

TRINANJAN DATTA, PhD

Department of Physics and Biophysics, GE 3049

Augusta University, 1120 15th Street, Augusta, GA 30912

Phone: 706-667-4516 (O); **Email:** tdatta@augusta.edu

Webpage: <https://spots.augusta.edu/tdatta>

arXiv: www.tinyurl.com/ArXiv-tdatta

ORCID: <https://orcid.org/0000-0003-0910-8328>

EDUCATION

Ph.D.

Theoretical Condensed Matter Physics, Purdue University, Indiana **May 2007**
(Advisor: 150th Anniversary Professor Erica Carlson)

M.S.

Physics, Indian Institute of Technology (Kanpur), India **April 2001**

B.S.

Physics, St. Xavier's College, University of Calcutta, India **August 1999**

EMPLOYMENT (* indicates name change for either department or university)

Professor of Physics

Dept. of Physics and Biophysics*, Augusta University **Aug 2023 – present**
Dept. of Chemistry and Physics, Augusta University **Aug 2019 – July 2023**

Associate Professor of Physics

Dept. of Chemistry and Physics, Augusta University* **Dec 2015 - July 2019**
Dept. of Chemistry and Physics, Georgia Regents University* **Aug 2013 – Dec 2015**

Assistant Professor of Physics

Dept. of Chemistry and Physics, Augusta State University **Aug 2008 – July 2013**

Visiting Professor of Physics

Dept. of Chemistry and Physics, Augusta State University **Aug 2007 – July 2008**

Bilsland Dissertation Fellow

Dept. of Physics, Purdue University, Indiana **Aug 2006 – July 2007**

Research Assistant

Dept. of Physics, Purdue University, Indiana **May 2004 – July 2006**

Graduate Teaching Assistant

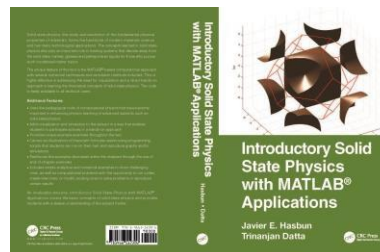
Dept. of Physics, Purdue University, Indiana **Aug 2001 - April 2004**

PUBLICATIONS

TEXTBOOK

Introductory Solid-State Physics with MATLAB Applications, 1st Edition

Javier E. Hasbun and **Trinanjana Datta**
CRC Press (Taylor & Francis Group), October 7, 2019.
576 Pages - 247 B/W Illustrations



RESEARCH (*UNDERGRADUATE RESEARCH STUDENT, **PHD STUDENT, CORRESPONDING AUTHOR)

Published 32 papers in peer-reviewed journals to date. Of these 16 are in the field of frustrated magnetism and correlated electrons, 12 are in the field of spectroscopy [RIXS, REXS and Raman], 2 are in the field of non-equilibrium statistical physics, 1 in the field of Biological Physics, and 1 in the field of Geophysics.

[1] Dynamical phase transitions in the XY model: A Monte Carlo and mean-field-theory study, Mainak Pal**, William D. Baez*, Pushan Majumdar, Arnab Sen, and #**Trinanjana Datta**, *Phys. Rev. E*, 110, 054109 (2024).

[2] Periodicity staircase in a Fe/Gd magnetic thin film, Singh *et al.*, *npj Quantum Mater.* 9, 2 (2024)

[3] A spin-rotation mechanism of Einstein-de Haas effect based on a ferromagnetic disk, X. Nie, Jun Li, #**Trinanjana Datta**, and Dao-Xin Yao, *Frontiers of Physics*, 19 (5), 53201 (2024).

[4] Raman spectroscopy of bimagnon and trimagnon excitations and rotonlike points in a distorted triangular lattice antiferromagnet, Junli Li**, Shangjian Jin, #**Trinanjana Datta**, and Dao-Xin Yao, *Phys. Rev. B* 107, 184402 (2023).

[5] Enhanced mechanical heterogeneity of cell collectives due to temporal fluctuations in cell elasticity, Garrett Zills*, #**Trinanjana Datta**, and Abdul N. Malmi-Kakkada, *Phys. Rev. E* 107, 014401 (2023).

[6] An effective curved space-time geometric theory of generic twist angle graphene with application to a rotating bilayer configuration, Jia-Zheng Ma**, #**Trinanjana Datta**, and Dao-Xin Yao, *Phys. Rev. B* 105, 245102 (2022).

[7] *Ab initio* study of spin fluctuations in the itinerant kagome magnet FeSn, Zhang *et al.*, *Phys. Rev. B* 106, 184422 (2022).

[8] Einstein-de Haas effect of Topological Magnons, Jun Li**, #**Trinanjana Datta**, and Dao-Xin Yao, *Phys. Rev. Research* 3, 023248 (2021).

- [9] Torque equilibrium spin wave theory of Raman scattering in an anisotropic triangular lattice antiferromagnet with Dzyaloshinskii-Moriya interaction, Chao Shan**, Shangjian Jin, #Trinanjan Datta, and Dao-Xin Yao, *Phys. Rev. B* 103, 024417 (2021).
- [10] Topological properties of multilayer magnon insulators, Stephen Hofer**, #Trinanjan Datta, Sumanta Tewari, and Dipanjan Mazumdar, *Phys. Rev. B* 104, 064427 (2021).
- [11] The Magnetoelastic Distortion of Multiferroic BiFeO₃ in the Canted Antiferromagnetic State, Room et al., *Phys. Rev. B* 102, 214410 (2020).
- [12] Resonant inelastic x-ray scattering study of vector chiral ordered kagome antiferromagnet, Zijian Xiong**, #Trinanjan Datta, and Dao-Xin Yao, *npj Quantum Materials* 5, 78 (2020).
- [13] Spectroscopic signatures of next-nearest-neighbor hopping in the charge and spin dynamics of doped one-dimensional antiferromagnets, Umesh Kumar**, Alberto Nocera, Gregory Price*, Kenneth Stiwinter*, Steven Johnston, and #Trinanjan Datta, *Phys. Rev. B* 102, 075134 (2020).
- [14] *K*-edge and *L*₃-edge RIXS study of columnar and staggered quantum dimer phases of the square lattice Heisenberg model, Meiyu He**, #Trinanjan Datta, Dao-Xin Yao, *Phys. Rev. B* 101, 024426 (2020).
- [15] Detecting Crystallographic Lattice Chirality using Resonant Inelastic X-ray Scattering, Sean Mongan*, #Trinanjan Datta, Takuji Nomura, and D.-Xin Yao, *Scientific Reports* 9: 12771 (2019).
- [16] Torque equilibrium spin wave theory study of anisotropy and Dzyaloshinskii-Moriya interaction effects on the indirect *K*-edge RIXS spectrum of a triangular lattice antiferromagnet, Shangjian Jin**, Cheng Luo, #Trinanjan Datta, and D.-Xin Yao, *Phys. Rev. B* 100, 054410 (2019).
- [17] Indirect K-edge bimagnon resonant inelastic x-ray scattering spectrum of α -FeTe, Zengye Huang**, Sean Mongan*, #Trinanjan Datta, and D.-Xin Yao, *J. of Phys. Condens. Matt.*, 29, 505802 (2017).
- [18] Magnon-phonon coupling effects on the indirect K-edge resonant inelastic x-ray scattering spectrum of a two-dimensional Heisenberg antiferromagnet, Zijian Xiong**, #Trinanjan Datta, Kenneth Stiwinter*, and D. -Xin Yao, *Phys. Rev. B* 96,144436 (2017).
- [19] Spin and quadrupolar orders in the spin-1 bilinear-biquadratic model for iron-based superconductors, Cheng Luo**, #Trinanjan Datta, Dao-Xin Yao, *Phys. Rev. B* 93, 235148 (2016).
- [20] Signatures of indirect K-edge resonant inelastic x-ray scattering on magnetic excitations in triangular-lattice antiferromagnet, Cheng Luo**, #Trinanjan Datta, Zengye Huang**, Dao-Xin Yao, *Phys. Rev. B* 92, 035109 (2015).

- [21] Spectrum splitting of bimagnon excitations in a spatially frustrated Heisenberg antiferromagnet revealed by resonant inelastic x-ray scattering, Cheng Luo**, #Trinanjan Datta, Dao-Xin Yao, *Physical Review B*, 89, 165103 (2014).
- [22] Exact solution and high temperature series expansion study of the 1/5-th depleted square lattice Ising model, Simeon Hanks* and #Trinanjan Datta, and Jaan Oitmaa, *Physical Review E*, 87, 062143 (2013).
- [23] Spin transport in the Neel and collinear antiferromagnetic phase of the two dimensional spatial and spin anisotropic Heisenberg model on a square lattice, Zewei* Chen, #Trinanjan Datta, and Dao-Xin Yao, *European Physical Journal B*, 86, 63 (2013).
- [24] Effects of magnetic field, anisotropy, and biquadratic interactions in type-IIA fcc antiferromagnets studied by linear spin-wave theory, #Trinanjan Datta and Dao-Xin Yao, *Physical Review B*, 85, 054409 (2012).
- [25] Zero temperature phases of the frustrated J1 – J2 antiferromagnetic spin-1/2 Heisenberg model on a simple cubic lattice, Kingshuk Majumdar and #Trinanjan Datta, *J. Stat. Phys.* 139: 714 – 726 (2010).
- [26] The ground state phase diagram of the quantum J1 – J2 spin-1/2 Heisenberg antiferromagnet on an anisotropic square lattice, Griffith Mendonca, Rodrigo Lapa, J Ricardo de Sousa, Minos A Neto, Kingshuk Majumdar, and #Trinanjan Datta, *J. Stat. Mech.: Theory and Exp.*, P06022 (2010).
- [27] Effect of next-nearest neighbor interactions on the dynamic order parameter of the kinetic Ising model in an oscillating field, William D. Baez* and #Trinanjan Datta, *Physics Procedia, Volume 4, 15 (2010)* (University of Georgia conference proceedings of the 23rd Annual Workshop on Recent Developments in Computer Simulation Studies in Condensed Matter Physics).
- [28] The effects of crustal heterogeneity on ray-based teleseismic imaging, C. Poppeliers and #Trinanjan Datta, *Geophys. J. Int.*, 181, 1041 (2010).
- [29] Non-linear spin wave theory results for the frustrated S=1/2 Heisenberg antiferromagnet on a body-centered cubic lattice, Kingshuk Majumdar and #Trinanjan Datta, *J. Phys.: Condens. Matter* 21 406004 (2009).
- [30] 1D-FFLO state in the absence of time-reversal symmetry breaking, #Trinanjan Datta, *Eur. Phys. J. B* 67, 197 – 208 (2009).
- [31] The magnetoelectric coupling in the multiferroic compound LiCu₂O₂, C. Fang**, #Trinanjan Datta, and J. Hu, *Phys. Rev. B* 79, 014107 (2009).
- [32] RKKY range function of a one-dimensional non-interacting electron gas, Gabriele F. Giuliani, Giovanni Vignale, and #Trinanjan Datta, *Phys. Rev. B* 72, 033411 (2005)

MANUSCRIPTS SUBMITTED / UNDER PREPARATION

[1] RIXS spectra of spinon, doublon, and quarton excitations of a spin-1/2 antiferromagnetic Heisenberg trimer chain, Junli Li**, Jun-Qing Cheng, #**Trinanjan Datta**, and Dao-Xin Yao, (*under review with Phys. Rev. B.*)

[2] Mixed singlet and triplet two-hole states in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ unveiled by cluster modeling of the d-d excitations observed by Cu L_3 Resonant Inelastic X-Ray Scattering, He et al. (manuscript under preparation, *to be submitted to PRB*).

[3] Unraveling the L_3 edge RIXS spectrum of lightly manganese doped $\text{Sr}_3\text{Ru}_2\text{O}_7$, Chen et al., (*manuscript under revision*).

TEXTBOOK UNDER PREPARATION

[1] Correlated electronic systems and frustrated magnetic materials, contracted with Taylor and Francis (*under preparation*).

RESEARCH PRESENTATION

INVITED TALKS (All talks were delivered by me as the sole presenter)

Disciplinary research

[1] *Investigating lattice, spin, and phonon chirality using resonant inelastic x-ray scattering (RIXS)*, **Leibniz Institute for Solid State and Materials Research**, Dresden, Germany, July 5th, 2023.

[2] *Workshop [5-part lecture]: Quantum Magnetism and Spectroscopy*, **Sun Yat-Sen University**, Guangzhou, China, October 13th – 17th, 2022 (*virtual*).

[3] *Einstein-de Haas effect of topological magnons*, **Invited Speaker at Fundamental Quantum Science - Seminar**, Tsung-Dao Lee Institute, Shanghai, China, 2020 (*virtual*).

[4] *Investigating quantum magnetism using Resonant Inelastic X-ray scattering (RIXS)*, **Keynote Speaker Guangdong - Hong Kong - Macau Bay Area Conference**, Guangzhou, China, 2019.

[5] *Exploring quantum magnetism using Resonant Inelastic X-ray scattering (RIXS)*, **Indian Association for the Cultivation of Science (IACS)**, Kolkata, India, 2018.

[6] *Magnon-phonon coupling effects on the indirect K-edge bimagnon RIXS spectrum of an antiferromagnet*, **Oak Ridge National Laboratory**, Oak Ridge, TN, 2017

[7] *Exploring quantum magnetism using Resonant Inelastic X-ray Scattering (RIXS)*, **Sun Yat Sen University Theoretical Physics Summer School**, 2017.

[8] *Magnetic frustration and lattice anisotropy effects on indirect RIXS spectra of Heisenberg magnets*, **University of South Carolina**, Columbia, SC, 2017.

[9] *Engaging Undergraduate Research Students in Theoretical and Computational Physics Research*, **Georgia Southern University**, GA, 2016.

[10] *Magnetic frustration and lattice anisotropy effects on indirect RIXS spectra of Heisenberg magnets*, **Sun Yat-Sen University**, Guangzhou, China, 2016.

[11] *Magnetic frustration and lattice anisotropy effects on indirect RIXS spectra of Heisenberg magnets*, RIKEN Seminar, **RIKEN**, Japan, 2016.

[12] *Exploring quantum magnetism using Resonant Inelastic X-ray Scattering*, Physics Colloquium, **Georgia Southern University**, GA, 2015.

[13] *My two cents on nurturing budding condensed matter theorists*, **Kavli Institute for Theoretical Physics**, UC Santa Barbara, CA, 2015.

[14] *Magnetic Frustration and Lattice Anisotropy Effects on Indirect RIXS Spectra of Heisenberg Magnets*, Materials Science and Technology Division Seminar, **Oak Ridge National Laboratory**, Oak Ridge, TN, 2014.

[15] *Spin transport in the Neel and collinear antiferromagnetic phase of the two dimensional spatial and spin anisotropic Heisenberg model on a square lattice*, The 12th International Conference on Condensed Matter Theory and Computational Materials Science, **Sun Yat-Sen University**, Guangzhou, China, 2013.

[16] *Frustrated magnets – an exciting frontier in materials science*, at Department of Physics and Engineering at **Sun Yat-Sen University**, Guangzhou, China, May 2012 & **Augusta State University** Chapter of the National Society of Phi Kappa Phi A-Day symposium, October 2011.

[17] *Novel 1d-FFLO state in quantum wires and experimental signatures of spin-charge separation in 1d systems*, at Department of Physics and Engineering at **Sun Yat-Sen University**, Guangzhou, China, May 2011, **Indian Institute of Science Bangalore**, Bangalore, India, June 2011, **Indian Association for the Cultivation of Science**, Kolkata, India, July 2011

[18] *Spin-Charge separation*, Department of Mathematics and Computer Sciences at **Augusta State University**, Augusta, Georgia, November, 2007.

General Interest

[1] *Integrating Teaching, Research, and Service to foster an undergraduate research experience*

paradigm, **Plenary speaker** at 3rd Annual Faculty Development Symposium, Augusta University, January 19, 2018.

CONTRIBUTED TALKS AND POSTER PRESENTATION (All talks were delivered by me as the sole presenter)

Disciplinary research

[1] *Unraveling the L_3 edge RIXS spectrum of lightly manganese doped $Sr_3Ru_2O_7$* , 2024 March meeting of the American Physical Society, Minneapolis, Minnesota.

[2] *Mixed singlet and triplet two-hole states in $Bi_2Sr_2CaCu_2O_{8+\delta}$ unveiled by cluster modeling of the $d-d$ excitations observed by Cu L_3 Resonant Inelastic X-ray Scattering*, 2023 March meeting of the American Physical Society, Las Vegas, Nevada.

[3] *Einstein de-Haas effect of topological magnons*, 2022 March meeting of the American Physical Society, Chicago, Illinois.

[4] Resonant inelastic x-ray scattering study of vector chiral ordered kagome antiferromagnet, 2021 Hybrid Workshop on Resonant Inelastic X-ray Scattering, Brookhaven National Laboratory & 2021 March meeting of the American Physical Society, Virtual.

[5] *Torque equilibrium spin wave theory study of anisotropy and Dzyaloshinskii-Moriya interaction effects on the indirect K -edge RIXS spectrum of a triangular lattice antiferromagnet*, 2020 March meeting of the American Physical Society, Denver, Colorado [accepted, but conference cancelled due to COVID-19].

[6] *Detecting crystallographic lattice chirality using Resonant Inelastic X-ray scattering*, 2019 March meeting of the American Physical Society, Boston, Massachusetts.

[7] *Indirect K -edge Bimagnon Resonant Inelastic X-ray scattering spectrum of α -FeTe*, 2018 March meeting of the American Physical Society, Los Angeles, California.

[8] *Magnon-phonon coupling effects on the indirect K -edge RIXS spectrum of a 2D Heisenberg antiferromagnet*, 2017 March meeting of the American Physical Society, New Orleans, Louisiana.

[9] *Indirect RIXS study of roton excitation in triangular-lattice quantum Heisenberg antiferromagnet*, 2016 March meeting of the American Physical Society, Baltimore, Maryland.

[10] *Indirect RIXS study of bimagnon excitations in triangular-lattice quantum Heisenberg antiferromagnet*, 2015 March meeting of the American Physical Society, Denver, Colorado.

[11] *Two-peak structure in the K -edge RIXS spectra of a spatially frustrated Heisenberg antiferromagnet*, 2014 March meeting of the American Physical Society, Denver, Colorado.

[12] *Exact solution and high temperature series expansion study of the 1/5-th depleted square lattice Ising model*, 27th Annual Workshop on Recent Developments in Computer Simulation

Studies in Condensed Matter Physics (University of Georgia), 2014.

[13] *Spin transport in the Neel and collinear antiferromagnetic phase of the two dimensional spatial and spin anisotropic Heisenberg model on a square lattice*, poster pitch talk presented at **2013 Kavli Institute for Theoretical Physics Spintronics Conference** & 2013 March meeting of the American Physical Society, Baltimore, Maryland.

[14] *Effects of magnetic field, anisotropy, and biquadratic interactions in type-IIA fcc antiferromagnets studied by linear spin-wave theory*, Poster presented at the **2012 Gordon Research Conference on Correlated Electron Systems** at Mount Holyoke College & March 2012 meeting of the American Physical Society, Boston, Massachusetts.

[15] *Non-linear spin wave theory results for the frustrated $S = 1/2$ Heisenberg antiferromagnet on a body-centered cubic and simple cubic lattice*, Poster presented at the **2010 Gordon Research Conference on Correlated Electron Systems** at Mount Holyoke College, South Hadley, Massachusetts & March 2010 meeting of the American Physical Society, Portland, Oregon.

[16] *Dynamic Phase Transition and Hysteresis Dispersion Law of the Kinetic Ising Model with next-nearest neighbor interaction*, *23rd Annual Workshop on Recent Developments in Computer Simulational Studies in Condensed Matter Physics* (University of Georgia), 2010 & 2010 Anacapa Society West Coast Meeting at California State Polytechnic University, Pomona, California.

[17] *The magnetoelectric coupling in the multiferroic compound – LiCu₂O₂*, Poster presented at the Workshop on Magnetoelectric Interaction Phenomena in Crystals (MEIPIC6), University of California, Santa-Barbara, 2009, Poster presented at the 2nd Workshop on Novel Electronic Materials, University of Kentucky, Lexington, KY, and talk presented at the March 2008 meeting of the American Physical Society, New Orleans, Louisiana.

Scholarship of Teaching and Learning (SoTL)

[1] *SoTL Communities of Practice for Research on Teaching and Learning, 2016 – 2017 USG SoTL Fellow Presentation Panel Member*, at the 2017 University System of Georgia Teaching and Learning Conference, University of Georgia, Athens, Georgia.

[2] *Investigating the Benefits of Visual Python Computational Activities in Introductory Calculus Based Physics Course*, 2016 University System of Georgia Teaching and Learning Conference, University of Georgia, Athens, Georgia

AWARDS AND HONORS

- Georgia Regents University College of Science Mathematics Outstanding Faculty Award, 2014 - 2015

Research

- Kavli Institute for Theoretical Physics (KITP) Scholar Award, 2021 – 2023
- College of Science and Mathematics Excellence in Research Award, 2015 - 2016
- Kavli Institute for Theoretical Physics (KITP) Scholar Award, 2010 – 2012

- Louis K. Bell Alumni Research Award, 2011
- Recipient of Bilsland Dissertation Fellowship, Purdue University, 2006 – 2007
- 2005 Department of Physics Research Poster Presentation Award, Purdue University
- 2005 Recipient of Purdue Research Foundation Fellowship, Purdue University,
- Purdue Summer Research Grant, summer 2003 and summer 2004

Teaching

- Augusta University CURS Mentor excellence award, 2024
- Augusta University Individual Teaching Excellence Award, 2017
- College of Science and Mathematics Exemplary Teaching Award, 2016 - 2017
- University System of Georgia Scholarship of Teaching and Learning Fellow, 2016 – 2017
- (Augusta University *nomination to USG, not awarded*) University System of Georgia Individual Teaching Excellence Award (2018)
- Augusta University Favorite Faculty Award, 2017 (*administered by the Augusta University Office of Housing & Residence Life*)
- Augusta State University (*Student Ambassador Board*) Most Valuable Professor Award, 2010

Service (to profession)

- Anacapa Scholar, 2010; Augusta State University
- Department of Physics Leadership Award, Purdue University

GRANTS

Extramural (awarded)

Sun Yat-Sen University State Key Laboratory of Optoelectronics (Guangzhou, China) 2020 – 2022, **\$10,000 - \$27,000** [travel award, did not visit due to COVID]

Sun Yat-Sen University State Key Laboratory of Optoelectronics (Guangzhou, China) 2017 – 2019, **\$27,000** [travel award]

Savannah River National Lab (SRNL) – CURS Augusta University Grant 2018 – 2019, **\$8000** [undergraduate research student scholarship]

Cottrell College Science Award from Research Corporation 2011 – 2013, **\$35,000**

National Science Foundation (NSF) (DMR-0922362), 2009, MRI: Acquisition of a High Performance Computing System for Undergraduate Physics Research, **\$126,000**

Intramural (awarded)

2013 – 2018 Augusta University Scholarly Activity Award (*total*), **\$4109**

2015 - 2011 CURS Faculty with Student Travel Grant (*total*), **\$936**

2013, 2017, & 2018 CURS Summer Scholars Program Grant (*total*), **\$23,500**

Faculty Development Initiative (FDI) Grant (2010), Augusta State University, **\$5000**

Faculty Research and Faculty development award, Augusta State University, 2009 (**\$705.00**), 2010 (**\$926.11**), 2011 (**\$840**), 2012 (**\$ 1065**), 2013 (**\$1300**);

Pamplin Student Research and Travel award, Augusta State University, 2008 – 2011, **\$1400.00**

RESEARCH VISITS

Visiting Research Professor: June 2011 - June 2013, June 2016, June 2017, Dec 2017, September 2018, June 2019, School of Physics and Engineering, **Sun Yat-Sen University**, Guangzhou, China, Collaborator: Prof. Dao-Xin Yao

SHORT TERM RESEARCH VISITS (2 weeks – month)

- 2018 **Indian Association for the Cultivation of Science (IACS)**, Kolkata, India, *Host:* Dr. Krishnendu Sengupta
- 2010 – 2012 & 2022 – 2024, **Kavli Institute for Theoretical Physics**, Santa Barbara, UCSB as a *Kavli Institute for Theoretical Physics (KITP) scholar*
- 2017 & 2018 **Oak Ridge National Laboratory**, *Collaborator:* Dr. Randy Fishman
- 2014 **Oak Ridge National Laboratory**, *Host:* Dr. Valentino Cooper

TEACHING EXPERIENCE

Courses taught (traditional classroom)

- Physical science – physics for non-science majors (PHSC1011)
- College algebra-based physics (PHYS1111&1112)
- Calculus based physics (PHYS2211&2212)
- Thermal physics (PHYS4310)
- Classical Mechanics (PHYS3250)
- Five special topics courses (PHYS 4950, all developed at Augusta University)*
 - i. Solid State Physics
 - ii. Magnetism and Magnetic Materials
 - iii. Phase Transition and Critical Phenomena
 - iv. Many particle physics (including Green function)
 - v. FORTRAN programming

**these courses are the motivation behind pursuing my solid-state physics textbook project (which has now been published)*

Guest lecturer: Sun Yat-Sen University, Electrodynamics for Physics and Pre-engineering

majors, June 2011 (one lecture)

Online course

Physical science – physics for non-science majors (PHSC1011) – *summer 2017 - present*

The course was fully online with embedded lectures, interactive materials (video, figures), quizzes, review questions, and exams included in D2L. I also teamed up with Hands-on-Lab (HOL) from Denver, CO to offer the students an at home lab experience. Students purchased a lab kit with 10 lab sessions that included the traditional physical science lab activities. Thus, the students received a course whose contents were at the same level as that of a regular face-to-face class.

RESEARCH MENTORING (UNDERGRADUATE AND GRADUATE)

UNDERGRADUATE RESEARCH GROUP ACCOMPLISHMENTS (Supervised 70+ students [2007 – 2023], only selected students below)

Undergraduate student	Publications/Awards/Presentation (National [American Physical Society (APS)], Regional [Georgia Academy of Sciences, (GAS)], Local [Augusta State University (ASU)])
Alexander Brady Project: Integrating LASSO machine learning algorithm with LLG spin dynamics	2023 Best Undergraduate Physics Research Award 2023 APS March Meeting Outstanding Research Presentation Award
Richard Baker (Physics Major) Project: <i>dd</i> excitation in RIXS	2022 Best Undergraduate Physics Research Award 2022 APS Outstanding Research Presentation Award
Greg Price (Math Major) Project: Exact diagonalization study of 1d spin chains using RIXS	2017 – 2019 Savannah River National Laboratory – Augusta University CURS Scholar 2017 & 2018 Augusta University CURS Summer Scholars Program 2019 Best Undergraduate Physics Research Award 2019 APS Outstanding Research Presentation Award
Sean Mongan (Physics Major) Project: RIXS studies in quantum magnets MS Medical Physics, Georgia Inst. of Tech.	<i>Scientific Reports</i> 9: 12771 (2019); <i>J. of Phys. Condens. Matt.</i> , 29, 505802 (2017); 2018 American Physical Society (APS) March Meeting, Los Angeles, CA; 2018 Georgia Academy of Sciences oral presentation; 2017 Phi Kappa Phi Research Presentation; 2017 Augusta University CURS Summer Scholars Program 2018 Best Undergraduate Physics Research

<p>Kenny Stiwinter (Physics Major) Project: Effect of phonons on RIXS spectrum</p>	<p><i>Phys. Rev. B</i> 96, 144436 (2017); 2018 American Physical Society (APS) March Meeting, Los Angeles, CA (presenting author); 2017 American Physical Society (APS) March Meeting, New Orleans, LA (contributing author); 2018 Georgia Academy of Sciences oral presentation; 2017 Best Undergraduate Physics Research Award 2018 Augusta University CURS Summer Scholars Program</p>
<p>CurtisLee Thornton (Physics major) Project: Effect of pressure in spin ice materials</p>	<p>2016 APS Best Research Presentation Award; 2016 Georgia Academy of Sciences Best Research Presentation Award; 2015 American Physical Society (APS) March Meeting, San Antonio, TX; 2015 Best Undergraduate Physics Research Award; Best Research Presentation Award Phi Kappa Phi Research conference</p>
<p>Alex Price (Physics major) Project: XAS and FY-XAS analysis of transition metal ions</p>	<p>2016 APS Best Research Presentation Award; 2015 APS March Meeting, San Antonio, TX; 2014 APS March Meeting, Denver, Colorado; 2014 Best Undergraduate Physics Research Award</p>
<p>Simeon Hanks (Physics major) Project: Series Expansion methods in classical Ising model, MS Concordia University</p>	<p><i>Physical Review E</i>, 87, 062143 (2013); 2013 APS Best Research Presentation Award; 2013 Best Undergraduate Physics Research Award</p>
<p>Philip Javernick (Physics/Math Major) Project: Non-linear optics of multiferroic systems MS Theoretical Physics at UNC Chapel Hill</p>	<p>Best undergraduate physics research student (2012 & 2011); Best research presentation awards (2012): APS March Meeting, Georgia Academy of Sciences (GAS), ASU Phi Kappa Phi Research Conference</p>
<p>Zewei Chen (Sun Yat-Sen University, China, Physics Major) Project: Spin transport; Presently doctoral student at Hong Kong University of Science and Technology</p>	<p><i>European Physical Journal B</i>, 86, 63 (2013)</p>

<p>William Baez (Physics Major) Project: Non equilibrium Monte Carlo simulation; PhD in Theoretical biophysics from The Ohio State University</p>	<p>Dynamic Phase Transition in the Ising model <i>Physics Procedia</i>, <i>Volume 4, 15 (2010)</i> (University of Georgia conference proceedings of the <i>23rd Annual Workshop</i> on Recent Developments in Computer Simulational Studies in Condensed Matter Physics) Best undergraduate physics research student (2009 & 2010); Best research presentation awards: Georgia Academy of Sciences [GAS] (2009, 2010), ASU Phi Kappa Phi Research Conference (2009)</p>
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PhD Thesis supervision (PhD co-supervisor with Prof. Dao-Xin Yao - Sun Yat Sen University, 2012 – present)

PhD awarded - Dr. Cheng Luo, Dr. Zengye Huang, Dr. Zijian Xiong

PhD candidates - Meiyu He, Jia Zheng Ma Junli Li, Weiyang Chen, Baijian Guo

PhD Thesis supervision (PhD co-supervisor with Prof. Dipanjan Majumdar - Southern Illinois University, 2018 – 2023)

PhD awarded – Dr. Stephen Hofer

PhD Thesis supervision (PhD co-supervisor with Prof. Arnab Sen – Indian Association for the Cultivation of Science, 2018 – present)

Mainak Pal (PhD candidate)

Master’s Thesis supervision (MS co-supervisor with Prof. Dao-Xin Yao - Sun Yat Sen University, 2015 – present)

MS awarded - Shangjian Jin, Shan Chao, Jun Li

Undergraduate research student mentorship at Sun Yat Sen University (2011 – 2013)

BS awarded - Zewei Chen

High school research students (Augusta University)

Colby Duke, Alonte Trowel, Cal Stephens, Courtney Johnson, and Rahul Shah

SERVICE

Reviewer and Journal Referee – National Science Foundation (*Division of Materials Research, DMR – Condensed Matter and Materials Theory*); **Scientific journals:** Physical Review B, Physical Review E, Physical Review Letters, European Physical Journal B, Physica B, Condensed Matter (MDPI) and Modern Physics Letters B.

National

- **Conference chair**, 2013 National Anacapa Society Conference held at Georgia Regents

University (GRU).

- **Planning committee member** of 2009 South Atlantic Coastal Section (**SACS**) – AAPT conference at Augusta State University
- 2021 - *present* APS March Meeting abstract sorting committee

Regional

- **Editor-in-Chief**, Georgia Journal of Science (<https://digitalcommons.gaacademy.org/gjs/>) [2020 - 2022]
- **Reviewer Board** - Condensed Matter (<https://www.mdpi.com/journal/condensedmatter>)
- **Team leader** for Augusta State University physics majors exhibiting nanoscale science for grade 4 – 8 students at the Science Education and Enrichment Day (S.E.E.D) held at the University of South Carolina Aiken, October 18, 2008
- Served as a **supervisor** for **Georgia Regional Science Olympiad** Tournament, 2008
- Automated Data Processing (ADP) Science day participant (physics), Augusta, GA, 2010

University

- **Phi Kappa Phi Conference planning committee chair** (2014, 2012, 2018, 2020), **planning committee member** (2017, 2015, 2013, 2011, 2019) of GRU Phi Kappa Phi Honor Society Undergraduate Student Research Conference, 2011 – present
- Augusta University Materials Science and Biophysics Research Seminar Series organizing committee **chair**, 2014 – *present*.
- Augusta University CRCA Materials Science Panel Symposium – 2017, 2018
- Augusta University Research Institute (AURI) Board of Directors Faculty (Senate) Representative, 2016 – present
- University workload committee

College of Science and Mathematics

- Committee Member, Promotion and Tenure

Department

- Committee Member, CSM Pamplin Travel and Research Fund. (March 7, 2016 - 2017)
- Committee Member, Curriculum and Academic Policies Committee. (2017 - Present)
- Committee Member, Augusta University Cyber Institute Advisory Committee (2016 – 2017)
- Committee Member, Promotion and Tenure
- Chair, Undergraduate BS physics program assessment and student learning outcomes

PROGRAMMING

Fortran, Python, C++, open MPI, GPU computing (with Fortran), Mathematica, MATLAB (including parallel MATLAB), LaTeX, and Inkscape

CITIZENSHIP: United States of America