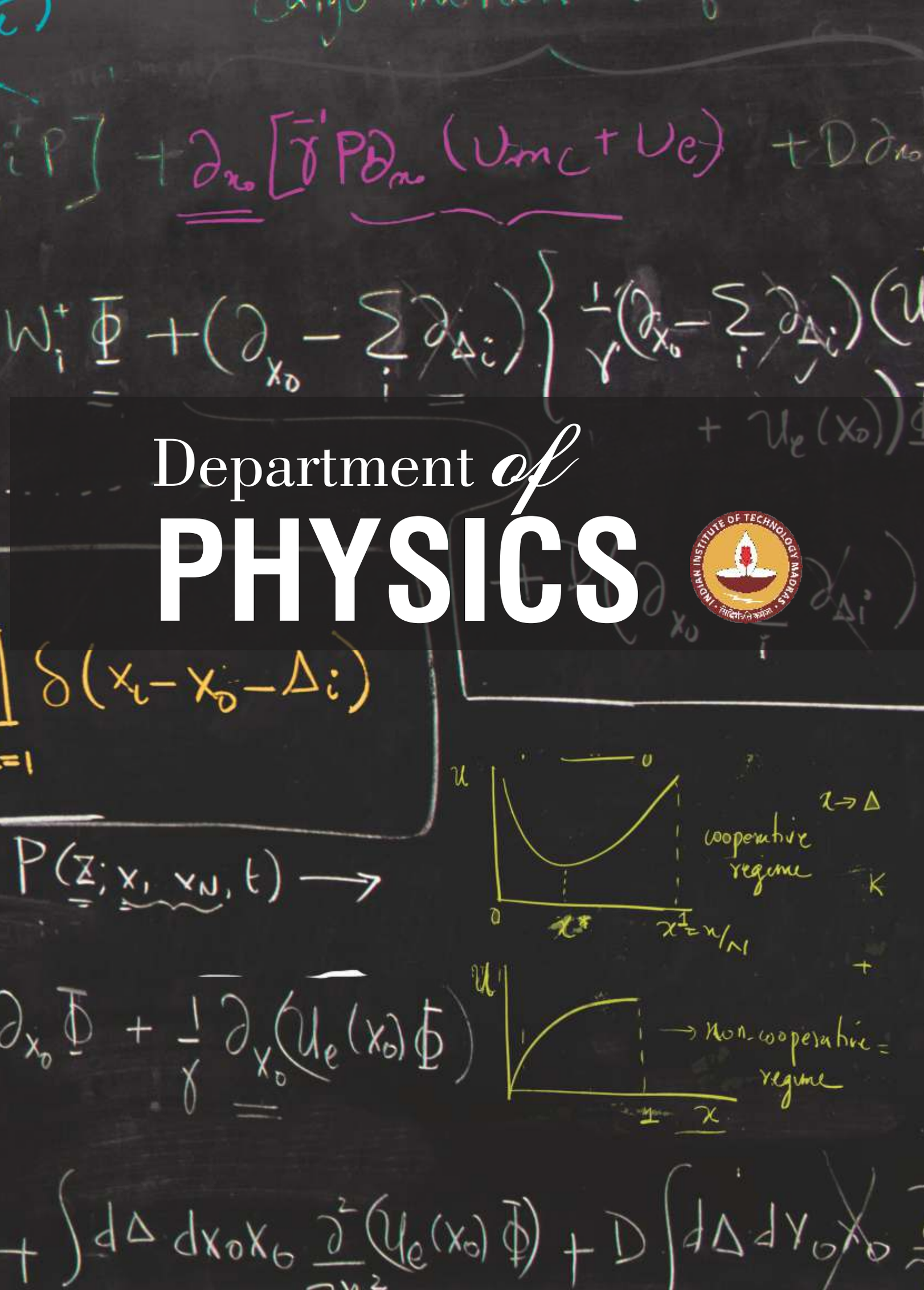
Department *of*
PHYSICS



Indian Institute of Technology Madras

THE INSTITUTE

Indian Institute of Technology Madras is one among the foremost institutes of national importance in higher science and technology education, basic and applied research. The first Indo-German agreement for the establishment of the Indian Institute of Technology at Madras was signed in 1959. The Institute was formally inaugurated in 1959 by Prof. Humayun Kabir, Union Minister for Scientific Research and Cultural Affairs. The IIT system now has sixteen institutes of Technology.

IIT Madras is a residential institute with nearly 550 faculty, 8000 students and 1250 administrative and supporting staff and is a self-contained campus located in a beautiful wooded land of about 250 hectares. It has established itself as a premier centre for teaching, research and industrial consultancy in the country.

The Institute has sixteen academic departments and a few advanced research centres in various disciplines of engineering and pure sciences, with nearly 100 laboratories organised in a unique pattern of functioning. A faculty of international repute, a brilliant student community, excellent technical and supporting staff and an effective administration have all contributed to the pre-eminent status of IIT Madras. The campus is located in the city of Chennai, previously known as Madras. Chennai is the state capital of Tamilnadu, a southern state in India.

PREFACE

Welcome to the Department of Physics, Indian Institute of Technology – Madras, where physics in all branches is taught, practised and researched with rigour and dedication. The Physics department of IIT-Madras is amongst the largest physics departments in the country in terms of the number of faculty, students and the programs that it offers (B. Tech., BS-MS, M.Sc., M. Tech., and Ph.D.). With 55 strong faculty spanning the entire gamut of physics with themes including, but not limited to, gravity and cosmology, high-energy physics, quantum physics, condensed matter physics, string theory, optics and photonics, science of the small, statistical physics, soft matter, dynamical systems, atomic and molecular physics, photovoltaics and others. The plethora of research areas covered by this department are akin to the beautiful night sky covered with glittering stars. And the breadth of courses and topics covered in various programs can be likened to the vastness of the open blue sky seen from the Marina beach in Chennai above the shimmering waters of the Bay of Bengal. In the Department of Physics, we strive to excel equally in teaching and research. While physics teaching is a part of our routine, research is our cup of coffee. We train students and produce physicists who are future torch-bearers of physics education and research in the country.

"Everything happens for a reason and the reason is usually physics". There is a sense of pride in being a part of the exciting world of physics. There is seldom another walk of life that generates such deep curiosity to learn and explore the universe immersing oneself in the vast ocean of knowledge:

"It is impossible to trap modern physics into predicting anything with perfect determinism because it deals with probabilities from the outset."
– Arthur Eddington

"Those who are not shocked when they first come across quantum theory cannot possibly have understood it." – Niels Bohr

"I would rather have questions that can't be answered than answers that can't be questioned." – Richard Feynman

As Albert Einstein said, there are two perspectives of life: one, as though nothing is a miracle, and the other is as though everything is a miracle. This miracle, of course, is Physics. Congratulations on being a part of the physics family, for you have chosen to live to explore the miracles that physics offers us – for which, albeit, one life time is not sufficient. Let us live and learn!

- Physics faculty of IIT Madras.

PHYSICS OFFICE

COFFEE ROOM

AREAS OF RESEARCH

Gravitation Cosmology

Molecular Electronic & Instr.

Theoretical High Energy Physics

Low Dimensional Materials

Dielectric Materials & Microwave Physics

Alternative Energy & Nano-technology

Photovoltaics

Expt. High Energy Pyhsics

Multi Functional Materials

Nano Materials

Thin Films

Magnetism & Magnetic Materials

Low Temperature Physics

Experimental Condensed Matter Physics

Nuclear & High Energy Physics

Measurement Tech.

Soft Condensed Matter & Biological Physics

Optics & Photonics

Theoretical Condensed Matter & Many Body Physcis

Spin Liquids & Topological Insulators

Atomic & Molecular Physics

N-V Centres in Diamond & Diamond Electronics

Quantum Information

Ultra-Fast Dynamics

Dynamical Systems, Quantum & Dynamics Statistical Physics

Quantum Field Theory

Device Physics

S N BOSE HALL
SMART CLASSROOM
HSB 210

CLASSROOM
IN RAMAN
BLOCK

COURSE PROGRAMS

B.S. & M.S. Dual Degree

Entry: JEE
Duration: 10 semesters
Features: The 554 credit program offers

- Core and Elective courses in Sciences (97 credits), Professional courses (346 credits), Engineering (12 credits), Free electives (72 credits) and Humanities (27 credits).
- Engineering Drawing and Workshop training.
- Introductory courses on Chemistry, Life sciences and Ecology & Environment.
- A course on Professional Ethics and self-study courses.
- Option for exceptional students to get a Honors Degree.

M.Sc.

Entry: JAM
Duration: 4 semesters
Features: The 227 credit program offers

- Core courses (117 credits), Laboratory courses (35 credits), Electives (36 credits) and a project (39 credits).

CORE COURSES

- The core courses cover the fundamentals of Classical Physics. Electrodynamics, Quantum Physics, Statistical Physics, Nuclear and Atomic Physics, and Condensed Matter Physics in addition courses on Mathematical Physics, Numerical/Computational Physics and Electronics are also prescribed.

ELECTIVES

- Wide ranging electives reflecting the broad spectrum of faculty research interests.
- Courses include General Relativity & Cosmology, Quantum Computation & Quantum Information, Ultrafast lasers, Photonics, Introduction to Physics of the cell, Physics & Technology of Thin Films, Science and Technology of Nanomaterials (a complete list includes 150 electives).
- Self-study options (under faculty supervision).

LABORATORY COURSES

- Thematic labs dealing with Mechanics, Thermal Physics, Electricity & Magnetism, Optics and Spectroscopy, Electronics, Computational Physics, Condensed Matter Physics and Materials Science are designed to expose the students to various methods of Experimental physics and to augment class-room activity. Emphasis is laid on quantitative aspects as well as on the conceptual basis.

PROJECTS

- Research oriented projects.
- Exposure to research level facilities (XRD, SEM, TEM, AFM, SQUID Magnetometer).
- Internships at leading universities/institutes in India and abroad.

RESEARCH FACILITIES

- Research facilities include systems common to IITM, specialized systems at SAIF, and systems exclusive to the Department of Physics.
- Department and Central Workshops, Central Fabrication Facilities, Central Glass Blowing Facilities.
- Liquid Nitrogen and Liquid Helium plants.
- Supercomputing facility at the Institute computer center.
- Femtosecond Laser Facility
- Physical property measurement system (PPMS), DST - FIST Facility

B.Tech. (Engineering Physics)

(Jointly offered by the Dept. of Physics and the Dept. of Electrical Engg.)
Entry: JEE
Duration: 8 semesters
Features: The 433 credit program includes

- Core and Elective courses in Sciences (84 credits), Professional courses (205 credits), Engineering (45 credits), Free electives (72 credits) and Humanities (27 credits).
- Engineering Drawing and Workshop training.
- Industrial training and lecture, Seminar/Viva-Voce.
- Introductory courses on Chemistry, Life sciences and Ecology & Environment.
- Courses include Networks & Systems, Analog and Digital Circuits.
- Option for exceptional students to get a Honors Degree.
- Specific electives include VLSI Design, Fiber Optics, Analog/Digital/ Optical Communication Systems.
- A course on Professional Ethics and self-study courses.

M.Tech. (Functional Materials and Nanotechnology)

Entry: GATE
Duration: 4 semesters
Features: The 199 credit program includes

- Core courses (64 credits), Laboratory courses (20 credits), Electives (27 credits) and a two semester project seminar (88 credits).
- Core courses focus on Synthesis and Characterization of Functional Materials, Introduction to Nanoscience, Nanomaterials and Nanotechnology.
- Laboratory courses focus on Materials Synthesis and Characterization.
- Courses include Functional Materials, Sensors and Transducers.
- Electives include Physics at Low Temperatures, Physics of Semiconductor Devices and others.

Ph.D.

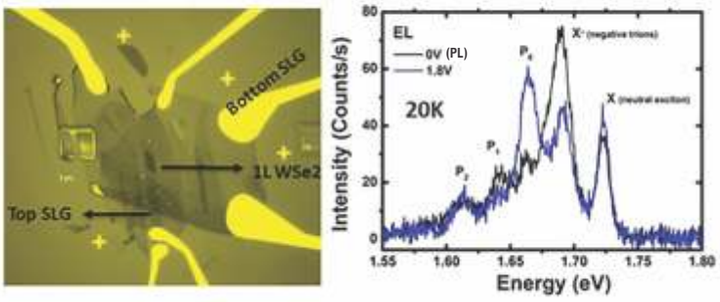
Entry: Written exam and interview, conducted by the Department twice a year in May and November.
Duration: 5 years with fellowship

- Course work includes three core courses Foundations of Theoretical Physics and Foundations of Experimental Physics and Introduction to Research and a minimum of two electives.
- Graduate students go through a orientation program enabling them to take up the role of teaching assistants and provide support to faculty in handling tutorials of large classes, lab courses and in handling various common experimental facilities.

BROADBAND DIELECTRIC RELAXATION SPECTROMETER WITH VARIABLE TEMPERATURE FACILITY

CRYOFREE PHYSICAL PROPERTIES MEASUREMENT SYSTEM

Atomically thin LED from van der Waals heterostructures

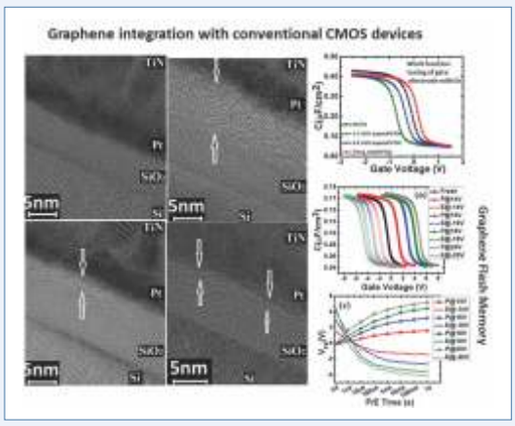


Selected Publications

Propagating plasmons in a charge-neutral quantum tunneling transistor; A Woessner, A Misra, Y Cao, I Torre, A Mishchenko, MB Lundeberg, Kenji Watanabe, Takashi Taniguchi, Marco Polini, Kostya S Novoselov, Frank HL Koppens; ACS Photonics, (2017).

Tuning the valley and chiral quantum state of Dirac electrons in van der Waals heterostructures; J.R Wallbank, D Ghazaryan, A Misra, Y Cao, JS Tu, BA Piot, M Potemski, S Pezzini, S Wiedmann, U Zeitler, TLM Lane, SV Morozov, MT Greenaway, Laurence Eaves, AK Geim, VI Fal'ko, KS Novoselov, A Mishchenko; Science, (2016).

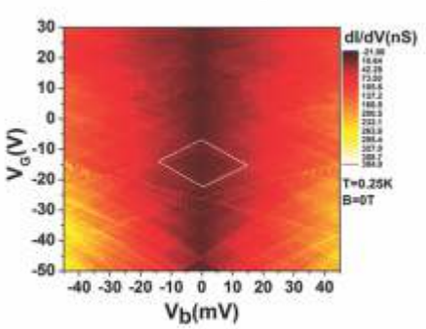
Work function modulation and thermal stability of reduced graphene oxide gate electrodes in MOS devices; Abhishek Misra, Hemen Kalita, Anil Kottantharayil; ACS Applied Materials and Interfaces, (2013).



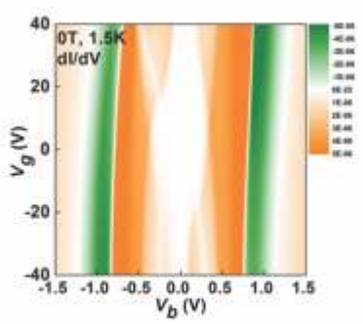
Reduced multilayer graphene oxide floating gate flash memory with large memory window and robust retention characteristics; Abhishek Mishra, Amritha Janardanan, Manali Khare, Hemen Kalita, Anil Kottantharayil; IEEE Electron device letters, (2013).

Electrical transport and electromigration studies on nickel encapsulated carbon nanotubes: possible future interconnects; Neha Kulshrestha, Abhishek Misra, DS Misra; IOP Nanotechnology, (2013).

Tunnelling in van der Waals heterostructures



Single electron charging events in Gr/BN/Gr-QD/BN/Gr/SiO_2/Si van der Waals heterostructure.



Negative differential resistance in Gr/3 layer BN/Gr/SiO_2/Si van der Waals tunnel heterostructure.

Abhishek Misra

Assistant Professor

M.Tech: Microelectronics, IIT Bombay (2006-2008)

Ph.D: Microelectronics, IIT Bombay (2008-2013)

Principal Engineer: Taiwan Semiconductor Manufacturing Company (TSMC), Hsinchu, Taiwan (2013-2014)

Postdoctoral Research Staff: With Prof. Konstantin Novoselov, University of Manchester, UK (2015-2018)

Assistant Professor: Dept. of Physics, IIT Madras (Since Feb 2018)

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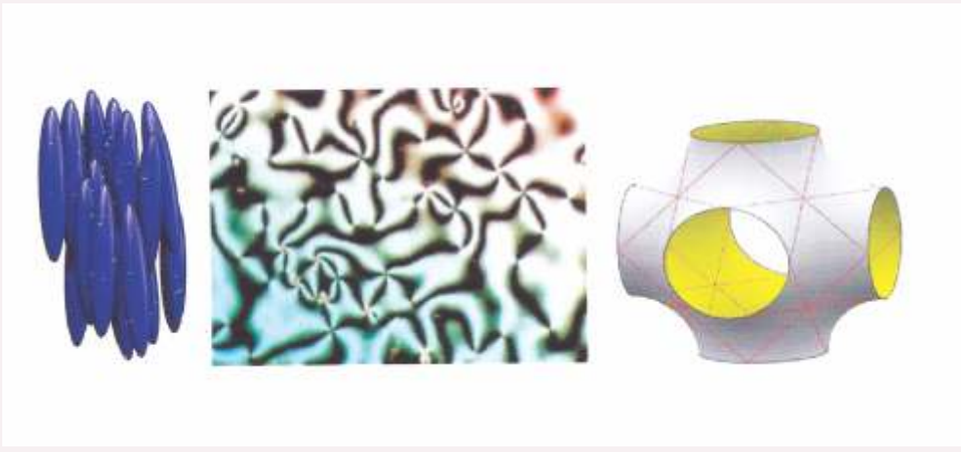
Awards and Recognitions

- "Excellence in Ph.D thesis award" by Department of Electrical Engineering, IIT Bombay (2015)
- All India rank 5 in Graduate Aptitude Test in Engineering (GATE: Physics) (2006)
- Junior Research fellowship (JRF-NET), Physics (2005)

Research Interests

- Experimental condensed matter physics
- Van der Waals layered materials and their hetero-structures: Transport physics, optoelectronics and applications
- Non volatile memory (Flash): novel materials and device optimization
- CMOS device physics and process integration



Aditi Simha
Assistant Professor

Ph.D.: Indian Institute of Science, Bangalore (2003)

Post-Doc: Max Planck Institute for the Physics of Complex Systems, Dresden, Germany (2003-2005)

Post-Doc: School of Physics and Astronomy, University of Leeds, Leeds, UK (2005-2008)

Assistant Professor: IIT Madras (Since 2008)

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Email: aditi@iitm.ac.in

Research Interests

- Theoretical soft matter with a focus on systems driven out of equilibrium
- Hydrodynamics and topological defects in Liquid crystalline phases
- Fluctuations and response in none-quilibrium steady states

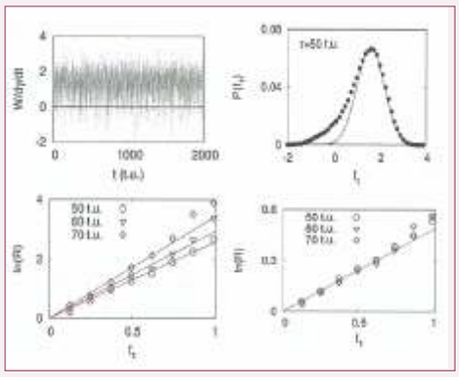
Selected Publications

Soft Active Matter; M. C. Marchetti, J. F. Joanny, S. Ramaswamy and T. B. Liverpool; J. Prost, M. Rao, Aditi Simha, Rev. Mod. Phys. 85, 1143 (2013).

A minimal polar model for self-propulsion in viscous flows; Ankita Pandey and Aditi Simha; Eur. Phys. J. E 35, 52 (2012).

A dynamic renormalization group study of active nematics; Shraddha Mishra, Aditi Simha and S. Ramaswamy; J. Stat. Mech. P02003 (2010).

Statistical Mechanics far from equilibrium: prediction and test for a sheared system; R. M. L. Evans, Aditi Simha, A. Baule and P. D. Olmsted; Phys. Rev. E 81, 051109 (2010).



Properties of a non equilibrium heat bath; Aditi Simha, R. M. L. Evans and A. Baule; Phys. Rev. E 77, 031117 (2008).

Wave Propagation by Critical Oscillators; D. Andor, T. Duke, R. A. Simha and F. Julicher; Auditory Mechanisms-Processes and Models, World Scientific Publishing (2006).

Active Nematics on a substrate: giant number fluctuations and long-time tails; S. Ramaswamy, R. Aditi Simha and J. Toner; Europhys. Lett. 62, 196 (2003).

Hydrodynamic Fluctuations and instabilities in ordered suspensions of self-propelled particles; R. Aditi Simha and S. Ramaswamy; Phys. Rev. Lett. 89, 058101 (2002).

Selected Publications

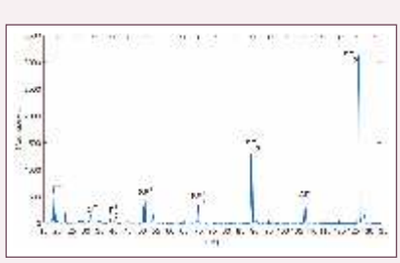
Probing anion resonances in FeO−: a species of astrophysical relevance; Roby Chacko, Shreyak Banhatti, A. K. Gupta and G. Aravind; Journal of Physics: Conference Series, 875,102019 (2017).

COLLISIONAL DESTRUCTION OF FeC-n (n=1 TO 4, 6) ANIONS OF ASTROPHYSICAL RELEVANCE; M. Nrisimhamurty, R. G. Mane, Roby Chacko, A. K. Gupta, P. C. Deshmukh and G. Aravind; The Astrophysical Journal, 833, 269 (2016).

Autoionization resonances in the neon isoelectronic sequence using relativistic multichannel quantum-defect theory; Nrisimhamurty Madugula, G. Aravind, P. C. Deshmukh and S. T. Manson; Physical Review A, 91, 013404 (2015).

Photoelectron imaging of interstellar medium anions; Nrisimhamurty Madugula, Roby Chacko, Pranawa C. Deshmukh and Aravind Gopalan; Journal of Physics: Conference Series, 635, 112115 (2015).

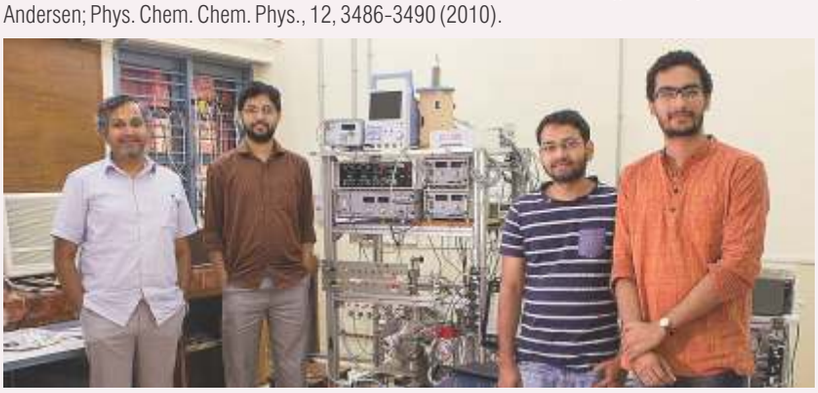
Probing electronic states of TaC and observation of a stable excited state of TaC- by anion-photoelectron spectroscopy; G. Aravind, Nrisimhamurty Madugula, Rupali G. Mane, A. K. Gupta and E. Krishnakumar; Physical Review A, 92, 042503 (2015).



Autoionization resonances in the Argon iso-electronic sequence; Juby George, G.B.Pradhan, Milind Rundhe, Jobin Jose, G. Aravind and P. C. Deshmukh; Canadian Journal of Physics, 90(6) 547-555 (2012).

Photodissociation pathways and lifetimes of protonated peptides and their dimers; G. Aravind, Benedikte Klaerke, Jyoti Rajput, Yoni Toker, Lars Andersen, Anastasia Bochenkova and Rodolphe Antoine; Jerome Lemoine, Amandine Racaud, and Philippe Dugourd, Chem. Phys. 136, 014307 (2012).

Sub-microsecond regime dissociation lifetime studies on Adenosine 5' monophosphate ions; G. Aravind, R. Antoine, B. Klaerke, J. Lemoine, A. Racaud, D. B. Rahbek, J. Rajput, P. Dugourd and L.H. Andersen; Phys. Chem. Chem. Phys., 12, 3486-3490 (2010).



Aravind G

Associate Professor

Ph.D.: Tata Institute of Fundamental Research, Mumbai, INDIA (2001-2007)

Post-Doc: University of Aarhus, Aarhus, Denmark (2008-2009)

Post-Doc: Research at University of Basel, Basel, Switzerland (2010)

Assistant Professor: Department of Physics, IIT Madras (2010-2016)

Associate Professor: Department of Physics, IIT Madras (Since 2016)

Phone: +91 44 2257 4863

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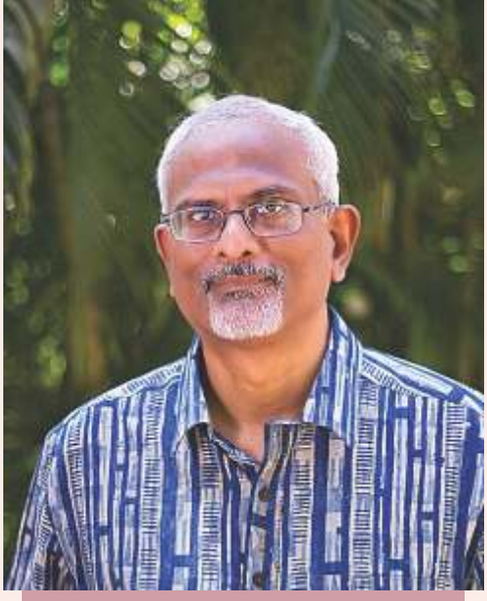
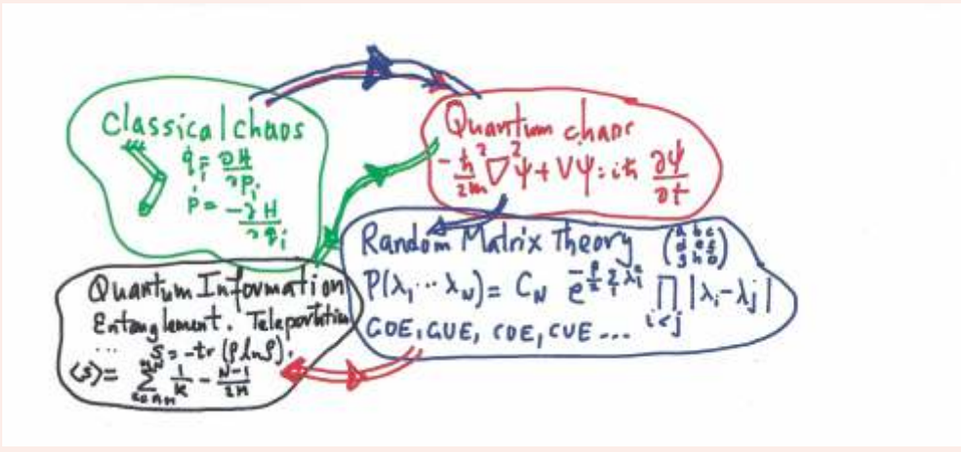
Awards and Recognitions

- Young Faculty Recognition Award, IIT Madras (2017)
- INSA Medal for Young Scientist (2012)
- Geeta Udgaonkar award for the best thesis in Physics from TIFR (2008)
- Best thesis award for the Indian Society of Atomic and Molecular Physics (2008)
- Best outgoing student of Physics award, BITS, Pilani, India (2001)

Research Interests

- Photoelectron spectroscopy on inter-stellar medium anions using Velocity Map Imaging
- Construction of state-of –the art multi-pole ion trap experimental setup
- Collision-induced dissociation of interstellar medium anions to probe anion resonances





Arul Lakshminarayan

Professor

Ph.D. (SUNY Stony Brook, 1993)

Post-Doc: Physical Research Laboratory, Ahmedabad (1993-1996)

Scientist and Reader: Physical Research Laboratory, Ahmedabad (1996-2003)

Faculty: IIT Madras (Since 2003)

Visiting Professor: WSU Pullman (1998), HT Kanpur (2002)

Visiting Scientist: Max Planck Institute for Physics of Complex Systems, Dresden (2007)

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Awards and Recognitions

- Ph.D. Thesis accepted with Distinction (1993, Stony Brook)
- INSA Young Scientist award for Theoretical Physics (1998, New Delhi)

Research Interests

Quantum Chaos, Hamiltonian Chaos, Quantum Information. Entanglement in Condensed Matter Models, Random Matrix Theory, Extreme Value Statistics.

Selected Publications

Local entanglement structure across a many-body localization transition; Soumya Bera, Arul Lakshminarayan; Phys. Rev. B 93, 134204, (2016).

Universal scaling of spectral fluctuation transitions for interacting chaotic systems; Shashi C. L. Srivastava, Steven Tomsovic, Arul Lakshminarayan, Roland Ketzmerick, Arnd Backer; Phys. Rev. Lett. 116, 054101, (2016).

Diagonal unitary entangling gates and contradiagonal quantum states; Arul Lakshminarayan, Zbigniew Puchala, and Karol Zyczkowski; Phys. Rev. A 90, 032303, (2014).

On the number of real eigenvalues of products of random matrices and an application to quantum entanglement; Arul Lakshminarayan; J. Phys. A: Math. Theor. 46 152003, (2013).

Extreme statistics of complex random and quantum chaotic states; Arul Lakshminarayan, Steven Tomsovic, Oriol Bohigas, Satya N. Majumdar; Phys. Rev. Lett. 100, 044103, (2008).

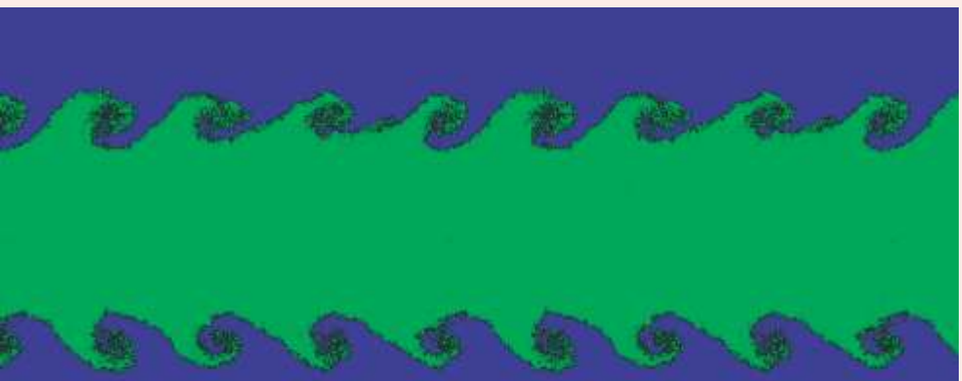
Multifractal eigenstates of quantum chaos and the Thue-Morse sequence; N. Meenakshisundaram, A. Lakshminarayan; Phys. Rev. E. 71, 065303 (Rapid Comm.), (2005).

Multipartite Entanglement in a One-Dimensional Time Dependent Ising Model; A. Lakshminarayan, V. Subrahmanyam, Phys. Rev. A., 71, 062334, (2005).

Cyclic Identities Involving Jacobi Elliptic Functions - II; A. Khare, A. Lakshminarayan, U. Sukhatme, J. Math. Phys. 44, 1822, (2003).

Testing Statistical Bounds on Entanglement Using Quantum Chaos; J. N. Bandyopadhyay, A. Lakshminarayan, Phys. Rev. Lett. 89, 060402, (2002).

Entangling Power of Quantized Chaotic Systems; A. Lakshminarayan; Phys. Rev. E., 64, 036207, (2001).



blue fluid (moving along +x) green fluid (moving along -x)

Ashwin Joy

Assistant Professor

Ph.D: Institute for Plasma Research, Gandhinagar (2011)

DST-INSPIRE Faculty: Institute for Plasma Research, Gandhinagar (2013-15)

Post Doctoral Fellow: Weizmann Institute of Science, Israel (2011-2015)

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Email: ashwin@iitm.ac.in

Selected Publications

Compressible Kolmogorov flow in strongly coupled dusty plasma using Molecular dynamics and Computational fluid dynamics: A comparative study - Part II; Akanksha Gupta, Rajaraman Ganesh and Ashwin J.; Physics of Plasmas 25, 013706 (2018).

Universal Scaling of Pair-Excess Entropy and Diffusion in Strongly Coupled Liquids; Ashwin J.; Letter to the Physics of Plasmas, 24 010702 (2017).

Molecular shear heating and vortex dynamics in thermostatted two-dimensional Yukawa liquids; Akanksha Gupta, Rajaraman Ganesh and Ashwin J.; Physics of Plasmas, 23, 073706 (2016).

Spreading plastic failure as a mechanism for the shear modulus reduction in amorphous solids; Vijayakumar Chikkadi, Oleg Gendelman, Valery Ilyin, Ashwin J., Itamar Procaccia and Carmel A. B. Z. Shor; Euro Physics Letters, 110, 48001 (2015).

Microscopic Origin of Shear Relaxation in a Model Viscoelastic Liquid; Ashwin J. and Abhijit Sen; Physical Review Letters, 114, 055002 (2015).

Kolmogorov flow in two dimensional strongly coupled dusty plasma; Akanksha Gupta, R. Ganesh and Ashwin J.; Physics of Plasmas, 21, 073707 (2014)

Coherent Vortices in Strongly Coupled Liquids; Ashwin J. and R. Ganesh; Physical Review Letters, 106, 135001 (2011).

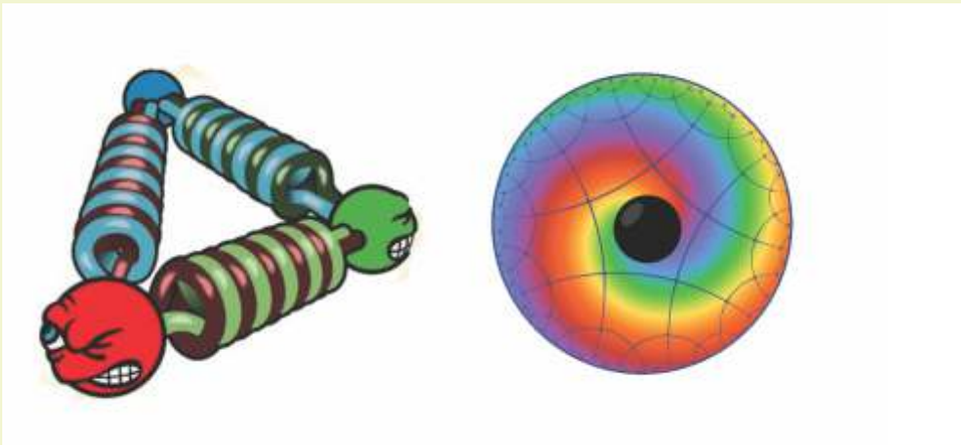
Kelvin Helmholtz Instability in Strongly Coupled Yukawa Liquids; Ashwin J. and R. Ganesh; Physical Review Letters, 104, 215003 (2010).

Awards and Recognitions

- Parvez Guzdar Young Scientist medal, PSSI (2015)
- Junior Associate of the Abdus Salam Internl. Center for Theoretical Physics, Trieste, Italy (2014)
- INSPIRE faculty award, DST (2013)
- VATAT Fellowship by the Govt. of Israel to Outstanding Post-docs from China and India (2012)
- Dean of Faculty Fellowship by the Weizmann Institute of Science, Rehovot, Israel (2012)
- National Graduate Physics Examination, Top 1% in the state of Gujarat, India (2002)

Research Interests

- Soft condensed matter physics
- Turbulence



Ayan Mukhopadhyay
Assistant Professor

Ph.D.: Harish-Chandra Research Institute (2010)

Post-Doc: LPTHE Paris-6, Sorbonne Universities Paris (2010-2012)

Post-Doc: Ecole Polytechnique Palaiseau and CEA-Saclay (2012-2014)

Post-Doc: Crete Center for Quantum Complexity and Nanotechnology, Heraklion (2014-2015)

Post-Doc: Institute for Theoretical Physics, TU Vienna (2015-2017)

Research Associate: CERN (2016-2017)

Visiting professor: TU Vienna (2018-2021)

Assistant Professor: IITM (Since 2017)

Ph.: +91 44 2257 4842

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Awards and Recognitions

- Beautriu de Pinos Fellowship, Ageny for Management of University and Research Grants, Barcelona (2012)
- ESPRC research-in-groups grant (2013)
- Senior Lise-Meitner Fellowship (2015-2017)
- Visiting professorship at TU Vienna (2018-2021)
- Ramanujan Fellowship of DST India (2018-2023)

Research Interests

Fundamental aspects of quantum field theories (exploring dualities and semi-dualities)

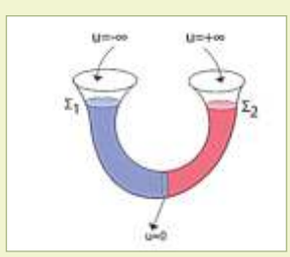
Selected Publications

Density response and collective modes of semiholographic non-Fermi liquids; B. Doucot, C. Ecker, A. Mukhopadhyay and G. Policastro; Phys. Rev. D 96, no. 10, 106011 [arXiv:1706.04975 [hep-th] (2017).

Exact time-dependence of causal correlations and non-equilibrium density matrices in holographic systems; L. K. Joshi, A. Mukhopadhyay, F. Preis and P. Ramadevi; Phys. Rev. D 96, no. 10, 106006 [arXiv:1704.02936 [hep-th] (2017).

Illustrated study of the semi-holographic non- perturbative framework;S. Banerjee, N. Gaddam and A. Mukhopadhyay; Phys. Rev. D 95 no. 6, 066017 [arXiv:1701.01229 [hep-th] (2017).

Time-dependence of the holographic spectral function: Diverse routes to thermalisation; S. Banerjee, T. Ishii, L. K. Joshi, A. Mukhopadhyay and P. Ramadevi; JHEP 08 048, [arXiv:1603.06935[hep-th] (2016).

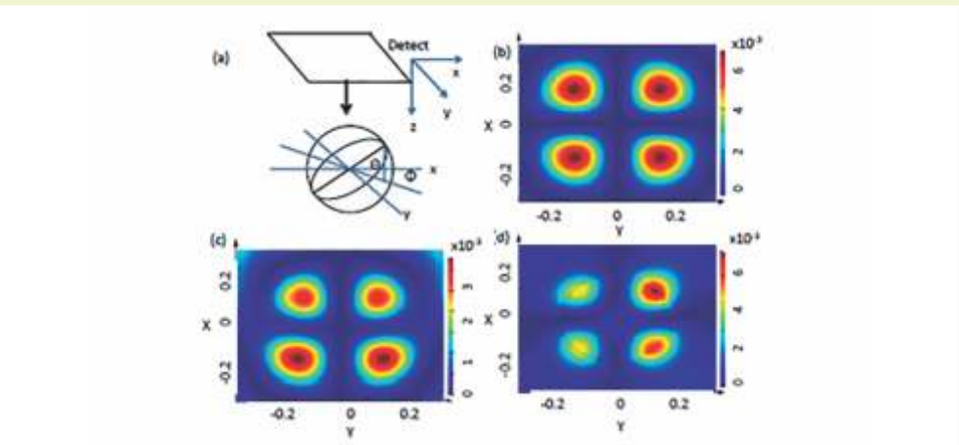


Semi-Holography for Heavy Ion Collisions: Self-Consistency and First Numerical Tests; A. Mukhopadhyay, F. Preis, A. Rebhan and S. A. Stricker; JHEP 1605, 141 [arXiv:1512.06445 [hep-th] (2016).

Holography as a highly efficient RG flow. II. An explicit construction; N. Behr and A. Mukhopadhyay; Phys. Rev. D 94, no. 2, 026002 [arXiv: 1512.09055 [hep-th] (2016).

Holography as a highly efficient RG flow. I. Rephrasing Gravity; N. Behr, S. Kuperstein and A. Mukhopadhyay; Phys. Rev. D 94, no. 2, 026001 [arXiv:1502.06619 [hep-th] (2016).

A semi-holographic model for heavy-ion collisions; E. Iancu and A. Mukhopadhyay; JHEP 1506, 003 [arXiv: 1410.6448 [hep-th] (2015).

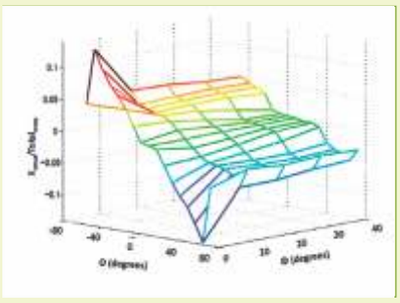


Selected Publications

Determination of pitch rotation in a spherical birefringent microparticle; Basudev Roy*, Avin Ramaiya and Erik Schaffer; Accepted in Journal of Optics, (2018).

Kinesin rotates unidirectionally and generates torque while walking on microtubules; Avin Ramaiya*, Basudev Roy*, Michael Bugiel and Erik Schaffer; Proceedings of National Academy of Sciences (USA), 114, 10894, (2017).

In-situ self-assembly and photopolymerization for hetero-phase synthesis and patterning of conducting materials using soft-oxometalates in thermo-optical tweezers; Subhrokoli Ghosh, Santu Das, Shuvojit Paul, Preethi Thomas, Basudev Roy, Partha Mitra, Soumyajit Roy, Ayan Banerjee; Journal of Materials Chemistry C, 5, 6718, (2017).

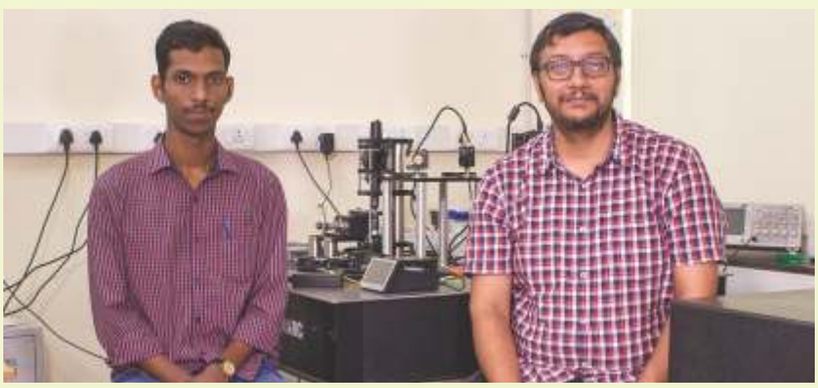


Using Brownian motion to measure shape asymmetry in mesoscopic matter using optical tweezers; Basudev Roy, ArghaMondal, SudiptaBera and Ayan Banerjee; Soft Matter (as Communications), 12, 5077, (2016).

Simultaneous detection of rotational and translational motion in optical tweezers by measurement of backscattered intensity; Basudev Roy, Sudipta K. Bera and Ayan Banerjee; Opt. Lett., 39, 3316, (2014). Accepted in Virtual Journal of Biomedical Optics.

Controlled and continuous patterning of organic and inorganic materials by induced nucleation in an optical tweezers; Basudev Roy, Manish Arya, Preethi Thomas, Julius Constantin Jurgschat, Venkat Rao, Ayan Banerjee, ChillaMalla Reddy and Soumyajit Roy, Langmuir, 29,14733, (2013).

Controlled transportation of mesoscopic particles by enhanced spin-orbit interaction of light in an optical trap; Basudev Roy, Nirmalya Ghosh, S. Dutta Gupta, Prasanta K. Panigrahi, Soumyajit Roy and Ayan Banerjee; Phys. Rev. A 87, 043823, (2013).



Basudev Roy

Assistant Professor

Ph.D: Indian Institute of Science Education and Research, Kolkata, India (2015)

Postdoctoral Fellow: Alexander von Humboldt Fellow, University of Tuebingen, Germany (2015-2017)

Assistant Professor: IIT Madras (Since April 2017)

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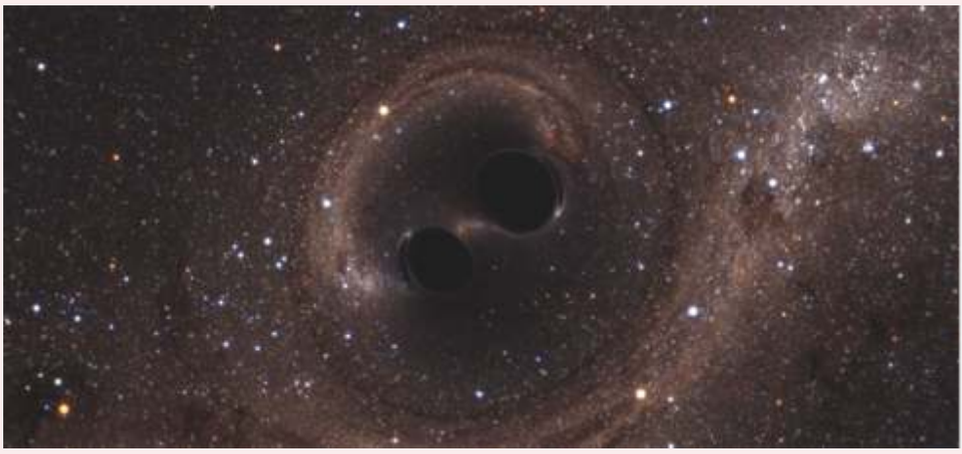
Research Interests

My current research is in the field of experimental soft condensed matter physics. We specialise in optical tweezers with special emphasis on rotational micromanipulation. We have not only performed yaw rotational motion using the polarization properties of the trapping light but also developed a technique to study the pitch degree of rotational motion. We shall extend the yaw rotational motion to the study of rheology and tribology which can then be used to measure the properties of the cell membranes to characterize diseased and healthy cells. We shall also try to get into general single molecule biophysics eventually.



Chandra Kant Mishra

Assistant Professor

Ph.D: IISc and Raman Research Institute, Bengaluru, India (2012)

Post Doc: IISER-TVM, Trivandrum, India (2012-2013)

Post Doc: ICTS-TIFR, Bengaluru, India (2014-2016)

Assistant Professor: IIT Madras, (Since 2016)

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Awards and Recognitions

- Special Breakthrough Prize in Fundamental Physics for the detection of Gravitational Waves (as a part of the LIGO Scientific Collaboration) (2016)
- The 2016 Gruber Cosmology Prize for the detection of Gravitational Waves (as part of the LIGO Scientific Collaboration) (2016)

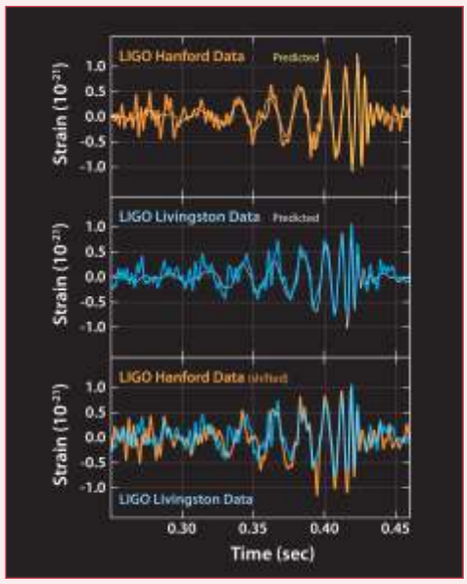
Research Interests

- Gravitational waves from compact binary sources
- Post-Newtonian theory and phenomenology
- Testing General Relativity and alternative theories of gravity

Selected Publications

Observation of Gravitational Waves from a Binary Black Hole Merger; LIGO and Virgo Collaboration; Physical Review Letters 116, 061102, (2016).

Observation of Gravitational Waves from a Binary Neutron Star Inspiral; LIGO and Virgo Collaboration; Physical Review Letters 119, 161101, (2017).

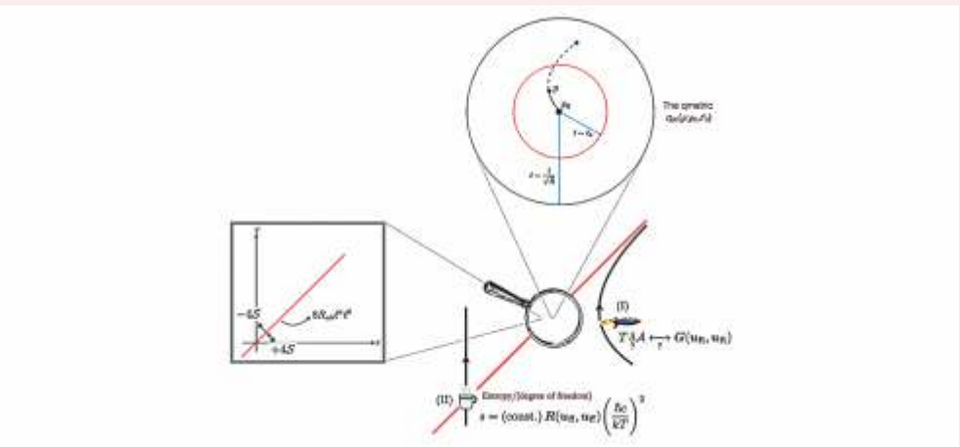


Testing the binary black hole nature of a compact binary coalescence; N. V. Krishnendu, K. G. Arun, Chandra Kant Mishra; Physical Review Letters 119, 091101, (2017).

Accurate inspiral-merger-ringdown gravitational waveforms for nonspinning black-hole binaries including the effect of subdominant modes; Ajit Kumar Mehta, Chandra Kant Mishra, Vijay Varma, and Parameswaran Ajith; Physical Review D 96, 124010, (2017).

Synergy of short gamma ray burst and gravitational wave observations: Constraining the inclination angle of the binary and possible implications for off-axis GRBs; K. G. Arun, Hideyuki Tagoshi, Archana Pai, Chandra Kant Mishra; Physical Review D 90, 024060, (2014).

Parametrized tests of post-Newtonian theory using Advanced LIGO and Einstein Telescope; Chandra Kant Mishra, K. G. Arun, Bala R. Iyer, Iyer, B. S. Sathyaprakash; Physical Review D, 82, 064010, (2010).



Selected Publications

Action and Observer Dependence in Euclidean Quantum Gravity; Dawood Kothawala; Class. Quantum Grav. (Letters) 35, 03LT01 (2018).

Spacetime with Zero Point Length is Two-dimensional at the Planck Scale; T. Padmanabhan, S. Chakraborty and Dawood Kothawala; Gen. Rel. Grav. 48: 55 (2016).

Entropy Density of Spacetime as a Relic from Quantum Gravity; Dawood Kothawala and T. Padmanabhan; Phys. Rev. D 90, 124060 (2014).

Minimal Length and Small Scale Structure of Spacetime; Dawood Kothawala; Phys. Rev. D 88, 104029 (2013).

Lanczos-Lovelock models of gravity; T. Padmanabhan and Dawood Kothawala; Physics Reports 531, 115 (2013).

Generalized uncertainty principles and quantum field theory; V. Husain, Dawood Kothawala and S. Seahra; Phys. Rev. D 87, 025014 (2013).

Holographic repulsion and confinement in gauge theory; V. Husain and Dawood Kothawala; Class. Quant. Grav. 30 [FastTrack Communication]. 032001 (2013).

Membrane Paradigm and Horizon Thermodynamics in Lanczos-Lovelock gravity; S. Kolekar and Dawood Ko1hawala; Jour. High Energy Phys. 1202, 006 (2012).

Two aspects of black hole entropy in Lanczos-Lovelock models of gravity; S. Kolekar, Dawood Kothawala and T. Padmanabhan; Phys. Rev. D 85, 064031 (2012).

Box of ideal gas in free fall; Dawood Kothawala; Phys. Letts. B 720,410 (2013).

Duality of force laws and conformal transformations; Dawood Kothawala; Am. J. Phys. 79, 6 (2011).

The Thermodynamic structure of Einstein tensor; Dawood Kothawala; Phys. Rev. D 83, 024026 (2011).

Dawood Kothawala

Assistant Professor

Ph.D.: Inter-University Centre for Astronomy and Astrophysics, Pune (2010)

Post-doctoral Fellowship: Dept. of Mathematics and Statistics, University of New Brunswick, Fredericton, Canada (2010-2012)

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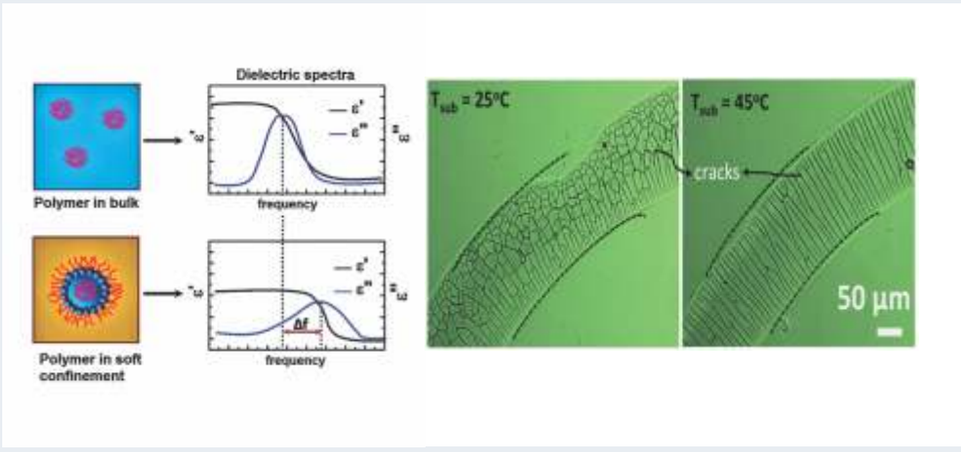
Email: dawood@iitm.ac.in

Awards and Recognitions

- INSPIRE Faculty Award awarded by the DST, India (2012)
- Gravity Research Foundation Essay Competition: Honorable Mention for the essay titled "Holography, Quantum Gravity and Confinement" (with Prof. Viqar Husain) (2012)
- Postdoctoral Fellowship awarded by AARMS, Canada (2012)
- 60th Lindau Nobel Laureate Meeting: Selected for participation in this prestigious meeting held at Germany; one of the 9 nominees of Siemens AG across the world (2010)
- Dr. Shyama Prasad Mukherjee Fellowship awarded by the CSIR, India (2005-2010)
- National Rank 2 in JEST, Physics (2005)
- National Rank 4 in GATE, Physics (2005)

Research Interests

- Small scale structure of spacetime and quantum gravity
- Statistical mechanics in curved spacetime
- Black hole thermodynamics



Dillip Kumar Satapathy

Associate Professor

Ph.D.: Faculty of Mathematics and Natural Sciences, Humboldt University, Berlin, Germany (2005)

Post-Doc: Swiss Light Source, PSI Switzerland (2006-2009)

Post-Doc: Department of Physics, University of Fribourg, Switzerland (2009-2012)

Assistant Professor: IIT Madras (Since 2012)

Phone: +91 44 2257 4899

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Awards and Recognitions

- Institute Research and Development Award (Early Career level), IIT Madras (2018)
- Young Scientist Award, Academy of Sciences, Chennai (2017)
- Young Faculty Recognition Award, IIT Madras (2017)

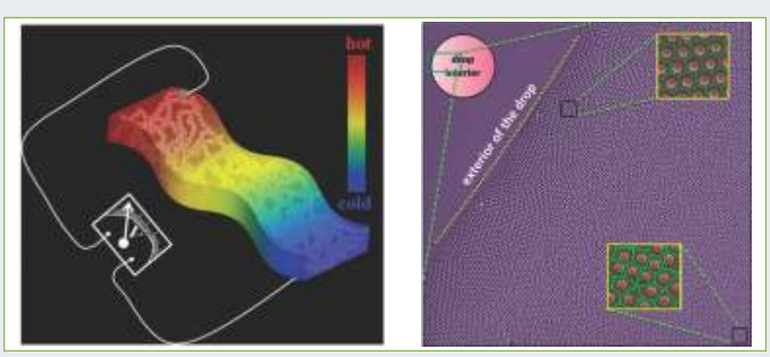
Research Interests

- Swelling kinetics, wrinkling and cracking of thin polymer films
- Self assembly of colloids and surfactants
- Stimuli responsive biopolymer membranes
- Ferroelectric and Thermoelectric Polymers
- X-ray and Neutron scattering characterization of materials

Selected Publications

Water Desorption from a Confined Biopolymer; L. Pradipkanti and D. K. Satapathy; Soft Matter, **14**, 2163-2169 (2018).

Cracks in dried deposits of hematite ellipsoids: Interplay between magnetic and hydrodynamic torques; Hisay Lama, Ranajit Mandal, M. G. Basavaraj, and D. K. Satapathy; Journal of Colloid and Interface Science, **510**, 172-180 (2018).



Loosely Packed Monolayer Coffee Stains in Dried Drops of Soft Colloids; M. Mayarani, M. G. Basavaraj and D. K. Satapathy; Nanoscale, **9**, 18798-18803 (2017).

Enhancement in Elastic Bending Rigidity of Polymer Loaded Reverse Microemulsions; P. M. Geethu, I. Yadav, V. K. Aswal and D. K. Satapathy; Langmuir, **33**, 13014-13026 (2017).

Stratification and Two Glass-Like Thermal Transitions in Aged Polymer Films; L. Pradipkanti, Mithun Chowdhury and D. K. Satapathy; Physical Chemistry Chemical Physics, **19**, 29263-29270 (2017).

Tailoring crack morphology in coffee-ring deposits via substrate heating; Hisay Lama, M. G. Basavaraj and Dillip K. Satapathy; Soft Matter, **13**, 5445-5452 (2017).

Soft confinement effects on dynamics of hydrated gelatin; P. M. Geethu, I. Yadav, S. K. Deshpande , V. K. Aswal and D. K. Satapathy; Macromolecules, **50**, 6518-6528 (2017).

Selected Publications

Conceptual Design and Assessment of Profiled Fresnel Lens Daylight Collector; M. G. Nair, A. R. Ganesan and K. Ramamurthy; Lighting Research & Technology, DOI: 10.1177/1477153514535421, (2014).

Nanocrystalline Samarium Oxide Coated Fiber Optic Gas Sensor; B. Renganathan, D. Sastikumar, R. Srinivasan and A. R. Ganesan; Mat.Sci. & Engg.,B, 186, 122-127, (2014).

Daylight enhancement using laser cut panels integrated with a profiled Fresnel Collector; M. G. Nair, A. R. Ganesan and K. Ramamurthy; Lighting Research & Technology, DOI: 10.1177/1477153514556524, (2015).

Influence of Annealing on Optical Fiber Gas Sensing Properties of TiO_2 Nanomaterial; B. Renganathan and A. R. Ganesan; International Journal of Chem. Tech, 7 (2), 878-883, (2015).

Tolerance analysis of misalignment in an Optical System using Shack Hartmann Wavefront Sensor; K. Venkatramana, V. C. Preetheesh Kumar, K. Kannan and A. R. Ganesan; An experimental study", Opt. Engg., 54(7), 075104, (2015).

Design of an anidolic concentrator and evaluation of daylight enhancement under an overcast sky"; M. G. Nair, A. R. Ganesan and K. Ramamurthy; Lighting Research & Technology , 48, 917-929 , (2016).

Effective Medium Based Plasmonic Waveguides for Tailoring Dispersion; M. Balasubrahmaniyam, T. Abhilash, A. R. Ganesan and S. Kasiviswanathan; IEEE Photonics Technology Letters, 27, 1965-68, (2015).

Increasing the sensitivity for tilt measurement using a cyclic interferometer with multiple reflections; V. C. Preetheesh Kumar, C. Joenathan, A. R. Ganesan and U. Somasundaram; Opt. Engg., 55 (8) 084103(2016), Applied Optics, 57(7), (2018).

Ganesan A R

Professor

Ph.D: IIT Madras (1989)

Post Doc: Institute for Advanced Studies, Univ. of Malaysia

Post Doc: Alabama A & M University, USA

Post Doc: Univ. of Oldenburg, Germany

Visiting Scientist: DRDO, Dehradun

Assistant Professor: NIT Trichy (8 years)

Associate Professor: IIT Madras (Since 2006)

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Awards and Recognitions

- Recipient of Alexander von Humbolt Fellowship from Germany
- Principal Investigator for 7 sponsored research projects and 4 consultancy projects of more than Rs. 1.5 crore funding
- Has been teaching courses in Optics, Lasers, Instrumentation, Electrodynamics and Electronics

Research Interests

- Applied and Adaptive Optics
- Holography and Speckle
- Fiber Optic Sensors
- Interferometry & Optical Instrumentation
- Vision Science and Biomedical Imaging
- Solar light collection

Harish Kumar N

Professor

Ph.D: University of Hyderabad (1996)

Visiting Fellow: TIFR, Mumbai (1996-1998)

Guest Scientist: FZK, Germany (1998-1999)

Visiting Scientist: IGCAR, Kalpakkam (2000-2001)

Lecturer: BITS-Pilani (2001-2003)

Assistant Professor: IIT Madras (2003-2010)

Associate Professor: IIT Madras (2010-2015)

Professor: IIT Madras (Since 2015)

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Research Interests

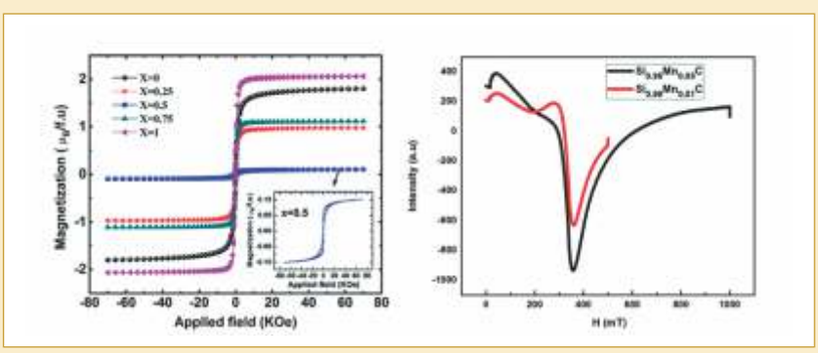
- Half metals
- Dilute Magnetic Semiconductors
- Complex Magnetic Phases
- Nanostructured Magnetic Materials
- Superconductivity

Selected Publications

Near total magnetic moment compensation with high Curie temperature in $Mn_2V_{0.5}Co_{0.5}Z$ (Z=Ga,Al) Heusler alloys; P. V. Midhunlal, J. Arout Chelvane, U. M. Arjun Krishnan, D. Prabhu, R. Gopalan and N. Harish Kumar; J. Phys. D: Appl. Phys. 51, 075002, (2018).

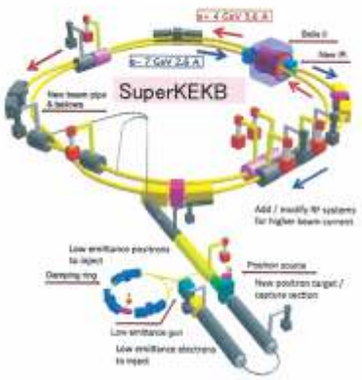
Magnetic and anomalous electronic transport properties of the quaternary Heusler alloys $Co_2Ti_{1-x}Fe_xGe$; B. Venkateswarlu, P. V. Midhunlal, P. D. Babu, N. Harish Kumar; Journal of Magnetism and Magnetic Materials, 407, 142, (2016).

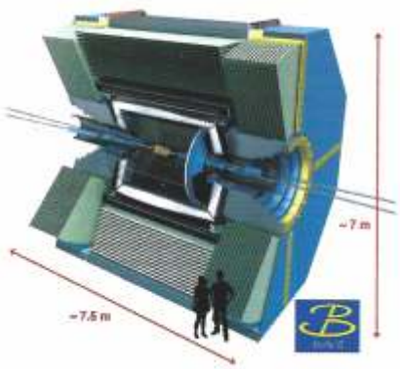
Complex Magnetic Behavior of the Heusler Alloy—$Cu_2Mn_{0.75}Fe_{0.25}Al$, B. Venkateswarlu, P. D. Babu, and N. H. Kumar; IEEE trans. Magn 50, 6971306, (2014).



Dielectric resonance and magnetic properties of Fe-3% doped $BaSnO_3$ thin films grown by pulsed laser deposition; K. Balamurugan, E. Senthil Kumar, B. Ramachandran, S. Venkatesh, N. Harish Kumar,M. S. Ramachandra Rao, and P.N. Santhosh, J. Appl. Phys. 111, 074107, (2012).

Investigation of atomic anti-site disorder and ferrimagnetic order in half-metallic Heusler alloy Mn_2VGa; K. Ramesh Kumar, N. Harish Kumar, P. D. Babu, S. Venkatesh and S. Ramakrishnan; J. Phys.: Condens. Matter 24, 336007, (2012)..

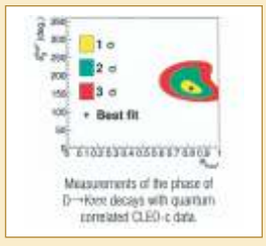




Selected Publications

P. K. Resmi et al., Quantum-correlated measurements of $D \to K^0_S \pi^+ \pi^- \pi^0$ decays and consequences for the determination of the CKM angle γ, JHEP 1801 082 (2018).

P. Krishnan et al. (Belle Collaboration), .First measurement of T-odd moments in $D^0 \to K^0 \pi^+ \pi^- \pi^0$ decays, Phys. Rev. D 95 no.9, 091101 (2017).

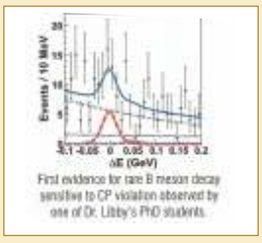


Measurements of the phase of D→Kππ decays with quantum correlated CLEO-c data.

M. Nayak et al., First determination of the CP content of $D \to \pi^+ \pi^- \pi^0$ and $D \to K^+ K^- \pi^0$," Phys. Lett. B 740 1 (2015).

H. Aihara et al. [Belle Collaboration], "First Measurement of ϕ_3, with a Model-independent Dalitz Plot Analysis of $B \to DK, D \to K^0_S \pi^+ \pi^-$ (Decay," Phys. Rev. D 85 112014 (2012).

J Libby et al. [CLEO Collaboration], "Model-independent determination of the strong-phase difference between D^0 and $\bar{D} \to K^0_S h^+ h^-$ ($h = \pi, K$) and its impact on the measurement of the CKM angle $= \gamma$," Phys. Rev. D 82 112006 (2010).



First evidence for rare B meson decay sensitive to CP violation observed by one of Dr. Libby's PhD students.

N. Lowrey et al. [CLEO Collaboration], "Determination of the $D^0 \to K^- \pi^+ \pi^-$ and D0 ---. $K^- \pi^+ \pi^+ \pi^-$ Coherence Factors and Average Strong - Phase Differences Using Quantum-Correlated Measurements," Phys. Rev. D 80 031105 (2009).

M. Adinolfi etal., "Performance of the LHCb RICH photo-detectors and readout in a system test using charged particles from a 25-ns- structured beam," Nucl. Instrum. Meth. A 603 287 (2009).

James Frederick Libby

Professor

D.Phil: Experimental Particle Physics (DELPHI experiment), University of Oxford, UK (1999)

Post-doctoral Fellow: LHCb experiment, University of Oxford (1999-2000)

Post-doctoral Fellow: LHCb experiment. CERN, Switzerland (2000-2002)

Post-doctoral Fellow: BABAR experiment, Stanford Linear Accelerator Center, USA (2002 -2005)

Departmental Lecturer: LHCb and CLEO-c experiments, University of Oxford (2005-2009)

Assistant Professor: Belle, CLEO-c and INO experiments, IITM (2009-2010)

Associate Professor: Belle, BES III and INO experiments, IITM (2010-2018)

Professor: IIT Madras (Since 2018)

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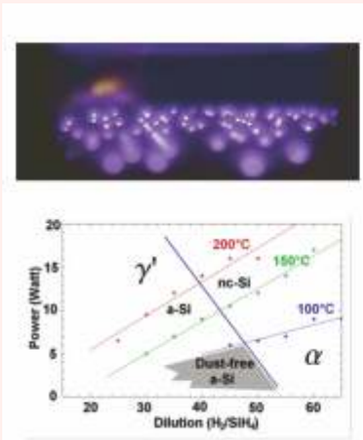
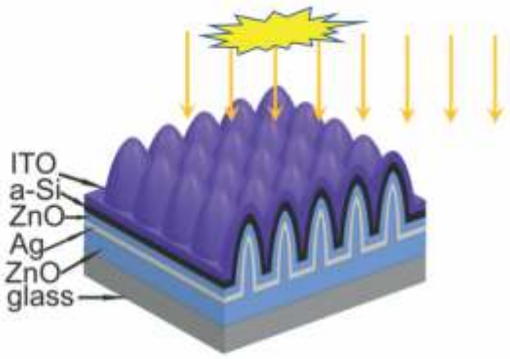
Awards and Recognitions

- Belle: Convenor $_3$ working group (2014-present)
- Belle II: Co-convenor of the B to charm hadron decay working group (2015-present)
- Belle II: Member of the Publication and Speakers boards of the experiment (2017-present)
- BES III: Co-convenor of the open charm working group (2017-present)





Optically Thick Electrically Thin Solar Cell

Jatindra Kumar Rath

Professor

Ph. D.: Physics IITM

United Nations Fellowship: Marburg University (Germany)

Tenured Faculty: Utrecht University, The Netherlands

Group Leader: Physics of Devices, Utrecht University @ Phillips High Tech Campus, Eindhoven, The Netherlands

Phone: +91 44 2257 4855

Email: jkr@iitm.ac.in

Awards and Recognitions

- Holder of "Basic Univ. Teaching Qualification Certificate", Utrecht University.
- Certified "Emergency Response Officer. (Bedrijfshulpverlening or BHV)"

Research Interests

Solar cells

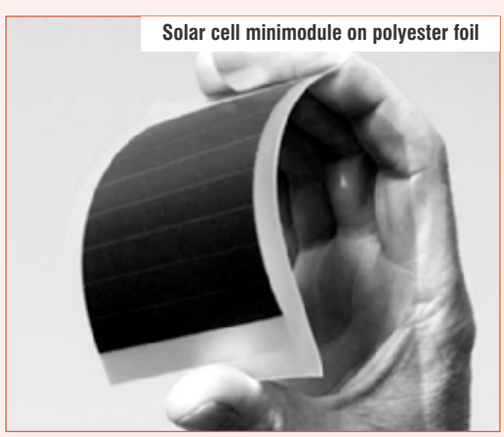
- 1st Gen : Silicon heterojunction c-Si/a-Si
- 2nd Gen :Thin film Single junction, multijunction tandem (a-Si, a-Si/a-SiGe,a-Si/nc-Si, a-Si/a-SiGe/nc-Si) Cell on glass, flexible cells (SS, PC, PET, PEN)
- 3rd Gen : Si/SiGe QD tandem, Upconversion, Intermediate Band gap, SHJ/-Perovskite tandem

Selected Publications

Decoupling high surface recombination velocity and epitaxial growth for silicon passivation layers on crystalline silicon; Kees Landheer, Monja Kaiser, Marcel A Verheijen, Frans D Tichelaar, Ioannis Poulios, Ruud E I Schropp and Jatin K Rath; Journal of Physics D: Applied Physics 50, 065305 (2017).

Recombination reduction at the c-Si/RCA oxide interface through Ar-H2 plasma treatment; K. Landheer, P.C.P.Bronsveld, I. Poulios, F.D. Tichelaar, M. Kaiser, R. E.I. Schropp and J. K. Rath; Applied Surface Science, 396, 1226-1230 (2017).

Note: Laser-cut molybdenum grids for a retarding field energy analyzer; K. Landheer, A. A. Kobelev, A. S. Smirnov, J. Bosman, S. Deelen, M. Rossewij, A. C. de Waal, I. Poulios, A. F. Benschop, R. E. I. Schropp and J. K. Rath; Review of Scientific Instruments, 88, 066108 (2017).



Solar cell minimodule on polyester foil

Inorganic photovoltaics - Planar and nanostructured devices; J. Ramanujam, A. Verma, B. González-Díaz, R. Guerrero-Lemus, C. Del Cañizo, E. García-Tabarés, I. Rey-Stolle, F. Granek, L. Korte, M. Tucci, J. Rath, U. P. Singh, T. K. Todorov, O. Gunawan and S.Rubio; Plaza, J.L., Diéguez, E.I, Progress in Materials Science, 82, 294-404 (2016).

(VHF) PECVD/HWCVD UHV 5 chamber cluster tool

Comparison of batch and in-line PECVD of a-Si:H passivation layers for silicon heterojunction solar cells; K. Landheer, M. Kaiser, I. Poulios and (...); Schropp, R.E.I., J.K. Rath, Physica Status Solidi - Rapid Research Letters, 10 (10) 725–729 (2016).

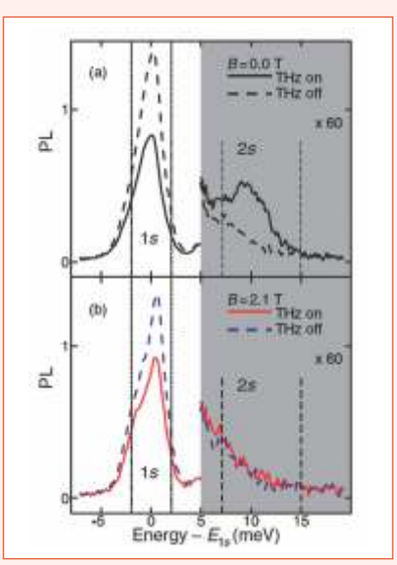
Utilization of geometric light trapping in thin film silicon solar cells: simulations and experiments; MM. De Jong, PJ. Sonneveld, J. Baggerman, CJM. Van Rijn and JK. Rath; Schropp, REI, Progress In Photovoltaics: Research and Applications, 22 (5) 540 (2014).

Elongated nanostructures for radial junction solar cells; YH. Kuang, M. Di Vece, JK. Rath and L. Van Dijk; Schropp, REI, Reports On Progress In Physics, 76 (10) 106502 (2013).

Selected Publications

Inter-sublevel dynamics in single InAs/GaAs quantum dots induced by strong terahertz excitation; D. Stephan, J. Bhattacharyya, Y. H. Huo, O. G. Schmidt, A. Rastelli, M. Helm and H. Schneider; Appl. Phys. Lett. 108, 082107, (2016).

Magnetic control of Coulomb scattering and terahertz transition among excitons; J. Bhattacharyya, S. Zybell, F. Eßer, M. Helm, H. Schneider, L. Schneebeli, C. N. Böttge, B. Breddermann, M. Kira, S. W. Koch, A. M. Andrews, and G. Strasser; Phys. Rev. B, 89, 125313, (2014).



Characterizing intra-exciton Coulomb scattering in terahertz excitations; S. Zybell, J. Bhattacharyya, S. Winnerl, F. Eßer, M. Helm, H. Schneider, L. Schneebeli, C. N. Böttge, M. Kira, S. W. Koch, A. M. Andrews, G. Strasser; Appl. Phys. Lett., 105, 201109, (2014).

In-plane interdot carrier transfer in InAs/GaAs quantum dots; J. Bhattacharyya, S. Zybell, S. Winnerl, M. Helm, M. Hopkinson, L. R. Wilson, and H. Schneider; Appl. Phys. Lett. 100, 152101, (2012).

Simultaneous time and wavelength resolved spectroscopy under two-colour near infrared and terahertz excitation; J. Bhattacharyya, M. Wagner, S. Zybell, S. Winnerl, D. Stehr, M. Helm,and H. Schneider; Rev. Sci. Instrum. , 82, 103107, (2011).

Jayeeta Bhattacharyya

Assistant Professor

Assistant Professor: IITM, Tamil Nadu, India (Since 2014)

Post-doctoral fellow: Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany (2009-2013)

Ph.D.: Tata Institute of Fundamental Research, Mumbai, India (2008)

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Awards and Recognitions

- Alexander-von-Humboldt Fellowship for postdoctoral research (2009-2011)
- Third prize for "Colloquium for Young Physicists 2007", SINP, Kolkata, 2007

Research Interests

- Spectroscopic study of semiconductor heterostructures
- Investigation of carrier dynamics
- Optical polarization anisotropy
- THz spectroscopy

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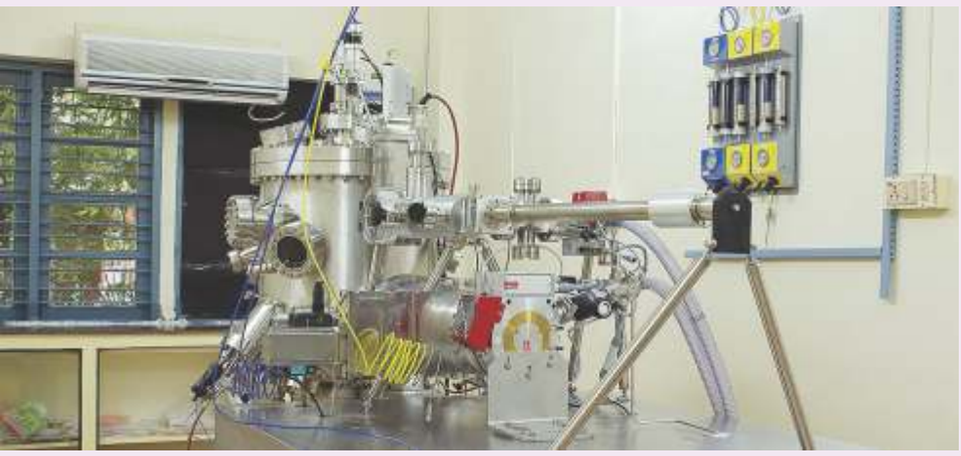
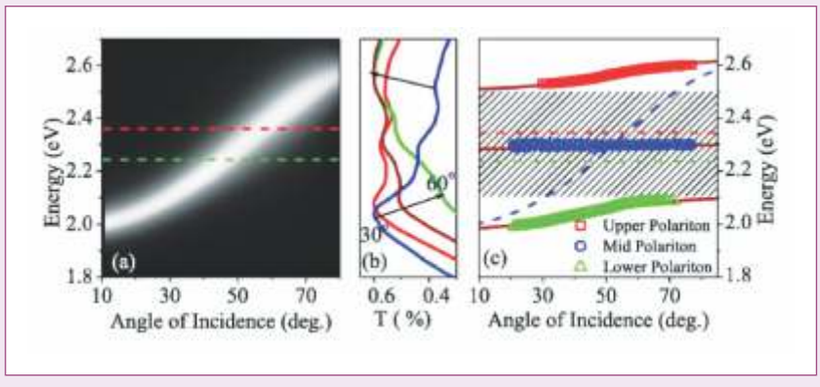


Selected Publications

Size-dependent persistent photocurrent and its origin in dc sputtered indium oxide films under UV and subbandgap illuminations; Prabal Sen, M. Balasubramanian, Durgesh Kar and S. Kasiviswanathan; J. Appl. Physics 121, 185303 (2017).

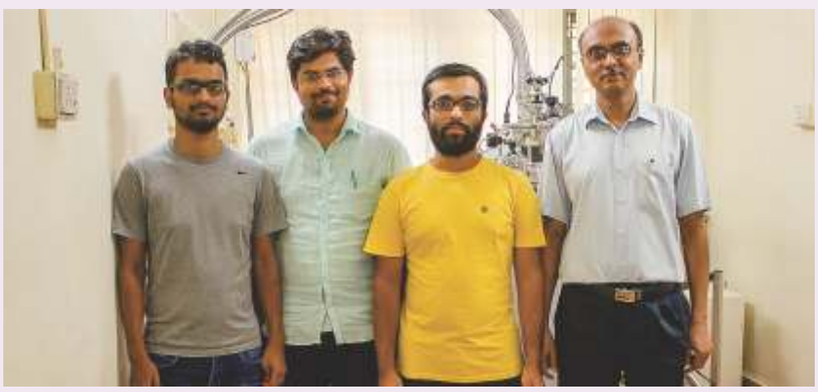
Observation of subwavelength localization of cavity plasmons induced by ultra-strong exciton coupling; M. Balasubrahmaniyam, Durgesh Kar, Prabal Sen, Prem B. Bisht and S. Kasiviswanathan; Appl. Phys. Lett. 110, 171101 (2017).



Effective medium based optical analysis with finite element method simulations to study photo-chromictransitions in Ag-TiO2 nanocomposite films; T. Abhilash, M. Balasubrahmaniyam, and S. Kasiviswanathan; J. Appl. Phys. 119, 123014 (2016).

Effective medium based plasmonic waveguide for tailoring dispersion; M. Balasubrahmaniyam, T. Abhilash, A. R. Ganesan and S. Kasiviswanathan; IEEE Photon. Technol. Lett. 27, 1965 (2015).

Localized surface plasmon resonance in Au Nanoparticles embedded DC sputtered ZnO thin films; Anuradha Patra, M. Balasubrahmaniyam, Ranjit Laha, P. Malar, T. Osipowicz, A. Manivannan and S. Kasiviswanathan J. Nanosci. Nanotehnol. 15, 1805 (2015).



Kasiviswanathan S

Professor

Ph. D.: IIT Madras

DAAD Fellow: RWTH Aachen

Member: Task Force, IIT Hyderabad (2008-2009)

Received plaque at IIT Hyderabad: Teacher who made lasting positive influence on students (2009)

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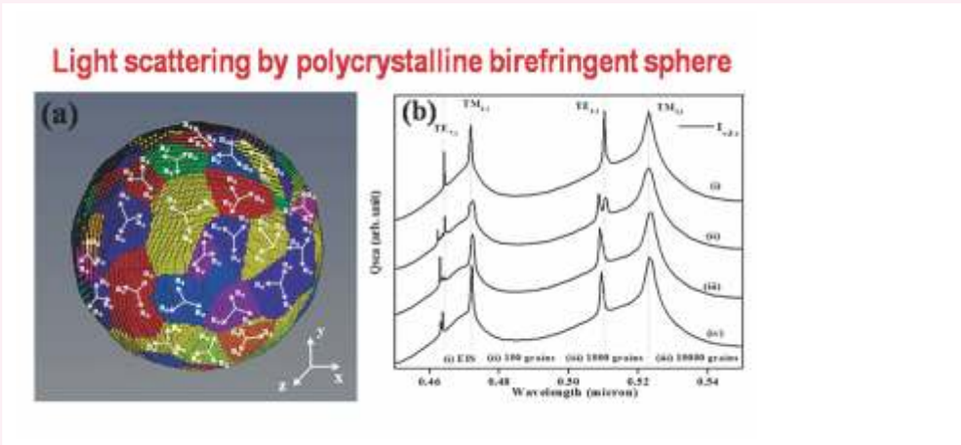
Research Interests

- Surface Plasmons, Coupled Plasmonic Systems, Oxide Thin Films



Krishnamurthy C V

Associate Professor

Ph.D.: Condensed Matter; Department of Physics, IIT Madras (1989)

Associate Professor: Measurements & Modeling Lab, Department of Physics, IIT Madras (Since 2010)

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Awards and Recognitions

A co-recipient of the prestigious DRDO Academy Excellence Award for 'Outstanding and Internationally recognized contribution in the field of NDT in collaboration with DRDO Laboratories leading to innovative and implementable products for DRDO Stakeholders' as an Associate of the Center for Nondestructive Evaluation, IIT Madras (Award for year 2015, received in April 2017

Research Interests

- Molecular dynamics of confined systems
- Modeling elastic, thermal and electro-magnetic properties of polycry-stalline and heterogeneous media using wave propagation characteristics
- Development of diagnostic tools for nondestructive evaluation and Imaging with ultrasound, electromagnetic spectrum

Patents

K Balasubramaniam, S Alavudeen, C V Krishnamurthy; Technique for imaging using array of focused virtual sources using phased excitation; US Patent 9,261,486 (2016)

Selected Publications

Structural behavior of supercritical fluids under confinement; Kanka Ghosh and C. V. Krishnamurthy; Phys. Rev. E 97, 012131, (2018).

Dendritic Growth of a Polymer on a 2D Mesoscale Square Lattice; Joel Martis, Kaushik Satapathy, P R Shaina, C V Krishnamurthy and Manu Jaiswal; arXiv:1711.10141v2 (2018).

Hot-rod thermography for in-plane thermal diffusivity Measurement; C. M. Basheer, C. V. Krishnamurthy and K. Balasubramaniam; Measurement 103, 235-240, (2017).

Static dielectric constant assessment from capacitance over a wide range of electrode separations; Gokul Raj .R and C. V. Krishnamurthy; Journal of Electrostatics 87, 19–25, (2017).

Scaling relations for parallel disc Capacitance with Dielectric media; C. V. Krishnamurthy and Gokul Raj .R; arXiv:1710.03703v1, (2017).

Anomalous diffusion of water at electrode interfaces through Impedance Spectroscopy; Satyanarayana Raju and C.V.Krishnamurthy; Roma Tre Congress on Water under extreme conditions, Rome (2017).

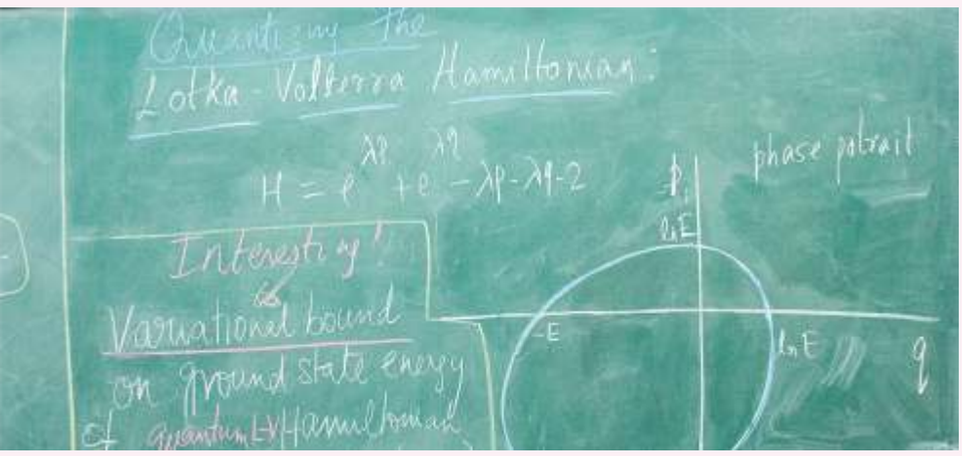
Confined Dynamics of Supercritical Fluids; Kanka Ghosh and C. V. Krishnamurthy; MOLSIM2017, Centre Europeen de Calcul Atomique et Moleculaire (CECAM), Van't Hoff Institute for Molecular Science, University of Amsterdam, The Netherlands, (2017).

Study of factors influencing performance of substrate backed FSS for millimeter wave atmopsheric remote sensing; Jayaprakash Poojali, Shaumik Ray, Bala Pesala, Krishnamurthy V. Chitti and Kavitha Arunachalam; 11th European Conference on Antennas and Propagation (EUCAP) (2017).

A Tri-Band Frequency Selective Surface (FSS) to Diplex Widely Separated Bands for Millimeter Wave Remote Sensing; Jayaprakash Poojali, Shaumik Ray, Bala Pesala, Krishnamurthy V. Chitti, Kavitha Arunachalam; Journal of Infrared, Millimeter, and Terahertz Waves, 37, 944-952, (2016).

Resonance Modes In Birefringent Polycrystalline Sphere, International Conference on Fibre Optics and Photonics; Imon Kalyan and C. V. Krishnamurthy; P1A. 8 (2016).

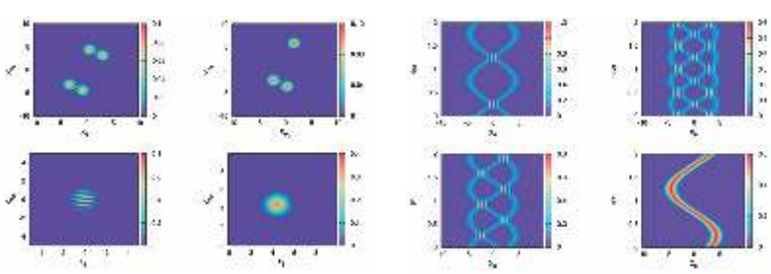
Design and validation of slot spiral antenna for stepped frequency ground penetrating radar, 17th International Radar Symposium (IRS); P. P. Patnaik, K. Arunachalam and C. V. Krishnamurthy; 1-4 (2016)



Selected Publications

Pradip Laha, S. Lakshmibala and V. Balakrishnan; J. Mod. Opt. doi:10.1080/09500340,1454527 (2018).

B Sharmila, K Saumitran, S. Lakshmibala and V. Balakrishnan; J. Phys. B: At. Mol. Opt. Phys. 50 045501 (2017).



Tomograms of select instants of time evolution of double-well Bose-Einstein condensate

Tomograms of select states of the radiation field

Signatures of nonclassical effects in optical tomograms; B. Sharmila, K Saumitran, S. Lakshmibala and V. Balakrishnan; J. Phys. B: At. Mol. Opt. Phys. 50 045501, (2017).

Pradip Laha, B. Sudarsan, S. Lakshmibala and V. Balakrishnan; Int. J. Theor. Phys. 55 4044 (2016).

Athreya Shankar, S. Lakshmibala and V. Balakrishnan; J. Phys. B: At. Mol. Opt. Phys. 47 215505 (2014).

Lakshmi Bala S

Professor

Ph.D.: Madras University (1987)

Post-doctoral Fellow: IIT Madras (1987-1991)

Assistant Professor: IIT Madras (1991-1999)

Associate Professor: IIT Madras (2000-2006)

Professor: IIT Madras (Since 2006)

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Awards and Recognitions

Teaching : Taught a variety of undergraduate postgraduate and Ph.D level courses and undergraduate and postgraduate labs in IIT Madras. Includes coordination of B.Tech and Ph.D courses. Have taught all the core courses at the postgraduate level. Guided several projects at the postgraduate and undergrMuate level, set curriculum for many UG and PG courses including the Minor Stream courses. Written pedagogical articles for undergraduate and postgraduate students, given an NPTEL course on quantum mechanics (available on YouTube and on the NPTELsite)

Research Interests

Papers in areas ranging from high energy physics, random walks, chaos and more recently quantum dynamics, and quantum optics

Mahaveer Kumar Jain

Associate Professor

Dr. Mahaveer Kumar Jain has done his Ph.D. at Physics Department, IIT Delhi. For his post doctoral work at University of Kentucky and Pennsyivania State University, USA. He has worked on various chemical and physical sensors using remote query magnetoelastic base materials. In another post doctoral research at RRCAT Indore, he has worked with transparent IR window materials like ZnS grown using chemical vapor deposition. He joined IIT Madras in Feb 2003 as Assistant Professor and is presently working here as Associate Professor Since July 2012

During his 26 year career in research, he has published 42 peer reviewed papers with H-index of 14. He has presented 41 papers in national and international conferences and guided 9 Ph.D. students.

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Research Interests

- Worked extensively on chemical sensors during his Ph.D. and post doctoral program. His current interest is in materiafs for energy appiications. Specifically he is interested in materials for photovoltaics like CZTS (Coper Zinc Tin Sulphide/Selenides)
- He has also developed materials for LED's like InGaN (a MI spectrum material)
- He has developed an industrially viable technique for depositing thin films called MARE (Modified Activated Reactive Evaporation)

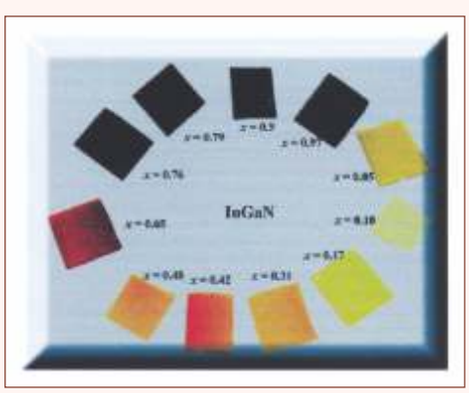
Selected Publications

Tailoring p-and n-type semiconductor through site selective oxygen doping in Cu3N: Density functional studies; Sahoo G., Kashikar R., Jain M.K. and Nanda B.R.K.; Materials Research Express 3 65902 (2016).

Room temperature growth of high crystalline quality Cu3N thin films by modified activated reactive evaporation; Sahoo G., Meher S.R. and Jain M.K.; Materials Science and Engineering B: Solid-State Materials for Advanced Technology 191 7-14 (2015).

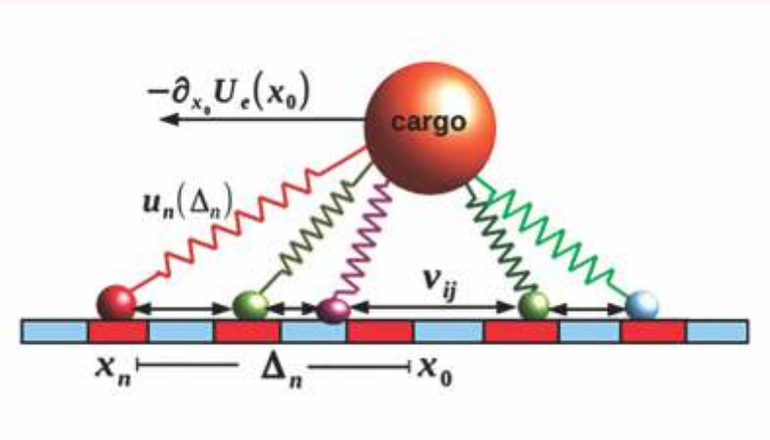
Composition-dependent structural, optical and electrical properties of in x Ga1-x N (0.5 ⩽ x ⩽ 0.93) thin films grown by modified activated reactive evaporation; Meher S. R., Subrahmanyam A., Jain M.K.;Journal of Materials Science 48 1196-1204 (2013).

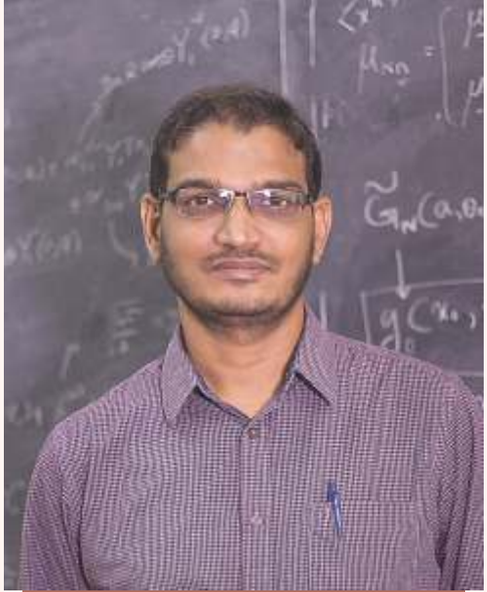
Impedometric anion sensing behaviour of InxGa1-xN film grown by modified activated reactive evaporation; S. R. Meher, Kuyyadi P. Biju and Mahaveer K. Jain; Applied Surface Science, 258 1744-9 (2011).



Role of charged species on the growth of GaN films by modified activated reactive evaporation; Kuyyadi P. Biju, S. R. Meher and Mahaveer K. Jain; Electrochem. Solid-State Lett., 14 H46-9 (2011).

Effect of post-annealing on the band gap of sol-gel prepared nano-crystalline MgxZn1-xO (0.0 ⩽ x ⩽ 0.3) thin films; Meher S.R., Biju K.P. and Jain Mahaveer K; Journal of Sol-Gel Science and Technology, 52 Pages 228-34. (Citation – 24; Impact factor – 1.525) (2009).





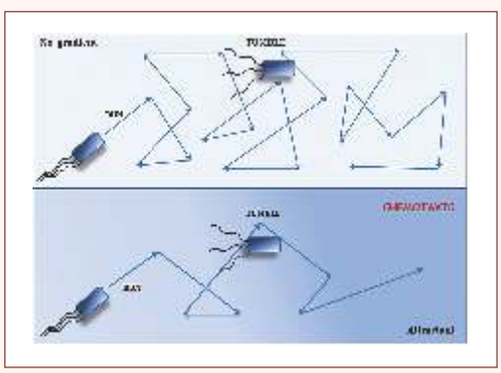
Selected Publications

Polymerisation force of a rigid filament bundle: diffusive interaction leads to sublinear force-number scaling; Jemseena Valiyakath and M Gopalakrishnan; Sci. Rep. 8: 2526, (2018).

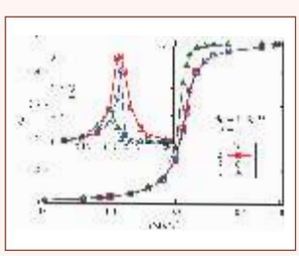
Utrasensitivity and fluctuations in the Barkai-Leibler model of chemotaxis receptors in Escherichia coli; U Roy and M Gopalakrishnan; PloS one 12 (4), e0175309, (2017).

Stall force of a cargo driven by N interacting motor proteins; D. Bhat and M. Gopalakrishnan; EPL 117 (2), 28004, (2017).

Effects of aging in catastrophe on the steady state and dynamics of a microtubule population; V. Jemseena and M. Gopalakrishnan; Phys. Rev. E 91 (5): 052704, (2015).



Zero-order ultrasensitivity: A study of criticality and fluctuations using system size expansion; P. K. Jithinraj, Ushasi Roy and M. Gopalakrishnan; J. Theor. Biol. 344:1-11, (2014).



Microtubule catastrophe from protofilament dynamics; V. Jemseena and M. Gopalakrishnan; Phys. Rev. E 88(3): 032717, (2013).

Effectiveness of a dynein team in tug of war helped by reduced load sensitivity of detachment: evidence from study of bidirectional transport in D. discoideum; D. Bhat and M. Gopalakrishnan; Phys. Biol. 9 (4): 046003, (2012).

A first-passage-time theory of capture of chromosomes by microtubules in mitosis; M. Gopalakrishnan and B. S. Govindan; Bull. Math. Biol. 73: 2483-2506, (2011).

Manoj Gopalakrishnan

Associate Professor

Ph. D.: Institute of Mathematical Sciences (2001)

Research Associate: Virginia Tech, USA (2001 - 2004)

Guest Scientist: MPI-PKS, Dresden, Germany (2004 - 2006)

Fellow and Reader: Harishchandra Research Institute, Allahabad (2006 - 2008)

Assistant Professor: IIT Madras (2008-2014)

Associate Professor: IIT Madras (Since 2014)

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Research Interests

Biological Physics is a new and emerging multidisciplinary area of research. Biophysical processes in the cell take place in a highly noisy environment. I use concepts and tools from the theory of stochastic processes to study these phenomena, using mathematics and computer simulations. Specific subareas of interest include motor proteins, microtubule dynamics, signal transduction, biological information and bacterial chemotaxis.

Manu Jaiswal

Associate Professor

Ph.D.: Indian Institute of Science, Bangalore (2004-2008)

Max Planck Fellow: Max Planck Institute for Polymer Research, Mainz, Germany (2008-2009)

Post-Doc: Graphene Laboratory, National University of Singapore, Singapore (2009-2011)

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Awards and Recognitions

- Young Faculty Recognition Award, IIT Madras (2016)
- Young Scientist Award, Academy of Sciences, Chennai (2016)
- Prof. Anil Kumar Memorial Award for Best PhD Thesis in Physics, IISc., Bangalore (2009)
- GC Jain Memorial Award for Best Ph.D Thesis in Material Science, MRSI (2009)

Research Interests

- Low dimensional systems, Graphene
- Membrane aspects of 2D systems
- Dynamical properties of 2D systems
- Flexible Electronics
- Confined Water – structure and transport
- Mesoscopic Physics, Charge & Spin Transport
- Carbon Nanotubes, conducting polymers and other Carbon

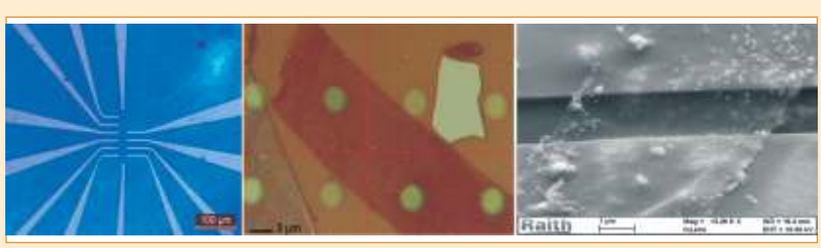
Selected Publications

Thickness-dependent crack propagation in uniaxially strained conducting graphene oxide films on flexible substrates; Tushar Sakorikar, MK Kavitha, V. Pramitha and Manu Jaiswal; Scientific Reports, 7, 2598, (2017).

Molecular doping of graphene across ultra-thin molybdenum disulphide spacers; Lijin George, P. R. Shaina, K. Afsal, and Manu Jaiswal; Physica Status Solidi: B, 254, 16000521, (2017).

Wrinkle and crack-dependent charge transport in a uniaxially strained conducting polymer film on a flexible substrate; Biporjoy Sarkar, Dillip Satapathy and Manu Jaiswal; Soft Matter, 13, 5437, (2017).

Estimating thermal expansion coefficient of graphene: the role of graphene-substrate interactions; P. R. Shaina, Lijin George, Vani Yadav, and Manu Jaiswal; Journal of Physics: Condensed Matter, 28, 085301, (2016).



Mechanical tearing of graphene on an oxidizing metal surface; Lijin George, A. Gupta, P. R. Shaina, Nandita Das Gupta and Manu Jaiswal; Nanotechnology, 26, 495701, (2015).

Confined water layers in graphene oxide probed with spectroscopic ellipsometry; Mandakranta Ghosh, L. Pradipkanti, V. Rai, D. K.Satapathy, V. Pramitha and Manu Jaiswal; Applied Physics Letters, 106, 241902, (2015).

Selected Publications

Magnetostriction and spin reorientation studies on $Sm_{0.9-x}Nd_xPr_{0.1}Fe_{1.93}$ ($x = 0, 0.12, 0.2, 0.24, 0.32, 0.36$) compounds; Rajasekhar P and Markandeyulu G;J. Magn. Magn. Mater., 448, 82-87 (2018).

Magnetic Properties of Nanocrystalline N-NFO Thin Films; Baby K.B.A., Markandeyulu G and Subrahmanyam A; IEEE Trans. Mag., 53, 7955054 (2017)

Structure-Property Correlations of Carbon and Nitrogen Incorporated $NiFe_2O_4$; Anoop Baby K.B., George L., Jaiswal M., Markandeyulu G and Subrahmanyam A; IEEE Trans. Mag., 53, 7959118 (2017).

Competing magnetic interactions and superparamagnetism like behaviour in $xNiFe_2O_4$ - $(1-x)BaTiO_3$ ($x = 0.2$ and 0.3) nano composites; Umashankar S., Parida T., Ramesh Kumar K., Strydom A.M., Markandeyulu G and Kamala Bharathi K; J. Magn. Magn. Mater., 439, 213-219 (2017).

Effect of frustrated exchange interactions and spin-half-impurity on the electronic structure of strongly correlated $NiFe_2O_4$; Ugendar K., Samanta S., Rayaprol S., Siruguri V., Markandeyulu G and Nanda B.R.K; Phys. Rev. B, 96, 35138 (2017).

Temperature Dependence of Magnetization, Anisotropy, and Hyperfine Fields of $NiFe_{2-x}Yb_xO_4$ ($x = 0, 0.05, 0.075$); Ugendar K., Reddy V.R and Markandeyulu G; IEEE Trans. Mag., 52, 7239577 (2016).

Anomalous Hall effect studies on Tb-Fe thin films; Rajasekhar P., Deepak Kumar K and Markandeyulu G; J. Magn. Magn. Mater., 412, 201-206 (2016).

Magnetoimpedance studies on ion irradiated $Co_{33}Fe_{33}Ni_7Si_7B_{20}$ ribbons; Kotagiri G., Markandeyulu G., Thulasiram K.V., Fernandes W.A., Misra D and Tribedi L.C; J. Magn. Magn. Mater., 404, 79-82 (2016).

Markandeyulu G

Professor

Ph. D.: IIT Madras

Post-Doc: IIT Kharagpur and TIFR

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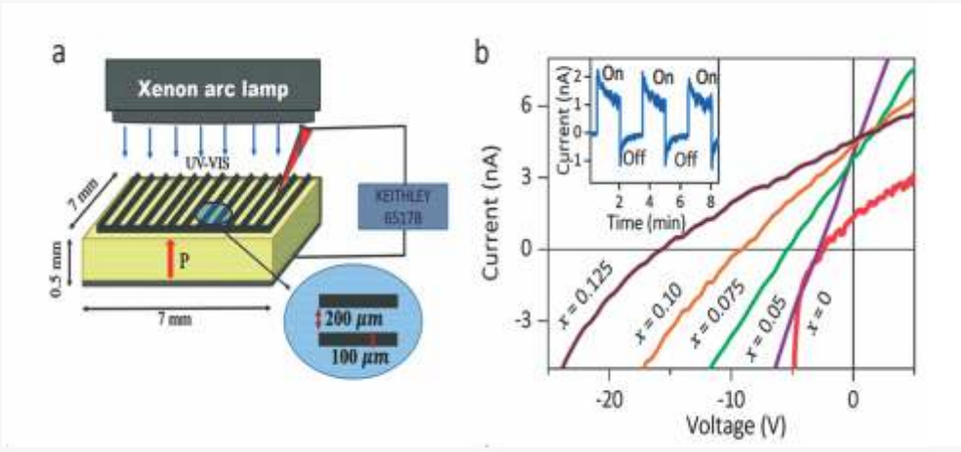
Research Interests

- Magnetoimpedance in Fe/Co rich ribbons. thin films and wires: Development of magnetic field sensors
- Magnetostriction and magnetoelectric effect in rare-earth and 5d-doped ferrites and rare-earth iron intermetallic compounds
- Rare earth substituted ferrite permanent magnetic materials



Murugavel P
Associate Professor

Ph.D.: IISc, Bangalore, India (2001)

Postdoctoral fellow: Seoul National Univ., Republic of Korea (2001-2003)

Postdoctoral fellow: CHRISMAT, CNRS, Caen, France (2003-2004)

Visiting Lecture, Seoul National Univ. Republic of Korea (2004-2006)

Assistant Professor: IIT Madras (2006-2014)

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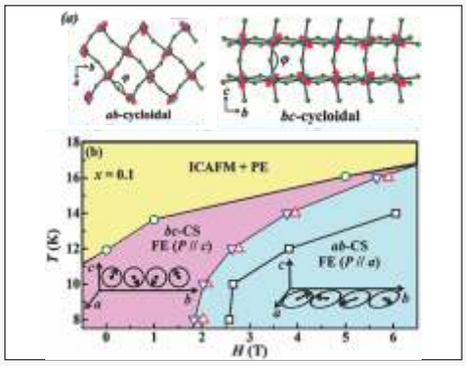
Research Interests

- Magnetoelectric composites
- Ferroelectric and ferroelectric photo-voltaics
- Single phase multiferroics
- Multiferroic heterostructures
- Oxide electronics and energy harvesting

Selected Publications

Investigations on the defect dipole induced pyroelectric current in multiferroic GdMnO3 system; A. Pal, C. Dhana Sekhar, A. Venimadhav, W. Prellier and P. Murugavel; J. Appl. Phys. 123, 014102 (2018).

Dipole pinning effect on photovoltaic characteristics of ferroelectric $BiFeO_3$ films; P. P. Biswas, Ch. Thirmal, S. Pal and P. Murugavel; J. Appl. Phys. 123, 024101(2018).



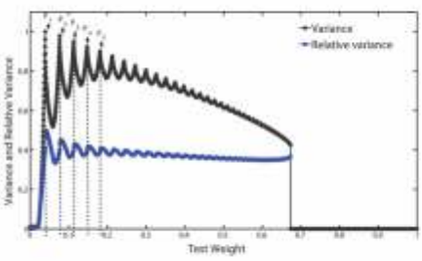
The role of precursors on piezoelectric and ferroelectric characteristics of 0.5BCT-0.5BZT ceramic; Atal Bihari Swain, V. Subramanian and P. Murugavel; Ceramics International 44, 6861(2018).

Photovoltaic and photo-capacitance effects in ferroelectric $BiFeO_3$ thin film; P.P. Biswas, CH. Thirmal, D. Dhayanithi, V. N. Giridharan, V. Subramanian and P. Murugavel; Appl. Phys. Lett.110, 192906 (2017).

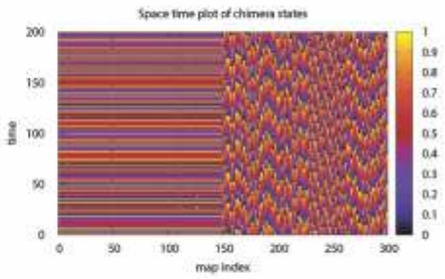
Tailoring of magnetic orderings in Fe substituted $GdMnO_3$ bulk samples towards room temperature; A. Pal, C. Dhana Sekhar, A. Venimadhav and P. Murugavel; J. Phys. Condens. Matter 29, 405803 (2017).

Study of ferroelectric characteristics of diisopropylammonium bromide films; C. Thirmal, P. P. Biswas, Y. J. Shin, T. W. Noh, N. V. Giridharan, A. Venimadhav and P. Murugavel; J. Appl. Phys. 120, 124107 (2016).

Spin-glass state in nanoparticulate (1-x)$(La_{0.7}Sr_{0.3}MnO_3)$-x$(BaTiO_3)$ solid solutions: Experimental and density-functional studies; C. Nayek, S. Samanta, Kaustuv Manna, A. Pokle, B. R. K. Nanda, P. S. Anil kumar and P. Murugavel; Phys. Rev. B 93, 094401 (2016).



Microtransitions in a network



Chimera states in a CML

Selected Publications

Dynamics of impurities in a 3-d volume preserving map; S. Das and N. Gupte; Phys. Rev. E, 90, 012906, (2014).

Bifurcations, crisis, unstable dimension variability and the spreading transition in the coupled sine circle map system; A. Das, Z. Jabeen and N. Gupte; The European Physical Journal Special Topics, 224, 2869, (2014).

The hidden geometry of traffic jamming; M. Andjelkovic, N. Gupte and B. Tadic; Phys. Rev. E 91, 052817, (2015).

Synchronization in area-preserving maps: Effects of mixed phase space and coherent structures; S. Mahata, S. Das and N. Gupte; Phys. Rev. E, 93,062212, (2016).

Spatial splay states and splay chimera states in coupled map lattices; J. Singha and N. Gupte; Phys. Rev. E, 94,052204, (2016).

Transport, diffusion, and energy studies in the Arnold-Beltrami-Childress map; S. Das and N. Gupte; Phys. Rev. E {\bf 96}, 032210, (2017).

The Simplicial Characterisation of TS Networks: Theory and Applications; N. Gupte, N. Nirmal Thyagu, Malayaja Chutani; DOI: 10.1007/978-3-319-52621-8-25, Proceedings of the 4th International Conference on Applications in Nonlinear Dynamics (ICAND 2016), 289-296 (Springer), 289-296, (2017).

Special section edited

Special section in Current Science: Women in Science, New Horizons in Research; S. K. Kulkarni and N. Gupte; Current Science Vol. 112, Issue 07, Guest Editors, (2017).

Neelima M Gupte

Chair Professor

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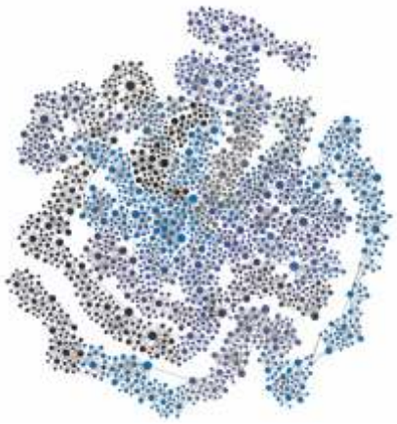
Awards and Recognitions

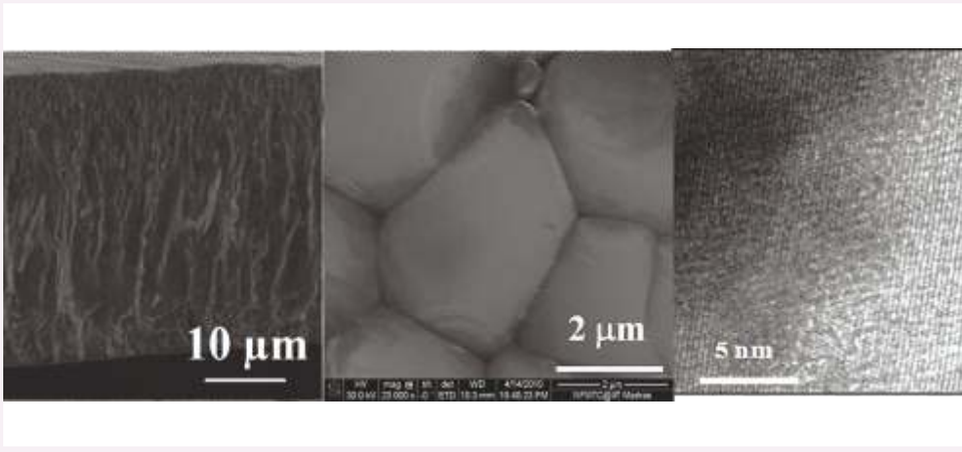
- Stree Shakti Science Samman (2006)

Research Interests

- Dynamical Systems and Statistical Physics
- Dynamics of extended systems, Complex Networks, Dynamics of impurities



A time series network



Nirmala R

Associate Professor

Ph.D: IIT Madras (2003)

Post-doc: TIFR, Mumbai;
IISc, Bangalore;
The Ames Laboratory, Lowa State University, USA &
SKKU, South Korea

Visiting Fellowship: SNU, South Korea

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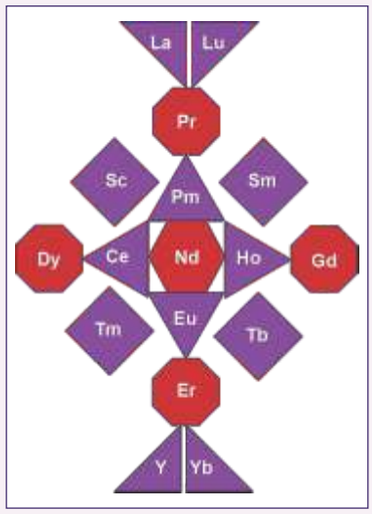
Research Interests

- Magnetism and Transport in Rare earth intermetallics and oxides
- Magnetic entropy changes near magnetic transitions
- Coexisting phases
- Magnetism in reduced dimensions
- Sponsoring agencies: IITMadras, DAE-BRNS, DST, DST-RFBR, UGC-DAE-CSR

Selected Publications

Magnetocaloric effect in textured rare earth intermetallic compound ErNi; Aparna Sankar, J. Arout Chelvane, A. V. Morozkin, A. K. Nigam, S. Quezado, S. K. Malik and R. Nirmala; AIP Advances 8, 056208, (2018).



Magnetocaloric effect across the metamagnetic transition in $Dy_5Si_2Ge_2$ single crystal; R. Nirmala, Chan Ik Lee and Yong Seung Kwon; Journal of Magnetism and Magnetic Materials 448 19-22, (2018).

Spin glass behavior in frustrated quantum spin system $CuAl_2O_4$ with a possible orbital liquid state; R. Nirmala, Kwang-Hyun Jang, Hasung Sim, Hwanbeom Cho, Junghwan Lee, Nam-Geun Yang, Seongsu Lee, R. M. Ibberson, K. Kakurai, M. Matsuda, S. W. Cheong, V. V. Gapontsev and S. V. Streltsov and Je-Geun Park; Journal of Physics: Condensed Matter 29 13LT01, (2017).

Effect of rapid quenching on the magnetism and magnetocaloric effect of equiatomic rare earth intermetallic compounds RNi (R = Gd, Tb and Ho); R. Rajivgandhi, J. Arout Chelvane, S. Quezado, S. K. Malik and R. Nirmala; Journal of Magnetism and Magnetic Materials 433 169, (2017).

Magnetocaloric effect in Rare earth intermetallics: Recent trends; R. Nirmala, A. V. Morozkin and S. K. Malik; Pramana – J. Phys. 84 977, (2015).

Pattabiraman M

Associate Professor

Ph.D.: IIT Madras (2003)

Post-Doc: Paul Drude Institute, Berlin

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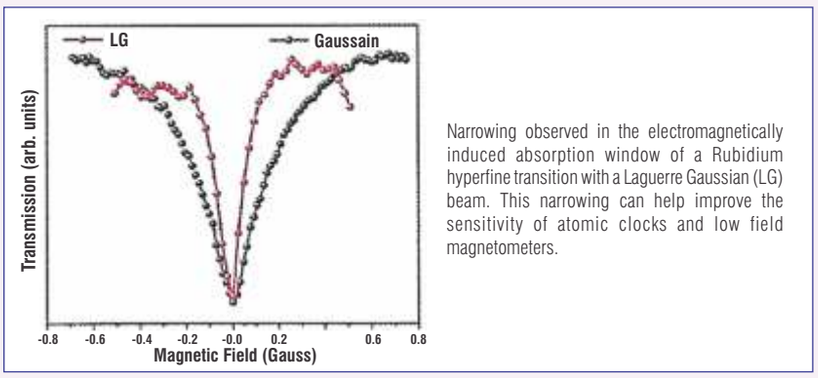
Selected Publications

Sign reversal of Hanle Electromagnetically Induced Absorption with orthogonal circularly polarized optical fields; Nibedita Ram and M. Pattabiraman; J. Phys. B: At. Mol. Opt. Phys, 43, 245503 (2010).

Effect of Ellipticity on Hanle Electromagnetically Induced Absorption and Transparency Resonances with Longitudinal and Transverse Magnetic fields; Nibedita Ram, M. Pattabiraman and C. Vijayan; Phys Rev A ,82, 033417 (2010).

Hanle electromagnetically induced transparency and absorption resonances with a Laguerre Gaussian beam; J. Anupriya, Nibedita Ram and M. Pattabiraman; Phys Rev A ,81, 043804 (2010).

Role of Transfer of Coherence in Enhanced Absorption Hanle Effect with Two Optical Fields; Nibedita Ram, J Anupriya, M. Pattabiraman, and C. Vijayan; J. Phys. B: At. Mol. Opt. Phys. 42, 175504 (2009).



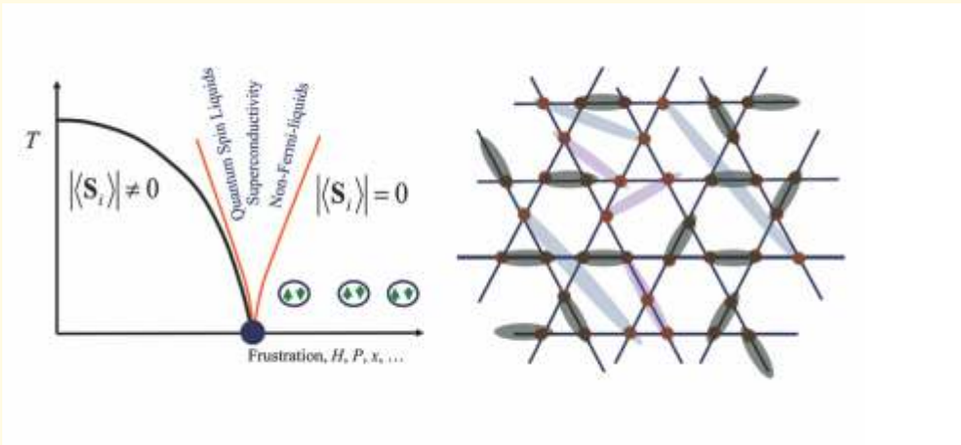
Narrowing observed in the electromagnetically induced absorption window of a Rubidium hyperfine transition with a Laguerre Gaussian (LG) beam. This narrowing can help improve the sensitivity of atomic clocks and low field magnetometers.

Awards and Recognitions

- Young Faculty Recognition Award 2011

Research Interests

- Study of coherent atom-electro-magnetic field interactions



Panchanana Khuntia

Assistant Professor

Ph.D.: IIT Bombay (2010)

Max Planck Fellow: Max Planck Institute, Dresden, Germany (2010-2013)

Visiting Scientist: Ames Laboratory, USA (2013-2014)

Marie Curie Fellow: Laboratoire de Physique des Solides, Orsay, France and Paul Scherrer Institute, Switzerland (2014-2016)

Assistant Professor: IIT Madras (Since 2016)

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Awards and Recognitions

- Marie Curie Intl. Incoming Fellowship
- Max Planck Fellowship
- US Department of Energy Fellowship
- European Union Network of Excellence Fellowship
- Outstanding Reviewer, Institute of Physics, UK
- National Merit Scholarship
- Editorial Board Member of Frontiers in Physics

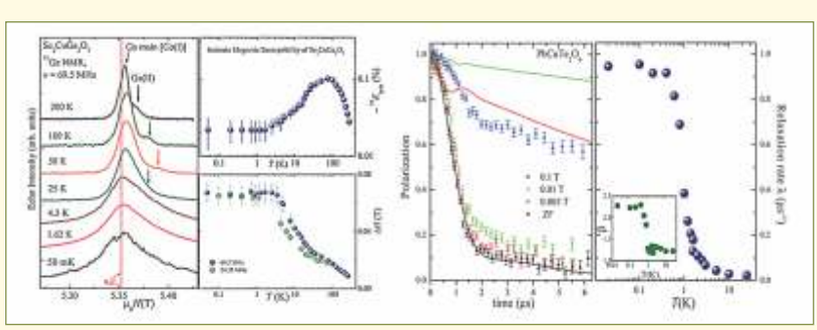
Research Interests

- Quantum Phase Transitions, Spin Liquids
- Topological Insulators
- Frustrated Magnets
- NMR, μSR and Neutron Scattering Techniques

Selected Publications

Contiguous 3*d* and 4*f* Magnetism: Strongly Correlated 3*d* Electrons in $YbFe_2Al_{10}$; P. Khuntia, P. Peratheepan, A. M. Strydom, Y. Utsumi, K. T. Ko, K. D. Tsuei, L. H. Tjeng, F. Steglich and M. Baenitz; Phys. Rev. Lett. 113, 216403 (2014).

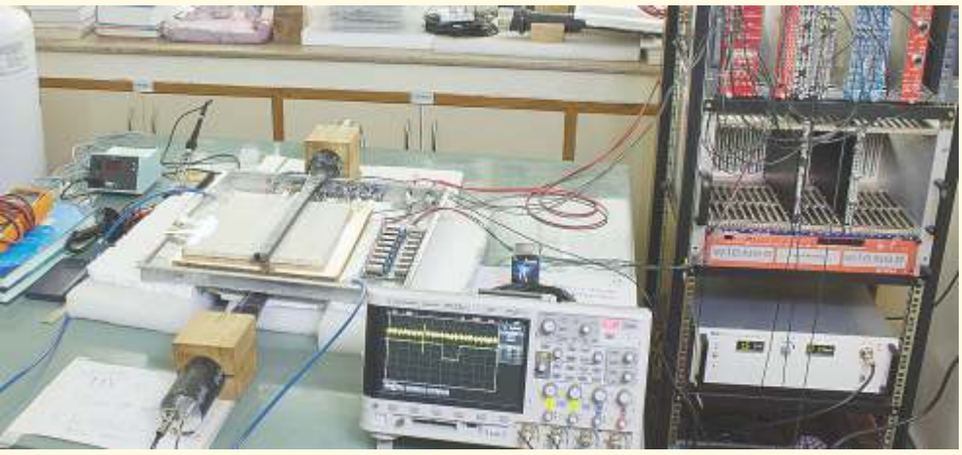
Design of compensated ferrimagnetic Heusler alloys for giant tunable exchange bias; Ajaya K. Nayak, Michael Nicklas, Stanislav Chadov, Panchanana Khuntia, Chandra Shekhar, Adel Kalache, Michael Baenitz, Yurii Skourski, Veerendra K. Guduru, Alessandro Puri, Uli Zeitler and Claudia Felser; Nature Materials 14, 679 (2015).



Spin Liquid State in the 3D Frustrated Antiferromagnet $PbCuTe_2O_6$: NMR and Muon Spin Relaxation Studies; P. Khuntia, F. Bert, P. Mendels, B. Koteswararao, A. V. Mahajan, M. Baenitz, F. C. Chou, C. Baines, A. Amato and Y. Furukawa; Phys. Rev. Lett. 116, 107203 (2016).

Symmetry Reduction in the Quantum Kagome Antiferromagnet Herbertsmithite; A. Zorko, M. Herak, M. Gomilsek, J. van Tol, M. Velazquez, P. Khuntia, F. Bert and P. Mendels; Phys. Rev. Lett. 118, 017202 (2017).

Field tuned critical fluctuations in YFe_2Al_{10}: Evidence from magnetization, ^{27}Al (NMR, NQR) investigations; P. Khuntia, A.M. Strydom, L. S. Wu, M. C. Aronson, F. Steglich and M. Baenitz; Phys. Rev. B 86, 220401 (R) (2012).



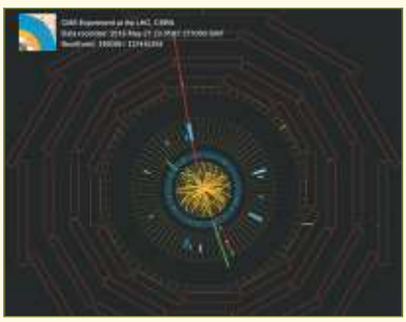
Selected Publications

A. Abashian, et al.; Muon identification in the Belle experiment at KEKB; Nucl. Instrum. Meth. A {bf 491}, 69 (2002). doi:10.1016/S0168-9002(02)01164-6

K. Abe, et al.; [Belle Collaboration], Production of prompt charmonia in e+ e- annihilation at s(1/2) is approximately 10.6-GeV,; Phys. Rev. Lett. {bf 88}, 052001 (2002) doi:10.1103/PhysRevLett.88.052001

K. Abe, et al.; [Belle Collaboration], Observation of double c anti-c production in e+ e- annihilation at s**(1/2) approximately 10.6-GeV; Phys. Rev. Lett. {bf 89}, 142001 (2002) doi:10.1103/PhysRevLett.89.142001

B. Aubert, et al; [BaBar Collaboration], Observation of $B ^ {+} to phi phi K ^ {+}$ and evidence for $B ^ 0 to phi phi K ^ 0$ below eta_c threshold; Phys. Rev. Lett. {bf 97}, 261803 (2006) doi:10.1103/PhysRevLett.97.261803



B. Aubert, et al; [BaBar Collaboration], Observation of an excited charm baryon Omega(C)* decaying to Omega(C)0 gamma; Phys. Rev. Lett. {bf 97}, 232001 (2006) doi:10.1103/PhysRevLett.97.232001

G. Aad, et al; ATLAS pixel detector electronics and sensors; JINST {bf 3}, P07007 (2008). doi:10.1088/1748-0221/3/07/P07007

G. Aad, et al; [ATLAS Collaboration], Observation of a new particle in the search for the Standard Model Higgs boson with the; ATLAS detector at the LHC Phys. Lett. B {bf 716}, 1 (2012) doi:10.1016/j.physletb.2012.08.020

K. Raveendrababu, P. K. Behera and B. Satyanarayana; Effect of electrical properties of glass electrodes on the performance of RPC detectors for the INO-ICAL experiment; JINST {bf 11}, no. 08, P08024 (2016) doi:10.1088/1748-0221/11/08/P0802

Prafulla Kumar Behera

Associate Professor

Ph.D: Utkal University, BELLE Experiment, Japan (2003)

Post-Doc: University of Pennsylvania, Philadelphia, U.S.A (2002-2006)

Assistant Research Scientist: University of Iowa, U.S.A

Visiting Associate Professor: IIT Madras (2011-2012).

Associate Professor: IIT Madras (Since 2012)

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Awards and Recognitions

- Coordinator for the detector simulation group, India"based Neutrino collaboration. Since 2011.
- Best participant award from the organizing committee of XXXIX International Symposium on Multiparticle Dynamics "Gold Sands", Gomel Region, Belarus, 4-9 September 2009.

Research Interests

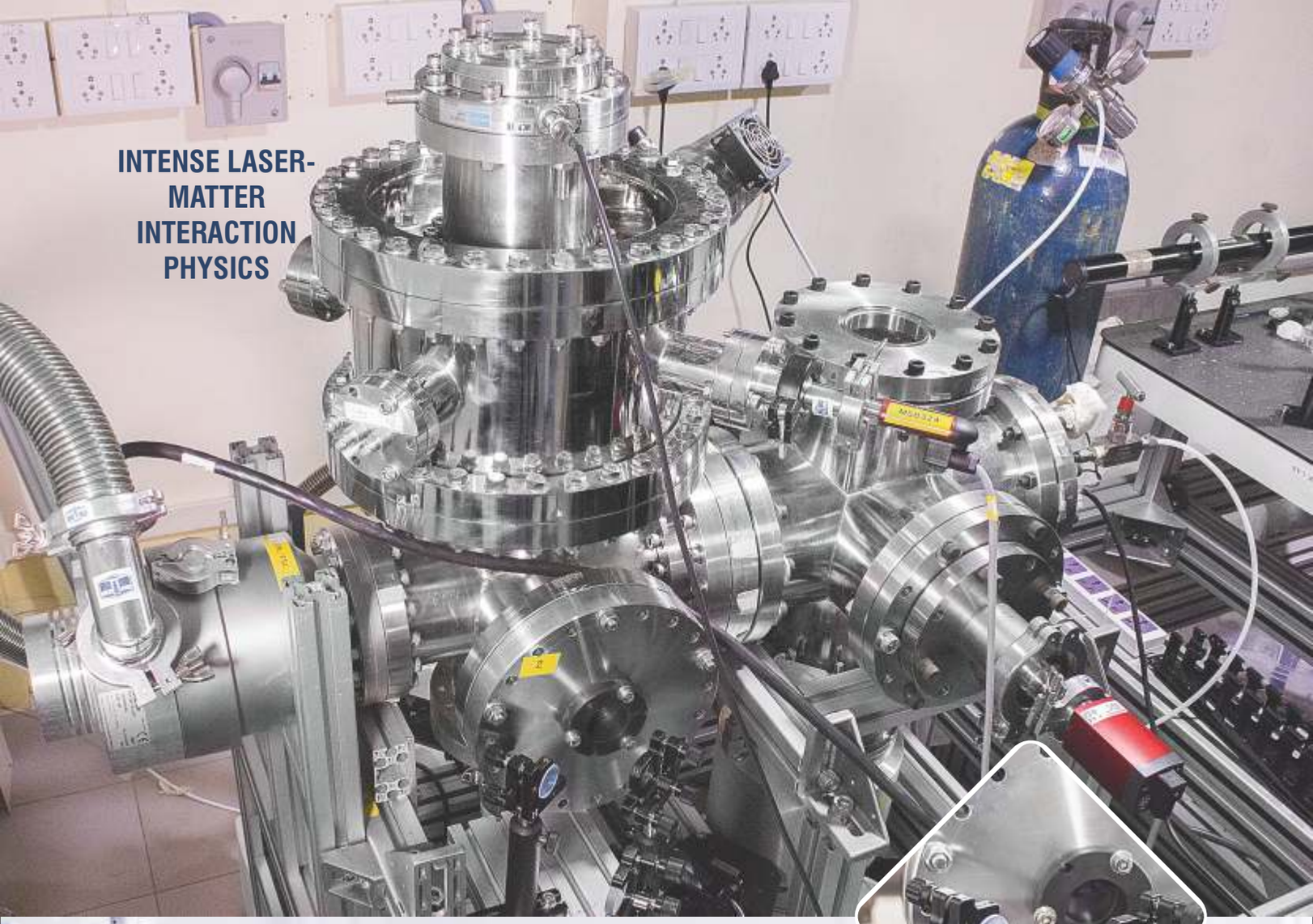
Experimental High Energy Physics

- BSM, SUSY and Dark matter searches using CMS experimental data. Detector (Silicon tracker and HgCal) development for Phase II upgrade for CMS experiment
- Detector development (RPC) and simulation for INO experiment
- Signature of BSM through precision measurement of SM parameter using BELLE-II data

ATOMIC FORCE MICROSCOPY

MFP-3D AFM SYSTEM WITH FLUID CELL

INTENSE LASER-MATTER INTERACTION PHYSICS



FEMTOSECOND LASER FACILITY

Prahallad Padhan

Associate Professor

Ph.D.: IIT Kanpur (2004)

Post-Doc: CRISMAT, Caen, France (2003-2006)

Post-Doc: MINT, UA, Tuscaloosa, Alabama, USA (2006-2008)

Assistant Professor: IIT Madras (2008-2015)

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Awards and Recognitions

- Indo-French bilateral postdoctoral fellowship (2003)
- CNRS postdoctoral fellowship (2006)
- LAFICS visiting fellowship (2010 & 2013)
- Best Poster Presentation Award: Intl. Conference on Nanoscience, Nanotechnology and Advanced Materials (2015)
- Best Poster Presentation Award: Intl. Conference On Laser Deposition (2017)

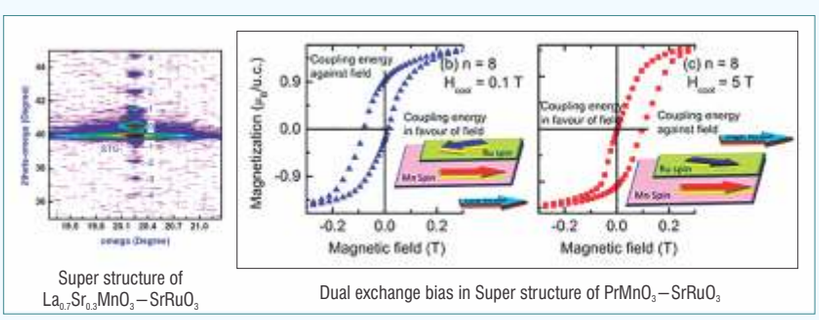
Research Interests

- Synthesis of nanostructured materials in the form of nanocrystal, nanowires, thin films, thin film heterostructures and superlattices.
- Explore the effect of structural and composition variations and probing the surface and interface properties of the heterostructured artificial materials for potential applications.
- Simulation of band structure to calculate various physical properties of the nanostructured artificial materials to understand the corresponding experimental result.

Selected Publications

Interfacial Antiferromagnetic Coupling and Dual-Exchange Bias in Tetragonal $SrRuO_3$–$PrMnO_3$ Superlattices; A. Sahoo, Prahallad Padhan, and W. Prellier; ACS Appl. Mater. Interfaces, 41, 36423 (2017).

Effect of $La_{0.7}Sr_{0.3}MnO_3$ crystal structures on magnetization of (111) oriented $La_{0.7}Sr_{0.3}MnO_3$ – $SrRuO_3$ superlattices; B. C. Behera, Prahallad Padhan and W. Prellier; J. Phys.: Condens. Matter 28, 196004 (2016).



Super structure of $La_{0.7}Sr_{0.3}MnO_3 - SrRuO_3$

Dual exchange bias in Super structure of $PrMnO_3 - SrRuO_3$

Influence of substrate in all-ferromagnetic superlattices; B. C. Behera, Prahallad Padhan and W. Prellier; J. Magn. Magn. Mater. 338, 22 (2015).

Tailoring of crystal phase and Neel temperature of cobalt monoxides nanocrystals with synthetic approach conditions; A. V. Ravindra, B. C. Behera, Prahallad Padhan, O. I. Lebedev, and W. Prellier; J. Appl. Phys. 116, 033912 (2014).

Raman spectra and magnetization of all-ferromagnetic superlattices grown on (110) oriented SrTiO3; B. C. Behera, A. V. Ravindra, Prahallad Padhan and W. Prellier; Appl. Phys. Lett. 104, 092406 (2014).

Structural phase transformation of nickel nanostructures with synthetic approach conditions; B. C. Behera, A. V. Ravindra and Prahallad Padhan; J. Appl. Phys. 115, 17B510 (2014).

Geometry	λ	u_0	$u_i, l \neq 0$	Stability
Lifshitz	-34	3	1	no
Bianchi II	$-\frac{27}{2}$	$\sqrt{2}$	$u_1 = u_2 = \frac{1}{2\sqrt{2}}$	no
Bianchi VI $h < 0$	$-1 + \frac{14h}{9} - h^2$	$\frac{1}{\sqrt{2}}(1-h)$	$u_1 = -\frac{1}{\sqrt{2}}h, u_2 = \frac{1}{\sqrt{2}}$	no
$Lif_{m_1}(2) \times M_l$	$-\frac{5\pi^2}{3}$	any $u_0 > 0$	0	yes
$AdS_2 \times M_l$	$-\frac{1}{3}$	1	0	yes
$Lif_{m_1}(2) \times M_O$	$-\frac{21}{5}$	$\sqrt{\frac{11}{2}}$	0	yes
$Lif_{m_1}(2) \times M^*$	$\lambda < 0$	any $u_0 > 0$	0	yes

Selected Publications

Supersymmetric Black Holes and Freudenthal Duality; Alessio Marrani, Prasanta K. Tripathy and Taniya Mandal; arXiv:1703.08669 [hep-th], 10.1142/S0217751X17501147, Int.J.Mod.Phys, A32 , no.19n20, 1750114 (2017).

New branches of non-supersymmetric attractors in $N =$ 2 supergravity; Prasanta K. Tripathy; arXiv:1701.00368 [hep-th], 10.1016/j.physletb.2017.04.068, Phys.Lett. B770 182-185 (2017).

On the Uniqueness of Supersymmetric Attractors; Taniya Mandal and Prasanta K. Tripathy; arXiv:1506.06276 [hep-th], 10.1016/j.physletb.2015.07.070, Phys.Lett. B749, 221-225 (2015).

$$x_1^a = \frac{1}{p^0}\left(p^a - \frac{D - \frac{1}{2}q_0 p^{0^2}}{D_c I^c{}_d p^d} I^a{}_b p^b\right)$$

$$x_2^a = \frac{1}{p^0}\left(1 - \left(\frac{D - \frac{1}{2}q_0 p^{0^2}}{D_c I^c{}_d p^d}\right)^2\right)^{1/2} I^a{}_b p^b$$

$$S = \frac{\pi}{p^0}\sqrt{4\left(D_a I^a{}_b p^b\right)^2 - \left(2D - q_0 p^{0^2}\right)^2}$$

The Geroch group in Einstein spaces; Robert G. Leigh, Anastasios C. Petkou, P. Marios Petropoulos and Prasanta K. Tripathy; arXiv:1403.6511 [hep-th], 10.1088/0264-9381/31/22/225006, Class.Quant.Grav. 31, no.22, 225006 (2014).

Generalized Attractors in Five-Dimensional Gauged Supergravity; Karthik Inbasekar and Prasanta K. Tripathy; arXiv:1206.3887 [hep-th], 10.1007/JHEP09(2012)003, JHEP 1209 003 (2012).

Non-Supersymmetric Stringy Attractors; Pramod Dominic and Prasanta K. Tripathy; arXiv:1109.6918 [hep-th], 10.1007/JHEP01(2012)030, JHEP 1201 030 (2012).

Prasanta Kumar Tripathy

Associate Professor

Ph.D.: IOP Utkal University (2001)

Department of Theoretical Physics, TIFR, Mumbai (2001-2004)

Arnold Somnerfeld Center for Theoretical Physics, LMU, Munich (2004-2005)

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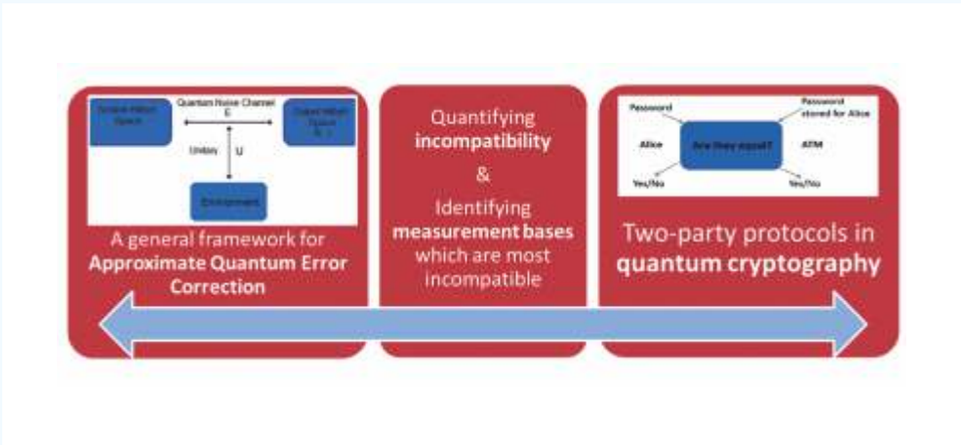
Research Interests

- Attractor Mechanism
- Black Holes
- Gauged Supergravity
- Flux Compactification



Prabha Mandayam

Assistant Professor

Ph.D.: California Institute of Technology (2011)

Post-Doctoral Fellow: Institute for Mathematical Sciences (IMSc), (2011-2014)
INSPIRE Faculty: Chennai Mathematical Institute, (April–July 2014)

Assistant Professor: Dept. of Physics, IIT Madras (Since 2014)

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Awards and Recognitions

- INSPIRE Faculty Award (2014-2019).

Research Interests

- Quantum Information Theory
- Quantum Error Correction and Quantum Cryptography
- Foundations of quantum theory

Selected Publications

Impact of local dynamics on entangling power; Bhargavi Jonnadula, Prabha Mandayam, Karol Życzkowski, and Arul Lakshminarayan; Phys. Rev. A 95, 040302, (2017).

Disturbance tradeoff principle for quantum measurements; P. Mandayam and M. D. Srinivas; Physical Review A 90, 062128, (2014).

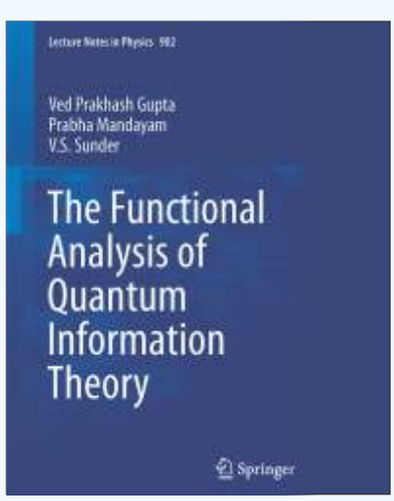
Unextendible MUBs from Pauli Classes; P. Mandayam, S. Bandyopadhyay, M. Grassl and W.K. Wootters, Quantum Information and Computing; 14, 0823, (2014).

Operational measure of incompatibility of non-commuting observables; S. Bandyopadhyay and P. Mandayam; Physical Review A 87, 042120, (2013).

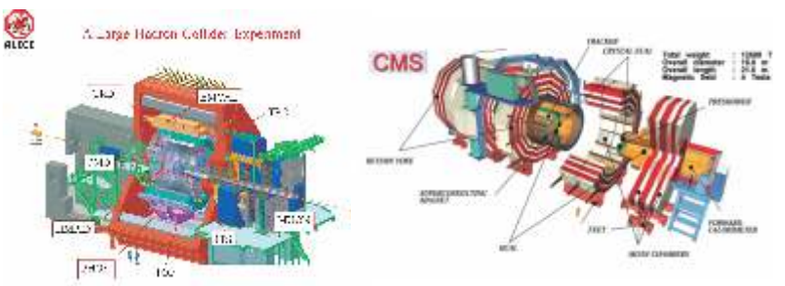
A transform of complementary aspects with applications to entropic uncertainty relations; P. Mandayam, N. Balachandran and S. Wehner; Journal of Mathematical Physics 51, 082201, (2010).

Simple approach to approximate quantum error correction based on the transpose channel; H.K. Ng and P. Mandayam; Physical Rev A 81, 062342, (2010).

Achieving the physical limits of the bounded-storage model; P. Mandayam and S. Wehner; Physical Review A 83, 022329, (2011).



Functional analysis of quantum information theory; V. Gupta, P. Mandayam and V.S. Sunder; Springer Lecture notes in Physics, 902, (2015).



Selected Publications

Flow dominance and factorization of transverse momentum correlations in Pb-Pb collisions at the LHC; Phys.Rev.Lett. 118 (2017) no.16, 162302; J. Adam et al. [ALICE Collaboration].

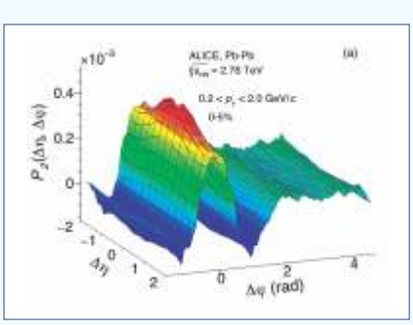
Insight into particle production mechanisms via angular correlations of identified particles in pp collisions at 7 TeV; Eur.Phys.J. C77 (2017) no.8, 569; J. Adam et al. [ALICE Collaboration].

Anomalous evolution of the near-side jet peak shape in Pb-Pb collisions at 2.76 TeV; Phys.Rev.Lett. 119 (2017) no.10, 102301; J. Adam et al. [ALICE Collaboration].

Higher harmonic flow coefficients of identified hadrons in Pb-Pb collisions at 2.76 TeV; JHEP 1609 (2016) 164; J. Adam et al. [ALICE Collaboration].

Pseudorapidity dependence of the anisotropic flow of charged particles in Pb-Pb collisions at 2.76 TeV; Phys.Lett. B762 (2016) 376-388; J. Adam et al. [ALICE Collaboration].

Charge-dependent flow and the search for the chiral magnetic wave in Pb-Pb collisions at 2.76 TeV; Phys.Rev. C93 (2016) no.4, 044903; J. Adam et al. [ALICE Collaboration].



Multiplicity and transverse momentum evolution of charge-dependent correlations in pp, p–Pb, and Pb–Pb collisions at the LHC; Eur.Phys.J. C76 (2016) no.2, 86; J. Adam et al. [ALICE Collaboration].

Multiplicity dependence of jet-like two-particle correlation structures in p–Pb collisions at 5.02 TeV; B. Abelev et al. [ALICE Collaboration].

Correcting correlation function measurements; S. Ravan, P. Pujahari, S. Prasad, and C. A. Pruneau; Phys. Rev. C 89 (2014), 024906.

Prabhat R Pujahari

Assistant Professor

Ph.D.: IIT Bombay, India (2012)

Postdoctoral Fellow: ALICE experiment at LHC, CERN, Geneva, Switzerland. Wayne State University, Detroit, Michigan, USA (2012-2016)

Assistant Professor: CMS experiment at CERN, IITM (Since 2016)

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Awards and Recognitions

- Best Ph.D. thesis award for the year, IIT Bombay, (2011-2012)
- Best presentation and participant award received from the organizers of 'Hot Quarks' International conference, Las Negras, Spain, (2014)

Research Interests

My current research is in the field of experimental high-energy heavy ion physics. The theory of strong interactions known as quantum chromodynamics predicts that nuclear matter at high density and high temperature undergoes a phase transition, where the quarks and gluons are no longer confined to individual nucleons. The experimental detection of such a state called Quark Gluon Plasma (QGP) and study its various properties are the primary objectives of my research.

Prem B. Bisht

Professor

Ph.D.: Kumaun University, Naini Tai, India.

PDF: Institute for Molecular Science, Okazaki and Kyoto Institute of Technology, Kyoto, Japan.

Teaching UG and PGs: Basic Physics courses, Ultrafast lasers and applications, Laboratory courses.

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Awards and Recognitions

- Platinum Jubilee Lecture award for Physical Sciences, Indian Science Congress in Jammu (2014)
- IITM-BMBF Projects (2002-2004)
- JSPS Fellow (1995)
- MONBUSHO fellow (1991)

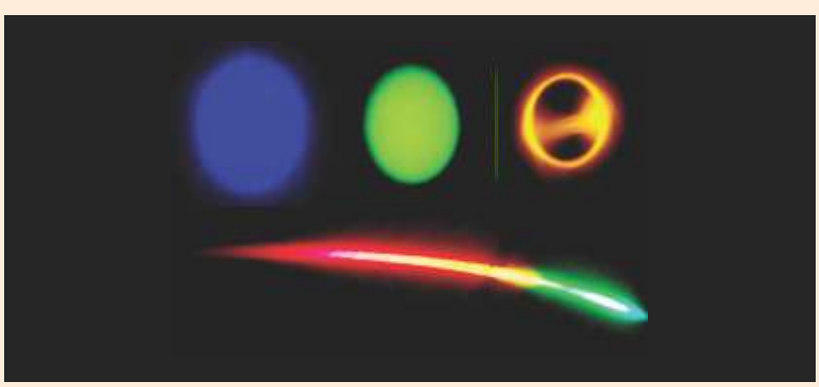
Research Interests

Ultrafast Laser Optics and Photonics, Optical Parametric Amplifiers, Time-Resolved Fluorescence Microscopy, Excitation Energy Transfer and Relaxation Processes, Charge transfer in 2D systems

Selected Publications

Broad band nonlinear optical parameter measurements using a single white light Z-scan; Soumyodeeep Dey , Sudhakara Reddy Bongu and Prem B. Bisht; Journal of Applied Physics 121 113107, (2017).

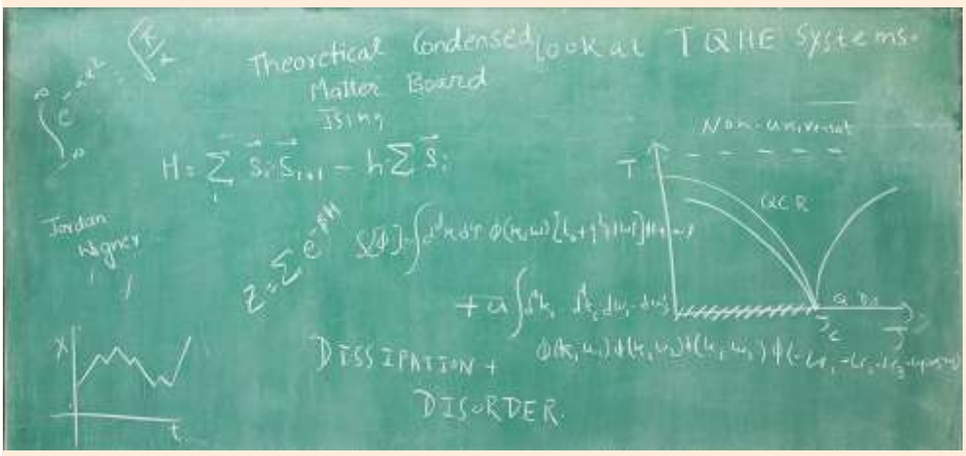
Control over the charge transfer in dye-nanoparticle decorated graphene; Sudhakara Reddy Bongu, Aneesh V. Veluthandath, B. R. K. Nanda, Sundara Ramaprabhu, and Prem B. Bisht; Chem. Phys. Letters 644, 176-182, (2016).



Radiative rate modification in CdSe quantum dot-coated microcavity; Aneesh V. Veluthandath and Prem B. Bisht; Journal of Applied Physics, 118, 233102, (2015).

Influence of localized surface plasmons on Pauli blocking and optical limiting in graphene under femtosecond pumping; S.R. Bongu, P. B. Bisht, R.C.K. Namboodiri, P. Nayak, S. Ramaprabhu, T.J. Kelly, C. Fallon and J.T. Costello; Journal of Applied Physics, 116, 073101, (2014).

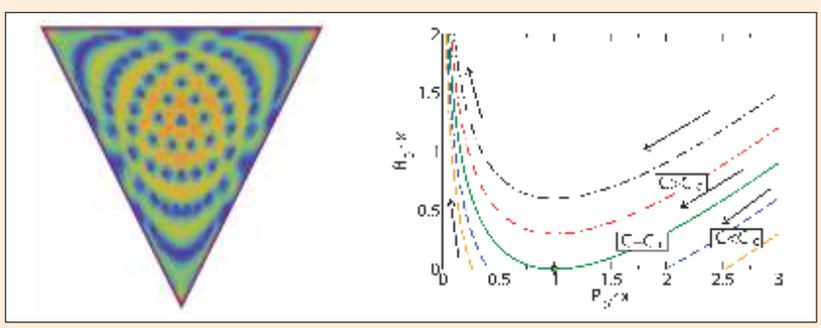
Enhanced short wave IR third order nonlinearity of gold nanoparticle embedded ZnO thin films; Ali SA, P. B. Bisht , Kalanoor B. S., Patra .A, Kasiviswanathan .S; J. Opt. Soc. Am. B, 30(8):2226-2232, (2013).



Selected Publications

Emergent infinite-randomness fixed points from the extensive random bipartitions of the spin-1 Affleck-Kennedy-Lieb-Tasaki topological state; Min Lu, Wen-Jia Rao, Rajesh Narayanan, Xin Wan, Guang-Ming Zhang; Phys. Rev. B 94, 214427, (2016).

Emerging criticality in the disordered three-color Ashkin-Teller model; Qiong Zhu, Xin Wan, Rajesh Narayanan, José A. Hoyos, Thomas Vojta; Phys. Rev. B 91, 224201, (2015).



Density of states in graphene with vacancies: midgap power law and frozen multifractality; V.Haefner, J. Schindler, N. Weik, T. Mayer, S. Balakrishnan, R. Narayanan, S. Bera, F. Evers; Phys. Rev. Lett. 113, 186802, (2014).

Localised zero-energy modes in the Kitaev model with vacancy-disorder; Santhosh G., V. Sreenath, Arul Lakshminarayan and Rajesh Narayanan; Phys. Rev. B 85, 054204, (2012).

Infinite randomness and "quantum"; Griffiths effects in a classical system: the randomly layered Heisenberg magnet}; Priyanka Mohan, Rajesh Narayanan and Thomas Vojta; Phys. Rev B. 82, 195445, (2010).

An Anomalously Elastic, Intermediate Phase in Randomly Layered Superfluids, Superconductors; and Planar Magnets, Priyanka Mohan, Paul M. Goldbart, Rajesh Narayanan, John Toner and Thomas Vojta; Phys. Rev. Lett. 105, 085301, (2010).

Rajesh Narayanan

Associate Professor

Ph.D.: (University of Oregon, Eugene (1999)

Post-doctoral fellowships:

Oxford University (1999-2001)

Max-Planck Institute for Physics of Complex Systems (2001-2003)

Institute of Nanotechnology, FZK (2003-2006)

Assistant Professor: IIT Madras (2006-2010)

Associate Professor: IIT Madras (Since 2010)

Visiting Associate Professor: Hongkong University

Visiting Professor: APCTP, Pohang, Korea

Visiting Position: Hong Kong University of Science and Technology and Zhejiang University, Hangzhou, China (2011-2012)

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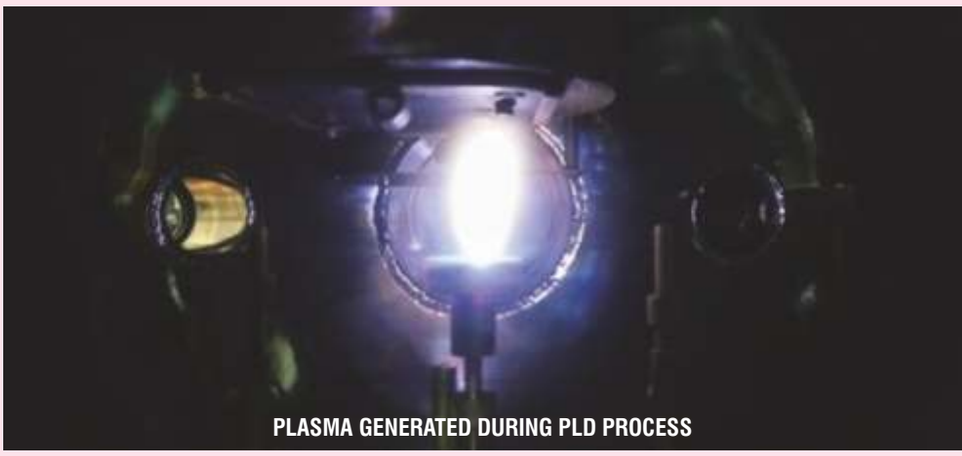
Research Interest

- Quantum Phase Transitions
- Disordered System
- Quantum Hall Effects
- Dissipative Systems
- Superconductivity
- Dynamical Mean Field Theory



PLASMA GENERATED DURING PLD PROCESS

Ramachandra Rao M S

Professor

M. Sc.: IIT Kharagpur (1983)

Ph.D.: IIT Kharagpur (1988)

Research Scientist: Solid State Physics lab, CNRS Bellevue, France (1990-1991)

Visiting Fellow: Solid State Electronics Group, TIFR, Bombay (1993-1994)

Visiting Faculty: IISER Trivandrum, (2015-Present)

BoG Member: IISER, Trivandrum (2017-Present)

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Awards and Recognitions

- Alexander von Humboldt Fellow (1999)
- FinstP: Fellow of Institute of Physics (since 2008)
- Visiting Faculty University of Maryland, College Park, MD 20742 (2003-2004)
- JSPS Fellow, Kyushu University, Japan (2007)
- Erasmus Mundus Foreign Academician (2007-present)
- DAAD STAR Professor, Walther Meissner Institute, Garching, Germany (2010)
- Visiting Prof., Dept. of Electrical Engg., Kyushu University, Fukuoka (2015-2016)

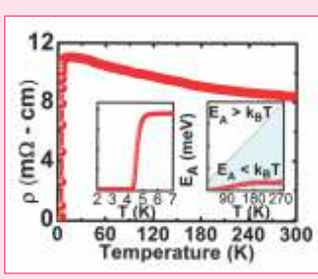
Research Interests

- Diamond: Superconductivity in diamond, NV centers, Mechanical applications.
- Spintronics; Spin transport in oxide interfaces and piezotronics

Selected Publications

Dinesh Kumar, Maneesh Chandran, and M. S. Ramachandra Rao; Appl. Phys. Lett. 110, 191602 (2017).

Mahmoud Abdel-Hafiez, Dinesh Kumar, R. Thiyagarajan, Q. Zhang, R. T. Howie, K. Sethupathi, O. Volkova, A. Vasiliev, W. Yang, H. K. Mao, and M. S. Ramachandra Rao; Phys. Rev. B 95, 174519, 25 (2017).



Resistivity vs temperature curve of superconducting boron doped diamond film. Inset shows T_c = 4.5 K and the activation energy curve demonstrating disordered type metallic behaviour in boron doped diamond

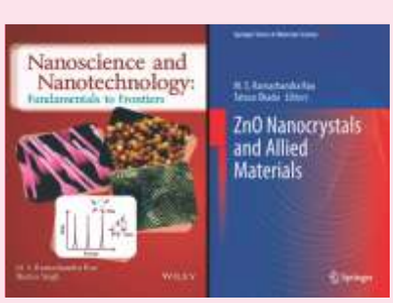
Joynarayan Mukherjee and M. S. Ramachandra Rao; Appl. Phys. Lett. 110, 122101 (2017).

Matthias Althammer, Joynarayan Mukherjee, Stephan Geprägs, Sebastian T. B. Goennenwein, Matthias Opel and M. S. Ramachandra Rao; Rudolf Gross Appl. Phys. Lett. 110, 052403 (2017).

Fabitha, K., and M. S. Ramachandra Rao; JOSA B 34.12, 2485-2492 (2017).

Joynarayan Mukherjee, Ramanjaneyulu Mannam and M S Ramachandra Rao; Semicond. Sci. Technol. doi: 10.1088/1361-6641 (2017).

A. V. Radhamani , K. Shareef and M. S. Ramachandra Rao; ACS Applied Materials and Interfaces,8 (44) (2016).



Kapil Gupta, Shubra Singh and M. S. Ramachandra Rao, Nanoenergy (11) 146-153 (2015).

Selected Publications

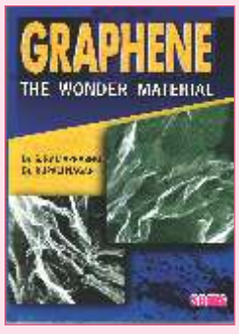
High- performance Platinum-free oxygen reduction reaction and hydrogen oxidation reaction catalyst in polymer electrolyte membrane fuel cell; C. Priji, Arpita Ghosh and S. Ramaprabhu; Scientific Reports, 8, 3591 (2018).

One-pot environment-friendly synthesis of boron doped graphene-SnO_2 for anodic performance in Li ion battery; Madhumita Sahoo and S. Ramaprabhu; Carbon, 127, 627-635, (2018).

Recent advances in hydrogen storage using catalytically and chemically modified graphene nanocomposites; Rupali Nagar, Bhaghavathi, P. Vinayan, Sai Smruti Samantaray, and S. Ramaprabhu; Journal of Materials Chemistry A, 5, no. 44: 22897-22912, (2017).

Palladium-nitrogen coordinated cobalt alloy towards hydrogen oxidation and oxygen reduction reactions with high catalytic activity in renewable energy generations of proton exchange membrane fuel cell; Arpita Ghosh, Priji Chandran and S. Ramaprabhu; Applied Energy, 208: 37-48, (2017).

An efficient and durable novel catalyst support with superior electron-donating properties and fuel diffusivity for a direct methanol fuel cell; Arpita Ghosh and S. Ramaprabhu; Catalysis Science & Technology 7, no. 21: 5079-5091, (2017).



High pressure investigation of Ionic liquid functionalized graphitic carbon nitride nanostructures for CO_2 capture; Sreetama Ghosh, S. Ramaprabhu; Journal of CO_2 utilization, 21: 89-99 (2017)

Theoretical Insights into the Experimental Observation of Stable p-Type Conductivity and Ferromagnetic Ordering in Vacuum-Hydrogenated TiO_2; Nechiyil, Divya, Manoharan Muruganathan, Hiroshi Mizuta, and Sundara Ramaprabhu; The Journal of Physical Chemistry C, 121, no. 26: 14359-14366, (2017).

Solar synthesized tin oxide nanoparticles dispersed on graphene wrapped carbon nanotubes as a Li ion battery anode material with improved stability;" Madhumita Sahoo, and S. Ramaprabhu; RSC Advances 7, no. 23: 13789-13797, (2017).

Ramaprabhu S

Institute Chair Professor

Ph.D.: IIT Madras

Post-Doc: Université de Genève, Switzerland & Technische Universität, Darmstadt, Germany

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Awards and Recognitions

- Alexander von Humboldt Fellow, Germany
- DAAD Fellow, Germany
- Visiting Fellow to Germany by BMBF & DFG German Science Foundations
- Visiting Fellow to JAIST, Japan
- Research excellence Indian citation award, Thomson Reuters (2015)
- Chair-Elect of Local section of India, American Nano Society (2017)
- Editorial Board Member of Journal of Nanofluids, Journal of Nanocommunication (American Scientific Publishers)

Research Interests

- Hydrogen Energy Technology, Nanotechnology, Fuel Cell Technology
- Synthesis of Carbon Nanotubes, Graphene, GQD, Metal Oxide NTs & their hybrid Composites
- Proton Exchange Membrane Fuel Cell, Direct Alcohol Fuel Cells, Hydrogen storage, Photovoltaic, Li ion-(S) battery, Na ion-(S) battery, Nano fluids, Nano lubricants, Super-capacitors, Gas sensors, biological sensors, EMI shielding, SHM, Water purification, CO_2 capture and conversion

Ranjit Kumar Nanda

Associate Professor

Ph.D.: IIT Bombay (2006)

Post-Doct: University of Missouri, USA (2005-2010)

Assistant Professor: IIT Madras (2011-2016)

Associate Professor: IIT Madras (Since 2016)

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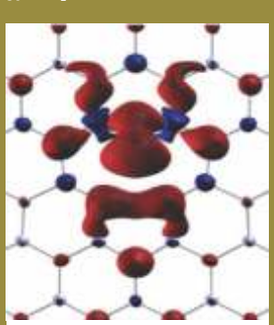
Research Interests

We solve the Hamiltonian of interacting electrons to provide a theoretical description of the physical properties of solids. Generally we use mean-field based methods such as density-functional theory (DFT) and tight-binding models within Hartree-Fock formalism for this purpose. The primary component of my research is to understand the interplay between the spin, charge and lattice degrees of freedom of electrons in crystalline solids. Tailoring new materials for application purposes is one of the important aspects of my research.

Areas of Interests: Magnetism in Strongly Correlated Oxides and 2D materials, Band Topology, CO_2 Reduction, Cathode Materials



Spin density in graphene with a vacancy

Selected Publications

Topologically Invariant Double Dirac States in Bismuth based Perovskites: Consequence of Ambivalent Charge States and Covalent Bonding; B. Khamari, R. Kashikar, and B. R. K. Nanda; Phys. Rev. B, 97, 045149 (2018).

Designing Non-Polar Metallic Interfaces using Insulating Transition Metal Olivine Phosphates; A. Jena, D. Murali and B. R. K. Nanda; Adv. Theory and Simulations, 1, 1700007 (2018).

Engineering Diffusivity and Operating Voltage in Lithium Iron Phosphate through Transition Metal Doping, Ajit Jena and B. R. K. Nanda; Phys. Rev. Applied, 7, 034007 (2017).

Effect of frustrated exchange interactions and spin-half-impurity on the electronic structure of strongly correlated NiFe2O4; K. Ugendar, S. Samanta, S. Rayaprol, V. Siruguri, G. Markandeyulu, B. R. K. Nanda, Phys. Rev. B, 96, 035138 (2017).

Enhancing CO_2 Electroreduction by Tailoring Strain and Ligand Effects in Bimetallic Cu-Rh and Cu-Ni Heterostructures; T. A. Maark and B. R. K. Nanda; J. Phys. Chem. C, 121, 4496 (2017).

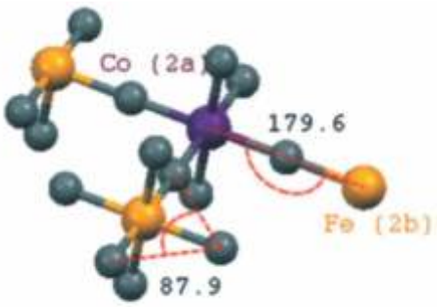
CO and CO_2 Electrochemical Reduction to Methane on Cu, Ni, and Cu_3Ni (211) Surfaces; T. A. Maark and B. R. K. Nanda; J. Phys. Chem. C 120 (16), 8781 (2016).

Intertwined lattice deformation and magnetism in monovacancy graphene; H. Padmanabhan, B. R. K. Nanda; Phys. Rev. B 93, 165403 (2016).

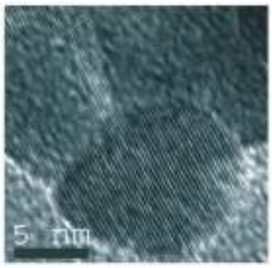
Spin-glass state in nanoparticulate (L a 0.7 S r 0.3 Mn O 3) 1 – x (BaTi O 3) x solid solutions: Experimental and density-functional studies; C. Nayek, S. Samanta, K. Manna, A. Pokle, B. R. K. Nanda and P. Murugavel; Phys. Rev. B 93, 094401(2016).

Unconventional Magnetism and Band Gap Formation in LiFePO4: Consequence of Polyanion Induced Non-planarity; A. Jena and B. R. K. Nanda; Scientific reports 6, 19573 (2016).

Nuclear tunneling and dynamical Jahn-Teller effect in graphene with vacancy; Z.S. Popović, B. R. K. Nanda and S. Satpathy; Phys. Rev. B 86, 085458 (2012).



Schematic of the crystal structure of Sr_2FeCoO_6.



High resolution TEM micrograph of the nanocrystalline $Ce_{0.8}Gd_{0.1}Pr_{0.1}O_{2-\delta}$ material calcined at 800 °C. Size of the particle shown here is around 14 nm.

Selected Publications

Effect of micro-defects and Pb-loss on electrical and optical properties of PLZT ceramic; S. Samanta, V. Sankaranarayanan and K. Sethupathi; Journal of Materials Science: Materials in Electronics, In Press DOI: https://doi.org/10.1007/s10854-018-8713-0 (2018).

Magnetic glass state and magnetoresistance in $SrLaFeCoO_6$ double perovskite; R. Pradheesh, Harikrishnan S Nair, G. R. Haripriya, Anatoliy Senyshyn, Tapan Chatterji, V. Sankaranarayanan and K. Sethupathi K; Journal of Physics: Condensed Matter, 29, 95801 (2017).

Temperature dependent structural studies on the spin correlated system A_2FeCoO_6 (A= Sm, Eu, Dy and Ho) using synchrotron radiation; G. R. Haripriya, R. Pradheesh, M. N. Singh, A. K. Sinha, K. Sethupathi and V. Sankaranarayanan; AIP Advances, 7, 055826 (2017).

Spin reorientation and disordered rare earth magnetism in Ho_2FeCoO_6; G. R. Haripriya, H.S. Nair, R. Pradheesh, S. Rayaprol, V. Siruguri, D. Singh, R. Venkatesh, V. Ganesan, K. Sethupathi and V. Sankaranarayanan; Journal of Physics: Condensed Matter, 29, 475804 (2017).

Band gap reduction and redshift of lattice vibrational spectra in Nb and Fe co-doped PLZT; S. Samanta, M. Muralidhar, V. Sankaranarayanan, K. Sethupathi, Ramachandra Rao M S and M. Murakami; Journal of Material Science, 52, 13012 (2017).

The Effect Of Particle Size on the Magnetic Properties of Y_2FeCoO_6; G. R. Haripriya, Shashi Priya Balmuchu, R. Pradheesh, K. Sethupathi and V. Sankaranarayanan; Proc. of the Intl. Conf. on Nanotechnology for Better Living, 3, 1, 173 (2016).

Large magntoresistance and Jahn-Teller effect in Sr_2FeCoO_6; R. Pradheesh, Harikrishnan S Nair, V. Sankaranarayanan and K. Sethupathi; European Journal ofPhysics B, 85, 260 (2012).

Exchange bias and memory effects in Sr_2FeCoO_6; R. Pradheesh, Harikrishnan S Nair, V. Sankaranarayanan and K. Sethupathi; Applied Physics Letter 101, 142401 (2012).

Sankaranarayanan V
Professor

Ph.D.: IIT Madras (1984)
Senior Scientific Officer Gr. II: (1984)
Senior Scientific Officer Gr. I: (1989)
Assistant Professor: (1993)
Associate Professor: (2000)
Professor: IIT Madras (Since 2006)
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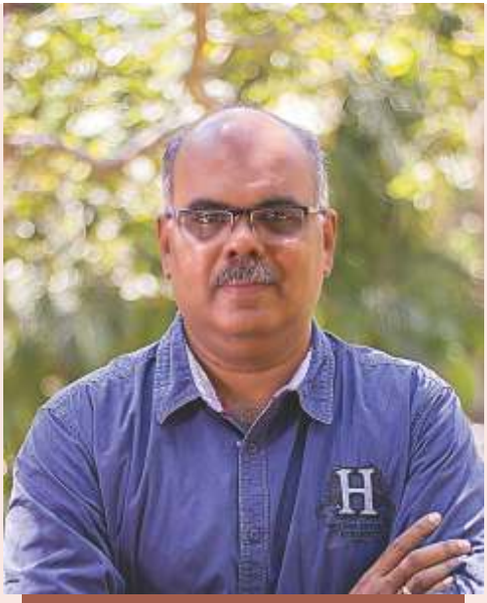
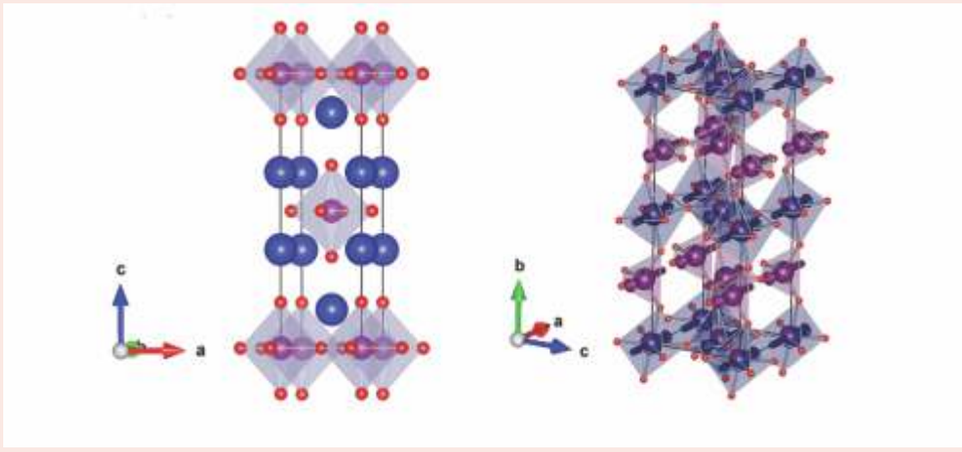
Awards and Recognitions

- DAAD Fellowship (1989)

Research Interests

- Fundamental studies on iron containing Superconductors like FeSe.
- Effects of synthesizing parameters on the critical temperature of superconductors.
- Basic property studies on disordered double perovskites.
- Magnetism and Magnetocaloric effect.
- Synthesizing high quality dielectric materials and physical property studies.
- Study of Electrocaloric effects in dielectrics





Santhosh P N
Professor

Ph.D.: National Chemical Laboratory, Pune (1997)

Post-Doc: Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, India (1997-1999)

Post-Doc: Ohio State University (1999-2001)

Post-Doc: Oxford University, UK (2001-2003)

Assistant Professor: IIT Madras (2003-2010)

Associate Professor: IIT Madras (2010-2015)

Professor: IIT Madras (since 2015)

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Research Interests

- Design and development of novel multifunctional oxide materials: Ordered/Disordered perovskite oxides ($A_2BB'O_6/AB_{0.5}B'_{0.5}O_3$); Modular Structure of Perovskite (Ruddlesden-Popper,(AO)-$(ABO_3)n$,n=1,2,..); Anion-Deficient Perovskite (Brownmillerite, $A_2B_2O_5/A_2BB'O_5$)
- Correlation between crystal structure and physical properties: Crystallography: X-ray and Neutron Diffraction; Magnetic memory effect; Exchange Bias; Spin-reorientation; Spin-Phonon Coupling; Thermoelectric effect
- Double perovskite thin films
- Magnetic/Semiconducting/Nanomaterials/ Biosensors
- Lithium ion Battery cycling for Electrochemistry Controlled Magnetism: Magneto-Ionic Effect

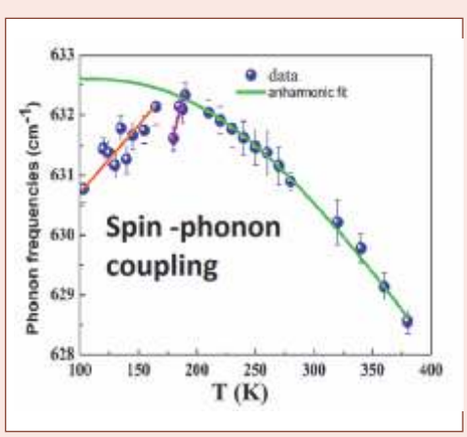
Selected Publications

Observation of Nd ordering in a novel double perovskite Nd_2MgRuO_6 with weak exchange interaction at B-site; M. P. Sharannia, P. Kayser, S. S. Pillai, B. Kennedy, M. Avdeev, R. Nirmala and P. N. Santhosh; Journal of Solid State Chemistry, 259, 73-78 (2018).

Observation of magnetization and exchange bias reversals in $NdFe_{0.5}Cr_{0.5}O_3$; M. P. Sharannia, S. De, R. Singh, A. Das, R. Nirmala and P. N. Santhosh; Journal of Magnetism and Magnetic Materials, 430, 109-113 (2017).

Orbital driven impurity spin effect on the magnetic order of quasi-3D cupric oxide. B. G. Ganga, P. N. Santhosh and B. R. Nanda; J. Phys Condens Matter, 29 (15), 155802, (2017).

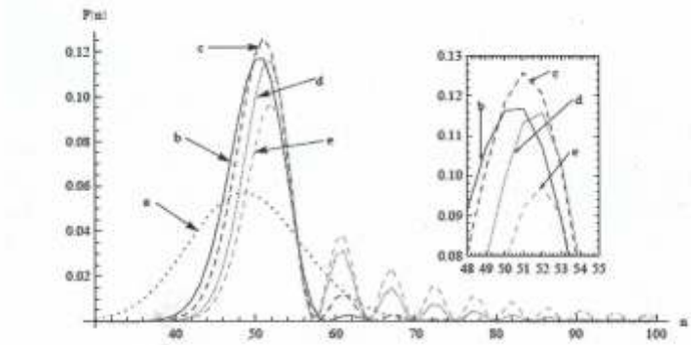
Photovoltaic properties of low temperature solution processed earth abundant CuO nanocrystal-based hybrid solar cells; B. G. Ganga, S. M. Seetharaman, P. C. R. Varma, M. A. G. Namboothiry and P. N. Santhosh; Physica status solidi (a), 214 (1), 1600671 (2017).



Evidence of reduced antiferromagnetic transition in mesocrystals of CuO synthesized by a surfactant-free solution phase method; B. G. Ganga, M. R. Varma and P. N. Santhosh; CrystEngComm, 17 (37), 7086-7093 (2015).

Facile synthesis of porous copper oxide nanostructure using copper hydroxide acetate precursor; B. G. Ganga and P.N. Santhoshl; Materials Letters, 138, 113-115 (2015).

Electrical surface-resistivity, dielectric resonance, polarization and magnetic properties of $Bi_{0.5}Sr_{0.5}FeO_{3-\delta}$ thin films grown by pulsed laser deposition; K. Balamurugan, B. Ramachandran, M. K. Surendra, N. H. Kumar, M. S. R. Rao and P. N. Santhosh; Journal of Physics D: Applied Physics, 47 (35), 355304 (2014).



P(n) versus n for squeezed coherent stat with Nc=49 for different squeezing parameters. (a) coherent state, (b) N_s=2, N_s=5,(e) N_s=10.

Satyanarayana M V

Professor

Ph.D.: Institute of Mathematical Sciences, Madras university (1987)

Post-Doc: University of Arkansas, USA (1987-1988)

Post-Doc: IIT Madras (1988-1990)

Research Scientist: UGC, IIT Madras (1991-1995)

Reader: Mangalore University, Mangalore (1995)

Assistant Professor: IIT Madras (1995-2004)

Associate Professor: IIT Madras (2004-2010)

Professor (Since 2010)

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Selected Publications

Effect of Squeezing on the Atomic and the Entanglement Dynamics in the Jaynes-Cummings Model; T. Subeesh, Vivishek Sudhir, A. B. M. Ahmed and M. Venkata Satyanarayana; Nonlinear Optics and Quantum Optics, Vol. 44, 245～258 (2012).

Ph ase Estimation, photon cloning and Bernoulli map; S. Lakshmibala and M. Venkata Satyanarayana, Phys. Letters A298, 1-6 (2002).

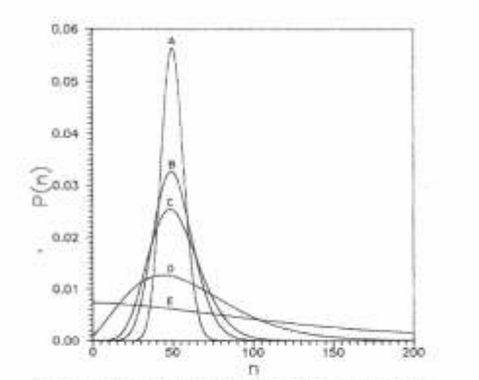


FIG. 1. *A*, *B*, *C*, *D*, and *E* denote the photon-counting distributions for the Glauber-Lachs states corresponding to $S=50$, $N=0$; $S=50$, $N=1$; $S=50$, $N=2$; $S=50$, $N=10$; and $S=50$, $N=50$; respectively.

Effects of higher-order nonlinear dispersion on ultrashort pulse evolution in a fiber laser; T. G. Sindhu, P. B. Bisht, R. J. Rajesh and M. Venkata Satyanarayana; Microwave @ Opt. Tech. Letters, 28, 196-198 (2001).

G aluber-Lachs version of the Jaynes-Cummings interaction of a two-level atom; M. V. Satyanarayana, M. Vijayakumar and P. Alsing; Phys.Rev. A45, 5301-5304 (1992).

Research Interests

Theoretical Quantum Optics / Optical Coherence, Non-classical states of radiation

- Quantum Mechanics/Entanglement-role of squeezing and anti-bunching, atom-radiation interaction-generation and application to novel sources of radiation-dynamics of atom(S)-radiation interaction-Role of entanglement in Quantum Optics
- Localization of photon counting distribution and consequences
- Fresnel Optics/connection between squeezing and fresnel propagation

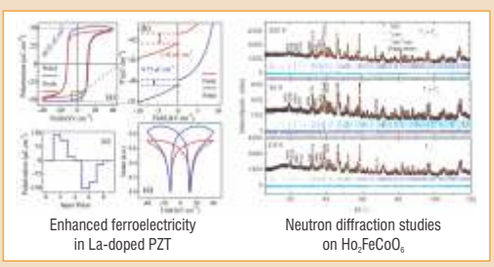
SQUID-VIBRATING SAMPLE MAGNETOMETER

GLOVE BOX

Selected Publications

Effect of micro-defects and Pb-loss on electrical and optical properties of PLZT ceramic; Shibnath Samanta V. Sankaranarayanan and K. Sethupathi; Journal of Materials Science: Materials in Electronics, 29, 7239 (2018).

Hole doping effect on structure, transport and magnetic properties of $Dy_{1-x}Ba_xMnO_3$ ($0<x<1$); K. Yadagiri , R. Nithya , A.T. Satya and K. Sethupathi; Journal of Alloys and Compounds 744, 82 (2018).



Enhanced ferroelectricity in La-doped PZT

Neutron diffraction studies on Ho_2FeCoO_6

Spin reorientation and disor-dered rare earth magnetism in Ho_2FeCoO_6; G. R. Haripriya, S. Hari krishnan Nair, R. Pradheesh, S. Rayaprol, V. Siruguri, Durgesh Singh, R. Venkatesh, V. Ganesan, K. Sethupathi and V. Sankar-anarayanan; J. Phys. Condens. Matter 29, 475804 (2017).

Band gap reduction and redshift of lattice vibrational spectra in Nb and Fe co-doped PLZT; Shibnath Samanta, Miryala Muralidhar, V. Sankaranarayanan, Sethupathi K, M. S. Ramachandra Rao and Masato Murakami; Journal of Materials Science 52, No. 20 (2017).

Enhanced electron-phonon coupling and critical current density in rapid thermally quenched MgB_2 bulk samples; T. S. Suraj , M. Muralidhar , K. Sethupathi , M.S. Ramachandra Rao and Murakami Masato; AIP Advances 7, 085014 (2017).

Temperature dependent structural studies on the spin correlated system A_2FeCoO_6 (A= Sm, Eu, Dy and Ho) using synchrotron radiation; G. R. Haripriya, R.Pradheesh, M. N. Singh, A. K. Sinha, K. Sethupathi and V. Sankaranarayanan; AIP Advances 7, 055826 (2017).

Magnetic glass state and magnetoresistance in $SrLaFeCoO_6$ double perovskite; R. Pradheesh, Harikrishnan S. Nair, G. R. Haripriya, Anatoliy Senyshyn, Tapan Chatterji, V. Sankaranarayanan and K. Sethupathi; Journal of Physics: Condensed Matter V 29, 9, 095801 (2017).

Sethupathi K

Professor

Ph.D.: Moscow State University, Moscow (1992)

Junior Scientific Officer: Dept. of Low Temperature Physics and Super-conductivity, Moscow State University

Post Doc: Research work at IIT Madras

Assistant Professor: IIT Madras (1995)

Associate Professor: IIT Madras (2004)

Professor: IIT Madras (Since 2009)

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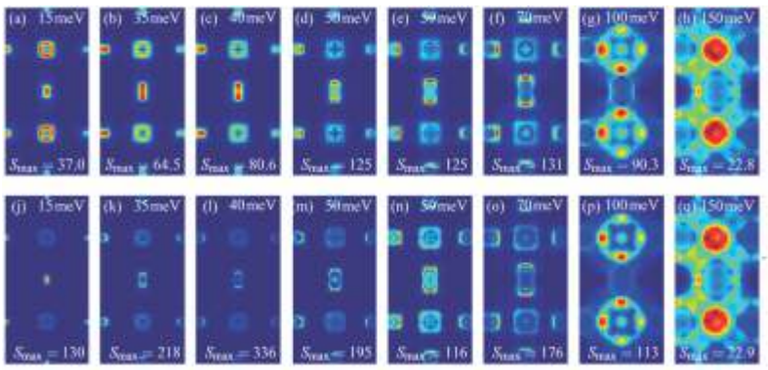
Awards and Recognitions

- Does research in experimental Condensed Matter Physics with special emphasis on magnetic oxide materials and high temp-erature superconductors
- Published more than 120 research papers in international peer reviewed journals and equal number in conference proceedings

Research Interests

- Magnetic and transport properties in novel oxides materials in the bulk, thin film and nanocrystalline forms for magnetic cooling and magneto resistive sensor applications
- Enhancement of ferroelectric properties and study the electrocaloric effect
- Superconductivity: Effect of external parameters on the critical components of superconductivity in MgB_2 and RE 123 compounds
- Thermoelectric materials
- Cryogenic insulation



Shantanu Mukherjee

Assistant Professor

Ph.D.: University Of Wisconsin-Milwaukee,USA, (2010)

Post-Doc: Niels Bohr Institute, University Of Copenhagen, Denmark, (2011-2015)

Post-Doc: State University Of New York, Binghamton, (2015-2016)

Assistant Professor: IIT Madras, (Since 2017)

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Awards and Recognitions

- Marie Curie Fellowship from the European commission.
- Papastamatiou Award. University Of Wisconsin-Milwaukee,USA.

Research Interests

- Many Body Quantum Theory for strongly correlated electronic systems.
- Ginzburg Landau model and symmetry based analysis in condensed matter physics.
- Microscopic physics of unconventional superconductors like cuprates, pnictides, heavy Fermions etc.
- Metal insulator transition, magnetism, charge order transitions and competing orders in strongly interacting quantum systems.
- Modelling of experiments like ARPES, neutron scattering, STM, NMR, quantum oscillations, etc.

Selected Publications

Discovery of orbital-selective Cooper pairing in FeSe; P. O. Sprau, A. Kostin, A. Kreisel, A. E. Böhmer, V. Taufour, P. C. Canfield, Shantanu Mukherjee, P. J. Hirschfeld, B. M. Andersen, J. C. Séamus Davis; Science, 357, 75-80, (2017).

Resonant Plasmon-Axion Excitations Induced by Charge Density Wave Order in Weyl Semimetal; Matthew D. Redell, Shantanu Mukherjee, Wei-Cheng Lee; Phys. Rev. B (Rapid), 93, 241110, (2016).

Structural and magnetic field effects on spin fluctuations in Sr3Ru2O7; Shantanu Mukherjee, and Wei-Cheng Lee; Phys. Rev. B, 94, 064407, (2016).

Tuning a Strain-Induced Orbital Selective Mott Transition in Epitaxial VO2; Shantanu Mukherjee, N. F. Quackenbush, H. Paik, S. Schlueter; T.-L Lee, D. G. Schlom, L. F. J. Piper, Wei-Cheng Lee; Phys. Rev. B (Rapid), 93; 241110, (2016).

Spin excitations in a model of FeSe with orbital ordering; A. Kreisel, Shantanu Mukherjee, P. J. Hirschfeld, and B. M. Andersen; Phys. Rev. B 92, 224515, (2015).

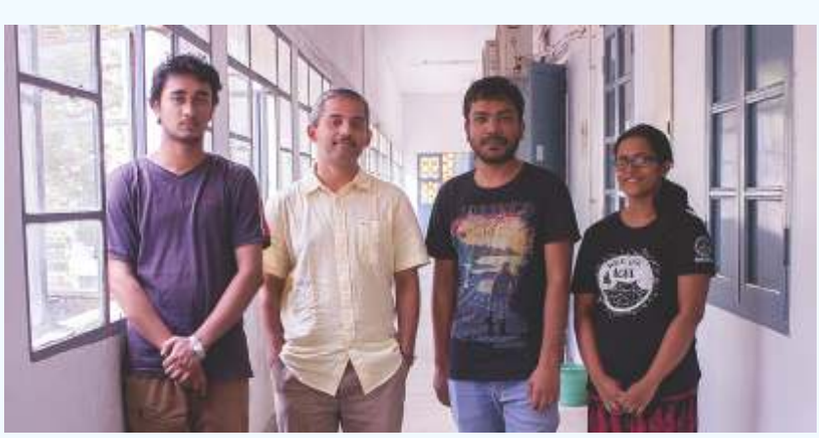
Characterizing Featureless Mott Insulating State by Quasiparticle Interferences- A Dynamical Mean Field Theory view; S. Mukherjee and Wei-Cheng Lee; Phys Rev B (Rapid) 92, 241102, (2015).

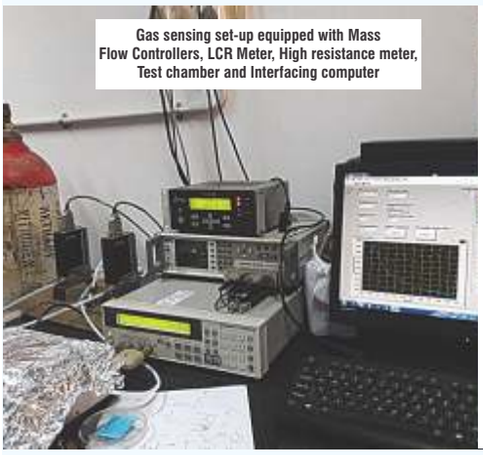
Model of electronic structure and superconductivity in orbitally ordered FeSe; Shantanu Mukherjee, Andreas Kreisel, P.J. Hirschfeld, B. M. Andersen; Phys. Rev. Lett., 115, 026402, (2015).

Ferroelectric order and magnetoelectric coupling in underdoped La-214 cuprates; Z. Viskadourakis, S. S. Sunku, S. Mukherjee; et al., Scientific Reports (Nature Publishing Group) 5, 15268, (2015).

Impurity-induced sub-gap bound gap states in alkali doped iron chalcogenide superconductors; Shantanu Mukherjee, M. N. Gastiasoro, and B. M. Andersen; Phys. Rev. B 88, 134508, (2013).

Theory of magnetoelectric effect in lightly doped high-Tc cuprate.; S. Mukherjee; et al., Phys. Rev. B 85, 140405 (Rapid), (2012).





Gas sensing set-up equipped with Mass Flow Controllers, LCR Meter, High resistance meter, Test chamber and Interfacing computer

DC and RF Magnetron Sputter Deposition system (background) and Thermal Evaporation system (Foreground)

Somnath Chanda Roy

Associate Professor

Ph.D.: IIT Delhi (2005)

Lecturer: Applied Physics, Amity University, Noida (2005-2006)

Post-Doc: Materials Research Institute, Pennsylvania State University, USA (2006-2010)

Assistant Professor: IIT Madras (2010-2015)

Associate Professor: IIT Madras (Since 2016)

Phone: +91 44 2257 4886

Email: somnath@iitm.ac.in

Selected Publications

Controlled and Selective Growth of 1D and 3D CdTe Nanostructures through a Structurally Engineered Porous Alumina Template for Enhanced Optical Applications; H S Bindra, Subish John, Somnath C Roy, O P Sinha, S S Islam, Ranu Naik; Journal of the Electrochemical Society 165 (4) H3061-H3068, doi: 10.1149/2.0091804jes, (2018).

Photo-electrochemical properties of hierarchically branched, graphene wrapped nanostructures obtained through hydrothermally transformed TiO_2 nanotubes; Y Rambabu, Manu Jaiswal, Somnath C Roy; Nanotechnology, 28, 405706, doi: 10.1088/1361-6528/aa8355, (2017).

Probing the charge recombination in rGO decorated TiO_2 nanotube arrays; Y. Rambabu, Manu Jaiswal, Somnath C Roy; AIP Advances, 6, 115010, doi:10.1063/1.4967387, (2016).

Modified photo-electrochemical and photo-voltaic properties of solvothermally crystallised TiO_2 nanotube arrays; B Mamnadha Rao, Mukta Tathavadekar, C. Venkatrao, Somnath C Roy; Journal of Materials Science: Materials in Electronics, 12427-12437, doi: 10.1007/s10854-016-5248-0, (2016).

Enhanced photoelectrochemical properties of reduced graphene oxide wrapped TiO_2 multileg nanotubes; Y Rambabu, Manu Jaiswal, Somnath C Roy; Journal of the Electrochemical Society, 163 (8) H652-H656, doi: 10.1149/2.0351608jes, (2016).

Copper oxide nanostructures

Graphene oxide wrapped TiO_2 nanotubes

Effect of annealing temperature on phase transformation, structural stability and photoel-ectrochemical performance of TiO_2 multi-leg nanotubes; Y Rambabu, Manu Jaiswal, Somnath C Roy; Catalysis Today.278, 255-261,doi: 10.1016/j. cattod. 2016.01.016, (2016).

Photoelectrochemical properties of reduced graphene oxide modified TiO_2 micro-whiskers; Y Rambabu, Manu Jaiswal, Somnath C Roy; Journal of Nanoscience and Nanotechnology,16,4835,doi:10.1166/jnn.2016.12072 (2016).

Awards and Recognitions

- Bhaskara Advanced Solar Energy (BASE) Fellowship (jointly awarded by the Indo-US Science and Technology Forum (IUSSTF) and DST) (2015-2016)
- Faculty Travel and Internationalization (FTI) award grant (awarded by the Shastri Indo-Canadian Institute (SICI) (2016-2017)

Research Interests

- One dimensional nanostructures and thin films
- Electrical transport in nanomaterials
- Light-Materials interaction for solar energy harvesting
- Photo-electrochemical water splitting and photocatalytic CO_2 reduction
- Gas solid interaction and gas sensing studies

Srinivas V
Professor

Ph.D.: IIT Bombay (1988)

Post-Doc: Dalhousie Univ. Canada (1987-1990)

Post-Doc: TIFR, Bombay (1990-1992)

Lecturer: IITKGP (1992)

Assistant Professor: IITKGP (1995)

Associate Professor: IITKGP (1999)

Visiting Scientist: KTH, Stockholm Sweden (1999-2001)

Visiting Scientist: Chungbuk National University, South Korea (2002)

JSPS fellow (short term): Nagoya Univ. (2003)

Professor: IIT Kharagpur (2004)

Professor: IIT Madras (Since 2010)

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Research Interests

- Magnetic & Electrical transport properties
- Novel magnetic materials
- Thermoelectrics

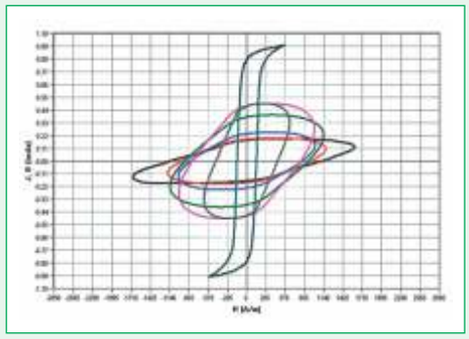
Selected Publications

AC magnetic and magnetoimpedance properties of CoFe(NbMnNi)BSi amorphous ribbons; S. K. Manna and V. Srinivas; J. Magn. Mag. Mater 449, 467 (2018).

Structure and magnetic properties of ZnO coated MnZn ferrite; S. Mallesh, A. Sunny, M. Vasundhara and V. Srinivas; J. Magn. Mag. Mater 418, 112 (2016).

Anomalous Magnetic and Electrical Transport Behavior in Intermetallic Co58.5Ga41.5; S. K. Manna, MD. Yasin, R. Saha, V. Srinivas, S. Kasiviswanathan and A. K. Nigam; IEEE Trans. Magn. MAG- 51, 2448571 (2015).

AC magnetic properties and core loss behaviour of FeP soft magnetic sheets; S. K. Manna, V. Srinivas, D. Prabhu and R. Gopalan; IEEE Trans. Magn. MAG-50, 2008604 (2014).



Effect of site disorder on the electronic properties of Fe2VAl Heusler alloy; CH. Venkatesh, V. Srinivas, V.V. Rao, S.K. Srivastava and P. Sudheer Babu; J. Alloys & Compounds 577, 417 (2013).

Observation of magnetic cluster phase above Curie temperature in Fe2CrAl Heusler alloy; Ritwik Saha, V. Srinivas and A. Venimadhav; J. Magn. Mag. Mater 324, 1296 (2012).

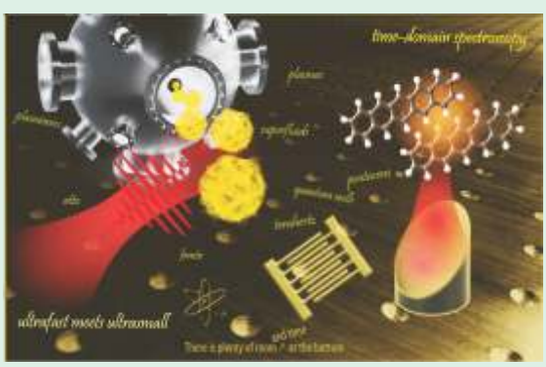
Role of polymer matrix in large enhancement of dielectric constant in polymer-metal composites; M. Panda, V. Srinivas and A. K. Thakur; Appl. Phys. Lett. 99, 042905 (2011).

Effect of polymer coating on magnetic properties in oxygen stabilized Nickel nanoparticles; V. Singh, V. Srinivas, M. Ranot, S. Angappane, and Je-Geun Park; Phys. Rev. B 82, 054417 (2010).

Selected Publications

Femtosecond laser-pumped plasmonically enhanced near-infrared random laser based on engineered scatterers; V. S. Gummaluri, R. V. Nair, S. R. Krishnan, C. Vijayan; Optics Letters 42 (23), 5002-5005 (2018).

Charging dynamics of dopants in helium nanoplasmas; A. Heidenreich, B. Grüner, D. Schomas, F. Stienkemeier, S. R. Krishnan; Journal of Modern Optics 64 (10-11), 1061-1077 (2017).



Enhanced Ionization of Embedded Clusters by Electron-Transfer-Mediated Decay in Helium Nanodroplets; A. C. LaForge, V. Stumpf, K. Gokhberg, J. Von Vangerow, F. Stienkemeier, N. V. Kryzhevoi, P. O'Keeffe, A. Ciavardini, S. R. Krishnan, M. Coreno, K. C. Prince, R. Richter, R. Moshammer, T. Pfeifer, L. S. Cederbaum, M. Mudrich; Physical review letters 116 (20), 203001 (2016).

Fano resonances observed in helium nanodroplets; A. C. LaForge, D. Regina, G. Jabbari, K. Gokhberg, N. V. Kryzhevoi, S. R. Krishnan, M. Hess, P. O'Keeffe, A. Ciavardini, K. C. Prince, R. Richter, F. Stienkemeier, L. S. Cederbaum, T. Pfeifer, R. Moshammer and M. Mudrich; Physical Review A 93 (5), 050502 (2016).

Dual pulse driven extreme ultraviolet (EUV) radiation source utilizing a droplet comprising a metal core with dual concentric shells of buffer gas; S. R. Krishnan with D. A. Corliss, S. V. Deshpande, V. V. Deshpande, O. Gluschenkov; US Patent US9301381B1, (filed - Sept. 2014, granted - March 2016).

Sivarama Krishnan

Assistant Professor

Ph.D.: Max Planck Institute for Nuclear Physics, Heidelberg (2011)

Post-Doc: Max Planck Institute for Nuclear Physics (2012)

Post-Doc: IBM Semiconductor R&D Center, Bangalore (2013)

Post-Doc: Tata Institute of Fundamental Research (2014)

Assistant Professor: IIT Madras (since 2014)

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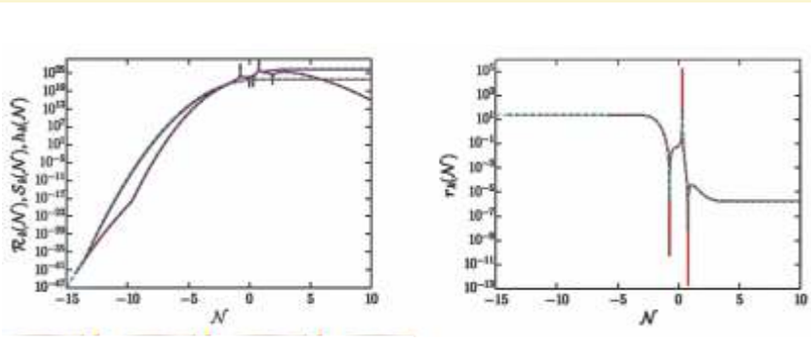
Awards and Recognitions

- Nominated to lead the Max Planck – India Partner Group on "Scaling Electron Dynamics from Angstrom to Nanoscale," with Prof. Th. Pfeifer (MPI-K, Heidelberg) (2015)
- Selected into the Elite group of Young Researchers for the Lindau Nobel Laureate meet (2012)

Research Interests

Ultrafast dynamics and intense light-matter interaction, femto- and atto-second physics, physics with synchrotrons and advanced light sources, photonic technologies



Evolution of the scalar and tensor perturbations and the tensor-to-scalar ratio in a bouncing scenario.

Sriramkumar L

Professor

Ph.D. Physics: Inter-University Centre for Astronomy and Astrophysics, Pune, (1992-1997)

Post-Doc: Racah Institute of Physics, Hebrew University, Jerusalem, Israel (1997-1999)

Post-Doc: Theoretical Physics Institute, Department of Physics, University of Alberta, Edmonton, Canada (1999-2001)

Post-Doc: Harish-Chandra Research Institute, Allahabad (2001-2003)

Fellow E: Harish-Chandra Research Institute, Allahabad (2003-2005)

Reader F: Harish-Chandra Research Institute, Allahabad (2005-2010)

Associate Professor G: Harish-Chandra Research Institute, Allahabad (2010-2011)

Associate Professor: Indian Institute of Technology Madras (2011-15)

Professor: Indian Institute of Technology Madras (since 2015)

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Email: sriram@iitm.ac.in

Research Interests

- Inflationary cosmology and the cosmic microwave background
- Alternatives to inflation
- Aspects of black hole physics
- Quantum field theory in classical backgrounds

Selected Publications

Viable tensor-to-scalar ratio in a symmetric matter bounce; R. N. Raveendran, D. Chowdhury and L. Sriramkumar; JCAP 1801, 030 (2018).

Moving mirrors and the fluctuation-dissipation theorem; D. J. Stargen, D. Kothawala and L. Sriramkumar; Phys. Rev. D 94, 025040 (2016).

BINGO: A code for the efficient computation of the scalar bi-spectrum; D. K. Hazra, L. Sriramkumar and J. Martin; JCAP 1305, 026 (2013).

Scalar bi-spectrum during preheating in single field inflationary models; D. K. Hazra, J. Martin and L. Sriramkumar; Phys. Rev. D 86, 063523 (2012).

The scalar bi-spectrum in the Starobinsky model: The equilateral case; J. Martin and L. Sriramkumar; JCAP 1201, 008 (2012).

Punctuated inflation and the low CMB multipoles; R. K. Jain, P. Chingangbam, J. O. Gong, L. Sriramkumar and T. Souradeep; JCAP 0901, 009 (2009).

An introduction to inflation and cosmological perturbation theory; L. Sriramkumar; Curr. Sci. 97, 868 (2009).

Initial state of matter fields and trans-Planckian physics: Can CMB observations disentangle the two?; L. Sriramkumar and T. Padmanabhan; Phys. Rev. D 71, 103512 (2005).

Probes of the vacuum structure of quantum fields in classical backgrounds; L. Sriramkumar and T. Padmanabhan; Int. J. Mod. Phys. D 11, 1 (2002).

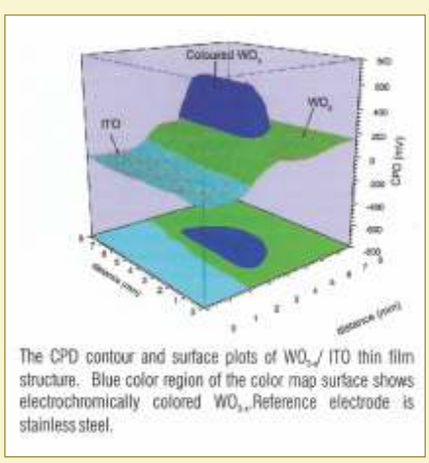
Finite-time response of inertial and uniformly accelerated Unruh-DeWitt detectors; L. Sriramkumar and T. Padmanabhan; Class. Quantum Grav. 13, 2061 (1996).

Selected Publications

Gate Recess Structure Engineering using Silicon Nitride Assisted Process for Increased Breakdown Voltage in Pseudomorphic HEMTs; K. Mahadeva Bhat, A. Subrahmanyam and P. D. Vyas; Semiconductor Science and Technology, 27,115013 (2013).

Composition Dependent Structural, Optical and Electrical Properties of $In_xGa_{1-x}N$ ($0.5 \leqslant X \leqslant 0.93$) Thin Films Grown by Modified Activated Reactive Evaporation; S. R. Meher, A. Subrahmanyam and Mahaveer K. Jain; Journal of Materials Science Research, 48,1196 (2013).

Surface Modification of Sol-gel TiO_2 Surface with Sputtered Metallic Silver for Sunlight Photo-Catalytic Activity: Initial Studies; A. Subrahmanyam, K. P. Biju, P. Rajesh, K. Jagadeesh Kumar and M. Raveendra Kiran; Solar Energy Materials and Solar Cells, 101241 (2012).



The CPD contour and surface plots of WO_{3-x}/ ITO thin film structure. Blue color region of the color map surface shows electrochromically colored WO_{3-x}. Reference electrode is stainless steel.

Grain Boundary Carrier Scattering in ZnO Thin Films: A Study by Temperature-Dependent Charge Carrier Transport Measurements; R. V. Muniswami Naidu, Aryasomayajula Subrahmanyam, Arnaud Verger, M. K. Jain, S. V. N. Bhaskara Rao, S. N. Jha and D. M. Phase; Journal of Electronic Materials, 41, 660 (2012).

Carrier Transport in $In_xGa_{1-x}N$ Thin Films Grown by Modified-Activated Reactive Evaporation; S. R. Meher, R. V. Munniswami Naidu, Kuyyadi P. Biju, A. Subrahmanyam, and Mahaveer K. Jain; Applied Phys Letter, 99, 110 (2011).

Subrahmanyam A

Professor

M.Sc. Physics: Andhra University

Ph.D.: Experimental Solid Physics, IIT Kharagpur

Post-Doc Fellowship: International Centre for Theoretical Physics, Trieste, Italy

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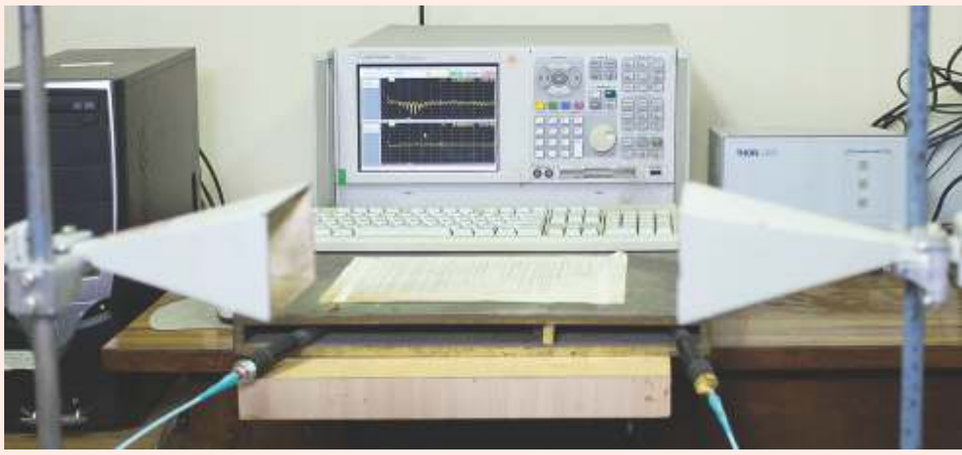
Awards and Recognitions

- BOYSCAST Fellowship, DST Govt. of India (1979)
- Alexander von Humboldt Fellowship, AvH Foundation, Germany (1980)
- Saint Gobain Chair Professor, Ecole Polytechnique, Palaiseau, France (2008)
- DAAD Professor (W3), Technical University Dresden, Germany (2009)
- Member, Plasma Group of Joint Plasma Committee European Commission
- International Advisory Committee Member: Socicty of Vacuum Coaters (USA), Plasma and Surface Engineering, (Germany), Photocatalysis and Advanced oxidation Technology (USA)
- Editor, Solar Energy Materials and Solar Cells (Journal from Elseiver)

Research Interests

- Functional metal Oxide Thin Films
- Photovoltaics, Energy Efficient Windows (Electro-chromcis)
- Bio-medical Engineering
- Surface Engineering with Kelvin Probe



Subramanian V
Professor

Ph.D.: IIT Madras (1995)

Post-Doc: CSIR RA (1995-1996)

Lecturer: BITS, Pilani (1996-1998)

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Associate Professor: IIT Madras (2006-2012)

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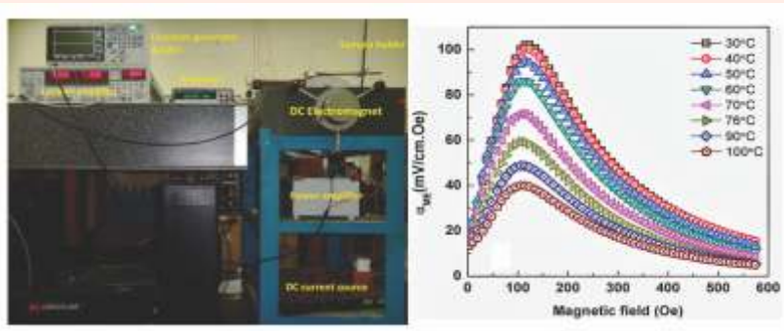
Research Interests

- Dielectric Resonators
- Ferroelectrics
- Magnetoelectric materials
- Photonic Crystal at Microwave Frequency
- Metamaterials
- Microwave near-field and far-field Imaging
- Microwave Hall Effect
- EMI Shielding
- Non-Destructive Evaluation at Microwave Frequencies

Selected Publications

The role of precursors on piezoelectric and ferroelectric characteristics of 0.5BCT-0.5BZT ceramic; Atal Bihari Swain, V. Subramanian and P. Murugavel; Ceramic International, 44(6), 6861-6865 (2018).

Broadband Asymmetric Transmission of Linearly Polarized Electromagnetic Waves Based on Chiral Metamaterial ; Lincy Stephen, N. Yogesh and V. Subramanian ; Journal of Applied Physics 123, 033103 (2018).



Magnetoelectric Measurement Arrangement and Temperature Variation of α_{ME} in 65PIN-35PT/NFO Composite

Enhanced magnetoelectric response from lead-free $(Ba_{0.85}Ca_{0.15})(Zr_{0.1}Ti_{0.9})O_3$ - $CoFe_2O_4$ laminate and particulate composites ; Paul J. Praveen, Vinithareddi Monaji, Dinesh Kumar, V. Subramanian and Dibakar Das; Ceramic International, 44(4), 4298-4306 (2018).

Tuning of bandwidth by superposition of bending and radial resonance modes in bilayer laminate composite; S. Dinesh Kumar, J. Magesh and V. Subramanian; Journal of Materials and Design, 122, 315-317 (2017).

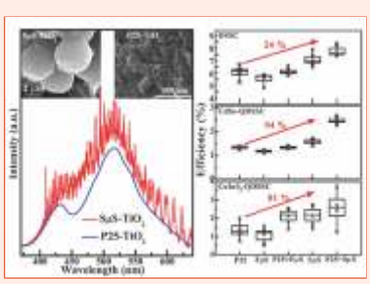
Polar nano regions in lead free $(Na0.5Bi_{0.5})TiO_3$-$SrTiO_3$-$BaTiO_3$ relaxors: An impedance spectroscopic study; S. Praharaj, D. Rout, S. Anwar, V. Subramanian and V. Sivasubramanian; Journal of Alloys and Compounds, 706, 502-510 (2017).

Selected Publications

Whispering-gallery mode assisted enhancement in the power conversion efficiency of DSSC and QDSSC devices using TiO_2 microsphere photoanodes; T. K. Das, P. Ilaiyaraja and C.Sudakar; ACS Applied Energy Materials; 1, 2, 765-774 (2018).

$CuInS_2$ Quantum Dot Sensitized Solar Cells with High Voc ~ 0.9 V achieved using Microsphere-Nanoparticulate TiO_2 Composite Photoanode; P. Ilaiyaraja, K Benadict Rakesh, T.Kumar Das, P. S. V.Mocherla and C. Sudakar; Solar Energy Materials and Solar Cells, 178, 208 (2018).

Template assisted nanoporous TiO_2 nanoparticles; T. K. Das, P.Ilaiyaraja and C. Sudakar; The effect of oxygen vacancy defects on photovoltaic performance of DSSC and QDSSC, Solar Energy; 159, pp. 920-929 (2018).



Well-connected microsphere-nanoparticulate TiO_2 composites as high performance photoanode for dye sensitized solar cell; P. Ilaiyaraja, T. Kumar Das, P. S. V. Mocherla and C. Sudakar; Solar Energy Materials and Solar Cells, 169, pp. 86-97 (2017).

Photoconductivity induced by nanoparticle segregated grain-boundary in spark plasma sintered $BiFeO_3$; S. Nandy, P. S. V. Mocherla and C. Sudakar; Journal of Applied Physics; 121 (20) 203102 (2017).

Coexistence of strongly and weakly confined energy levels in (Cd, Zn)Se quantum dots: Tailoring the near-band-edge and defect-levels for white light emission; T. K. Das, P. Ilaiyaraja and C. Sudakar; Journal of Applied Physics; 121 (18) 183102 (2017).

Microstrain engineered magnetic properties in $Bi_{1-x}CaxFe_{1-y}TiyO_{3-\delta}$ nanoparticles:Deviation from Neel's 1/d size-dependent magnetization behaviour; P. S. V. Mocherla, MB. Sahana, R. Gopalan, MS. Ramachandra Rao, BRK. Nanda and C. Sudakar; Materials Research Express; 4 (10), 106106 (2017).

High-rate capability of bamboo-like single crystalline $LiFePO_4$ nanotubes with an easy access to b-axis 1D channels of olivine structure; M. Viji, P. Swain, P. S. V. Mocherla and C. Sudakar; RSC Advances, 6 (46), pp. 39710-39717 (2016).

Sudakar Chandran

Associate Professor

Ph.D.: IISc Bangalore, (2004)

Post-Doc: Royal Institute of Technology (2004-2005)

Post-Doc: Wayne State University, (2005-2009)

Research Assistant Professor: Wayne State University, (2009-2010).

Assistant Professor: IIT Madras (2010-2015)

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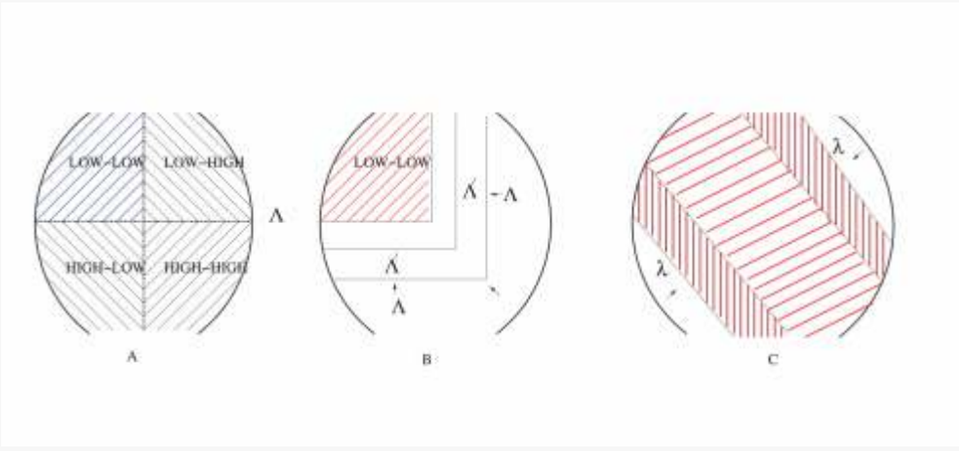
Awards and Recognitions

- DAAD fellowship (2013)
- Awarded JSPS fellowship (2005)
- Carl Tryggers postdoctoral fellowship, Sweden (2004)
- Prof. K.P. Abraham Medal for best Ph.D. thesis in the area of Materials Chemistry, IISc, Bangalore, (2004)

Research Interest

- Defect-structure property correlations in multifunctional materials
- Synthesis/fabrication of nanostructures, complex heterostructures, composites for advanced applications
- Engineering the microstructure and defect structure of cathode and anode materials for Li-ion battery applications
- Nanostructured materials for dye, quantum dot and perovksite sensitized solar cells



Sunethra Ramanan

Assistant Professor

Ph.D.: The Ohio State University, Columbus Ohio, U.S.A. (2007)

Post-Doc: ICTP, Trieste, Italy (2010-2011)

Post-Doc: IISc, Bangalore, India (2007-2010)

Post-Doc: The Ohio State University, Columbus, Ohio, U.S.A (2007)

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Research Interest

- EFT approach to Nuclear Structure
- Renormalization Group Approaches
- Cold Atomic Systems
- Computational Many-body Physics

Selected Publications

Screening and Anti-screening of the pairing interaction in low-density neutron matter; S. Ramanan and M. Urban; arXiv: 1804.04332, Submitted to PRC as a regular article (2018).

Triplet Pairing in pure neutron matter; Sarath Srinivas and S. Ramanan; Phys. Rev. C94. 6, 064303 (2016).

BEC-BCS Crossover in Neutron Matter with Renormalization Group based Effective Interactions; S. Ramanan and M. Urban; Phys. Rev. C88, 5, 054315 (2013).

Local Projections of Low-Momentum Potentials; K. A. Wendt, R. J. Fumstahl and S. Ramanan; Phys. Rev. C86, 014003, e-Print: arXiv:1203.5993 [nucl-th] (2012).

Theory of Unitarity Bounds and Low-Energy Form Factors; Gauhar Abbas, B. Ananthanarayan, I. Caprini, S. Imsong and S. Ramanan; arXiv:1004.4257 [hep-ph], Journal. Eur. Phys. J. A. 45, 389 (2010).

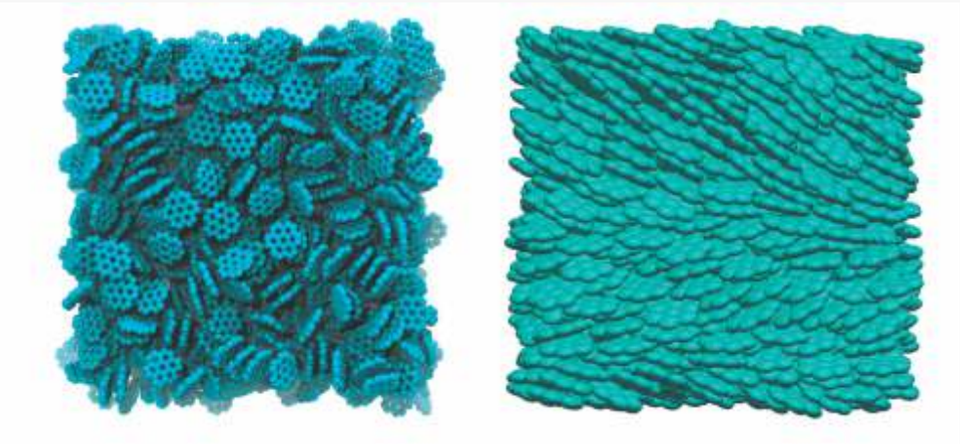
Supersolid and solitonic phases in 1-0 Bose-Hubbard model; Tapan Mishra, R. V. Pai, S. Ramanan, M Sethi and B. P Das; arXiv: 0907.1258 [cond-mat.quantgas], Phys. Rev. A B O, 043614 (2009).

Signatures of the superlluid to Mott insulator transition in cold bosonicatoms in a one dimensionai optical lattice; S. Ramanan, T.Mishra, M. Sethi, R. V. Pai and B. P. Das; Phys. Rev. A 79, 013625, 0811.1280 [condmat.other], (2009).

Weinberg eigenvalues and pairing with low-momentum potenlials; S. Ramanan, S. K. Bogner and R. J. Furnstahl; Nucl. Phys. A 797, arXiv:0709.0534 [nucl-th] (2007).

Low-momentum potentials with smooth cut-offs; S. K. Bogner, R. J. Furnstahl, S. Rarnanan and A. Schwenk; Nucl. Phys. A. 784, nucl-W0609003, (2007).

Convergence of the Born series with low-momentum interaction; S. K. Bogner, R. J. Furnstahl, S. Ramanan and A. Schwenk; Nucl. Phys. A 773, nucl-th/0602060 (2006).

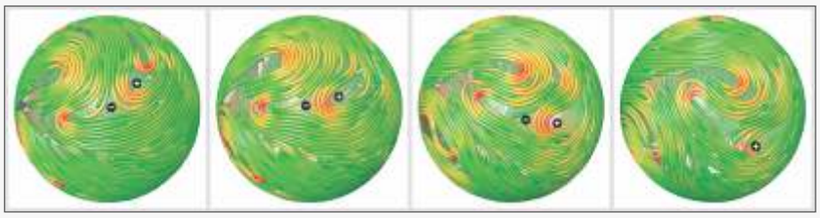


Selected Publications

Lipid-protein interaction induced domains: Kinetics and conformational changes in multicomponent vesicles; K. K. Sreeja and P. B. Sunil Kumar; The Journal of Chemical Physics 148 134703 (2018).

Kosmotropic effect leads to LCST decrease in thermoresponsive polymer solutions; Swaminath Bharadwaj, P. B. Sunil Kumar, Shigeyuki Komura and Abhijit P. Deshpande; The Journal of Chemical Physics 148 084903 (2018).

Colloidal transport by active filaments; Raj Kumar Manna, P. B. Sunil Kumar and R. Adhikar; Journal of Chemical Physics DOI: 10.1063/1.4972010 146 24901 (2017).



Molecular Structuring and Percolation Transition in Hydrated Sulfonated Poly(ether ether ketone) Membranes; Madhusmita Tripathy, P. B. Sunil Kumar and Abhijit P. Deshpande; The Journal of Physical Chemistry B 121, 4873, DOI: 10.1021/acs.jpcb.7b01045 (2017).

Membrane-mediated aggregation of anisotropically curved nanoparticles; Alexander D. Olinger, Eric J. Spangler, P. B. Sunil Kumar and Mohamed Laradji; Faraday Discussions, DOI: 10.1039/c5fd00144g 186 265 (2016).

Organelle morphogenesis by active membrane remodeling; N. Ramakrishnan, John H. Ipsen, Madan Rao and P. B. Sunil Kumar; Soft Matter DOI: 10.1039/c4sm02311k 11 2387 (2015).

Mesoscale computational studies of membrane bilayer remodeling by curvature-inducing proteins; N. Ramakrishnana, P.B. Sunil Kumar and Ravi Radhakrishnan; Physics Reports, 543, 1-60 (2014).

Sunil Kumar P. B

Professor

Ph.D.: Raman Research Institute, Bangalore University (1995)

Post doc: Institute of Mathematical Sciences, Chennai (1995-1997)

Post doc: Max Planck Institute of Colloids and Interfaces, Germany (1997-1999)

Professor: IIT Mardras

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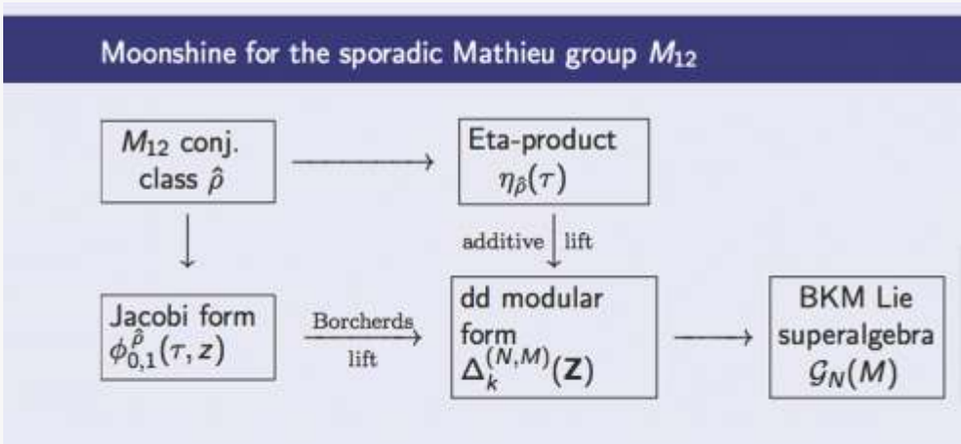
Awards and Recognitions

- Fellowship of the Indian Academy of Sciences, Bangalore , 2016
- Associate Member: Center for bio-membrane physics. University of Southern Denmark
- Visiting Professor Fellowship: Finnish Academy of Science, Finland (2005-2006)

Research Interest

- Soft condensed matter physics: Theory and simulations of polyelectrolytes, rheology of polymer solutions and melts, active polymers and membranes
- Biological physics: Computational modeling of membranes, cytoskeleton and their composites



Suresh Govindarajan

Professor

Ph.D.: U Pennsylvania (1991)

Post-Doc: IMSc, Chennai and Tata Institute Mumbai

Faculty Member: IIT Madras (Since 1995)

Humboldt Fellow at Bonn U (1997)

CERN-Asia Fellow (2006)

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Awards and Recognitions

- National Talent Scholar (1980-1986)
- Dean's Fellow at U. Pennsylvania (1987-1988)
- Alexander von Humboldt Fellow (1997)
- CERN-Asia Fellow (2006)

Research Interest

Quantum Field Theory, String Theory, Conformal Field Theory, Partftions & Exact enumerations; Topological Field Theories; Mathematical Physics

Selected Publications

Worldsheet approaches to D-branes on supersymmetric cycles; Suresh Govindarajan, T. Jayaraman, Tapobrata Sarkar; Nucl.Phys. B580 519-547, (This paper is one of the first papers to consider microscopic descriptions of D-branes for Calabi-Yau compactifications) (2000)

D-branes, exceptional sheaves and quivers on Calabi-Yau manifolds: From Mukai to McKay; Suresh Govindarajan and T. Jayaraman; Nucl. Phys. B600 457-486 (2001).

D-branes on Calabi-Yau manifolds and superpotentials; M. R. Douglas, Suresh Govindarajan, T. Jayaraman and A. Tomasiello; Commun. Math. Phys. 248 85-118, (First non-trivial D-brane superpotential computed here) (2004).

BKM Lie superalgebras from dyon spectra in z_N CHL orbifolds for composite N; Suresh Govindarajan and K. Gopala Krishna; JHEP 1005 014, (This paper points out a connection between the Mathieu group M_{24} and Dyon Spectra) (2010).

On the asymptotics of higher-dimensional partitions; S. Balakrishnan, Suresh Govindarajan and N. S. Prabhakar; J. Phys. A45 055001, (Paper wilh undergraduate students) (2012).

Unravelling Mathieu Moonshine; Suresh Govindarajan; Nucl. Phys. B864 823-839, (Provided additional evidence tor Mathieu Moonshine) (2012).

Notes on higher-dimensional partitions; Suresh Govindarajan and J. Comb; Theory Ser. A 120 622, (Significantly improves on a 1967 result of Atkin et. al. and explictly computes numbers of partitions in all dimensions for integers $\leqslant$ 26) (2013).

There are 346427974065172792 solid partitions of 72.

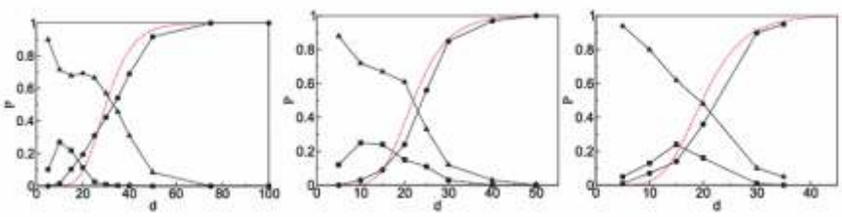


FIG. 1: Numerically measured probability of different types of dynamics as a function of dimension d of the phase space for Eq.(1) (left panel), Eq.(2) (central panel). Eq.(3) (right panel): ● - chaotic trajectories, ■ - limit cycles, ▲ - stable fixed points. For each case, the theoretical estimate for the probability of chaot.

Selected Publications

Quantum correlations in Quantum Communications protocols; Animesh Datta and Vaibhav Madhok; Lectures on General Quantum Correlations and their Applications; 241-255, Springer (2018).

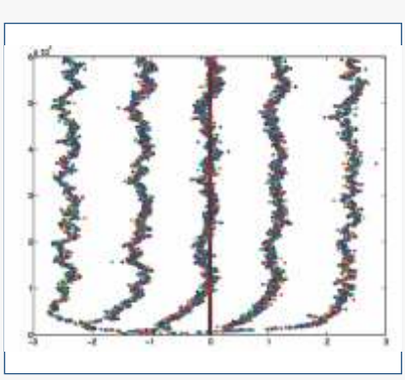
Individual-Based models for adaptive diversification in high-dimensional phenotype spaces; I. Ispolatov, V. Madhok and M. Doebeli, J. Theor; Biol., 390, 97-105 (2016).

Characterizing and Quantifying Quantum Chaos with Quantum Tomography; V. Madhok, C. A. Riofrio and I. H. Deutsch; Pramana, Indian Academy of Sciences (2016).

Chaos in High Dimensional Dynamical systems; I. Ispolatov, V. Madhok, S. Allende and M. Doebeli; Nature Scientific Reports 5; Article number: 12506.

Signatures of Chaos in the Dynamics of Quantum Discord; V. Madhok, V. Gupta, D. Trottier and S. Ghose; Phys. Rev. E 91, 032906 (2015).

Information Gain in Tomography - A Quantum Signature of Chaos; V. Madhok, C. A. Riofrio, S. Ghose and I. H. Deutsch; Phys. Rev. Lett. 112, 014102 (2014).



Role of quantum discord in quantum information theory; V. Madhok and A. Datta; International Journal of Modern Physics B. (2012).

Quantum discord in quantum information theory, from strong subadditivity to the Mother protocol; V. Madhok and A. Datta; 6th Conference on Theory of Quantum Computation, Communication and Cryptography Springer's Lecture Notes in Computer Science (2011).

Interpreting quantum discord through quantum state merging; V. Madhok and A. Datta; Physical Review A, 83, 032323 (2011).

Vaibhav Madhok

Assistant Professor

Ph.D.: University of New Mexico (2012)

Post-Doc: Ministry of Economic Development and Innovation Prized Postdoctoral Fellow, Wilfrid Laurier University, Canada (2012 – 2014)

Post-Doc: Department of Zoology, University of British Columbia, Canada (2014 - 2015)

Assistant Professor, IITM (Since 2016)

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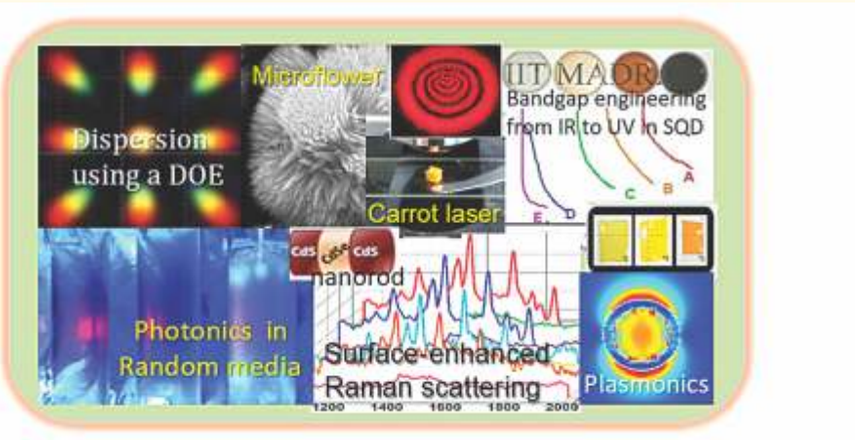
Research Interest

Harnessing the power of the quantum world for information processing is a key for mankind to enter a new information age. My research work focusses on using quantum information theory to understand the fundamental limits of information processing in the quantum world. Furthermore, I also work on using quantum information theory to unravel the workings of our universe at the quantum level. The second area of my research is to use the concepts from physics to understand complex systems. I use non linear dynamics and non equilibrium statistical physics to address questions in biology, ecology, evolution and engineering



Vijayan C
Professor

Ph.D.: IIT Madras (1986)

Senior Project Officer: IIT Madras (1986-1988)

Lecturer: Pondicherry Central University, (1988-1993)

Professor: IIT Madras (Since 1993)

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Awards and Recognitions

- Awardee of National Science Talent Scholarship of the NCERT, Govt of India throughout college education
- Reviewer for several international journals and thesis examiner for several Universities
- Resource person for teacher training programs in several Universities and institutes
- Inaugurated the Golden Jubilee lectures series of the NCERT on 'Science Education'
- Over 100 invited talks in conferences, Universities, institutes in India and abroad

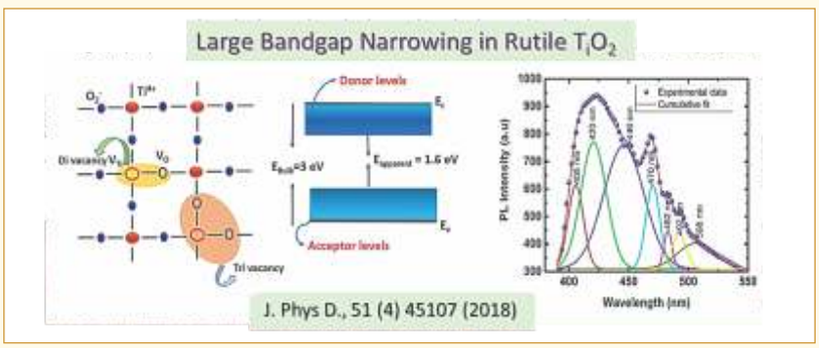
Awards and Recognitions

- Light-matter interaction, Nanophotonics and Physics Education

Selected Publications

Large bandgap narrowing in rutile TiO2 aimed towards visible light applications and its correlation with vacancy-type defects history and transformation; Radhika V Nair, PK Gayathri, Venkata Siva Gummaluri, PMG Nambissan and C Vijayan; Journal of Physics D: Applied Physics 51(4) 045107 (2018).

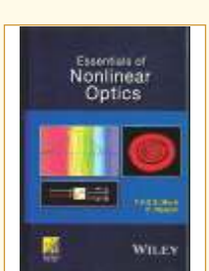
Femtosecond laser-pumped plasmonically enhanced near-efficient infrared random laser based on engineered scatterers; Venkata Siva Gummaluri, R.V. Nair, S.R. Krishnan and C. Vijayan; Optics Letters 42(23) 5002 (2017).



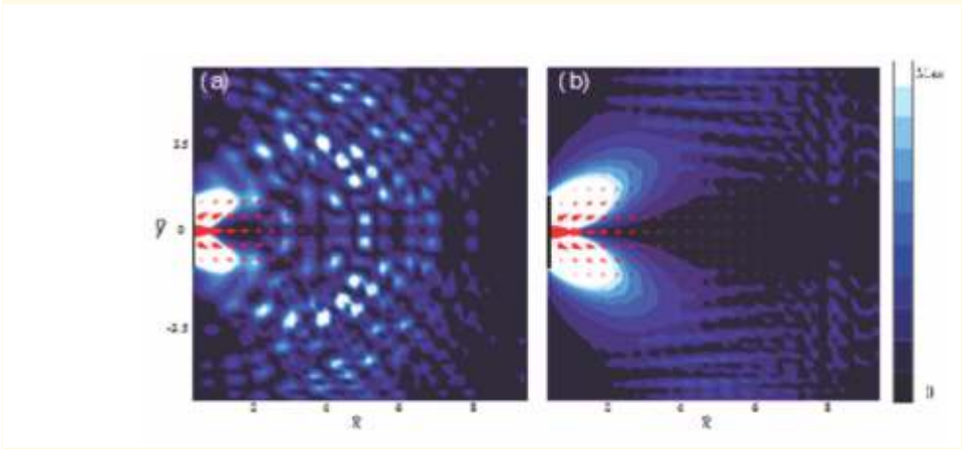
Slow Down of Charge Transfer Owing to Auger Recombination and Two-Photon Action Cross-section of CdS-CdSe-CdS Segmented Nanorods; R. Subha, V. Nalla, EJQ Lim, C. Vijayan, BBS Huang, WS Chin and W. Ji; ACS Photonics 2(1) 43 (2015).

Raman mode random lasing in ZnS-β-carotene random gain media Bingi; J. Warrier and A.R. Vijayan; Applied Physics Letters, 102 (22), 221105 (2013).

Enhancement of photoluminescence from defect states in ZnS random photonic crystal: An effect of electronic and photonic mode coupling; J. Bingi, A.R. Warrier and C. Vijayan; Journal of Applied Physics 115 (4), 043105, (2014).



ISBN
978-1-118-90106-9 (2014)



Selected Publications

Functional renormalization group for three-dimensional quantum magnetism; Iqbal, et.al; Phys. Rev. B 94, 140408(R), (2016).

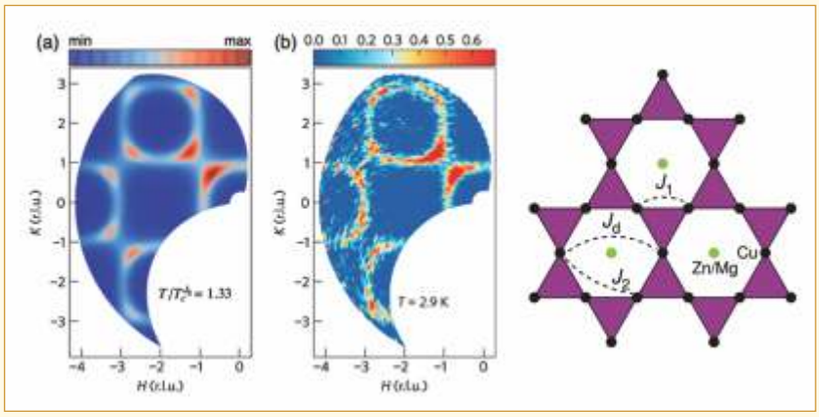
Gapless spin-liquid phase in the kagome spin-1/2 Heisenberg antiferromagnet; Iqbal, et.al; Phys. Rev. B 87, 060405(R), (2013).

Quantum-statistics-induced flow patterns in driven ideal Fermi gases; Beria, Iqbal, et.al;. Phys. Rev. A 88, 043611, (2013).

Intertwined nematic orders in a frustrated ferromagnet; Iqbal, et.al; Phys. Rev. B 94, 224403, (2016).

Signatures of a gearwheel quantum spin liquid in a spin-1/2 pyrochlore molubdate Heisenberg antiferromagnet; Iqbal, et.al; Phys. Rev. Materials 1, 071201, (2017).

Projected wave function study of Z2 spin liquids on the kagome lattice for the spin-1/2 quantum Heisenberg antiferromagnet; Iqbal, et.al; Phys. Rev B 84, 020407(R), (2011).



Paramagnetism in the kagome compounds $(Zn,Mg,Cd)Cu_3(OH)_6Cl_2$; Iqbal, et.al; Phys. Rev. B 92, 220404, (2015).

Spin liquid nature in the Heisenberg J1-J2 triangular antiferromagnet; Iqbal, et.al; Phys. Rev B 93, 144411, (2016).

Vanishing spin gap in a competing spin-liquid phase in the kagome Heisenberg antiferromagnet; Iqbal, et.al; Phys. Rev B 89, 020407(R), (2014).

Valance-bond crystals in the kagome spin-1/2 Heisenberg antiferromagnet: a symmetry classification and projected wave function study; Iqbal, et.al; New J. Phys. 14, 115031, (2012).

Yasir Iqbal

Assistant Professor

Ph.D.: Physics (Condensed Matter Theory), Laboratoire de Physique Théorique, Université de Toulouse III – Paul Sabatier, Toulouse, France (2009-2012)

Post-Doc: The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (2012-2014)

Post-Doc: Julius-Maximilian's University of Würzburg, Würzburg, Germany (2014-2017)

Assistant Professor: Department of Physics, IIT Madras (Since 2017)

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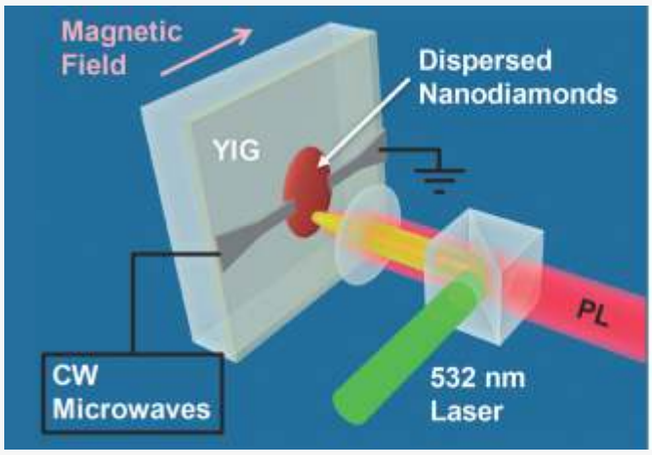
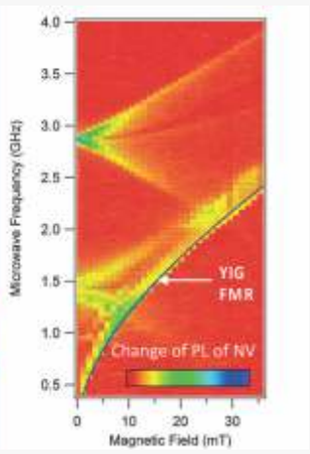
Research Interest

- Theoretical Condensed Matter Physics
- Strongly Correlated Systems
- Topological Phases in Condensed Matter
- Exotic quantum phases of matter
- Quantum Magnetism
- Frustrated Magnetism and Quantum Spin Liquids
- Numerical quantum many-body methods for strongly correlated electrom systems
- Strong Coupling Functional Renormalization Group Methods for spin systems
- Variational Wave Functions, Variational Quantum Monte Carlo, and Green's function Monte Carlo methods





Vidya Praveen Bhallamudi

Assistant Professor (Inter Disciplinary)

Ph.D.: Ohio State University (2011)

Research Associate: Ohio State University

Visiting Faculty: IIT Madras

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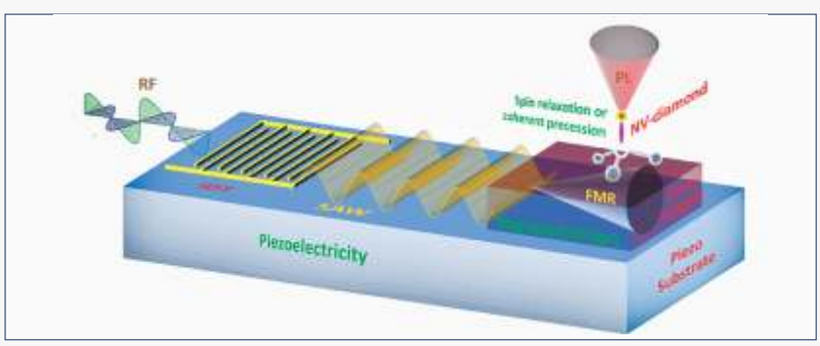
Research Interest

- Condensed matter physics with emphasis on magnetism and magnetic dynamics
- Spins based architectures for quantum and classical information processing
- Optically detected magnetic resonance using atomic defects such as NV centers in diamond
- Nanoscale magnetic resonance spectroscopy and imaging
- Scanned probe and optical microscopies

Selected Publications

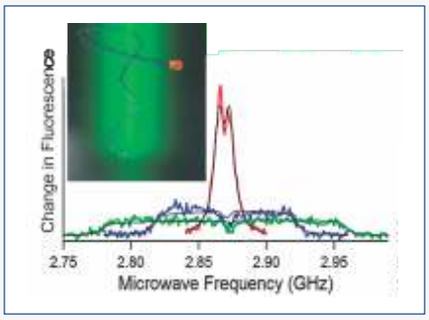
Voltage driven, local, and efficient excitation of nitrogen-vacancy centers in diamond; Dominic Labanowski, Vidya P. Bhallamudi, Qiaochu Guo, Carola M. Purser, Brendan A. McCullian, P. Chris Hammel and Sayeef Salahuddin; arXiv:1803.02863 [physics.app-ph].



Optically-detected broadband paramagnetic resonance spectroscopy using nitrogen-vacancy centers in diamond; Carola M. Purser, Vidya P. Bhallamudi, Christopher S. Wolfe, Huma Yusuf, Brendan A. McCullian, Ciriyam Jayaprakash, Michael E. Flatté and P. Chris Hammel; arXiv:1802.09635 [cond-mat.mes-hall].

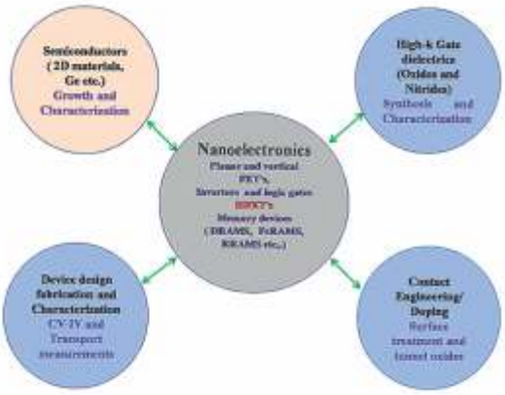
Optically Detected Ferromagnetic Resonance in Metallic Ferromagnets via Nitrogen Vacancy Centers in Diamond; Michael R. Page, Feng Guo, Carola M. Purser, Joseph G. Schulze, Tomoya M. Nakatani, Christopher S. Wolfe, Jeffrey R. Childress, P. Chris Hammel, Gregory D. Fuchs and Vidya P. Bhallamudi; arXiv:1607.07485.

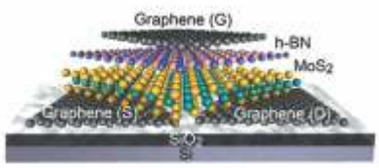
Local and broadband detection of ferromagnetic dynamics and spectroscopy using nitrogen-vacancy centers in diamond; C.S. Wolfe, S.A. Manuilov, C. Purser, R.M. Teeling-Smith, C. Dubs, P.C. Hammel and V.P. Bhallamudi; Appl. Phys. Lett., 108, 232409, (2016).



NV Center Electron Paramagnetic Resonance of a Single Nanodiasmond Attached to an Individual Biomolecule; Richelle M. Teeling-Smith, Young Woo Jung, Nicolas J. Scozzaro, Jeremy Cardellino, Isaac Rampersaud, Justin North, Marek Simon, Vidya P. Bhallamudi, Arfaan Rampersaud, Ezekiel Johnston-Halperin, Michael G. Poirier and P. Chris Hammel; Biophys. J., 110, 2044, (2016).

Correlating spin transport and electrode magnetization in a graphene spin valve: simultaneous magnetic microscopy and non-local measurements; A. J. Berger, M. R. Page, H. Wen, V. P. Bhallamudi, R. K. Kawakami and P. Chris Hammel; Appl. Phys. Lett., 107, 142406, (2015).





All 2D FET

K. Lakshmi Ganapathi

INSPIRE Faculty

Ph.D: Department of Instrumentation and Applied Physics Indian Institute of Science-Bangalore (2008-2014)

Post-Doc(s): Centre for NanoScience and Engineering, Indian Institute of Science-Bangalore (2014-2017)

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Awards and Recognitions

- DST INSPIRE Faculty fellowship: 2017-2022
- Selected as a member of the Global Materials Network under 2D materials

Research Interest

- Device Physics and Device Integration
- 2D Materials and High-K Dielectrics
- Thin films Synthesis, Properties and their applications
- Technology development

Patents

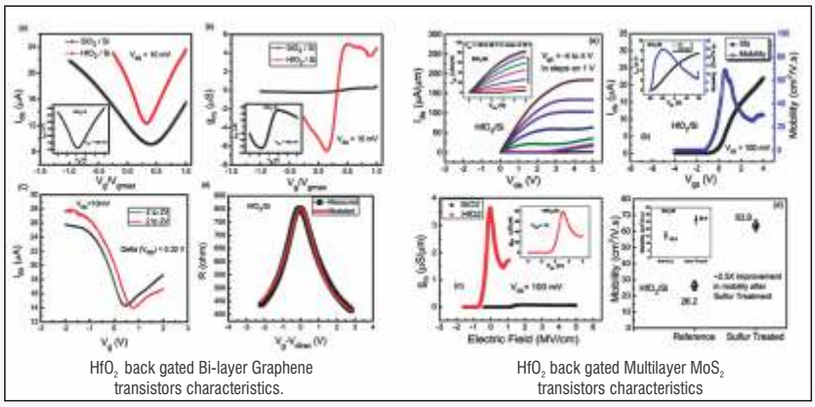
Shubhadeep Bhattacharjee, Kolla Lakshmi Ganapathi, Sangeneni Mohan and NavakantaBhat; "Asymmetric dual gate programmable thermionic tunnel field effect transistor"; Application No. 201741018661.

Selected Publications

Interface States Reduction in Atomic Layer Deposited TiN/ZrO_2/Al_2O_3/Ge Gate Stacks; K.L. Ganapathi, Y.M.Ding, D.Misra and N.Bhat; J. Vac. Sci. Technol. B 36(2), 021201 (2018).

Pulsed DC magnetron sputtered titanium nitride thin films for localized heating applications in MEMS devices; M. A. Jithin, K. L. Ganapathi, G. N. V.R. Vikram, N. K. Udayashankar and S. Mohan; Sensors and Actuators-A, 272, 199-205 (2018).

A sub-thermionic MoS_2FET with tunable transport; S. Bhattacharjee, K. L. Ganapathi, S. Mohan and N. Bhat; Applied Physics Letters, 111(16), 163501 (2017).



HfO_2 back gated Bi-layer Graphene transistors characteristics.

HfO_2 back gated Multilayer MoS_2 transistors characteristics

Nitride Dielectric Environments to Suppress Surface Optical Phonon Dominated Scattering in High-Performance Multilayer MoS_2 FETs; S. Bhattacharjee, K. L. Ganapathi, H. Chandrasekar, T. Paul, S. Mohan, A. Ghosh, S. Raghavan and N. Bhat; Adv. Electron. Mater., 3, 1600358, (2017).

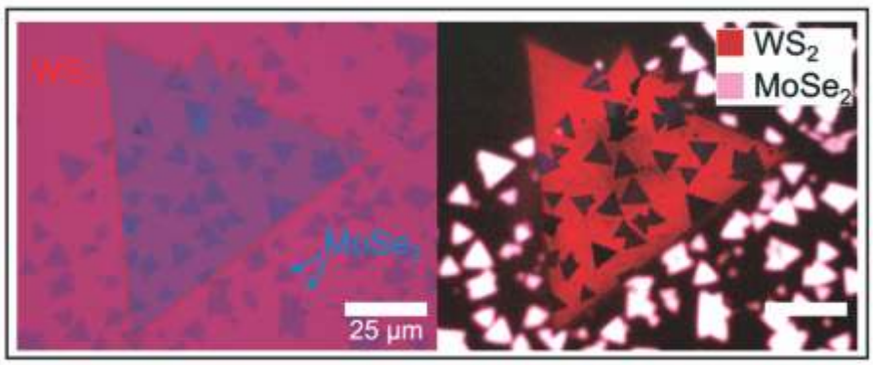
Surface States Engineering of metal/MoS_2 contacts using Sulfur Treatment for Reduced Contact Resistance and Variability; S. Bhattacharjee, K. L. Ganapathi, D. N. Nath and N. Bhat; IEEE Transactions on Electron Devices (TED), 63, 6, 2556-2562 (2016).

High Performance HfO_2 Back Gated Multilayer MoS_2 transistors; K. L. Ganapathi, S. Bhattacharjee, S. Mohan and N. Bhat; IEEE Electron Device Letters (EDL), 37, 6, 797-800 (2016).

Intrinsic limit for Contact Resistance in exfoliated multilayered MoS_2 FET; S. Bhattacharjee, K. L. Ganapathi, D. N. Nath and D. N. Bhat; IEEEElectron Device Letters, 37 (1), 119-122 (2015).

Optical Phonon limited high field transport in layered materials; H. Chandrasekhar, K. L. Ganapathi, S. Bhattacharjee, N. Bhat and D. N. Nath; IEEE Transactions on Electron Devices (TED), 63, 2, 767-772 (2015).

Influence of O_2 flow rate on HfO_2 gate dielectrics for back gated graphene transistors; K. L. Ganapathi, N. Bhat, and S. Mohan; Semicond. Sci. Technol., 29, 055007 (2014).



Pramoda Kumar Nayak

DST Ramanujan Fellow

Ph.D.: IIT Guwahati

Research Scientist: Ulsan National Institute of Science and Technology, South Korea

Research Fellow: National Tsing Hua University, Taiwan

Post-Doc: National Cheng Kung University, Taiwan

Post-Doc: Institute for Plasma Research, India

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Awards and Recognitions

- Ramanujan Fellowship, DST, India
- BK21Plus Research Fellowship, South Korea
- TACT (International Thin Film Conference) outstanding dissertation award, Taiwan

Research Interest

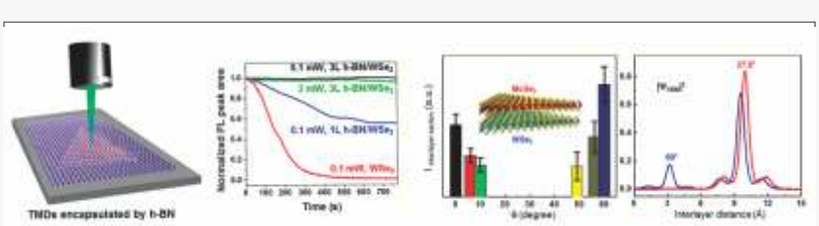
- Two-dimensional Materials
- Topological Insulators
- Van der Waals Heterostructures
- Quantum Dots
- Light-Matter Interaction at Nanoscale
- Novel Superconducting Materials

Selected Publications

Hydrogenation of Monolayer Molybdenum Diselenide via Hydrogen Plasma Treatment; Kyung Yeol Ma, Seong In Yoon, A-Rang Jang, Hu Young Jeong, Yong Jin Kim, Pramoda K. Nayak and Hyeon Suk Shin; Journal of Material Chemistry C, 5, 11294-11300 (2017).

Imaging of interlayer coupling in van der Waals heterostructures using a bright-field optical microscope; Evgeny M. Alexeev, Alessandro Catanzaro, Oleksandr V. Skrypka, Pramoda K. Nayak, Seongjoon Ahn, Sangyeon Pak, Juwon Lee, Jung Inn Sohn, Kostya S. Novoselov, Hyeon Suk Shin and Alexander I. Tartakovskii; Nano Letters, 17, 5342–5349 (2017).

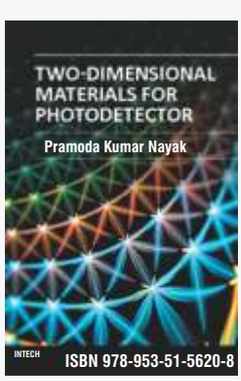
Probing Evolution of Twist Angle Dependent Interlayer Exciton in $MoSe_2/WSe_2$ van der Waals Heterostructures; Pramoda K. Nayak, Yevhen Horbatenko, Seongjoon Ahn, Gwangwoo Kim, Jae-Ung Lee, A-Rang Jang, Hyunseob Lim, Dogyeong Kim, Sunmin Ryu, Hyeonsik Cheong, Noejung Park and Hyeon Suk Shin; ACS Nano, 11, 4041–4050 (2017).



Prevention of Transition Metal Dichalcogenide Photodegradation by Encapsulation with h-BN Layers; Seongjoon Ahn, Gwangwoo Kim, Pramoda K. Nayak, Seong In Yun, Hyunseob Lim and Hyun-Joon Shin and Hyeon Suk Shin; ACS Nano, 10, 8973–8979 (2016).

Robust Room Temperature Valley Polarization in Monolayer and Bilayer Ws_2; Pramoda K. Nayak, Fang-Cheng Lin, Chao-Hui Yeh, J.S. Huang and Po-Wen Chiu; Nanoscale, 8, 6035-6042 (2016).

Layer dependent optical conductivity in atomic thin WS_2 by reflection contrast spectroscopy; Pramoda K. Nayak, Chao-Hui Yeh, Yu-Chen Chen and Po-Wen Chiu; ACS applied Materials and Interfaces, 6, 16020-16026 (2014).



OUTREACH LABORATORY

SCOPE

Design and development of simple and effective teaching and demonstration experiments for Physics classes and organization of teacher training and student outreach programs in neighboring schools and colleges

ELECTRONICS LAB

B.Tech. LAB

PHYSICS LAB

M.Sc. - DD Laboratory Program

Students from the first year MSc program and the third year DD program come together in two semesters. Experiments are grouped under various theme labs as indicated below. Each experiment is for three lab sessions per week. Students will get to do about nine to ten experiments from each theme lab in every semester. At the end of the regular experiments, student teams are formed and are assigned exploratory lab projects to be carried out over three weeks. Assessment is based on weekly lab reports, the exploratory lab project, and a short experiment done at the end of each semester. Weekly lab reports are assessed for preparation, implementation, and analysis.

Mechanics Lab

1. Determining the fractal dimensions of porous objects representative of 1D, 2D and 3D. Comparison with non-porous regular objects.
2. Visualization of waves using a series of uncoupled simple pendulums.
3. Study of small amplitude and large amplitude oscillations of simple pendulum using webcam.
4. Study of normal modes of coupled pendulums using webcam .
5. Study of the coupled oscillations in a Wilberforce pendulum.
6. Determination of longitudinal wave velocity of liquids using standing wave technique. Study of temperature dependence of the wave velocity.
7. Determination of longitudinal and shear wave velocities of solids such as metals, ceramics, glasses, and polymers and of their elastic moduli using pulse propagation technique.
8. Guided elastic waves - determination of phase and group velocities of guided waves.
9. Study of radiation pattern of extended acoustic sources

Data Analysis

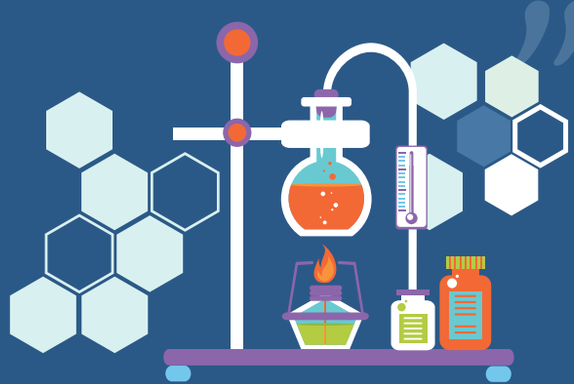
Analysis of the measured H-alpha line characteristics and inferring hydrogen gas distribution in the Milky way galaxy and inferring dark matter.

Electricity & Magnetism Lab

1. Mapping of equipotential curves for a range of electrode shapes and configurations in an electrolytic tank. Determining electric fields from equipotential curves.
2. Determining the Earth's magnetic field using the Helmholtz coil configuration and the Dip needle.
3. Transient response of lumped circuit element (L, C, R) circuits in series and parallel using a digital storage oscilloscope with a built-in function generator. (a) Study of underdamped, critically damped and overdamped oscillations. (b) Study of forced oscillations.
4. Estimation of low resistance and low inductance in the presence of noise using a Lock-In amplifier.
5. Determination of Boltzmann constant from experiments on Johnson noise.
6. Study of the kinematics of a magnet falling through a hollow conducter. Understanding eddy currents.
7. Studying characteristics of transmission lines, of distributed capacitance, inductance and resistance. Understanding impedance matching, impedance mismatch, resistive, capacitive, and inductive loading.

Thermal Physics Lab

1. Study of how hot liquids cool through evaporation, convection, conduction and radiation.
2. Measuring heat capacities of materials.
3. Determination of the Debye temperature of a solid.
4. Understanding Peltier effect and using Peltier cooling/heating setup for the determination of thermal conductivity of a solid.
5. Explorations with an infrared red camera – emissivity, Black and gray body radiation characteristics.
6. Study of the Brownian dynamics in colloidal dispersions.



PHYSICS WORKSHOP

M.Sc. LABORATORY

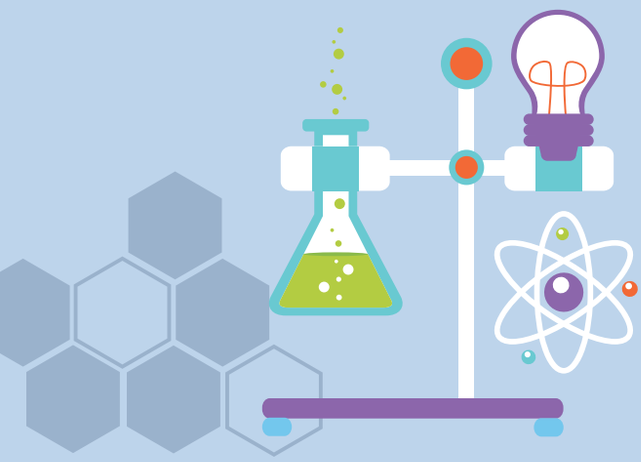
PHYSICS LAB

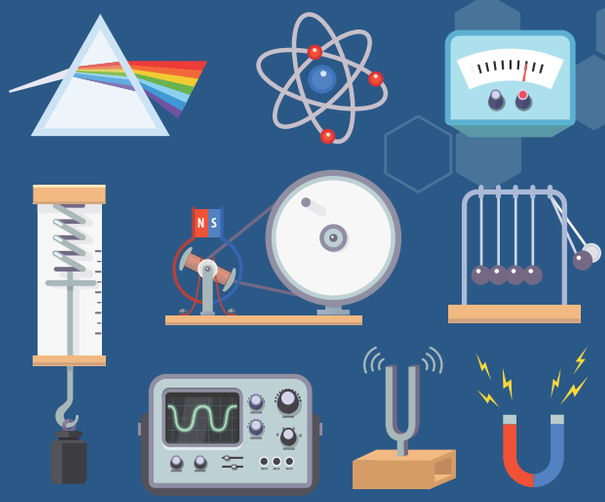
Optics & Spectroscopy

1. Interference: Experiments using Michelson interferometer.
2. Diffraction:
   (a) Single slit diffraction, effect of shapes of apertures (circular and rectangular)
   (b) Study of the diffraction pattern from a wire/strip (Babinet principle)
   (c) Study of the diffraction pattern from a grating
3. Spectral resolution features of prism and grating (with given sources)
4. Polarization: Brewster angle and refractive index determination
5. Lasers (He-Ne; coherence and beam characteristics)
6. X-Ray source spectrum analysis using three sources
   (a) Understanding the spectrum of a source (effect of voltage, current)
   (b) Moseley's law (3 sources)
   (c) Use JAVA applets as an aid in the understanding of the spectral characteristics
7. Application of diffraction phenomenon: Determination of surface tension of a liquid
8. Application of interferometry: Determination of linear thermal expansion coefficient of amaterial.
9. Study of Zeeman effect using Fabry-Perot etalon.
10. Study of Talbot effect involving self-imaging, and revivals.

Computational Physics Lab

1. Solving the equation of motion of a pendulum numerically. Study of small and large amplitude oscillations using Mathematica.
2. Dynamics in phase space using Mathematica. Understanding chaos.
3. Study of probability distributions
4. Introduction to Monte Carlo simulations





Virtual Physics Lab

Study of alpha, beta and gamma particle radiation using particle detectors. Understanding radioactivity, absorption and statistical aspects of the underlying processes.

Condensed Matter Lab

1. Determination of dielectric permittivity and magnetic permeability of materials using transient and sinusoidal excitations of an LCR circuit.
2. Determination of magnetic susceptibility of diamagnetic and paramagnetic materials using force measurements with Gouy balance setup.

Electronics Lab

1. Op-amp characteristics (math operations, oscillations, non-linear operations)
2. 555 timer and applications
3. Circuit simulations
4. Stepper motor basics and applications
5. Understanding of a multiplexer and a de-multiplexer
6. Understanding of registers and counters

Prof. Umesh V. Waghmare, JNCASR, Bengaluru

Prof. Xin Wan, Zhejiang University, China

Prof. Sabyasachi Bhattacharya, TIFR, Mumbai

Prof. Madan Rao, NCBS, Bengaluru

Prof. R. R Puri, IIT Bombay

Prof. Naba K. Mondal, TIFR, Mumbai

Prof. Jayaram Chengalur, NCRA, Pune

Prof. G. Ravindra Kumar, TIFR, Mumbai

Prof. Sriram Ramaswamy, TIFR, Hyderabad

Prof. Ajit Srivastava, Institute of Physics, Bhubaneswar

Prof. Jerome Martin, Institut d'Astrophysique de Paris, France

Prof. B. P. Das, Tokyo Institute of Technology, Japan

Prof. Ravin Bhatt, Princeton University, USA

Prof. Murukeshan Vadakke Matham, NTU, Singapore

Prof. Narayanan Menon, TIFR, Hyderabad

Prof. R. Shankar, Yale University, USA

Prof. Jeff Harvey, University of Chicago

Prof. Prem B Bisht, IIT Madras

Prof. T. Padmanabhan, IUCAA, Pune

Prof. Rohini Godbole, IISc, Bengaluru

Prof. C. S. Sundar, IGCAR, Kalpakkam

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Prof. Kajari Mazumdar, TIFR, Mumbai

Dr. Manu Jaiswal, IIT Madras

Prof. Pratap Raychaudhuri, TIFR, Mumbai

Prof. Dhananjai Pandey, IIT-BHU, Varanasi

Prof. Bill Brocklesby, University of Southampton, UK

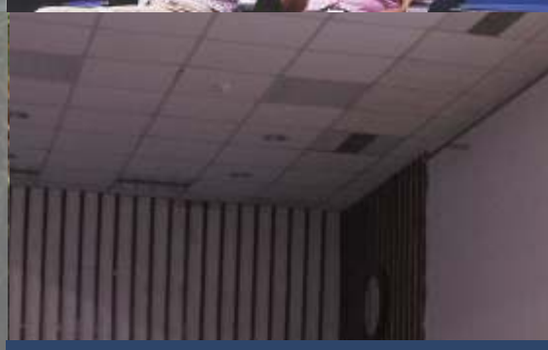
Prof. Hrvoje Petek, University of Pittsburgh, USA

Prof. P. S. Anil Kumar, IISc, Bengaluru

Prof. Phillip Urquijo, University of Melbourne

Prof. G. V. Shivashankar, National University of Singapore

Prof. Sir Michael Berry, University of Bristol, UK



BRAHMAGUPTA

COLLOQUIUM

Prof. Francois Bouchet , Institut d'Astrophysique de Paris, France

Prof. Pinaki Majumdar, HRI, Allahabad

Prof. S.S.N. Murthy, Jawaharlal Nehru University, Delhi

Prof. Roop Mallik, TIFR, Mumbai

Prof. Srikanth Sastry, JNCASR, Bengaluru

Prof. Abhay Ashtekar, Pennsylvania State University, USA

Prof. Rudolf Gross, Walther-Meissner-Institut, Germany

Prof. Somshubhro Bandyopadhyay, Bose Institute, Kolkata

Dr. G. Aravind, IIT Madras

Prof. Dietrich Belitz, University of Oregon, USA

Prof. Jan M. Rost, MPI for the Physics of Complex Systems, Germany

Prof. Ronojoy Adhikari, IMSc, Chennai

Dr. Ranjit Nanda, IIT Madras

Prof. Andrew Boothroyd, University of Oxford, UK

Prof. Rudra Pratap, IISc, Bengaluru

Prof. R.G. Pillay, TIFR, Mumbai

Prof. C.H. Sow, National University of Singapore

Prof. Ranjit Nanda, IIT Madras

Prof. Bedangadas Mohanty, NISER, Bhubaneswar

Prof. S. Ramakrishnan, TIFR, Mumbai

Prof. Raghunathan Srianand, IUCAA, Pune

Prof. R. Trotta, Imperial College, London, UK

Prof. Karol Zyczkowski, Jagiellonian University, Cracow, Poland

Prof. Sanjay Sane, NCBS, Bengaluru

Dr. Sunethra Ramanan, IIT Madras

Prof. John Chalker, University of Oxford, UK

Dr. Rajeev Paramel Pattathil, RAL, UK

Prof. P.B. Sunil Kumar , IIT Palakkad and IIT Madras

Prof. Abhijit Sen, IPR, Gandhinagar

Prof. Anjan Gupta, IIT Kanpur

Prof. Guy Wilkinson, University of Oxford, UK

Prof. Abhishek Dhar, ICTS, Bengaluru

Prof. Arnab Sen, IACS, Kolkata

Prof. Urbasi Sinha, RRI, Bengaluru

Prof. G. Baskaran, IMSc, Chennai and Perimeter Institute, Waterloo, Canada

Prof. Avinash A. Deshpande, RRI, Bengaluru

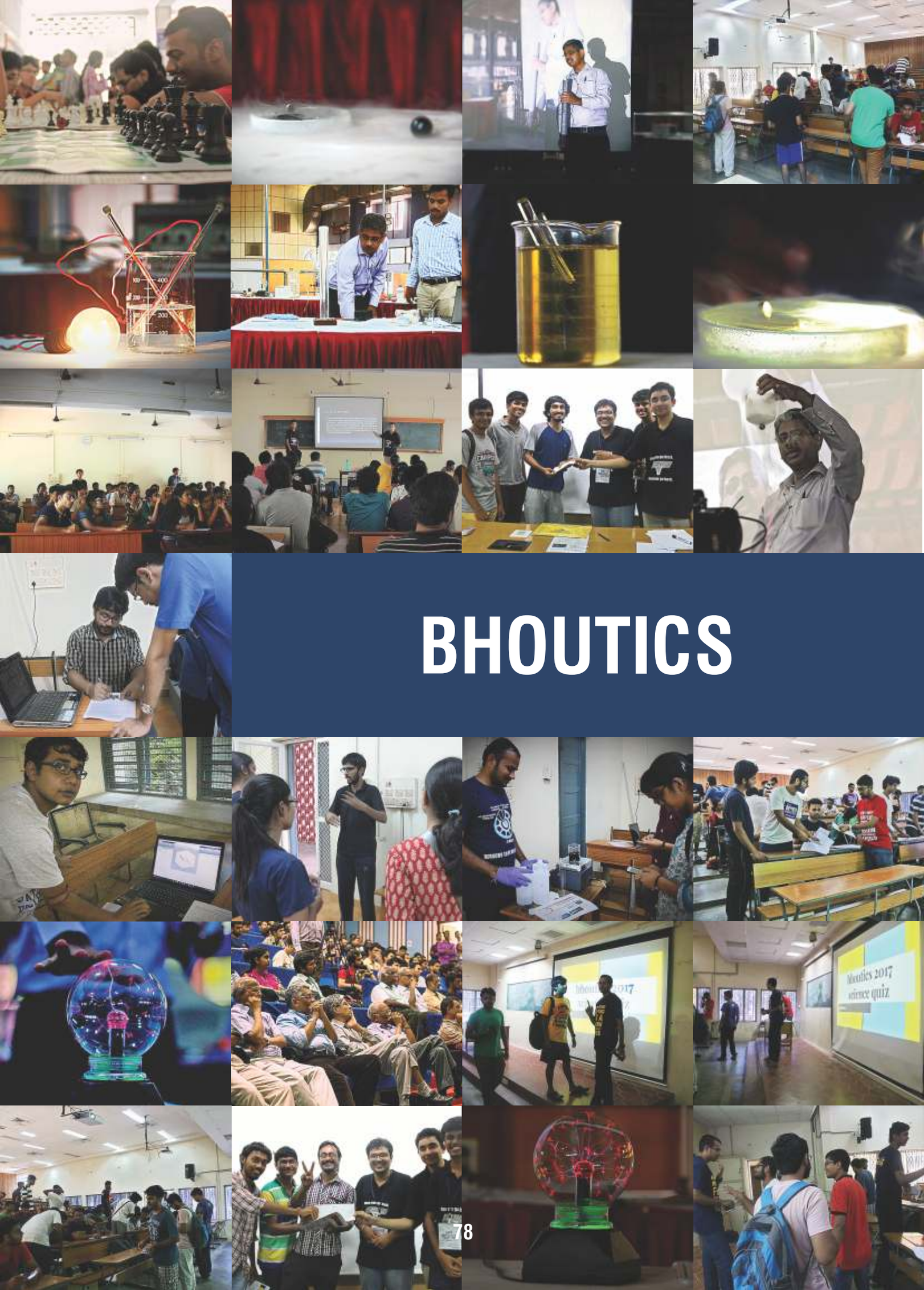
Prof. Rajesh Gopakumar, ICTS, Bengaluru

Dr. Chandra Kant Mishra, IIT Madras

Prof. Ubirajara van Kolck, Centre National de la Recherche Scientifique, Paris, France

Prof. G.P. Das, Indian Association for the Cultivation of Science, Kolkata

Prof. Joe Silk, IAP (Paris), John Hopkins University and the University of Oxford



BHOUTICS



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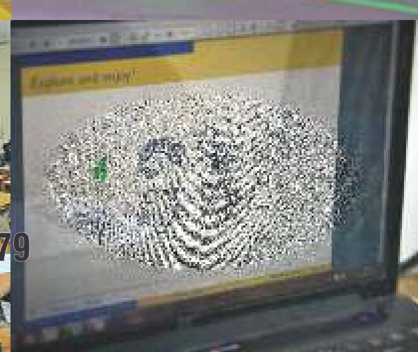
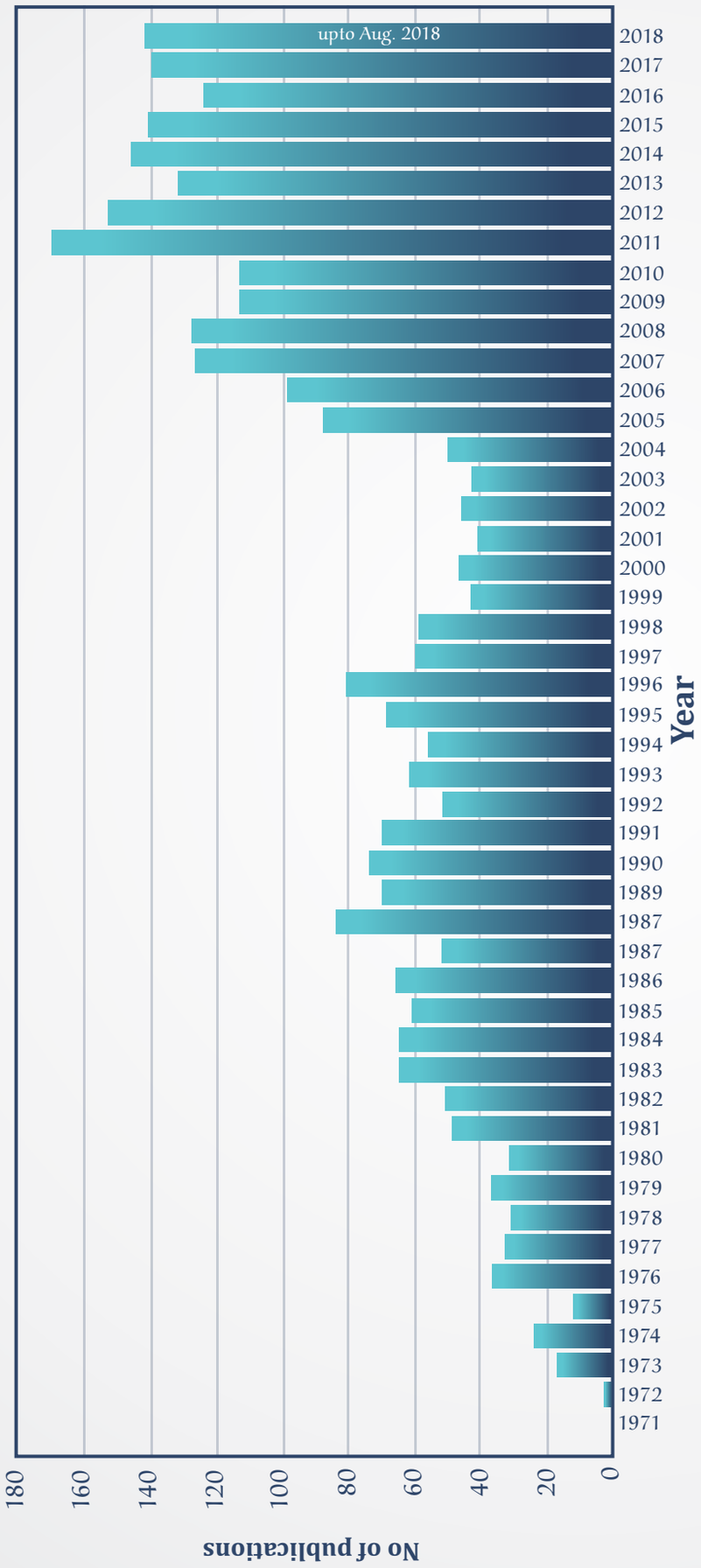


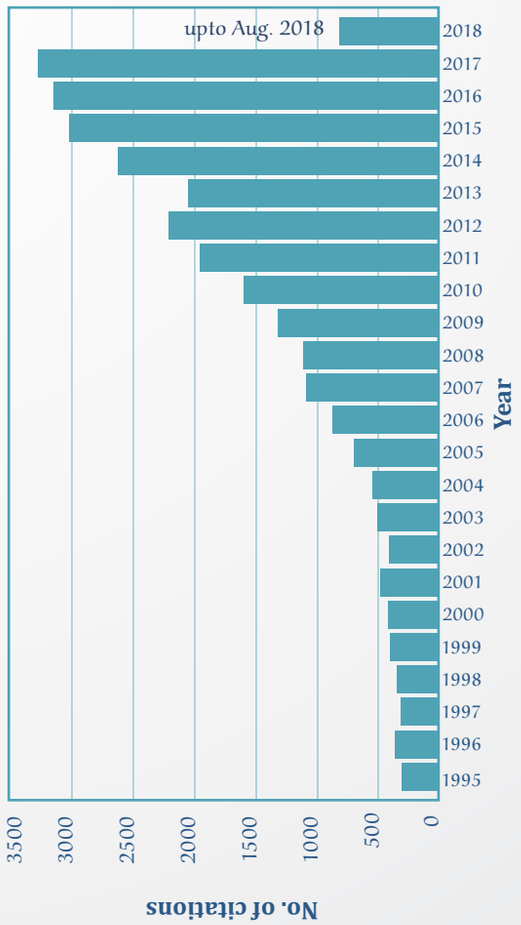
iCOLD CONFERENCE 2017

ACADEMIC ACHIVEMENTS



No. of Ph.D. Students	
Completed	482
Ongoing	184
Time Line*	1972 - 2018
Publications	3459*
Citations	29414*
h-index	61*

*citation shown from 1995 onwards
**Source: ISI Web of Science and Scopus



FACULTY GROUP

STAFF GROUP

The Department of Physics – set in the sylvan campus of IIT Madras – conducts research in many frontier areas. These areas include experimental solid state physics, optical and laser physics, and various aspects of theoretical and computational physics ranging from condensed matter to string theory and cosmology.

The Department conducts programs at the Bachelor's, Master's as well as at the Doctoral Research levels. We conduct a vibrant undergraduate program -- Bachelor of Technology (B.Tech.) in Engineering Physics – in conjunction with the Department of Electrical Engineering. We offer three types of Master's programs: a Dual Degree program that consists of a Bachelor of Science and a Master of Science in Physics, a separate Master of Science (M.Sc.) program in Physics, and a Master of Technology (M.Tech.) in Functional Materials and Nanotechnology. We also conduct a regular Doctoral Research (Ph.D.) program.

In addition to these programs conducted by the Department, we regularly offer several core and elective physics courses to the engineering and science students from all the other Departments of the Institute.

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