Magnonics <b>Prof. Anjan Barman, SNBNCBS, Kolkata</b>
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**17:20-17:45** **TEA BREAK**

<b>17:45-18:10</b>	Indian Pulsar Timing Array (InPTA): Joining the Global Hunt for NanoHz Gravitational Waves <b>Prof. Shantanu Desai, IIT Hyderabad, Hyderabad</b>	Synchronization on Simplicial complexes <b>Prof. Neelima Gupte, IIT Madras, Chennai</b>	Molecular Building Blocks for Brain-Inspired Computing, <b>Dr. Snigdha Thakur, IISER Bhopal, Bhopal</b>	<b>P5 - Funding Opportunities talks by DST and SERB Scientists</b> Opportunities of International Cooperation for Indian Physicists <b>Dr. Sanjeev K Varshney, Scientist G &amp; Head (International Cooperation), DST, Govt. of India</b>
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<b>18:10-18:35</b>	Recent Advances in Covariant Light-front Approach and its Impact on Weak Decays <b>Dr. Rohit Dhir, SRM IST, Chennai</b>	Entangling Chaos and the Quantum <b>Prof. Arul Lakshminarayan, IIT Madras, Chennai</b>	Beyond Bonds: Exploring Complexity of Hydrogen-Bonded Systems through Voronoi Entropy <b>Prof. V. Madhurima, Central University of Tamil Nadu, Tamil Nadu</b>	Impact Overview: SERB <b>Dr. Nilotpal Ghosh, Scientist F, SERB, Govt. of India</b>
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<b>18:35-19:00</b>	<b>Dr. Seema Sharma, IISER Pune</b>	Global field + Local interactions = Robust patterns in Biology <b>Dr. Sitabhra Sinha, IMSc, Chennai</b>	<b>Dr. Ravi Kumar Pujala, IISER Tirupati, Tirupati</b>	
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<b>19:00-19:25</b>		Dynamic Stability of Complex Networks <b>Dr. Chandrakala Meena, IISER Thiruvananthapuram</b>	Award/Contributory Lectures	
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**19:25-20:00** **Cultural Program by SRM IST Students at Dr. T. P. Ganesan Auditorium - Main Hall**

**20:00-21:00** **DINNER AT CONCLAVE VENUE**

Note: RRP Hall - Sir C. V. Raman Research Park, 9<sup>th</sup> Floor Conference Hall      GNR Hall - G. N. Ramachandran Hall, 6<sup>th</sup> Floor, Bioengineering Block      TPG Main Hall - Dr. T. P. Ganesan Auditorium Main Hall      Mini Hall - Dr. T. P. Ganesan Auditorium Mini Hall

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**FEBRUARY 7-10, 2024, SRM INSTITUTE OF SCIENCE AND TECHNOLOGY (SRM IST), CHENNAI, INDIA**

**08-02-2024 Thursday**

**CONCLAVE TALKS [ Dr. T. P. Ganesan Auditorium – Main Hall] CHAIR: Prof. M. S. Ramachandra Rao, IIT Madras**

09:00-09:25	<b>CONCLAVE TALK 5</b>	Invitation to the Blooming Quantum Garden and a Better Tomorrow, <b>Prof. G. Baskaran, The Institute of Mathematical Sciences, Chennai, IITM and Perimeter Institute</b>
09:25-09:50	<b>CONCLAVE TALK 6</b>	Astronomy from Ground and Space, <b>Prof. Annapurni Subramaniam, Director, Indian Institute of Astrophysics, Bangalore</b>
09:50-10:15	<b>CONCLAVE TALK 7</b>	The Heftiest Things We Know: Munching Black Holes as Beacons Across Our Cosmos, <b>Prof. Prajval Shastri, Raman Research Institute, Bangalore</b>
10:15-10:45	<b>CONCLAVE TALK 8</b>	Photonic Quantum Science and Technologies, <b>Prof. Urbasi Sinha, Raman Research Institute, Bangalore</b>
10:45 -11:15	<b>CONCLAVE TALK 9</b>	The Future of 2D Semiconductors and Challenges Ahead, <b>Dr. Mayank Shrivastava, IISc, Bangalore</b>

11:15-11:45 **COFFEE BREAK**

11:45-13:15	<b>PANEL DISCUSSION</b>	<b>Indian Women in Science: Breaking Barriers</b>  <b>Moderator: Dr. Shubashree Desikan, Associate Editor, IITM SASTRA Magazine</b> <b>Panelists:</b> <b>Prof. Prajval Shastri, Raman Research Institute, Bangalore</b> <b>Prof. Ramakrishna Ramaswamy, IIT Delhi</b> <b>Prof. Urbasi Sinha, Raman Research Institute, Bangalore</b> <b>Prof. Shobhana Narasimhan, JNCASR, Bangalore</b> <b>Prof. Madhurima, Central University of Tamil Nadu, Tamil Nadu</b> <b>Prof. Rukmani Mohanta, University of Hyderabad, Hyderabad</b>
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13:15-14:15 **LUNCH BREAK**

Parallel Sessions	P6- Photonics and Optoelectronics [Mini Hall 2]		P7- Condensed Matter Physics [Mini Hall 1]		P8-Quantum Materials [TPG Main Hall]/GNR Hall]		P9-ML, AI and Computational Physics [RRP Hall]	
	Chair	Dr. Shadak Alee, SRM IST Dr. Junaid M Laskar, SRM IST	Chair	Dr. R. Ramaseshan, IGCAR, Kalpakkam Dr. Rajabhoopathi Mani, SRM IST	Chair	Dr. Chandramohan, SRM IST Dr. Subhojyoti Sinha, SRM IST	Chair	Dr. Madhuparna Karmakar, SRM IST Dr. Subhajit Sarkar, SRM IST
14:15-14:40	The Story of the Super Solid Phase of Matter <b>Prof. Prasanta K. Panigrahi, IISER Kolkata, Kolkata</b>		Exploring Spin Defects in Wide Band Gap Systems for Quantum Technologies <b>Prof. M. S. Ramachandra Rao, IIT Madras</b>		Quantum Technology with 2D Materials <b>Prof. Mandar Deshmukh, TIFR, Mumbai</b>		Can First Principles Calculations Really Replace Experiments? <b>Prof. Shobhana Narasimhan, JNCASR, Bangalore</b>	
14:40-15:05	Converting an EMCCD to A Photon Counter for Quantum Photonic Applications <b>Prof. Sushil Mujumdar, TIFR, Mumbai</b>		Enhanced Atomic Ordering Leads to Ultra-High Thermoelectric Performance <b>Prof. Kanishka Biswas, JNCASR, Bangalore</b>		Magnetic Nanoswimmers <b>Prof. Ambarish Ghosh, IISc, Bangalore</b>		Applied Machine Learning for Science and Engineering <b>Dr. Alankar Alankar, IIT Bombay, Mumbai</b>	
15:05-15:30	Spin-Orbit Photonics: Another Twist in the Tale of Light <b>Prof. Nirmalya Ghosh, IISER Kolkata, Kolkata</b>		Extremely energy-efficient, magnetic field-free, skyrmion-based memristors for neuromorphic computing <b>Prof. P. S. Anil Kumar, IISc, Bangalore</b>		The Challenges and Prospects in Modeling Quantum Materials <b>Prof. Indra Dasgupta, IACS, Kolkata</b>		Dark Matter Searches at LHC <b>Dr. Bhawna Gomber, University of Hyderabad, Hyderabad</b>	
15:30-15:55	Efficient Nanomaterials and Methodologies for Trace Explosives Detection <b>Prof. Soma Venugopal Rao, University of Hyderabad, Hyderabad</b>		Astronomy, Quantum Optics, LIBS, and Combustion: Andor Cameras That Help Researchers Take Their Science to The Next Level <b>Jean-Michel Laurent, Andor Technology</b>		Is the Nature of Superconductivity in Twisted Bilayer Graphene Conventional or Unconventional? <b>Dr. Anindya Das, IISc, Bangalore</b>		Electronic Descriptor Then Predictive Model Using QM/ML Approach Then Experimental Validation <b>Prof. Ranjit Thapa, SRM University AP, Amaravati</b>	
15:55-16:20	Optothermal Tweezers and Spanners: Evolutionary Brownian Colloids <b>Dr. G. V. Pavan Kumar, IISER Pune, Pune</b>		Semiconductor Nanostructured-Based Gas Sensors Towards Healthcare Application <b>Dr. Mrinal Pal, CSIR-CGCRI, Kolkata</b>		High-Precision Experiments on 2D Semiconductors under Large Magnetic Fields using Light <b>Dr. Ashish Arora, IISER Pune, Pune</b>		Design of Multifunctional Dielectric Metasurface Based Devices <b>Dr. Jayasri D, Mahindra University, Hyderabad</b>	
16:20-16:45	Terahertz Sources Based on Optical Down Conversion for Security Applications <b>Dr. Ragam Srinivasa Rao, CSIR-NPL, New Delhi</b>		H-glass Supported Hybrid Gold Nanoislands for Multifunctional Applications <b>Dr. Amarnath R. Allu, CSIR-CGCRI, Kolkata</b>		Molecular Building Blocks for Brain-Inspired Computing <b>Dr. Sreetosh Goswami, IISc, Bangalore</b>		Predicting Scale-Dependent Chromatin Polymer Properties from Systematic Coarse-Training <b>Prof. Ranjith Padinhateeri, IIT Bombay, Mumbai</b>	
16:45-17:15	<b>TEA BREAK</b>							
17:15-17:35	All-optical Modulation and Logic Gate Applications in Novel Organic Materials <b>Dr. Sai Santhosh Kumar Raavi, IIT Hyderabad, Hyderabad</b>		<b>Dr. Surendra Anantharaman, IIT Madras, Chennai</b>		Stacking and Twisting van der Waals Materials <b>Dr. Vidya Kochat, IIT Kharagpur, Kharagpur</b>		Prediction of Efficient Energy Materials using First-Principles based Computational Methodologies <b>Prof. Priya Johari, Shiv Nadar University, Uttar Pradesh</b>	
17:35-18:00	<b>Award/Contributory Lectures [15-20 mins each]</b> Dr. Vandana Sharma, IIT Hyderabad Dr. Anjali Chaudhri, IIT Bhilai		<b>Dr. Vibhor Singh, IISc Bangalore</b>		Formation and Evolution of Perfect One-Dimensional Atomic/Molecular Chain <b>Dr. Atindra Nath Pal, S.N. Bose National Centre for Basic Sciences</b>		Exploring the Thermodynamic Stability and Spin Orbit-Driven Rashba Splitting in Perovskite Oxides <b>Dr. Amrita Bhattacharya, IIT Bombay, Mumbai</b>	
18:00-18:25	Dr. Niladri Modak, IISER Kolkata Dr. Reshma Beeram, University of Hyderabad		<b>Dr. Kasturi Saha, IIT Bombay</b>		Unlocking the Potential: Liquid-Phase Conversion of Graphite to Graphene Nanosheets with Stabilizers <b>Dr. Eswaraiiah Varrla, SRMIST</b>		Contributory Lecture	
18:25-18:40			<b>Dr. U. Chandni, IISc Bangalore</b>		Award/Contributory Lectures			
18:40-20:00	<b>Poster Presentation</b>							
20:00-21:00	<b>DINNER AT CONCLAVE VENUE</b>							

Note: RRP Hall - Sir C. V. Raman Research Park, 9<sup>th</sup> Floor Conference Hall      GNR Hall - G. N. Ramachandran Hall, 6<sup>th</sup> Floor, Bioengineering Block      TPG Main Hall - Dr. T. P. Ganesan Auditorium Main Hall      Mini Hall - Dr. T. P. Ganesan Auditorium Mini Hall

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**09-02-2024 Friday**

**CONCLAVE TALKS [Dr. T. P. Ganesan Auditorium – Main Hall] CHAIR: Prof. Shikha Varma, Institute of Physics, Bhubaneswar**

09:00-09:30	<b>CONCLAVE TALK 10</b> From Lab to Land: Pioneering Inventions via Basic Science and Technology Confluence, <b>Prof. V. Ramgopal Rao, Vice-Chancellor, BITS Group</b>				
09:30-10:00	<b>CONCLAVE TALK 11</b> India's first Solar Space Observatory: Aditya L1, <b>Prof. Dipankar Banerjee, Director, Aryabhata Research Institute of Observational Sciences Nainital</b>				
10:00-10:30	<b>CONCLAVE TALK 12</b> Van der Waals Gap Engineering of Two Dimensional(2D) Materials and its Applications for Energy Storage, <b>Prof. Vijayamohan K Pillai, IISER Tirupati</b>				
10:30-11:00	<b>CONCLAVE TALK 13</b> Materials and Processes in Emerging Energy Technologies, <b>Dr. Tata Narasinga Rao, Director, ARCI, Hyderabad</b>				
11:00 -11:30	<b>COFFEE BREAK</b>				
<b>Parallel Sessions</b>	<b>P10 - Condensed Matter Physics [TPG Main Hall]/GNR Hall]</b>		<b>P11 - Condensed Matter Physics [Mini Hall 2]</b>		<b>P12 - Special Session: Interaction with Bhatnagar Awardee [RRP Hall]</b>
	Chair	Dr. S. Venkata Prasad Bhat, SRM IST Dr. Srijani Mallick, SRM IST	Chair	Dr. K. Kamala Bharathi, SRM IST Dr. Sougata Mallick, SRM IST	Chair Dr. Venkata Ravindra, SRM IST Dr. Payel Bandyopadhyay, SRM IST Dr. Lakshya Daukiya, SRM IST
11:30-11:55	Nanoscale Patterning of surfaces: For Sensors and Bio-applications <b>Prof. Shikha Varma, IOP, Bhubaneswar</b>		Dr. Poornendu Chaturvedi, Scientist F, SSPL, Delhi		<b>Unveiling the Brilliance: A Dialogue with Shanti Swarup Bhatnagar Awardee Prof. Anindya Das, IISc, Bangalore</b>
11:55-12:20	Probing the Interaction of Laser-induced Graphene Surfaces with Electrolytes in Electrochemical Devices <b>Prof. Susanta Sinha Roy, Shiv Nadar University, Delhi NCR</b>		Prof. Abha Misra, IISc, Bangalore		
12:20-12:45	Prof. Sandip Dhara, IGCAR, Kalpakkam		Heusler Alloy Thin Films for Spintronics <b>Prof. S. Srinath, University of Hyderabad, Hyderabad</b>		
12:45-13:10	Prof. S. Balakumar, University of Madras, Chennai		Dr. Gopal Dixit, IIT Bombay, Mumbai		
13:10-13:35	Defect-Engineered 2D Transition Metal Dichalcogenides and Oxide Nanoparticles as Plasmon-Free SERS Substrates for Ultrasensitive Trace Dye Detection <b>Prof. P. K. Giri, IIT Guwahati, Guwahati</b>		Material to Tunable Microwave Devices with Ferroelectric Thin Films <b>Prof. K. C. James Raju, University of Hyderabad, Hyderabad</b>		
13:35-14:20	<b>LUNCH</b>				
14:20-14:45	Electrochromic Materials and Device: Smart Windows and Multifunctional Applications <b>Prof. Rajesh Kumar, IIT Indore, Indore</b>		Prof. Dibakar Roy Chowdhury, Mahindra University, Hyderabad		
14:45-15:10	Brain-Inspired Computing – Nonvolatile Memory Devices <b>Prof. Suryanarayana Jammalamadaka, IIT Hyderabad, Hyderabad</b>		Spin transport across polar-Polyvinylidene fluoride thin films <b>Dr. Gangineni Ramesh Babu, Pondicherry Central University</b>		
15:10-15:35	Engineered-disorder tuned Fermi-Bose cross-over in superconductors <b>Dr. Madhuparna Karmakar, SRM IST, Chennai</b>		Physics of High-Performance Thermoelectric Materials <b>Dr. Suresh Perumal, IIT Hyderabad</b>		
15:35-16:00	Prof. Subhash Thota, IIT Guwahati		Dr. Syed Arshad Hussain, Tripura University, Tripura		
16:00-16:25	Exploring Physics of Nanoscale High-Frequency Electronic Devices - Aiming Beyond 5G Technology <b>Dr. Abhay A Sagade, SRM IST, Chennai</b>		Award/Contributory Lecture: Influence Of Molecular Orientation on The Electronic Transport of a Metal-Molecule-Metal Junction <b>Mr. Biswajit Pabi, S.N. Bose National Centre for Basic Sciences, Kolkata</b>		
16:30-17:30	<b>Valedictory Function and Awards Distribution at Dr. T. P. Ganesan Auditorium - Main Hall</b>				
17:30	<b>HIGH TEA</b>				

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**Saturday 10-02-2024 [Day 4]**

Department of Physics and Nanotechnology research labs visit and Faculty interactions.