

Gayatri Sarkar

ASSISTANT PROFESSOR



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Experienced with delivering high-quality physics instruction and pioneering research initiatives. Utilizes innovative teaching methods to engage students and cultivate deep understanding of complex concepts. Strong understanding of academic collaboration and communication, ensuring consistent and effective learning environments.



Work History

2024-12 - Current

Assistant Professor of Physics

Guru Ghasidas Vishwavidyalaya, Bilaspur, India

- Established a positive learning environment by promoting open communication among students and encouraging active participation in class discussions.
- Participated in professional development opportunities to stay current on industry trends, integrating new teaching methods into course delivery.

2024-09 - 2024-12

Assistant Professor of Physics

Noida Institute of Engineering & Technology, AKTU, Greater Noida, India

- Connected students with research opportunities and internships within the field of physics, supporting their professional growth and development.
- Developed and implemented comprehensive lesson plans tailored to diverse learning styles, resulting in increased student comprehension and success.

2024-02 - 2024-08

Assistant Professor in Physics

Malla Reddy Engineering College, JNT University, Secunderabad, India

- Created materials and exercises to illustrate application of course concepts.
- Mentored students and communicated internship and employment opportunities.



Education

2017-12 - 2023-04

Ph.D.: Nuclear Physics

Indian Institute of Technology Roorkee - Roorkee, Uttarakhand

I received a degree in Nuclear physics by defending the thesis and securing a CGPA of 8.6/10 in the coursework. I have learnt various techniques to perform the theoretical and experimental analysis of nuclear reactions.

2014-05 - 2016-06

Master of Science: Physics

University of Delhi - Delhi

I hold M.Sc. (PG) Degree in PHYSICS from the Department of Physics, University of Delhi and graduated in 2016.

2011-05 - 2014-05

Bachelor of Science: Physics, Chemistry, and Mathematics

Maharshi Dayanand University - Rohtak

I hold B.Sc. (U.G.) Degree from the Department of Physics, K.L. Mehta Dayanand College, M.D.U. (Rohtak). I graduated in 2014 with a CGPA of 7.52/10.

2010-04 - 2011-03

Intermediate: Science

Urmila Senior Secondary School - Faridabad

I completed my Senior Secondary Education with Science Stream from Urmila Senior Secondary School, Faridabad (Haryana Board of School Education), with a CGPA of 9.2/10.

2008-04 - 2009-03

Matriculation: Science

Urmila Senior Secondary School - Faridabad

I completed my Secondary Education at Urmila Senior Secondary School, Faridabad (Haryana Board of School Education), with a CGPA of 9.2/10.



Research Experience

- **Department of Physics, Indian Institute of Technology Roorkee, and BARC-Pelletron Facility, Tata Institute of Fundamental Research, Mumbai**, FUSION DYNAMICS OF WEAKLY BOUND PROJECTILES IN LOW ENERGY RANGE, 10/2018, 04/2023
- **Panjab University, Chandigarh and Thapar Institute of Engineering and Technology, Patiala**, ASPECTS OF HEAVY-ION REACTION ANALYSIS IN THE FRAMEWORK OF QUANTUM MECHANICAL FRAGMENTATION THEORY, 06/2018, 05/2022
- **Inter-University Accelerator Centre (IUAC), New Delhi**, PARTICIPATION IN THE EXPERIMENT WHICH WAS CARRIED OUT AT HEAVY ION REACTION ANALYZER (HIRA) FACILITY, 03/2019



Writing And Editing Experience

- Author and presenter of myriad scientific abstracts, posters, and speaking engagements from national to international conferences. - 07/2019
- Reviewer of one paper titled: "Investigation for Suitable Target-Projectile combination for fusion from the Isotopes of Ti and Nd using Intrinsic Fusion and Fission Barriers Analysis" for the submission in the Journal of Nuclear Physics, Material Sciences, Radiation, and Applications. - 06/2019
- Author of eight publications in peer-reviewed scientific journals, including four as primary authors and four as co-author. - 10/2018
- Author of the doctoral thesis: Aspects of heavy ion reaction analysis in the framework of Quantum Mechanical Fragmentation Theory. - 06/2018



International Visit

Participated in an International Conference named **57th Zakopane Conference on Nuclear Physics, Zakopane, Poland**, from August 28 - September 04, 2022, for the poster presentation.



Coursework

- Classical Mechanics
- Quantum Mechanics
- Electromagnetic Theory & Electrodynamics
- Waves & Optics
- Nuclear & Particle Physics
- Statistical Mechanics

- Radiation Theory
- Atomic & Molecular Physics
- Electronics Lab
- Advanced Solid State Theory
- Plasma Physics
- Computer Programming
- String Theory
- Nuclear Astrophysics
- Computational Nuclear Physics



Software

PYTHON

■ ■ ■ ■ ■
Advanced

C++

■ ■ ■ ■ ■
Advanced

Microsoft Office

■ ■ ■ ■ ■
Advanced

LaTeX

■ ■ ■ ■ ■
Advanced

ROOT

■ ■ ■ ■ ■
Advanced

GEANT4

■ ■ ■ ■ ■
Advanced

MATLAB

■ ■ ■ ■ ■
Upper intermediate

ADOBE PHOTOSHOP

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Upper intermediate



Awards

- Qualified CSIR-NET - 06/2018
- Student Research Fellowship, MHRD, Government of India - 12/2017
- Qualified GATE - 06/2017
- Certificate of Appreciation for participation in Saraswati Mahila MahaVidyalaya, Palwal and securing third position - 11/2013
- Certificate of Appreciation for participation in Annual Science Marathon-Science Quiz and securing third position - 09/2013



Interests

TEACHING

RESEARCH

PROGRAMMING



Languages

English

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Bilingual or Proficient
(C2)

German

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Training

- SCHOOL ON ROOT BASED ANALYSIS ORGANIZED BY IUAC - 03/2022
- THEME MEETING ON NUCLEAR LIFETIMES, TRANSITIONS AND MOMENTS (NLTM2022) ORGANIZED BY VECC - 02/2022
- IUAC WORKSHOP ON PHYSICS WITH RECOIL SEPARATORS - 02/2022
- FUS++ ON HEAVY-ION FUSION FAR BELOW THE BARRIER ORGANIZED BY UNIVERSITY OF PADUA AND INFN - 01/2022
- TASCA 21 - 18TH WORKSHOP ON RECOIL SEPARATOR FOR SUPERHEAVY ELEMENT CHEMISTRY - 06/2021
- IRRADIATION STATIONS AND ALTERNATIVES BY ORNL, FERMILAB AND ARGONNE NATIONAL LAB - 06/2021
- AN AUTHOR'S WORKSHOP BY TAYLOR & FRANCIS GROUP AND INTRODUCTION TO RESEARCH BY IIT ROORKEE - 08/2019



Teaching And Organizational Experience

- Assistant Professor in Malla Reddy Engineering College - 02/2024
- Joint Secretary of Indian Physics Association - 11/2020
- Wall Magazine Secretary of Physics Association - 10/2020
- Life Membership of Indian Physics Association - 03/2020
- Teaching Assistant of B.Tech. and Masters Students - 08/2018
- Assistant Professor in Lingaya's University - 12/2017



Publications

- Decay aspects of the compound nuclei formed via CF and ICF path in $^{12}\text{C}+^{52}\text{Cr}$ reaction - **GAYATRI SARKAR**, NEHA GROVER, MANOJ K. SHARMA, AND MOUMITA MAITI, NUCL. PHYS. A 94, 044603 (2021).
- Decay analysis of $^{197}\text{Tl}^*$ compound nucleus formed in $^{16}\text{O}+^{181}\text{Ta}$ reaction at above barrier energy Ec.m. ~ 100 MeV - **GAYATRI SARKAR**, AMANDEEP KAUR, MANOJ K. SHARMA AND MOUMITA MAITI, NUCL. PHYS: MAT. SCI. RAD. APP. 95, 064602 (2021).
- A theoretical study on the impact of centrifugal potential and fragment identification in the decay of compound nuclei (ACN=60 & 100) - **GAYATRI SARKAR**, AMANDEEP KAUR, MOUMITA MAITI, AND MANOJ K. SHARMA, INT. J MOD. PHYS. E 31, 10 & 11 (2022).
- Fragmentation analysis of various compound nuclei formed in mass region 200 and associated entrance channel effects - **GAYATRI SARKAR**, AMANDEEP KAUR, MOUMITA MAITI, AND MANOJ K. SHARMA, PRAMANA-J. PHYS., (2023) 97:74.
- Binary fragmentation within a clusterization approach based on temperature-dependent binding energies - **GAYATRI SARKAR**, MOUMITA MAITI, AND MANOJ K. SHARMA, Communicated to Publishing House.
- Ternary Fission of α -structured nuclei of mass range $60 \leq A \leq 100$ involving quadrupole deformations - **GAYATRI SARKAR**, C. KARTHIKRAJ, AND MANOJ K. SHARMA, MANUSCRIPT UNDER PREPARATION.
- Understanding of the reaction dynamics involving the weakly bound induced reaction - **GAYATRI SARKAR**, MOUMITA MAITI, AND PAVNEET KAUR, MANUSCRIPT UNDER PREPARATION.

- Examination of non-coplanarity in the fusion reaction $^{37}\text{Cl}+^{68}\text{Zn}$ using the dynamical cluster-decay model - **GAYATRI SARKAR** AND POOJA KAUSHAL, ACCEPTED in Physical Review C.
- Evaporation residue cross section in $^{37}\text{Cl}+^{68}\text{Zn}$ fusion reaction near the Coulomb barrier - AMIT CHAUHAN, RINKU PRAJAPAT, **GAYATRI SARKAR**, MOUMITA MAITI, RISHABH KUMAR, MALVIKA, GONIKA, JAGDISH GEHLOT, S. NATH, A. PARIHARI, AND N. MADHAVAN, PHYS. REV. C 102, 064606 (2020).
- Study of excitation functions and insights into the reaction mechanisms of ^6Li fusion in Cu - RISHABH KUMAR, MOUMITA MAITI, **GAYATRI SARKAR**, MALVIKA, PAVNEET KAUR, RINKU PRAJAPAT, T.N. NAG, AND S. SODAYE, EUR. PHYS. J A 57:209, 1 (2021).
- Asymmetric and symmetric fission of excited nuclei of $^{180,190}\text{Hg}$ and $^{184,192,202}\text{Pb}$ formed in the reactions with ^{36}Ar and $^{40,48}\text{Ca}$ ions - A. A. BOGACHEV, E. M. KOZULIN, G. N. KNYAZHEVA, I. M. ITKIS, M. G. ITKIS, K. V. NOVIKOV, D. KUMAR, T. BANERJEE, I. N. DIATLOV, M. CHERALU, V. V. KIRAKOSYAN, Y. S. MUKHAMEJANOV, A. N. PAN, I. V. PCHELINSTEV, R. S. TIKHOMIROV, I. V. VOROBIEV, M. MAITI, R. PRAJAPAT, R. KUMAR, **G. SARKAR**, W. H. TRZASKA, A. N. ANDREYEV, I. M. HARCA, AND E. VARDACI, PHYS. REV. C 104, 024623, (2021).
- Fission of $^{180,182,183}\text{Hg}^*$ and $^{178}\text{Pt}^*$ nuclei at intermediate excitation energies - E. M. KOZULIN, G. N. KNYAZHEVA, I. M. ITKIS, M. G. ITKIS, Y. S. MUKHAMEJANOV, A. A. BOGACHEV, K. V. NOVIKOV, V. V. KIRAKOSYAN, D. KUMAR, T. BANERJEE, M. CHERALU, M. MAITI, R. PRAJAPAT, R. KUMAR, **G. SARKAR**, W. H. TRZASKA, A. N. ANDREYEV, I. M. HARCA, A. MITU, AND E. VARDACI, PHYS. REV. C 105, 014607 (2022).
- Fission of $^{182,183}\text{Hg}$ nuclei at energies around the Coulomb Barrier- M. CHERALU, Y. S. MUKHAMEJANOV, I.M. ITKIS, T. BANERJEE, I.N. DIATLOV, D. KUMAR, N.I. KOZULINA, K.V. NOVIKOV, A.N. PAN, I.V. PCHELINTSEV, R.S. TIKHOMIROV, I.V. VOROBIEV, M. MAITI, R. PRAJAPAT, R. KUMAR, **G. SARKAR**, W.H. TRZASKA, P.P. SINGH, R.N. SAHOO, E. VARDACI, A. ANDREEV, A. MITU, AND I. HARCA, ACTA PHYSICA POLONICA B PROCEEDINGS SUPPLEMENT 14, 741 (2021).
- Study of the decay of compound nucleus $^{64}\text{Zn}^*$ within the Dynamical Cluster-decay Model - **GAYATRI SARKAR**, MOUMITA MAITI, SAHILA CHOPRA, HEMDEEP, POOJA KAUSHAL, AND RAJ K. GUPTA, PROCEEDINGS OF THE DAE SYMPOSIUM ON NUCLEAR PHYSICS, VOL. 63, PG. 552 (2018).
- Study of decay dynamics of the compound nucleus $^{160}\text{Er}^*$ formed via ^{16}O -induced reaction - **GAYATRI SARKAR**, MOUMITA MAITI, AND MANOJ K. SHARMA, PROCEEDINGS OF THE DAE SYMPOSIUM ON NUCLEAR PHYSICS, VOL. 64, PG. 377 (2019).
- Impact of static and dynamic deformations in the decay of $^{197}\text{Tl}^*$ compound nucleus - **GAYATRI SARKAR**, AMANDEEP KAUR, MOUMITA MAITI AND MANOJ K. SHARMA, PROCEEDINGS OF THE DAE SYMPOSIUM ON NUCLEAR PHYSICS, VOL. 65, PG. 269 (2021).
- $^7\text{Li}+^{93}\text{Nb}$: Investigation of complete and incomplete fusion with dynamical cluster-decay model - **GAYATRI SARKAR**, MOUMITA MAITI, AND MANOJ K. SHARMA, 55TH ZAKOPANE CONFERENCE ON NUCLEAR PHYSICS, ZAKOPANE, POLAND, PG. 43 (2022).
- The Alpha+LBE reaction upto 37.5 MeV/A - **GAYATRI SARKAR**, DEEPAK KUMAR, AND MOUMITA MAITI, PROCEEDINGS OF THE APPLICATION OF RADIOTRACERS AND ENERGETIC BEAMS IN SCIENCES (ARCEBS), VOL. 5, PG. 169 (2018).
- Decay analysis of light mass compound nucleus $^{70}\text{As}^*$ formed in ^6Li induced reaction - **GAYATRI SARKAR** AND MANOJ K. SHARMA, ZAKOPANE CONFERENCE ON NUCLEAR PHYSICS, ZAKOPANE, POLAND, ACCEPTED FOR POSTER PRESENTATION.
- Production of ^{68}Ga from the ^7Li -induced reaction on Cu - RISHABH KUMAR, RINKU PRAJAPAT, **GAYATRI SARKAR**, AMIT CHAUHAN, MOUMITA MAITI,

T. NAG, AND S. SODAYE, PROCEEDINGS OF THE DAE SYMPOSIUM ON NUCLEAR PHYSICS, VOL. 64, PG. 383_(2019).

- Probing fission fragments of $^{182,183}\text{Hg}$ nuclei at energies around Coulomb barrier - M. CHERALU, E. KOZULIN, I. ITKIS, D. KUMAR, G. KNYAZHEVA, M. ITKIS, K. NOVIKOV, T. BANERJEE, N. KOZULIN, I. DIALTOV, I. PCHELINTSEV, R. TIKHOMIROV, I. VOROBIEV, A. N. PAN, M. MAITI, R. PRAJAPAT, R. KUMAR, **G. SARKAR**, P. SINGH, R. SAHOO, E. VARDACI, A. ANDREY, A. MITU, AND I. HARCA, LXX INTERNATIONAL CONFERENCE "NUCLEUS-2020", SAINT PETERSBURG, RUSSIA, PG. 89_(2020).
- Decay analysis of light mass compound nucleus $^{70}\text{As}^*$ formed in ^6Li induced reaction - **GAYATRI SARKAR** AND MANOJ K. SHARMA, PROCEEDINGS OF THE DAE SYMPOSIUM ON NUCLEAR PHYSICS, VOL. 68, PG. 405_(2024).



Personal Details

Date of Birth: 02/11/1993

Nationality: INDIAN

Marital Status: Single

Passport: Z375078



Skills

- Demonstrated written and oral communication skills
- Demonstrated ability to analyze experimental data
- Excellence in nuclear electronics and data acquisition
- Knowledge of nuclear codes - PACE4, EMPIRE-3.2.2, and CCFULL
- Working knowledge of GENIE 2K spectroscopy software
- Elementary knowledge of ROOT
- English - Full Professional Proficiency
- German - Beginner (A1) level Proficiency
- Microsoft Office
- Ubuntu - Linux
- Origin - Data Analysis and Graphing Software
- LaTeX - Document Preparation System
- Interdisciplinary Collaboration