Riasat Sheikh

PhD Researcher · Theory of Elementary Particles Lab

Department of Physics, West Zone 1 (B724), Ito Campus, Kyushu University,
744 Motooka, Nishi-ku, Fukuoka, Japan, 819-0395

riasat.sheikh_at_phys.kyushu-u.ac.jp | global-anomaly | 0009-0007-1207-1358 | 2654482

Education

Oct 2024 - Present — **PhD (Physics)** — Japan
Kyushu University, Fukuoka

- Lab: Theory of Elementary Particles
- Dark Matter model building and particle phenomenology
- Scholarship: Ministry of Education, Culture, Sports, Science and Technology (MEXT) Scholarship, 2024

Jun 2020 - Jul 2022 — **Master of Science (Physics)** — India
Banaras Hindu University, Varanasi

- Specialization: Nuclear and Particle Physics
- Graduated with First Division, Distinction, Gold Medal, and First Position
- Key Courses: Particle Physics, Weak Interaction & Electroweak Unification, Quantum Field Theory, Methods in Theoretical Physics, Advanced Quantum Mechanics, Computational Physics.

Jun 2016 - Jul 2019 — **Bachelor of Science (Physics)** — India
Cotton University, Guwahati

- Graduated with First Division
- Major in Physics, Minor in Mathematics and Chemistry
- Key Courses: Classical Mechanics, Special Theory of Relativity, Quantum Mechanics, Mathematical Physics, Nuclear and Particle Physics, Radiation Theory, Statistical Mechanics.

Research & Teaching Experience

May 2025 - Jul 2025 (3 months) — **Teaching Assistant** — Japan
Kyushu University, Fukuoka

- Facilitate discussion among participants in Science English Training Session, School of Science

Oct 2024 - Mar 2025 (6 months) — **Research Assistant** — Japan
Kyushu University, Fukuoka

- Worked on the research project pseudo-Nambu-Goldstone boson Dark Matter

Aug 2022 - Mar 2023 (8 months) — **Research Assistant** — India
Banaras Hindu University, Varanasi

- Worked on a research project funded by the IoE Scheme (Number 6031) at Department of Physics, Banaras Hindu University, Varanasi.

Jul 2007 - Oct 2007 (4 months) — **Student Researcher** — India
National Children's Science Congress, Assam

- Contributed to a research project for the 15th National Children's Science Congress, State Level Children's Science Congress, Assam.
- Organized by Assam Science Technology and Environment Council (ASTEC), Bharat Jana Vigyan Jatha (BJVJ), Assam, and Society for Socio-Economic Awareness and Environment Protection (SSEAEP), GHAROA, Lumding.
- Supported by Rashtriya Vigyan Pradyogiki Sanchar Parishad (RVPSP) and Department of Science & Technology, Govt. of India, New Delhi.

Publications

Journal Articles

1. Riasat Sheikh, Takashi Toma, Koji Tsumura: **Pseudo-Nambu-Goldstone-boson dark matter from three complex scalars**. Journal of High Energy Physics **2025**(8), 18 (2025). https://doi.org/10.1007/JHEP08(2025)018
2. Sheikh Riasat, Bhabani Prasad Mandal: **Effect of quantum gravity on specific heat of solid**. The European Physical Journal Plus **138**(10), 943 (2023). https://doi.org/10.1140/epjp/s13360-023-04585-y

Presentations & Conferences

Conferences & Seminars

17 - 22 Aug 2025 — **29th International Summer Institute on Phenomenology of Elementary Particle Physics and Cosmology (SI 2025), 2025** — Korea
UTOP Marina Resort & Hotel, Yeosu
Presented a talk on searching for ways to probe pseudo-Nambu-Goldstone-boson dark matter.

18 - 21 Feb 2025 — **The 7th International Workshop on "Higgs as a Probe of New Physics 2025 (HPNP2025)", 2025** — Japan
The University of Osaka, Osaka
Presented a poster on pseudo-Nambu-Goldstone-boson as a dark matter candidate.

18 - 21 Feb 2025 — **KEK Theory Meeting on Particle Physics Phenomenology, 2025** — Japan
High Energy Accelerator Research Organization, KEK, Tsukuba
Presented a talk on pseudo-Nambu-Goldstone-boson as a Dark Matter Candidate.

Nov 2013 — **National Seminar titled "Plasma Science and Technology"** — India
Sponsored by UGC and organized by Dept. of Physics, Nabajyoti College, Assam
Student participant, no talk presented

Outreach & Other Presentations

Apr 2025 — **Kyushu University Virtual Study Abroad Fair** — Japan
Kyushu University, Fukuoka
Presented a talk about Our MEXT Journey in Kyushu University.

Projects

Oct 2024 - Present — **Searching for ways to probe pseudo-Nambu-Goldstone boson dark matter** — Japan
Kyushu University, Fukuoka

- Technical Skills: micrOMEGAs, LanHEP, CalcHEP, FeynRules, FeynArts.
- Soft Skills: Presentation skills, Research paper writing, Time Management.

Aug 2022 - Mar 2023 — **Gravity, Minimal Length and Quantum Phenomena** — India
Banaras Hindu University, Varanasi

- Research conducted under the research grant for faculty under IoE Scheme (Number 6031).
- Investigated Generalized Uncertainty Principle (GUP) quantization of Electromagnetic (EM) radiation fields.
- Computed corrections to the Einstein and Debye specific heat model using modified EM quantization, leading to observed changes in the dispersion relation of elastic waves.
- Technical Skills: Mathematica, LaTeX.
- Soft Skills: Time Management, Presentation skills, Research paper writing.

Jul 2007 - Oct 2007 — **Ecology and Conservation Strategy of Bats in Rural Areas** — India
National Children's Science Congress, Assam

- Conducted surveys and collected data on Bats and their habitats in a selected zone.
- Identified collected bats and recorded plant species data.
- Analyzed data to identify trends between bat species, favored habitats, and foraging plants.
- Technical Skills: Data management and analysis, Field survey.
- Soft Skills: Report writing, Logical and Critical Thinking, Presentation skills.

Thesis

May 2022 **Effect of Gravity in Quantum Mechanics** India

MSc Physics, Banaras Hindu University, Varanasi

- Abstract: All possible theories of quantum gravity suggest the existence of a minimal length. Therefore, the usual Heisenberg uncertainty principle (HUP) is replaced by a more general uncertainty principle known as the generalized uncertainty principle (GUP). The dynamics of all quantum mechanical system gets modified due to GUP. In this work, we consider various quantum mechanical phenomena and review the correction to their respective Hamiltonian and energy levels. GUP modified quantization of a particle inside a box potential indicates that the space is quantized in the units of $\alpha_0 l_p$ predicting an upper bound of the GUP parameter α_0. Furthermore, the modified Landau levels, simple harmonic oscillator (SHO) and Lamb shift also results in an upper bound of the GUP parameter. Apart from these, we review a relativistic quantum mechanical phenomenon, Dirac oscillator under the effect of magnetic field which is non-oscillating at a certain value of magnetic field even under the effect of gravity.
- Technical Skills: Mathematica, LaTeX.
- Soft Skills: Time Management, Presentation skills, Thesis writing.

Honors & Awards

International

Jun 2025 **Best Poster – Honorable Mention** *Japan*

Awarded by HPNP2025 conference for the poster presentation

Apr 2024 **Ministry of Education, Culture, Sports, Science and Technology (MEXT) Scholarship** *Japan*

Awarded by the Japanese Government for PhD in Japan

National

Nov 2022 **Prof. Ashwani Kumar Nigam Memorial Gold Medal** *India*

Awarded for securing highest marks in MSc Physics - Nuclear and Particle Physics

Oct 2021 **Elite Certification** *India*

Achieved in Introduction to Research NPTEL course

Apr 2021 **Elite + Silver Certification** *India*

Attained in Electronic Theory of Solids NPTEL course

Other Distinctions

Oct 2010 **Participant in Bijnan Jyoti Jatra** *India*

Selected for the Scientific Excursion by Train organized by ASTEC & DST, Govt. of Assam

May 2008 **Winner of Scientific Model competition** *India*

On the program Science Festival organized by Assam Science Society

Jun 2007 **Winner of Essay writing competition** *India*

On Conservation of Nature and Natural Resources conducted by Aaranyak

Training & Courses

Summer Schools

May 2021 - Jun 2021	**Introductory Summer School in Astronomy and Astrophysics** The Inter-University Center for Astronomy and Astrophysics, IUCAA, Pune	India
Jun 2017 - Jul 2017	**Cotton University Astronomy & Astrophysics Summer School 2017** Department of Physics, Cotton University, Guwahati	India

Diplomas & Courses

Apr 2024 - Jul 2024	**Japanese Training for Advanced Studies (JTAS)** Kyushu University, Fukuoka	Japan
Aug 2021 - Oct 2021	**Introduction to Research** NPTEL Course (Funded by the Ministry of HRD, Govt. of India)	India
Jan 2021 - Apr 2021	**Electronic Theory of Solids** NPTEL Course (Funded by the Ministry of HRD, Govt. of India)	India
Jul 2019 - Jul 2020	**Post Graduate Diploma in Computer Application (PGDCA)** NECEP Institute of Management & Technology, Assam	India

Skills

Programming Languages	Fortran, Python, C/C++
HEP Toolchain	FeynRules, FeynArts, LanHEP, CalcHEP, micrOMEGAs
OS & Shell	macOS, Linux, Shell (Bash/Zsh)
Version Control	Git, GitHub
Typesetting	LaTeX
Scientific Software	Mathematica, Stellarium

Languages

Assamese	Native
English	Fluent
Hindi	Fluent
Japanese	Intermediate