Ahin Roy

Curriculum Vitae

Materials Science Centre, Indian Institute of Technology, Kharagpur
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Research Webpage

Experience

Jan 2022 – present **Assistant Professor**, Materials Science Centre, IIT-Kharagpur, India.
Research area: synthesis, simulation and atomic-scale electron microscopy of nanomaterials

Aug 2019 – Oct 2021 **Research Fellow**, Advanced Microscopy Laboratory, Trinity College Dublin, Ireland.
Worked on atomic-scale electron microscopy of nanomaterials for energy applications

Nov 2017 – Jul 2019 **Research Associate**, Indian Institute of Science, Bangalore, India.
Worked on computation, synthesis and electron microscopy of functional nanomaterials

Sep 2015– Sep 2017 **JSPS Postdoctoral Fellow**, Kyushu University, Fukuoka, Japan.
Worked on functional nanomaterials using aberration-corrected transmission electron microscopy

Aug 2011– Aug 2015 **Integrated Ph. D Research Fellow**, Materials Research Centre, Indian Institute of Science, Bangalore, India.
Worked on synthesis, characterization and simulations of metal nanowires

Ph. D Thesis

Title Investigations of Structural and Electronic Aspects of Ultrathin Metal Nanowires

Awards

2017 Best Poster Award, International Conference and Annual Meeting of Electron Microscope Society of India, Mahabalipuram, Chennai

2015 Young Scientist Award in Physics, Dr. K. V. Rao Scientific Society, Hyderabad

2015 JSPS Postdoctoral Fellowship, MEXT Japan (2015-2017)

2014 Gold Award, Shell India Computational Talent Prize

2012 Unilever-RSC Science Communication Scholarship, Imperial College, London

2009 Integrated Ph. D fellowship, Indian Institute of Science, Bangalore (2009-2016)

2002 Certificate of distinction, International Australian Mathematics Olympiad

Education

2009–2011 **Masters of Science**, Indian Institute of Science,Bangalore.
First Class

2006–2009 **Bachelor of Science**, Ramakrishna Mission Residential College, Narendrapur, University of Calcutta.
First Class Honours in Chemistry

Skills and Expertise

Electron Microscopy Proficient in working with FEI T20 and F30 TEMs for regular imaging, FEI TITAN Themis, JEOL-ARM, and Nion UltraSTEM200 for atomic-scale STEM and associated energy dispersive X-ray spectroscopy (EDS) and electron energy loss spectroscopy (EELS).Experienced in regular maintenance (baking and conditioning) of JEOL-ARM machines. Extensive experience from user training to project conception and execution based on AC-STEM and complementary strengths. Contributed to establishment and operation of an AC-STEM facility at IIT Kharagpur under SATHI, and an analytical TEM at Central Research Facility, IIT Kharagpur.

Simulation Density Functional Theory (DFT) based simulation of functional nanomaterials - VASP and SIESTA codes: proficient in installation on parallel architecture clusters, execution and analysis.

Synthesis Wet-chemistry using hydrothermal and microwave methods, characterization using XRD, UV-vis spectroscopy, and electrochemistry using cyclic voltammetry.

Research Interest

Broad area Nanoscale materials for energy generation and storage, catalysis, 2D materials, Quantum materials.

Projects & Funding

Principal Investigator

2024–2027 Atomic-scale Interrogation and Engineering of Inorganic Heterostructure Catalysts for CO Oxidation; PI, Relevant Research Project, Department of Atomic Energy, India

2023–2025 Atomic-scale Electron Microscopic Interrogation and Electronic Structure Simulations of Heterostructure Catalysts for CO Oxidation (AtomCAT); PI, Faculty Startup Research Grant (FSRG), SRIC, IIT Kharagpur, India

2022–2024 Atomic-scale Structural and Electronic Interrogation of Symmetry-broken Noble Metal Nanostructures for Oxygen Reduction; PI, SERB Startup Research Grant (SRG), India

Co-Principal Investigator

2024–2027 Lithium - silver oxide (Li - AgO) recgargeable cells with hybrid electrolytes for underwater system applications ; co-PI, Naval Research Board, DRDO, India

2024–2027 Waste fiber or textile fiber reinforced greener engineered cementitious composites - A replacement of conventional concrete for sustainable infrastructure; co-PI, Ministry of textiles, India

2024–2026 Unlocking the Potential of Metal Chalcogenides for Memristive Device Applications; co-PI, Scheme for Promotion of Academic and Research Collaboration (SPARC), Ministry of Human Resource Development, India

2019–2021 Engineering photoluminescence of Tungsten Sulfide through Doping and Electrical Biasing; Co-PI, DST-JSPS Bilateral Research Funding, India & Japan

2015–2017 Three-dimensional nanoanalyses of catalytic nanocomposite by electron tomography; Fellow, JSPS Standard Postdoc Program, Japan

Publications

[48] A. Lakshan, K. Buxi, P. Acharyya, K. Das, B. Koley, K. Dolui, C. Candolfi, C. Prestipino, E. Guilmeau, A. Roy and P. P. Jana; Key Role of Positional Disorder and Soft Structural Framework for Lowering the Thermal Conductivity of Quaternary $Ag_{1-x}Cu_{3+x}TiSe_4$ $(0 \leq x \leq 0.8)$ System to an Ultralow Limit; Chemistry of Materials, 36, 10773–10785 (2024)

[47] S. Pandit, S. Kumar, D. Ganguly, P. Sardar, S. Nandi, M. Mandal, S. Chattopadhyay, A. Roy, D. Pradhan and R. K. Das; Freeze-thaw induced, metal ion cross-linked, mechanically robust and highly stretchable composite Poly(vinyl alcohol) hydrogels for flexible electronics applications; ACS Applied Polymer Materials, 6, 13, 7631-7647 (2024)

[46] A. Lakshan, B. Koley, K. Buxi, P. R. Raghuvanshi, J. Nuss, A. Bhattacharya, R. Chatterjee, A. Roy and P. P. Jana; A disorder-mediated Structural transformation in the Cu4TiSe$_{4-x}$S$_x$ $(0 \leq x \leq 4)$ system and its effects on the thermal transport property; Chemistry of Materials, 36, 11, 5741–5752 (2024)

[45] L. Hughes, A. Roy, N. Yadav, C. Downing, M. P. Browne, J. K. Vij and V. Nicolosi; Dielectric engineering of perovskite BaMnO3 for the rapid heterogeneous nucleation of Pt nanoparticles for catalytic applications; Advanced Functional Materials, 2402103 (2024)

[44] Y. Zhang, U. Gulzar, A. Lonergan, A. Grant, A. Carrol, A. Roy, V. Nicolosi, T. D. Keene and C. O'Dwyer; Surface Modification Improves Spinel $LiCoO_2$ Li-Ion Battery Cathode Materials Grown by Low-Temperature Solvothermal Flow Reaction; Journal of the Electrochemical Society, 171, 010531 (2024)

[43] N. Maity, M. K. Sharma, S. Ghosh, M. K. Huss-Hansen, A. Roy, N Ravishankar, M. Knaapila, W. Matsuda, S. Seki, S. Patil; Supramolecular Self-assembly of Diketopyrrolopyrrole with Unprecedented Photoconductivity; ACS Applied Electronic materials, 5, 9, 5093-5102 (2023)

[42] K. Buxi, S. Kuila, A. Roy, P. P. Jana; Atomic Distributions of Ag and In in the γ-Brass type Ag_9In_4; Journal of Solid State Chemistry, 124247 (2023)

[41] K. P. Mithun, S. Tripathi, A. Roy, N Ravishankar and A. K. Sood; Ultrafast Time Resolved Carrier Dynamics in Tellurium Nanowires using Optical Pump Terahertz Probe Spectroscopy; Nanoscale, 15, 12670-12678 (2023)

[40] Y. Zhang, A. Grant, A. Carroll, U. Gulzar, M. Ferguson, A. Roy, V. Nicolosi, C. O'Dwyer; Water-Soluble Binders That Improve Electrochemical Sodium-Ion Storage Properties in a $NaTi_2(PO_4)_3$ Anode; Journal of The Electrochemical Society, 170, 050529 (2023)

[39] S. Kuila, Harshit, N. Roy, S. Ghanta, R. Pan, K. Buxi, P. Pramanik, A. K. Bera, B. Saha, S. Yusuf, V. Petricek, A. Roy, P. P. Jana; Ni_3InSb: Synthesis, Crystal

Structure, Electronic Structure and Magnetic Properties; Inorganic Chemistry, 62, 730–7314 (2023)

[38] L. Hughes,*‡ A. Roy,*‡ C. Downing, M. P. Browne, A. Zhussupbekova, I. Shvets and V. Nicolosi;* Surface Reduced Manganese States as a Source of Oxygen Reduction Activity in $BaMnO_3$; Advanced Functional Materials, 2214883 (2023)

[37] S. Pinilla, S. Ryan, L. McKeon, M. Lian, S. Vaesen, A. Roy, J. N. Coleman, and V. Nicolosi; Additive manufacturing of Li-ion batteries: A comparative study between electrode fabrication processes; Advanced Energy Materials, 2203747 (2023)

[36] D. Tyndall, M. Craig, L. Gannon, C. McGuinness, N. McEvoy, A. Roy, M. García-Melchor, M. P. Browne and V. Nicolosi; Demonstrating the Source of Inherent Instability in NiFe LDH Based OER Electrocatalysts; Journal of Materials Chemistry A, 11, 4067-4077 (2023)

[35] O. Ronan,* A. Roy,* S. Ryan, L. Hughes, C. Downing, L. Jones and V. Nicolosi;* Templated synthesis of SiO_2 nanotubes for lithium-ion battery applications: an in-situ (Scanning) Transmission Electron Microscopy study; ACS Omega, 8, 1, 925-933 (2023)

[34] H. Kaur, B. Konkena, C. Gabbett, R. Smith, M. McCrystall, R. Tian, A. Roy, T. Carey, V. Vega-Mayoral, V. Nicolosi, J. N. Coleman; Amorphous 2D-Nanoplatelets of Red Phosphorus Obtained by Liquid-Phase Exfoliation Yield High Areal Capacity Na-Ion Battery Anodes; Advanced Energy Materials, 2203013 (2022)

[33] A. Garcia-Gil, S. Biswas, D. McNulty, A. Roy, K. M. Ryan, V. Nicolosi and J. D. Holmes; High aspect-ratio Germanium-Tin Alloy Nanowires: Potential as Highly Efficient Li-Ion Battery Anodes; Advanced Materials Interfaces, 2201170 (2022)

[32] B. Konkena, H. Kaur, R. Tian, C. Gabbett, M. McCrystall, D. Horváth, K. Synnatschke, A. Roy, R. Smith, V. Nicolosi, M. D. Scanlon and J. N. Coleman; Liquid Processing of Interfacially Grown Iron-Oxide Flowers into 2D-Platelets Yields Lithium-Ion Battery Anodes with Capacities of Twice the Theoretical Value; Small, 18, 2203918 (2022)

[31] T. Chen, H. Kaur, M. McCrystall, R. Tian, A. Roy, R. Smith, D. Horváth, J. Maughan, B. Konkena, M. Venkatesan, K. Synnatschke, T. Carey, J. Lui, J. Pepper, R. Zhang, C., V. Nicolosi, H. Xia and J. Coleman; Liquid Phase Exfoliation of Nonlayered Non-Van Der Waals Iron Trifluoride (FeF_3) into 2D-Platelets for High-Capacity Lithium Storing Cathodes; FlatChem, 33, 100360 (2022)

[30] A. Garcia-Gil, S. Biswas, A. Roy, D. Saladukh, S. Raha, T. Blon, M. Conroy, V. Nicolosi, A. Singha, L. M. Lacroix and J. D. Holmes; Growth and analysis of the tetragonal (ST12) germanium nanowires; Nanoscale, 14, 2030-2040 (2022)

[29] A. Garcia, S. Biswas, D. McNulty, A. Roy, S. Raha, S. Trabesinger, V. Nicolosi, A. Singha and J. D. Holmes; One-step Grown Carbonaceous Germanium Nanowires and their Application as Highly-efficient Lithium-ion Battery Anodes; ACS Applied Energy Materials, 5, 1922-1932 (2022)

[28] E. Piatti, A. Arbab, F. Galanti, T. Carey, L. Anzi, D. Spurling, A. Roy, A. Zhussupbekova, K. A. Patel, J. M. Kim, D. Daghero, R. Sordan, V. Nicolosi, R. S. Gonnelli, F. Torrisi; Charge transport mechanisms in inkjet-printed thin-film transistors based on two-dimensional materials; Nature Electronics, 4, 893-905 (2021)

[27] D. Samantaray, M. Gayen, A. Roy, B. Pavithra, N. Ravishankar; Mechanistic understanding of formation of ultrathin single crystalline Pt nanowires; Journal of Physical Chemistry C, 125, 27458-27464 (2021)

[26] H. Kaur, R. Tian, A. Roy, M. McCrystall, R.Smith, V. Nicolosi, J. Coleman; 2D Nanosheets from Fool's gold by LPE: High performance lithium-ion battery anodes made from stone; FlatChem, 30, 102995 (2021)

[25] D. Tyndall , S. Jaskaniec, B. Shortall, A. Roy, L. Gannon, K. O'Neill, M. P. Browne, J. Coelho, C. McGuinness, G. S. Duesberg and V. Nicolosi; Post-Synthetic Treatment of Nickel-Iron Layered Double Hydroxides for Optimum Catalysis of the Oxygen Evolution Reaction; npj 2D Materials and Applications, 5, Article number: 73 (2021)

[24] P. Thakur, K. Alam, A. Roy, C. Downing, V. Nicolosi, P. Sen, T. N. Narayanan; Extending the Cyclability of Alkaline Zinc-Air Batteries: Synergistic Roles of Li^+ and K^+ Ions in Electrodics; ACS Applied Materials & Interfaces, 13, 33112–33122 (2021)

[23] S. Ippolito, A. G. Kelly, R. F. de Oliveira, M. A. Stoeckel, D. Iglesias, A. Roy, C. Downing, Z. Bian, L. Lombardi, Y. A. Samad, V. Nicolosi, A. C. Ferrari, J. N. Coleman, P. Samori; Covalently interconnected transition metal dichalcogenide networks via defect engineering for high-performance electronic devices; Nature Nanotechnology, 16, 592–598 (2021)

[22] H. Kaur, R. Tian, A. Roy, M. McCrystall, D. Horváth, M. Ruether, A. Griffin, C. Backes, V. Nicolosi, J. Coleman; Production of quasi-2D platelets of non-layered iron pyrite (FeS_2) by liquid-phase exfoliation and their use in high performance battery anodes; ACS Nano, 14, 13418-13432 (2020)

[21] G. Prakash, S. Kundu, A. Roy, A. K. Singh, N. Ravishankar and A. K. Sood; Carrier Dynamics in Ultrathin Gold Nanowires: Role of Auger Processes; Plasmonics, 15, 1151–1158 (2020)

[20] T. Ahmed, P. Bellare, R. Debnath, A. Roy, N Ravishankar and A. Ghosh; Thermal history dependent current relaxation in hBN/MoS_2 van der Waals dimers; ACS Nano, 14, 5909-5916 (2020)

[19] P. Kumar, K. Thakar, N. Verma, J. Biswas, T. Maeda, A. Roy, K. Kaneko, C. Nandi, S. Lodha, B. Viswanath; Polymorphic in-plane heterostructure of WS_2 for light-triggered FET device applications; ACS Applied Nano Materials, 3, 3750-3759 (2020)

[18] L. Sharma, R. Gond, B. Senthilkumar, A. Roy, P. Barpanda; Fluorophosphates as Efficient Bifunctional Electrocatalysts for Metal-air Batteries; ACS Catalysis, 10, 43-50 (2020)

[17] N. Jain, A. Roy; Phase & Morphology Engineered Surface Reducibility of MnO_2 Nano-heterostructures: Implications on Catalytic Activity towards CO Oxidation; Materials Research Bulletin, 121, 110615 (2020)

[16] N. Jain, A. Roy, A. De; Ba-addition Induced Enhanced Surface Reducibility of $SrTiO_3$: Implication on Catalytic Aspects; Nanoscale Advances, 1, 4938-4946 (2019)

[15] N. Jain, A. Roy, S. Nair; Reduced $SrTiO_3$-Supported PtCu Alloy Nanoparticles for Preferential Oxidation of CO in Excess Hydrogen; Nanoscale, 11, 22423-22431 (2019)

[14] R. K. Rai, S. Islam, A. Roy, G. Agrawal, A. K. Singh, A.Ghosh and N Ravishankar; Morphology Controlled Synthesis of Low Bandgap $SnSe_2$ with High Photodetectivity; Nanoscale, 11, 870-877 (2019)

[13] P. Kumar, D. Chatterjee, T. Maeda, A. Roy, K. Kaneko and B. Viswanath; Scalable faceted voids with luminescence enhanced edges in WS_2 monolayers; Nanoscale, 10, 16321-16331 (2018)

[12] S. Tripathi, A. Roy, S. Nair, S. Durani,and R. Bose; Removal of U(VI) from aqueous solution by adsorption onto synthesized silica and zinc silicate nanotubes: Equilibrium and kinetic aspects with application to real samples; Environmental Nanotechnology, Monitoring & Management, 10, 127-139 (2018)

[11] K. Ghosh,‡ A. Roy,‡ S. Tripathi, S. Ghule, A. K. Singh and N. Ravishankar; Insights on Nucleation and Growth of Different Phases of WO_3: Morphology Control and Electrochromic Property; Journal of Materials Chemistry C, 5, 7307-7316 (2017)

[10] A. Pradhan, A. Roy, S. Tripathi, A. Som, D. Sarkar, J. K. Mishra, K. Roy, T. Pradeep, N, Ravishankar and A. Ghosh; Ultra-high Sensivity Infra-red Detection and Temperature Effects in Graphene-Tellurium Nanowire Binary Hybrid; Nanoscale, 9, 9284-9290 (2017)

[9] A. Manjanath,‡ A. Roy,‡ A. Samanta and A. K. Singh; Negative Differential Resistance in Armchair Silicene Nanoribbons; IOP Nanotechnology, 28, 275402 (2017)

[8] T. Maeda, K. Kaneko, K. Yamada, A. Roy, Y. Sato, R. Teranishi, T. Kato, T. Izumi, and Y. Shiohara; Nanostructural characterization of artificial pinning centers in PLD-processed $REBa_2Cu_3O_{7-\delta}$ films; Ultramicroscopy, 176, 151-160 (2017)

[7] A. Roy,‡ K. R. Amin,‡ S. Tripathi, S. Biswas, A. K. Singh, A. Bid, and N. Ravishankar; Manipulation of Optoelectronic Properties and Band Structure Engineering of Ultrathin Te Nanowires by Chemical Adsorption; ACS Applied Materials and Interfaces, 9, 19462-19469 (2017)

[6] K. R. Amin, S. Kundu, S. Biswas, A. Roy, A. K. Singh, and N. Ravishankar; Effect of Ambient on Electrical Transport Properties of Ultrathin Au Nanowires; Applied Physics Letters, 109, 253108 (2016)

[5] A. Roy, S. Tripathi, Y. Sato, and K. Kaneko; Transmission Electron Microscopic Analysis of One-dimensional Metal Nanowire: The Case of Tellurium and Gold; Materia Japan, 55 (12), 603 (2016)

[4] S. Tripathi, A. Roy, R. Bose, S. Nair, and N. Ravishankar; Synthesis of Hollow Nanotubes of Zn_2SiO_4 or SiO_2: Mechanistic Understanding and Uranium Adsorption Behaviour; ACS Applied Materials and Interfaces, 7 (48), 26430–26436 (2015)

[3] A. Roy, S. Kundu, K. Müller, A. Rosenauer, S. Singh, P. Pant, M. P. Gururajan, P. Kumar, J. Weissmüller, A. K. Singh, and N. Ravishankar; Wrinkling of Atomic Planes in Ultrathin Gold Nanowires; Nano Letters, 14, 4859-4866 (2014)

[2] A. Roy, T. Pandey, N. Ravishankar, and A. K. Singh; Semiconductor-like Sensitivity in Metallic Ultrathin Gold Nanowire based Sensors; Journal of Physical Chemistry C, 118, 676- 682 (2014)

[1] A. Roy, T. Pandey, N. Ravishankar, and A. K. Singh; Single Crystalline Ultrathin Gold Nanowires: Promising Nanoscale Interconnects; AIP Advances 3, 032131 (2013)

‡ *denotes equal contribution*

* *denotes corresponding author*

Conference Proceedings

2022 L. Hughes, A. Roy, C. Downing, M. P. Browne, A. Zhussupbekova, V. Nicolosi; The Advanced Characterization and Structure-Property Correlation of $BaMnO_3$ for the Oxygen Reduction Reaction Using Electron Microscopy; Microscopy and Microanalysis 28 (S1), 2586-2588

2022 T. Simonian, A. Roy, Z. Sofer, V.Nicolosi; Characterisation of Planar Defects in Ternary Layered Chalcogenides for Electronic Devices; Microscopy and Microanalysis 28 (S1), 2392-2393

2021 T. Simonian, A. Roy, V.Nicolosi, Z. Sofer; Characterisation and Defect Analysis of 2D Layered Ternary Chalcogenides; Microscopy and Microanalysis 27 (S1), 642-643

2020 D. Samantaray, S. Shetty, S. Mondal, A. Roy, D. Chatterjee, P. Bellare, N Ravishankar; Mechanistic Studies of Growth of Ultrathin Pt and Alloy Nanowires; Microscopy and Microanalysis 26 (S2), 2400-2401

2020 R. K. Rai, S. Islam, A. Roy, G. Agrawal, A. Ghosh, N Ravishankar; Morphology Controlled Low-dimensional Single-crystalline $SnSe_2$-Graphene Hybrid for near IR Photodetection; Microscopy and Microanalysis 26 (S2), 2338-2340

2018 A. Pradhan, A. Roy, S. Tripathi, D. Sarkar,J. K. Mishra, K. Roy, T. Pradeep, N Ravishankar, A. Ghosh; Temperature Dependent Infra-red Detection in Graphene-Tellurium Nanowire Binary Hybrid with Ultra-high Sensitivity; APS March Meeting 2018, abstract id.T60.175

2017 S. Tripathi, K. Ghosh, A. Roy, A. K. Singh, N Ravishankar; Wet-chemical Synthesis of Electrochromic WO_3 and $W_xMo_{1-x}O_3$ Nanomaterials with Phase and Morphology Control; Microscopy and Microanalysis 23 (S1), 1876-1877

2017 S. Tripathi, A. Roy, N Ravishankar; Ambient Dependent Formation of Zn_2SiO_4 and SiO_2 from Core-shell ZnO@SiO_2; Microscopy and Microanalysis 23 (S1), 1758-1759

2017 S. Tripathi, K. Ghosh, A. Roy, A. K. Singh, N Ravishankar; Electrochromic tungsten molybdenum oxide: synthesis with phase and morphology control; Acta Crystallographica A- Foundation and Advances 73, C1223

2016 A. Roy, K. Müller, K. Kaneko, A. Rosenauer, J. Weismüller, A. K. Singh, N Ravishankar; Atomic relaxation in ultrathin FCC metal nanowires; European Microscopy Congress 2016: Proceedings, 423-424

Outreach Experience

2017 **Microscopy at the Ultimate Limit: 'See'-ing the Atoms in Materials**, Invited talk at Meizen High School, Kurume, Fukuoka, Japan (JSPS Science Dialogue Program)

Invited Talks

Dec 2024 Functional Materials at Atomic Scale: Insights from Electron Microscopy and Simulations; VIT-AP University, Amaravati, India

Dec 2024 Principle of STEM-EELS and Applications in Materials Science; Inter University Accelerator Centre, New Delhi, India

Nov 2024 Application of STEM-based Spectrum Imaging [STEM-EDS-EELS] in Materials Science; CRNN, University of Calcutta, Kolkata, West Bengal, India

June 2024 Interrogating Inorganic Nanomaterials with a Transmission Electron Microscope for Structure-property Correlation; Advanced Materials Research Centre (AMRC), IIT Mandi, Himachal Pradesh, India

May 2024 Atomic-scale Simulation and Experiments for Structure-Property Correlation in Functional Oxides; Annual Meeting of Electron Microscope Society of India (EMSI-2024), IIT Bombay, Mumbai, India

Dec 2023 Structure-Property Correlation in Functional Oxides from Atomic-scale Electron Microscopy & Synergistic Simulation; International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2023), IIT Guwahati, India

Oct 2022 Interrogation of Materials with a Transmission Electron Microscope: from Micro/nano-structure to Atomic-scale; Analytical Advances in Studying Molecules, DST-STUTI Workshop, BITS Pilani, Rajasthan, India

Aug 2021 Synergistic Atomic-scale Electron Microscopy and Atomistic Simulations for Metal Nanowires; Future of Chemistry Symposium, Tata Institute of Fundamental Research, Mumbai, India

Jun 2019 Combinatorial Interrogation of Functional Nanomaterials through Electron Microscopy and DFT Simulations; EMAAT International Conference, Shimla, Himachal Pradesh, India

Oct 2018 Synergistic Atomistic Simulations and Designed Experiments for Functional Nanomaterials; IIT Mandi, Himachal Pradesh, India.

Aug 2018 Functional Materials Approaching Molecular Scale: Insights from Electron Microscopy, Simulations & Designed Experiments; TIFR-TCIS Hyderabad, India

July 2017 Functional Low dimensional Materials: Insights from Atomistic Simulations and Designed Experiments; Department of Metallurgical and Materials Engineering, IIT Madras, India

July 2017 Functional Low dimensional Materials: from Ab Initio Simulations and Experiments; CGCRI, Kolkata, India

July 2017 Designed Experiments on Functional Low dimensional Materials from Ab Initio Simulations; S. N. Bose National Centre for Basic Sciences, Kolkata, India

July 2017 Functional Low dimensional Materials from Atomistic Simulations and Targeted Experiments; Department of Chemistry, IIT Guwahati, India

Professional Membership

Life member Electron Microscope Society of India (EMSI)

Community Service

Reviewer J. Mat. Sci., ACS Sustain. Chem. Eng., npj 2D Mater. Appl., Commun. Chem.