George Yumnam, PhD

Materials Science & Technology Division,
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EMPLOYMENT

Postdoctoral Research Associate .....(Dec 2022 – present)

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE

Work Description: *Neutron and X-ray scattering studies, Mössbauer and Ultrasound spectroscopy*

Research focus: *Magnetic materials, Thermoelectrics, MOX photovoltaics, magnetoelastic alloys*

EDUCATION

Ph.D. in Physics .....(Aug 2017 – Dec 2022)

UNIVERSITY OF MISSOURI, COLUMBIA

Thesis: *Magnetic Charge Correlation and Quantum Disorder in Honeycomb Spin Ice Systems*

M.Sc. in Materials Science .....(Aug 2016 – June 2017)

INDIAN INSTITUTE OF SCIENCE, BANGALORE

Thesis: *Unravelling the Role of Ionicity in Thermal Transport of van der Waals Materials*

B.Sc. in Materials Science .....(Aug 2012 – June 2016)

INDIAN INSTITUTE OF SCIENCE, BANGALORE

Thesis: *Identifying efficient thermoelectric materials via first principle high throughput screening*

RESEARCH INTERESTS

I am broadly interested in Quantum Materials, Correlated-electron systems, Functional Materials – transport properties, structural and excited-state characterization.

- Energy-efficient systems leveraging magnetism and thermal transport phenomena for next-generation functional materials and devices.
- Synergystic study of pure and doped complex systems for enhanced functionalities.
- Development of new materials (pure systems, alloys, doped-systems, defect-engineered) for advanced functional properties
- Investigations into the interplay between spin, lattice, and electronic degrees of freedom in magnetic materials, leveraging advanced neutron and X-ray scattering methods, and computational modeling.
- Machine learning assisted prediction of electron and phonon transport properties.
- Precise control of spin-lattice interactions to develop energy-efficient platforms for spintronics and magnonics based information processing and quantum technologies.

RESEARCH EXPERIENCE

Postdoctoral Research Associate .....(Dec 2022 – present)

OAK RIDGE NATIONAL LABORATORY, OAK RIDGE *(ORNL)*

Advisors: Dr. Raphaël P. Hermann & Dr. Michael E. Manley

- Discovered Doping based Tunable Magnon-CEF hybridization via neutron scattering
- Elucidated the origin of spin-reorientation and magnon gap opening in Li-doped MnTe
- Led the neutron scattering investigation of chiral magnon in altermagnets
- Implemented total scattering techniques for average and local structure of doped systems
- Elucidated the stability controls for Tin-based halide perovskites for hot-carrier solar cell
- Investigated the origin of synthesis dependent atomic tunneling in $BaTiS_3$
- Mössbauer Spectral studies of Fe, Eu, Sb & Sn based compounds
- Spinwave calculations of complex interactions beyond the SU(2) approximation

⋆ *Time at ORNL includes leading 8 research projects, and contribution in 11 collaborative projects*

Graduate Research Assistant .....(Aug 2017 – Nov 2022)

UNIVERSITY OF MISSOURI, COLUMBIA *(MIZZOU)*

Advisors: Prof. Deepak K. Singh & Dr. Valeria Lauter

- Demonstrated current induced spin-reconfiguration in Artificial Honeycomb lattices (AHL)
- Quantified and elucidated the static and dynamic properties of Magnetic diodes in AHL
- Synthesized $\alpha-Na_2RuO_3$ and $\beta-CoAsSe$ via solid-state methods
- Conceptualized and Initiated a new project on the synthesis of CVD-grown superconducting films
- Fabricated an array of magnetic diode and transistor for low-powered electronics
- Designed a numerical framework for calculating and fitting PNR/SANS based on DWBA method

⋆ *Time at Mizzou includes leading 6 research projects, and contribution in 5 collaborative projects – including research work towards applied technology (unpublished)*

Masters Research Fellow .....(Aug 2016 – July 2017)

INDIAN INSTITUTE OF SCIENCE, BANGALORE *(IISC)*

Advisor: Prof. Abhishek K. Singh

- Implemented Bayesian Optimization for Machine-learning prediction of thermal conductivity (κ_{latt})
- Elucidated bonds hybridization strength as the origin of drastic κ_{latt} differences in (Mo/W)X_2
- Conceptualized & initiated a project on band-valley convergence study of $A^{II}B^{IV}C_2^V$ Chalcopyrites

† *Work at IISc was supported by the Department of Science & Technology (India), INSPIRE fellowship*

⋆ *Time at IISc led to 3 first-authored articles (including equal contribution), and 1 coauthor article*

Summer Research Intern .....(May - July 2015)

CENTRE FOR FUEL CELL TECHNOLOGY at
International Advanced Research Centre for Powder Metallurgy and New Materials, Chennai (CFCT, ARCI)

Advisor: Dr. R. Balaji

- Investigated fuel cell conductivity & degradation via Electrochemical Impedance Spectroscopy
- Improvised an in-house EIS system for analysis of Nyquist & Bode plots for multiple flow field geometry in proton exchange membrane fuel cells
- Helped design fuel cells based on polymer Electrolyte membrane & Solid Oxide Fuel Cells

† *Internship at CFCT, ARCI was funded by IISc via selection of 2 candidates from a pool of 36 candidates*

Undergraduate Research Student ..... (Aug 2014 – June 2016)

INDIAN INSTITUTE OF SCIENCE, BANGALORE *(IISc)*

Advisor: Prof. Abhishek K. Singh

· Comprehensive investigation of transition metal dichalcogenide thermoelectrics via DFT
· Initiated/developed tool for estimating electronic relaxation time via deformation potential theory
· Developed numerical framework for lattice thermal conductivity calculation

† *Work at IISc was supported by the Department of Science & Technology (India), INSPIRE fellowship*

RESEARCH GRANTS

Contributions to Ongoing Funded Research ..... (Aug, 2024 – present)

| ***1) Neutron Scattering Studies of Hybrid Excitations*** PI: Dr. Raphaël P. Hermann
| (Awarded by Department of Energy, Basic Energy Science) co-PI: Dr. Michael E. Manley
| co-PI: Dr. Lucas Lindsay
| My contributions: Lead the section on "*Understanding multicaloric and thermomagnetic transport properties emerge from spin-lattice coupling*" which consists of the following broad research topics:

· Impact of ferroic frustration on multicaloric function in magnetic shape memory alloys
· Spin-lattice coupling and piezomagnetism in complex antiferromagnets
· Magnon-polaron dynamics in materials featuring anomalous Nernst effect

Past Research Funding ..... (May – July, 2021)

| ***1) Exploration of Higher Temperature Superconductivity in Hydrogenated Metal Film***
| (Awarded by the Board of Curators and Research Council at the University of Missouri)
| PI: Prof. Deepak K. Singh
| My contributions: Led the research by conceptualizing and planning the experiment and design. Conducted initial research work on synthesis (including developing new method for CVD-based metal hydride synthesis), electrical and magnetic measurements of preliminary data and characterization.

HONORS AND AWARDS

⋆ **APS GERA 2025 Travel Fund Recipient** (2025)
⋆ **Gordon Research Seminar & Conference on Neutron Scattering**, Outstanding Poster Award (2023)
⋆ **Graduate Professional Council, Mizzou** Travel Award (2022)
⋆ **James L. and Dora D. Fergason Fund for Excellence in Physics Scholarship** (2020)
⋆ **Newell S. Gingrich Physics Scholarship** (2019)
⋆ **O. M. Stewart Scholarship** (2018)
⋆ **Graduate Professional Council, Mizzou**, 35^{th} RCAF – Best Researcher in Physical Science (2018)
⋆ **Kyoto University**, Invitation for Research Collaboration and Exchange (2017)
⋆ **18^{th} International Workshop on Computational Physics**, Selected for sponsored invitation (2017)
⋆ **INSPIRE Fellowship, Department of Science and Technology, India** (2012–2017)
⋆ **National Talent Search Examination** Recipient (1000 selected of ∼1 million paticipants) (2009)

PUBLICATIONS († – equal contribution)

# 12 first author (including 2 equal contribution), 11 coauthored articles

[23] **George Yumnam**, Parul R. Raghuvanshi, John D. Budai, Lars Bocklage, Douglas Abernathy, Yongqiang Cheng, Ayman H. Said, Igor I. Mazin, Haidong Zhou, Benjamin A. Frandsen, David S. Parker, Lucas R. Lindsay, Valentino R. Cooper, Michael E. Manley, and Raphaël P. Hermann (n.d.). "Constraints on magnetism and correlations in RuO_2 from lattice dynamics and Mössbauer spectroscopy". In: ***Cell Reports Physical Science*** 6 (102852). DOI: 10.1016/j.xcrp.2025.102852

[22] Anjali Verma, Arthur P. Ramirez, **George Yumnam**, Raphael P. Hermann, and M.A. Subramanian (2025). "New precious metal containing normal spinels: $LiRhRu_{1-x}Ir_xO_4$, $LiFeIr_{1-x}Ru_xO_4$, and $LiCoIr_{1-x}Ru_xO_4$". In: ***Prog. Solid State Chem.*** 79, p. 100537. DOI: 10.1016/j.progsolidstchem.2025.100537

[21] Edison P. Carlisle, **George Yumnam**, Stuart Calder, Bianca Haberl, Jia-Xin Xiong, Michael A. McGuire, Alex Zunger, Raphaël P. Hermann, and Benjamin A. Frandsen (2025). "Tuning the magnetic properties of the spin-split antiferromagnet MnTe through pressure". In: ***Phys. Rev. B*** 112 (1), p. 014450. DOI: 10.1103/dzk6-f68q *(Editor's suggestion)*

[20] Raphaël P. Hermann, **George Yumnam**, Kristyn D. Ardrey, and Beth L. Armstrong (2025). "A Mössbauer Spectroscopy Investigation of Nickel-Zinc Ferrites Synthesized by a Self-Combustion Method for Soft Magnetic Core Applications". In: ***Phys. Status Solidi A.***, p. 2500213. DOI: 10.1002/pssa.202500213 *(Early view)*

[19] Andrew F. May, **George Yumnam**, Raphael P. Hermann, Stuart Calder, Benjamin M. Lefler, Steven J. May, Zachary E. Brubaker, Matthew Brahlek, Xiaodong Xu, Dmitry Ovchinnikov, and Michael A. McGuire (2025). "Cleavable quaternary oxychlorides with high magnetic ordering temperatures". In: ***Phys. Rev. Mater.*** 9 (3), p. 034002. DOI: 10.1103/PhysRevMaterials.9.034002

[18] Juliane Weber, Brittany Moseley, Ke Yuan, Barbara R Evans, Vitalii Starchenko, Elena Tajuelo Rodriguez, Dong Youn Chung, Matthew G Boebinger, Michael A McGuire, **George Yumnam**, et al. (2024). "Influence of Dissolved Iron in Solution on MgO Hydroxylation and Carbonation". In: ***J. Phys. Chem. C*** 129.1, pp. 194–204. DOI: 10.1021/acs.jpcc.4c04953

[17] **George Yumnam**, Duncan H Moseley, Joseph AM Paddison, Christiana Z Suggs, Emma Zappala, David S Parker, Garrett E Granroth, Gerald D Morris, Md Mobarak Hossain Polash, Daryoosh Vashaee, et al. (2024). "Magnon gap tuning in lithium-doped MnTe". In: ***Phys. Rev. B*** 109.21, p. 214434. DOI: 10.1103/PhysRevB.109.214434

[16] T Seddik, B Rezini, K Djelid, Bakhtiar Ul Haq, Se-Hun Kim, M Batouche, Shah Fahad, A Djelloul, and **George Yumnam** (2023). "Electronic, optical, and thermoelectric properties of multifunctional zintl compound $BaAg_2Te_2$ for energy conversion". In: ***Phys. B: Condens. Matter*** 668, p. 415209. DOI: 10.1016/j.physb.2023.415209

[15] **George Yumnam**, Moudip Nandi, Pousali Ghosh, Amjed Abdullah, Mahmoud Almasri, Erik Henriksen, and Deepak K Singh (2023). "Field and temperature tuning of magnetic diode in permalloy honeycomb lattice". In: ***Mater. Today Adv.*** 18, p. 100386. DOI: 10.1016/j.mtadv.2023.100386

[14] Jiasen Guo, Vitalii Dugaev, Arthur Ernst, **George Yumnam**, Pousali Ghosh, and Deepak Kumar Singh (2022). "Topological monopole's gauge field-induced anomalous Hall effect in artificial honeycomb lattice". In: ***Nat. Sci.*** 2.4, e20210083. DOI: 10.1002/ntls.20210083

[13] **George Yumnam**, Jiasen Guo, Yiyao Chen, Ashutosh Dahal, Pousali Ghosh, Quinn Cunningham, Jong Keum, Valeria Lauter, Amjed Abdullah, Mahmoud Almasri, et al. (2022). "Magnetic charge

and geometry confluence for ultra-low forward voltage diode in artificial honeycomb lattice". In: ***Mater. Today Phys.*** 22, p. 100574. DOI: 10.1016/j.mtphys.2021.100574

[12] **George Yumnam**, Jiasen Guo, and Deepak K Singh (2021). "Various facets of magnetic charge correlation: Micromagnetic and distorted-wave Born approximation simulations study". In: ***Phys. Rev. B*** 104.13, p. 134429. DOI: 10.1103/PhysRevB.104.134429

[11] Yiyao Chen, **George Yumnam**†, Jiasen Guo, Laura Stingaciu, Piotr Zolnierczuk, Valeria Lauter, and Deepak K Singh (2021). "Magnetic charge's relaxation propelled electricity in two-dimensional magnetic honeycomb lattice". In: ***Iscience*** 24.3, p. 102206. DOI: 10.1016/j.isci.2021.102206

[10] **George Yumnam**, Yiyao Chen, Jiasen Guo, Jong Keum, Valeria Lauter, and Deepak Kumar Singh (2021). "Quantum disordered state of magnetic charges in nanoengineered honeycomb lattice". In: ***Adv. Sci.*** 8.6, p. 2004103. DOI: 10.1002/advs.202004103 *(Featured in Frontispiece)*

[9] Jiasen Guo, **George Yumnam**, Ashutosh Dahal, Yiyao Chen, Valeria Lauter, and Deepak K Singh (2021). "Local Spin Ice Order Induced Planar Hall Effect in Nd–Sn Artificial Honeycomb Lattice". In: ***Adv. Electron. Mater.*** 7.9, p. 2100079. DOI: 10.1002/aelm.202100079

[8] **George Yumnam**, Jiasen Guo, Yiyao Chen, Valeria Lauter, and Deepak K. Singh (2020). "Nonconventional magnetic phenomena in neodymium thin film". In: ***Phys. Rev. Research*** 2.4, p. 043018. DOI: 10.1103/PhysRevResearch.2.043018

[7] Yiyao Chen, **George Yumnam**, A Dahal, JA Rodriguez-Rivera, Guangyong Xu, TW Heitmann, and DK Singh (2020). "Magnetic order and instability in newly synthesized CoSeAs marcasite". In: ***Phys. Rev. Research*** 2.2, p. 023168. DOI: 10.1103/PhysRevResearch.2.023168

[6] KC Bhamu, Enamul Haque, CS Praveen, Nandha Kumar, **George Yumnam**, Md Anwar Hossain, and Gautam Sharma (2021). "Improving the optical and thermoelectric properties of $Cs_2InAgCl_6$ with heavy substitutional doping: a DFT insight". In: ***RSC Adv.*** 11.10, pp. 5521–5528. DOI: 10.1039/D0RA01840F

[5] **George Yumnam**, Yiyao Chen, Yang Zhao, Arumugam Thamizhavel, Sudesh K Dhar, and Deepak K Singh (2019). "Microscopic nature of magnetic ground state in $CeAuSb_2$". In: ***phys. status solidi RRL*** 13.10, p. 1900304. DOI: 10.1002/pssr.201900304

[4] Rinkle Juneja, **George Yumnam**†, Swanti Satsangi, and Abhishek K Singh (2019). "Coupling the high-throughput property map to machine learning for predicting lattice thermal conductivity". In: ***Chem. Mater.*** 31.14, pp. 5145–5151. DOI: 10.1021/acs.chemmater.9b01046

[3] Madhubanti Mukherjee, **George Yumnam**, and Abhishek K Singh (2018). "High thermoelectric figure of merit via tunable valley convergence coupled low thermal conductivity in $A^{II}B^{IV}C_2^V$ chalcopyrites". In: ***J. Phys. Chem. C*** 122.51, pp. 29150–29157. DOI: 10.1021/acs.jpcc.8b10564

[2] **George Yumnam**, Tribhuwan Pandey, and Abhishek Kumar Singh (2018). "Interplay of structural and bonding characters in thermal conductivity and born-effective charge of transition metal dichalcogenides". In: ***J. Phys. Chem. C*** 122.5, pp. 2521–2527. DOI: 10.1021/acs.jpcc.7b11160

[1] **George Yumnam**, Tribhuwan Pandey, and Abhishek K Singh (2015). "High temperature thermoelectric properties of Zr and Hf based transition metal dichalcogenides: A first principles study". In: ***J. Chem. Phys.*** 143.23. DOI: 10.1063/1.4937774

MANUSCRIPT IN PREPARATION/REVIEW († – equal contributions)

[4] Pousali Ghosh, **George Yumnam**†, Jiasen Guo†, *et al.* (in review at Phys. Rev. B) "Magnetic charge liquid state in honeycomb spin ice"

[3] **George Yumnam**, David Dahlbom, Duncan Moseley, *et al* (in preparation) "Controlling Unconventional Magnon–Crystal-field Hybridization via Doping up to the Percolation Threshold"

[2] **George Yumnam**, Eleanor Clements, Bing Li, *et al* (in preparation) "Neutron Scattering Evidence of Strong Paramagnon–Magnon Hybridization Inducing Large Chiral Altermagnon Splitting"

[1] **George Yumnam**, Ajay Kumar, Yaroslav Mudryk, Douglas Abernathy, Michael E. Manley, Raphaël P. Hermann. (in preparation) "Temperature dependent magnetic hysteresis due to crystal field and magnon hybridization in antiferromagnetic terbium silicide"

PRESENTATIONS IN CONFERENCES / SEMINARS / SYMPOSIUMS

Invited (3 invited talks)

[3] ***BES MSE Quantum Materials and Soft Matter Seminar Series***, MSTD/ORNL ..... (Jan, 2025)
· (***Invited talk***) "Probing Altermagnetism: Bridging Theory with Experiments"

[2] ***Roadmap to Altermagnetism***, New Jersey Institute of Technology ..... (Jan, 2025)
· (***Invited talk***) "Interplay of anisotropic paramagnons and phonons in altermagnetic MnTe"

[1] ***Gordon Research Conference & Seminar*** on **Neutron Scattering**, Ventura ..... (June, 2023)
· (***Invited talk***) "Doping-induced Magnetic Anisotropy and Spin Reorientation in MnTe"
· (poster) "Magnetic Anisotropy driven Magnon Gap opening in MnTe"
⋆ *Won the "Outstanding Poster Award"*

Contributed (8 talks, 7 posters)

[14] ***TMS Annual Meeting***, Las Vegas ..... (2025)
· **(talk)** "Enhanced magnetic-disorder driven magnon softening of TbSb via Y-doping"

[13] ***APS Global Physics Meeting***, Anaheim ..... (2025)
· **(talk)** "Resilient spin dynamics in Y-doped TbSb near percolation limits"
· **(poster)** "Interplay of anisotropic paramagnons and polarons in altermagnetic MnTe"

[12] ***9^{th} North American Mössbauer International Symposium***, ORNL ..... (2024)
· **(poster)** "Strongly coupled magnon-crystal-field spectra as an origin for strong magnetoelasticity"

[11] ***American Conference on Neutron Scattering***, Knoxville ..... (2024)
· **(talk)** "Magnetic Disorder driven Magnon softening in TbSb"

[10] ***APS March Meeting***, Minneapolis ..... (2024)
· **(talk)** "Antiferromagnetic magnon gap opening and spin-reorientation in Li-doped MnTe"

[9] ***SNS & HFIR User Group Meeting and Seminar***, Oak Ridge ..... (2023)
· **(poster)** "Magnon softening in Y-doped TbSb"

[8] ***APS March Meeting***, Las Vegas ..... (2023)
· **(talk)** "Field and temperature tuning of magnetic diode in permalloy honeycomb lattice"

[7] ***American Conference on Neutron Scattering***, Boulder ..... (2022)
· **(poster)** "Quantum Disordered State of Magnetic Charges in Nanoengineered Honeycomb Lattice"

[6] ***APS March Meeting***, Chicago ..... (2022)
· **(talk)** "Magnetic charge's relaxation propelled electricity in a 2-D magnetic honeycomb lattice"

[5] ***APS March Meeting***, Denver (*virtual due to COVID-19*) ..... (2020)
· **(talk)** "Cooperative liquid-like paramagnetic state in nanoengineered honeycomb lattice"

[4] ***35th Annual Research & Creative Activities Forum***, Graduate Professional Council, Mizzou . (2018)
· **(talk)** "Interplay of Structural and Bonding Characters in Thermal Conductivity and Born-Effective Charge of Transition Metal Dichalcogenides"
⋆ *Won 1st place in Physical Science Category, Mizzou – College of Arts and Science*

[3] ***18th International Workshop on Computational Physics and Materials Science: Total Energy and Force Methods***, International Centre for Theoretical Physics, Trieste ..... (Jan, 2017)
· **(poster)** "Electronic and thermal transport properties of bulk and monolayer TMDs"
⋆ *Selected for fully sponsored Travel Award among 30 international attendees*

[2] ***Asian Consortium on Computational Materials Science***, SRM University, Chennai ..... (2016)
· **(poster)** "High temperature thermoelectric properties of Zr and Hf based Transition Metal Dichalcogenides: A first principles study"

[1] ***28th Annual Symposium, Department of Materials Engineering***, IISc ..... (2016)
· **(poster)** "High temperature thermoelectric properties of Zr/Hf based TMDs via DFT"

PROFESSIONAL SERVICE

- **Peer Reviewer for Research in Condensed Matter Physics** (2023–present)
  Topics include: *Magnetism, Neutron Scattering, DFT, Energy Materials, Thermal transport*
  · *Phys. Rev. B*, *J. Mater. Sci.*, *Adv. Funct. Mater.*, *Commun. Phys*, *Adv. Mater. Interfaces*, *J. Appl. Crystallogr.*, *Thin Solid Films*, *Solar*
- **Oak Ridge Postdoctoral Research Associate (ORPA)**: Chair of Research Activities (2023–2024)
  · Co-organized the National Postdoc Appreciation Week in ORNL
  · Organized the 12th Oak Ridge Postdoctoral Research symposium, July–2024
  · Chaired and Organized *ten* ORPA Research Seminars and Colloquium
- **Neutron Scattering Seminar Series**: Organizer (2023–2024)
  · Chaired and Organized Monthly Seminars on Neutron Scattering: Science and Instrumentation
- **TMS Annual Meeting, Neutron Scattering Seminar:** Session Chair (March 26, 2025)
  · Chaired the session: Neutron and X-Ray Scattering in Materials Science and Engineering — Lattice and Spin Dynamics in Materials at the 2025 TMS Meeting at Las Vegas

SCIENTIFIC WORKSHOPS

- *Northeast Quantum Forum: Quantum Magnets and Magnetotransports*, New Hampshire ..... (2024)
  (poster:) Strongly coupled magnon-crystal field as an origin for strong magnetoelasticity in TbSb
- *Magnetic Structure Refinement Workshop*, Kennesaw ..... (2024)
- *Polarized Neutron Diffraction and Spectroscopy: Applications to Quantum Materials*, Knoxville . (2024)
- *Inelastic neutron scattering analysis software: Inspired, Shiver, Sunny*, Knoxville ..... (2024)

- *Methods for modelling transport and dynamics in quantum magnets*, Los Alamos .....(2024)
- *APS March Meeting Tutorial: T4. Quantum Computing Platforms*, Minneapolis .....(2024)
- *5th US Total Scattering School*, ORNL .....(2023)
- *21st National School on Neutron and X-Ray Scattering*, ORNL & Argonne (highly selective) .....(2019)
- *Advanced Workshop on High-Performance & High-Throughput Materials Simulations using Quantum ESPRESSO*, ICTP, Trieste (Among 30 fully-funded participants selected internationally) .....(2017)
- *IWPSD International Workshop on Physics of Semiconductor devices*, IISc .....(2015)

PROFESSIONAL SOCIETIES | (4 current, 4 past membership)

- American Physical Society (APS – GMAG, DCMP) – Member (2017–present)
- The Minerals, Metals and Materials Society (TMS) – Member (2022–present)
- American Neutron Scattering Society (ACNS) – Member (2018–present)
- SNS & HFIR User Group (SHUG) – Member (2018–present)
- Oak Ridge Postdoctoral Association (ORPA) – Executive Member & Research Chair (2023–2024)
- Graduate Professional Council (GPC), Mizzou – Member (2017–2022)
- Physics & Astronomy Graduate Students Association (PAGSA), Mizzou – Member (2017–2022)
- IISc Student Council – Member (2012–2017)

TEACHING & MENTORING EXPERIENCE

Teaching experience

- **Introduction to Modern Physics and Quantum Mechanics**, Teaching Assistant .....(Fall 2017)
- **Introduction to Thermodynamics and Statistical Mechanics**, Teaching Assistant .....(Spring 2019)
- **College Physics I – Intro Classical Mechanics**, Laboratory Instructor .....(Fall 2018)
- **College Physics II – Intro Electromagnetism**, Laboratory Instructor .....(Spring 2019)
- **College Physics I – Intro Classical Mechanics**, Recitation Instructor .....(Fall 2021)
- **College Physics II – Intro Electromagnetism**, Recitation Instructor .....(Spring 2022)
- **Introduction to Electromagnetism and Electrodynamics**, Teaching Assistant .....(Spring 2022)

 # As a teaching Assistant or Instructor, we perform proctoring, open office-hours, tutoring and grading
⋆ As Instructor, we also design teaching plan for Experiments/Weekly Revision & Recitation Problems

Mentoring experience

- Dr. Madhubanti Mukherjee, (2016-2017), *Mentored her initial research project at IISc.* .(Ph.D. student)
- Mr. Sannibha Das, (2015), *Mentored his Summer research project at IISc.* .....(UG summer intern)
- Mr. Kartikay Gaur, (2016), *Mentored his Summer research project at IISc.* .....(UG summer intern)
- Dr. Jiasen Guo (2018–2019), *Initial research including neutron expts. at Mizzou.* .....(Ph.D. student)
- Ms. Pousali Ghosh (2019–2021), *Initial research including neutron expts. at Mizzou.*...(Ph.D. student)

· Mr. Moudip Nandi (2021–2022), *Initial research including neutron expts. at Mizzou.* .... (Ph.D. student)
· Dr. Ashiq Shawon (2024), *Trained him on neutron scattering and analysis at ORNL* ... (Research Intern)
· Ms. Sierra Diller (2025), *Training her on inelastic neutron scattering at ORNL* ..... (UG summer intern)

REFERENCES

◯ Dr. Raphaël P. Hermann (✉ hermannrp@ornl.gov) ..... Sr. Scientist, ORNL
Postdoc Advisor (2022–)

◯ Dr. Michael E. Manley (✉ manleyme@ornl.gov) ..... Sr. Scientist, ORNL
Postdoc co-Advisor (2022–)

◯ Prof. Deepak K. Singh (✉ singhdk@missouri.edu) ..... Assoc. Prof., Mizzou
Ph.D. Advisor (2017–22)

◯ Dr. Valeria Lauter (✉ lauterv@ornl.gov) ..... Sr. R&D Scientist, ORNL
Ph.D. co-Advisor (2017–22)

◯ Prof. Abhishek K. Singh (✉ abhishek@iisc.ac.in) ..... Professor, IISc
UG Advisor (2014–17)