# Tutul Biswas

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Department of Physics
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## Previous Position

**April, 2015 - September, 2017**
Assistant Professor
Department of Physics
Vivekananda Mahavidyalaya- Burdwan
Sripally, 713103, Burdwan, India

## Academic Background

**Ph.D (Physics) - 2015**: Indian Institute of Technology Kanpur

**M.Sc (Physics) - 2010**: Indian Institute of Technology Kanpur

**B.Sc (Physics) - 2008**: Krishnagar Govt. College, University of Kalyani

## Teaching

**M.Sc Level** (@ NBU): Classical Electrodynamics, Quantum Mechanics-II, Condensed Matter Physics-I, Atomic Physics, Condensed Matter Physics-II, Laboratory Courses.

**B.Sc Level** (@VM): Mathematical Physics, Quantum Mechanics, Laboratory Courses.

## Research Interests

Theoretical Condensed Matter Physics (Physics of Dirac materials, Quantum transport, Floquet Systems, Topological phenomena)

**ResearcherID**: AAZ-2452-2021

**ORCID Id**: 0000-0002-7807-905X

**Google Scholar**: https://scholar.google.com/citations?user=8Db4xncAAAAJhl=en

**ResearchGate**: https://www.researchgate.net/profile/Tutul-Biswas

## Ph.D Supervision

**Four(04)** Ph.D students are currently working with me.

1. Lakpa Tamang
2. Shibshankar Biswas
3. Koushik Chakraborty
4. Md. Zafar Alam

## Publications

**[17]** "Floquet engineering of low-energy dispersions and dynamical localization in a periodically kicked three-band system", L. Tamang, T. Nag, and **T. Biswas***, Physical Review B **104**, 174308 (2021).

**[16]** "Thermoelectric and optical probes for a Fermi surface topology change in noncentrosymmetric metals", S. Verma*, **T. Biswas**, and T. K. Ghosh, Physical Review B **100**, 045201 (2019).

**[15]** "Hot electron cooling in Dirac semimetal $Cd_3As_2$ due to polar optical phonons" SS Kubakaddi and **T. Biswas***, Journal of Physics: Condensed Matter **30**, 265303 (2018).

[**14**] "Dynamics of a quasiparticle in the -T3 model: role of pseudospin polarization and transverse magnetic field on zitterbewegung", **T. Biswas**$^*$ and T. K. Ghosh, Journal of Physics: Condensed Matter **30**, 075301 (2018).

[**13**] "Phonon-drag magnetoquantum oscillations in graphene", SS Kubakaddi, **T. Biswas**$^*$, and T. K. Ghosh, Journal of Physics: Condensed Matter **29**, 305301 (2017).

[**12**] "Magnetotransport properties of the $\alpha$-$T_3$ model", **T. Biswas**$^*$ and T. K. Ghosh, Journal of Physics: Condensed Matter **28**, 495302 (2016).

[**11**] "Zitterbewegung of a heavy hole in presence of spin-orbit interactions", **T. Biswas**$^*$, S. Chowdhury, and T. K. Ghosh, The European Physical Journal B **88**, 220 (2015).

[**10**] "Wave packet dynamics in various two-dimensional systems: A unified description", A. Singh, **T. Biswas**$^*$, T. K. Ghosh, and A. Agarwal, Annals of Physics **354**, 274 (2015).

[**9**] "Electron–phonon interaction in a spin–orbit coupled quantum wire with a gap", **T. Biswas**$^*$ and T. K. Ghosh, Semiconductor Science and Technology 30, 015022 (2014).

[**8**] "Wave packet dynamics in monolayer MoS2 with and without a magnetic field", A. Singh, **T. Biswas**$^*$, T. K. Ghosh, and A. Agarwal, The European Physical Journal B **87**, 275 (2014).

[**7**] "Wave packet dynamics and zitterbewegung of heavy holes in a quantizing magnetic field", **T. Biswas**$^*$ and T. K. Ghosh, Journal of Applied Physics **115**, 213701 (2014).

[**6**] "Magnetotransport properties of 2D fermionic systems with k-cubic Rashba spin–orbit interaction", A. Mawrie$^*$, **T. Biswas**, and T. K. Ghosh, Journal of Physics: Condensed Matter **26**, 405301 (2014).

[**5**] "Phonon-drag magnetothermopower in Rashba spin-split two-dimensional electron systems", **T. Biswas**$^*$ and T. K. Ghosh, Journal of Physics: Condensed Matter **25**, 415301 (2013).

[**4**] "Phonon-drag thermopower and hot-electron energy-loss rate in a Rashba spin–orbit coupled two-dimensional electron system", **T. Biswas**$^*$ and T. K. Ghosh, Journal of Physics: Condensed Matter **25**, 265301 (2013).

[**3**] "Acoustic phonon-limited resistivity of spin–orbit coupled two-dimensional electron gas: the deformation potential and piezoelectric scattering", **T. Biswas**$^*$ and T. K. Ghosh, Journal of Physics: Condensed Matter **25**, 035301 (2012).

[**2**] "Zitterbewegung of electrons in quantum wells and dots in the presence of an in-plane magnetic field", **T. Biswas**$^*$ and T. K. Ghosh, Journal of Physics: Condensed Matter **24**, 185304 (2012).

[**1**] "Quantum information entropies of ultracold atomic gases in a harmonic trap", **T. Biswas** and T. K. Ghosh$^*$, Pramana **77**, 697 (2011).

($* \rightarrow$ **Corresponding Author**)

## Conferences/Schools/Invited talks

[**3**] Presented a poster in $29^{th}$ National (Virtual) Conference on Condensed Matter Physics - **CMDAYS21** at Central University of Jharkhand, Ranchi (Dec. 10, 2021 - Dec. 12, 2021).

[**2**] Delivered an invited talk at the department of Physics, IIT Kanpur during an academic visit (April 3, 2017 - April 8, 2017).

[**1**] Attended an international school on Topological Quantum Matter at Harish-Chandra Research Institute, Allahabad (Feb. 9, 2015 - Feb. 21, 2015).

## Awards

Received a **Top Cited Paper Award** from **IOP Publishing Ltd** for the article "Dynamics of a quasiparticle in the alpha-T-3 model: role of pseudospin polarization and transverse magnetic field on zitterbewegung" in the **Journal of Physics: Condensed Matter** in **2021**.
The selection process for this award was based on the top 1% of the most cited papers from **INDIA** in the **PHYSICS Category** published across the entire IOP Publishing journal portfolio within the past three years (**2018 to 2020**).

## Scientific Activities

**Reviewer**: Journal of Physics: Condensed Matter; New Journal of Physics; Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences; Physica B; Physica Scripta.

## Collaborations

**Prof. Tarun Kanti Ghosh**, IIT Kanpur.

**Dr. Amit Agarwal**, IIT Kanpur.

**Prof. SS Kubakaddi**, Karnatak University.

**Dr. Tanay Nag**, RTWH Aachen University, Germany/ Uppsala University, Sweden.

**Dr. Surajit Sarkar**: IIT Bombay/Concordia University, Montreal, Canada.

**Dr. Chanchal Barman**: IIT Bombay/ Sungkyunkwan University, South Korea.