

68th DAE SOLID STATE PHYSICS SYMPOSIUM

December 18-22, 2024

DAE Convention Centre, Anushaktinagar, Bhabha Atomic Research
Centre, Mumbai

Program Overview

Day 1: Wednesday, December 18, 2024

08:30-09:30	Registration	
09:30-10:30	Inaugural Function <i>(Venue: Auditorium 1)</i>	
10:30-11:10	PL-1: Satischandra B. Ogale, TCG CREST, Kolkata <i>Designing New Materials for the evolving energy landscape and sustainable development</i> Session Chair: Gianluca Ciatto, Soleil Synchrotron, France <i>(Venue: Auditorium 1)</i>	
11:10-12:00	Group Photo and High Tea	
12:00-12:40	PL-2: Tanusri Saha-Dasgupta, SNBNCBS, Kolkata	
12:40-13:20	<i>Quantum Materials by Computation: Challenges & Opportunities</i> PL-3: Sanat K Kumar, Columbia University, USA <i>Fragmentation Concepts explain Nanoplastic Formation and Temporal Persistence</i> Session Chair: S. M. Yusuf, BARC, Mumbai <i>(Venue: Auditorium 1)</i>	
13:20-14:30	Lunch	
14:30-16:30	Session 1: Emerging Magnetic Materials Session Chair: Narayani Choudhury, Lake Washington Institute of Technology, USA	Session 2: Soft matter and Biophysics Session Chair: Sanat K Kumar, Columbia University, USA <i>(Venue: Auditorium 2)</i>

	(Venue: Auditorium 1)	
	<p>IT-1: Pinaki Sengupta, NTU, Singapore</p> <p><i>Spin-1/2 kagome Heisenberg antiferromagnet: New insights from Machine Learning approaches</i></p> <p>IT-2: P. S. Anil Kumar, IISC, Bengaluru</p> <p><i>Magnetic-field free switching of ferromagnetic layers through Interfacial engineering</i></p> <p>IT-3: Indranil Das, SINP, Kolkata</p> <p><i>Novel Magnetic & Electrical Transport in Non-coplanar Magnetic Textures</i></p> <p>Contributory presentations: a0030, k0042</p>	<p>IT-4: Sarika Bhattacharyya, NCL, Pune</p> <p><i>Exploring the structural contribution to dynamics in supercooled Liquids</i></p> <p>IT-5: Shankar Ghosh, TIFR, Mumbai</p> <p><i>Crafting Perfection: Annealing a Granular Polycrystal</i></p> <p>IT-6: S. Mitra, BARC, Mumbai</p> <p><i>Beyond Brownian Motion: Non-Markovian and Non-Gaussian Mechanisms of Molecular Diffusion in Complex Fluids</i></p> <p>Contributory presentations: b0027, b0036</p>
16:30-18:30	Tea and Poster Presentation	
	a0001 to a0006, b0001 to b010, c0001 to c0012, d0001 to d0007, e0001 to e0004, f0001 to f0006, g0001 to g0006, h0001 to h0009, i0001 to i0011, j0001 to j0015, k0001 to k0013, l0001 to l0008, t0001 to t0033, y0001 to y0025	
18:30-19:30	<p>Evening Talk: Santanu Chaudhury, IITD, New Delhi</p> <p><i>Intersection – Physics & AI</i></p> <p>Session chair: U D Malshe, BARC/RRCAT, Mumbai</p>	
19:30	Banquet Dinner	

Day 2: Thursday, December 19, 2024

09:30-10:10	<p>PL 4: Rajeev Ahuja, IIT Ropar</p> <p><i>Computational materials science and its applications in the area of materials for energy</i></p> <p>Session chair: K. Maiti, TIFR, Mumbai</p> <p><i>(Venue: Auditorium 1)</i></p>	
10:15-11:15	<p>Session 3: 60 Years of DFT</p> <p>Session Chair: Rajeev Ahuja, IIT Ropar</p> <p><i>(Venue: Auditorium 1)</i></p>	<p>Session 4: Novel Physical Phenomena at Nanoscale</p> <p>Session Chair: V. K. Aswal, BARC, Mumbai</p> <p><i>(Venue: Auditorium 2)</i></p>
	<p>IT-7: Kapildeb Dolui, Cambridge University, UK</p> <p><i>Accelerating the Discovery of Ambient-Pressure High-Temperature Superconductors through Ab-initio Structure Search and Machine Learning</i></p> <p>IT-8: G. S. Vaitheeswaran, University of Hyderabad</p> <p><i>Uncovering Multifold Phonon Degeneracies in Cubic Nb₃Bi</i></p>	<p>IT-11: S. Dhara, IGCAR, Kalpakkam</p> <p><i>Phonons at nanoscale</i></p> <p>IT-12: Summet Walia, RMIT University Australia</p> <p><i>Two-dimensional materials for next-generation electronics and optoelectronics technologies</i></p>
11:15-11:45	Tea Break	
11:45-13:00	<p>Session Chair: Nandini Garg, BARC, Mumbai</p> <p>IT-9: Saurabh Ghosh, SRM Chennai</p> <p><i>Polarization Coupled Magnetization Switching in ABO₃ Oxides</i></p> <p>IT-10: Kartick Tarafder, NIT Surathkal</p>	<p>Session Chair: Prof. V. A. Bambole, Mumbai University</p> <p>IT-13: R. S. Ningthoujam, BARC, Mumbai</p> <p><i>The Nobel Prize in Chemistry 2023: Discovery and Synthesis of Quantum Dots</i></p> <p>IT-14: Santosh Gupta, BARC, Mumbai</p> <p>TBA</p>

	<i>The Non-Trivial Topological Landscape of 4D Transition Metal Systems</i>	
	Contributory presentation: g0002	Contributory presentation: d0018
13:00-14:00	Lunch Break	
14:00-16:00	Session 5: Contributory oral presentation Session chair: Debasis Sen, BARC, Mumbai <i>(Venue: Auditorium 1)</i>	Session 6: Novel Magnetic Phenomena Session Chair: Aftab Alam, IITB, Mumbai <i>(Venue: Auditorium 2)</i>
	Contributory presentations: c0023, c0063, c0102, d0027, e0012, f0022, f0030, 10006	IT-15: Chandan Mazumdar, SINP, Kolkata <i>Novel Magnetic Phenomena in Quaternary Heusler Alloys</i> IT-16: Ashis Bhattacharjee, Visva-Bharati University, Santiniketan <i>High Spin \rightleftharpoons Low Spin Transition in Iron(II) Complexes: Effect of External Stimuli</i> IT-17: Ram J. Choudhary, UGC-DAE CSR, Indore <i>Electronic Structure Aspects of Tunable Ferromagnetic and Antiferromagnetic States in the Charge Transfer materials: A Case Study of SrCoO_x Thin Films</i> IT-18: Anil Jain, BARC, Mumbai <i>Exotic Ground States and Spin Dynamics in One-Dimensional and Two-Dimensional Quantum Magnets</i>
16:00-18:00	Tea and Poster Presentation	

	a0007 to a0017, b0011 to b0018, c0013 to c0035, d0008 to d0015, e0005 to e0008, f0007 to f0016, g0007 to g0022, h0010 to h0017, i0012 to i0017, j0016to j0028, k0014 to k0031, l0009 to l0015
18:00-19:30	Cultural Programs
19:30	Dinner

Day 3: Friday, December 20, 2024

9:30-10:10	<p>PI 5: Sean Langridge, ISIS, RAL UK</p> <p><i>Applying polarised neutron techniques to the study of topologically nontrivial materials</i></p> <p>Session Chair: A. Sundaresan, JNCASR Bengaluru (A1)</p>	
10:15-11:15	<p>Session 7: Quantum materials</p> <p>Session Chair: Sean Langridge, ISIS, RAL UK</p> <p><i>(Venue: Auditorium 1)</i></p>	<p>Session 8: Surface and Interface Physics</p> <p>Session Chair: R. Mittal, BARC, Mumbai</p> <p><i>(Venue: Auditorium 2)</i></p>
	<p>IT-19: Bhavtosh Bansal, IISER Kolkata</p> <p><i>Solid state phase transitions with hysteresis: Mean field universality and beyond</i></p> <p>IT-20: Arnab Banerjee, Purdue University, USA</p> <p><i>Quantum Coarsening Dynamics in Frustrated Magnetic Hamiltonians using Quantum Simulators</i></p>	<p>IT-23: Gianluca Ciatto, Soleil Synchrotron, France</p> <p><i>In situ synchrotron radiation characterisation of the incipient growth of functional materials via atomic/molecular layer deposition</i></p> <p>IT-24: Karthik V Raman, TIFR(H), Hyderabad</p> <p><i>In-Plane Anisotropy of Magnetic Textures Revealed by Planar Hall Effect</i></p>
11:15-11:45	Tea Break	

<p>11:45-13:00</p>	<p>Session Chair: Thamizhavel Arumugam, TIFR, Mumbai</p> <p>IT-21: Srimanta Middey, IISC Bengaluru <i>Engineering collective quantum phenomena in oxide heterostructures</i></p> <p>IT-22: Sudipta Kanungo, IIT Goa <i>Tale of Iridates: How strong is the spin orbit coupling in reality</i></p> <p>Contributory presentation: I0031</p>	<p>Session Chair: G. Ravi Kumar, GITAM, Vizag</p> <p>IT-25: Neeraj Khare, IITD, New Delhi <i>Ferroelectric Films for Clean Energy Generation using Piezo and Tribo Effect</i></p> <p>IT-26: A. Biswas, BARC, Mumbai <i>X-ray-based investigations on interface engineered Neutron and X-ray multilayers</i></p> <p>Contributory presentation: f0048</p>
<p>13:00-14:00</p>	<p>Lunch Break</p>	
<p>14:00-16:00</p>	<p>Session 9: Contributory oral presentation</p> <p>Session Chair: Mala N. Rao, BARC, Mumbai <i>(Venue: Auditorium 1)</i></p> <p>Contributed Oral Presentations g0004, g0007, h0040, h0051, h0055, d0040, d0031, i0017</p>	<p>Session 10: Physics of Energy Materials</p> <p>Session Chair: D V Udupa, BARC, Mumbai <i>(Venue: Auditorium 2)</i></p> <p>IT-27: Tanmoy Maiti, IITK, Kanpur <i>High Performance Thermoelectric Nanocomposites with 2D Graphene and MXene</i></p> <p>IT-28: Abhik Banerjee, TCG CREST, Kolkata <i>Developing Safe, Cost Effective and High Energy Density Solid State Battery</i></p> <p>IT-29: M. Navaneethan, SRM Chennai</p>

	<i>Interfacial Engineering for Advanced Wearable and Bulk Thermoelectric Devices</i> Contributed Oral Presentations: d0041, k0008
16:00-18:00	Tea and Poster Presentations
	a0018 to a0027, b0019 to b0024, c0036 to c0056, d0016 to d0022, e0009 to e0015, f0017 to f0028, g0023 to g0034, h0018 to h0028, i0018 to i0025, j0029 to j0045, k0032 to k0050, l0016 to l0022
18:00-19:00	Industry Interaction
19:30	Dinner

Day 4: Saturday, December 21, 2024

09:30-10:10	<p>PI 6: Ravindra Kumar G, TIFR, Mumbai <i>Extreme States with Ultrahigh Intensity, Ultrafast Laser Pulses- Hot, Dense Matter</i> Session Chair: T. Sakuntala, BARC, Mumbai <i>(Venue: Auditorium 1)</i></p>	
10:15-11:00	<p>Session 11: Thesis Presentations Session chair: Chandan Mazumdar, SINP, Kolkata <i>(Venue: Auditorium 1)</i></p>	<p>Session 12: Young achiever presentations Session Chair: K. Maiti, TIFR, Mumbai <i>(Venue: Auditorium 2)</i></p>
11:00-11:30	Tea Break	
11:30-13:00	Thesis Presentations (contd.)	Young achiever presentations (contd.)
13:00-14:00	Lunch Break	
14:00-16:00	Session 13: Dynamics and critical phenomena	Session 14: Neutron: Probe for condensed matter Physics

	<p>Session Chair: K. G. Suresh, IITB, Mumbai</p> <p><i>(Venue: Auditorium 1)</i></p>	<p>Session Chair: P. D. Babu, UGC-DAE CSR, Mumbai</p> <p><i>(Venue: Auditorium 2)</i></p>
	<p>IT-30: Sunil Kumar, IITD</p> <p><i>Ultrafast terahertz dynamics in solids and interfaces</i></p> <p>IT-31: Gopal Dixit, IITB, Mumbai</p> <p>IT-32: Bobby Joseph, Elettra, Italy</p> <p><i>Pressure-induced structural modifications in Remeika phase quasi skutterudite stannides</i></p> <p>Contributed Oral Presentations: j0083, i0036</p>	<p>IT-33: A Sundaresan, JNCASR, Bengaluru</p> <p><i>Correlation between magnetic structure and magnetoelectric properties of the green phases R_2BaCuO_5 (R=Rare-earth)</i></p> <p>IT-34: Russell Ewings, ISIS, RAL, UK</p> <p><i>Entangled orbital, spin and ferroelectric order in cesium superoxide</i></p> <p>IT-35: S. D. Kaushik, UGC-DAE CSR, Mumbai</p> <p><i>Neutron diffraction: An unambiguous tool for characterizing magnetism in emerging materials</i></p> <p>Contributed Oral Presentations: a0004, j0072</p>
16:00-18:00	Tea and Poster Presentation	
	a0028 to a0035, b0025 to b0033, c0057 to c0081, d0023 to d0030, e0016 to e0019, f0029 to f0039, g0035 to g0046, h0029 to h0041, i0026 to i0030, j0046 to j0064, k0051 to k0072, l0023 to l0031	
19:30	Dinner	

Day 5: Sunday, December 22, 2024

9:30-10:10	<p>L. M. Pant, Single Crystal activities at BARC</p> <p>Session chair: Raghvendra Tewari, BARC, Mumbai</p> <p><i>(Venue: Auditorium 1)</i></p>
10:15-11:45	<p>Session 13: Topological and Multifunctional Materials</p> <p>Session Chair: Indranil Das, SINP, Kolkata</p> <p><i>(Venue: Auditorium 1)</i></p>
	<p>IT-36: B. R. K. Nanda, IITM</p>
	<p><i>Field Tunable band topology and topological Hall effect in skyrmion crystals</i></p> <p>IT-37: Amit Agarwal, IITK</p> <p><i>Hidden Berry curvature and planar Hall effect in 2D materials</i></p> <p>IT-38: Kamlendra Awasthi, MNIT Jaipur</p> <p><i>Polymer nanocomposite membranes for gas separation and sensing</i></p>
11:45-13:15	<p>Tea and Poster Presentations</p> <p>a0036 to a0048, b0034 to b0039, c0082 to c0103, d0031 to d0041, e0020 to e0025, f0040 to f0050, g0047 to g0062, h0042 to h0055, i0031 to i0037, j0065 to j0084, k0073 to k0102, l0032 to l0037</p>
13:15-14:15	<p>Lunch</p>
14:15-15:00	<p>Award Presentations</p> <p>S. M. Yusuf, BARC Mumbai L. M. Pant, BARC Mumbai</p> <p><i>(Venue: Auditorium 1)</i></p>
15:00-15:30	<p>Concluding Session</p> <p>Concluding Remarks: S. M. Sharma, BARC, Mumbai</p> <p><i>(Venue: Auditorium 1)</i></p>