

Dr. Tusharkanti Dey

Assistant Professor,
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Male, Indian
DOB: 15th April, 1984

Academic Details

- **M. Sc. and Ph. D. dual degree** in Physics (2013)
Department of Physics, IIT Bombay, Mumbai
Thesis title: *Bulk and NMR studies in some (i) 4d/5d-based, spin-orbit driven, insulating oxides and (ii) iron arsenide superconductors*
Supervisor: Prof. A. V. Mahajan
- **B. Sc** in Physics (Hons) (2005)
Ramakrishna Mission Vidyamandira, Belur Math, Howrah
University of Calcutta, Kolkata

Professional Experience

- **Assistant Professor:** Department of Physics, IIT (ISM) Dhanbad, India (Nov 2020 - till date)
- **Visiting Asst. Professor:** Department of Physics, IIT (ISM) Dhanbad, India (Nov 2019-Nov 2020)
- **Post-Doctoral Researcher:** Institute of Physics II, University of Cologne (July 2018-Oct 2019)
- **Post-Doctoral Researcher:** Institute for Physics, University of Augsburg (Dec 2014-June 2018)
- **Post-Doctoral Researcher:** IFW Dresden, Germany (Jan 2013-Nov 2014)

Visiting Experience

- **Guest PhD Student:** École Polytechnique Fédérale de Lausanne, Switzerland (June -July 2012)

Research Interest

My primary research interest is strongly correlated electron systems. This includes many interesting class of materials like:

- (i) Spin-orbit coupling driven Mott insulators
- (ii) Geometrically frustrated magnetic materials and spin liquids
- (iii) High temperature superconductors
- (iv) Low dimensional spin systems

Research Projects (As Principal Investigator)

- Project title: Frustrated Magnetism in Triangular Lattice Materials $\text{Ba}_3(\text{Cu/Ni})\text{Ta}_2\text{O}_9$
Period: 2022-2025
Amount: INR 15 Lakhs
Funding Agency: IIT (ISM) Dhanbad, India
- Project title: Single Crystal Growth and Study of Frustrated Magnetism in Triangular Lattice Cuprates $\text{Ba}_3\text{Cu}(\text{Nb/Ta})_2\text{O}_9$
Period: 2023-2025
Amount: INR 26.52 Lakhs
Funding Agency: Science and Engineering Research Board (SERB), DST, India

Supervision Experience (at IIT Dhanbad)

- Post-Doctoral mentorship:
 1. Dr. Jeetendra Kumar Tiwari (2023- Ongoing, Jointly with Prof. P.M. Sarun)
- PhD thesis supervision:
 2. Mr. Raja Das (2022- Ongoing)

3. Mr. Romario Mondal (2021- Ongoing)
- MSc project supervision:
 1. Mr. Krithartha Dey (Ongoing)
 2. Mr. Soham Maity (M.Sc. 2022)
 3. Mr. Sanjoy Sur Roy (M.Sc. 2022)
 4. Mr. Romario Mondal (M.Sc. 2021)
 5. Mr. Mrityunjoy Sow (M.Sc. 2021)
- B.Tech. Project supervision:
 1. Mr. Yogesh (Ongoing)
 2. Mr. Taneesh Gupta (Ongoing)
 3. Mr. Dhruv Singh (Ongoing)

Teaching Experience

- Teaching of theory courses at Department of Physics, IIT (ISM) Dhanbad.

No	Course	Class	Semester
1	Advanced Condensed Matter Physics	M.Sc (Physics)	Winter 2019-20 Monsoon 2020-21 Monsoon 2021-22
2	Plasma and Space Physics	M.Sc (Physics)	Winter 2019-20 Winter 2020-21
4	Classical Mechanics	B.Tech (Engineering Physics)	Monsoon 2020-21 Monsoon 2021-22 Monsoon 2022-23
5	Material Science and Engineering	B.Tech (Engineering Physics)	Winter 2020-21 Winter 2021-22 Winter 2022-23
6	Materials Characterization	PhD	Winter 2021-22 Winter 2022-23

- Teaching of several laboratory courses for B.Tech. (Engineering Physics) and M.Sc (Physics) students.
- Designed new courses for the undergraduate students.

Community Service

- Reviewer of Wiley, IOP Publishing, Elsevier journals

Administrative/Organizational Activities

At Institute level:

1. Member of the **JRF Admission Committee** of the Institute (2021- till date)
2. Member of the team for **scrutiny of the JAM applications-2021**
3. **Faculty Advisor** of Rhythm Club, IIT (ISM) Dhanbad (2021-till date)
4. Member of committee for evaluation of PhD thesis work for several PhD students.

At Department level:

1. Faculty-In-Charge for Department social media updates (2022- till date)
2. Faculty-In-Charge for preparatory laboratory (2022- till date)
3. Member of the organizing committee for National Science Day 2023 Celebration spanning for more than two months (Jan - March 2023).
4. Member of the Department Undergraduate Committee (DUGC) (2022-till date)
5. Faculty-In-Charge for department seminar (2022- till date)

Other responsibilities:

6. Centre Observer Duty at Dhanbad centre (Institute representative of IISER Berhampur) for IISER Aptitude Test in the year 2020, 2021 and 2022.

Presentations

1. *Novel magnetism in spin-orbit driven Mott insulators*, Department of Physics, IIT (ISM) Dhanbad, India, 27th Aug 2019 (**seminar talk**)
2. *Novel magnetism in spin-orbit driven Mott insulators*, Department of Physics, IIT (BHU) Varanasi, India, 8th Aug 2019 (**seminar talk**)
3. *Novel magnetism in spin-orbit driven Mott insulators*, Department of Physical Sciences, IISER Kolkata, India, 6th Aug 2019 (**seminar talk**)
4. *Novel magnetism in spin-orbit driven Mott insulators*, Department of Physics, Shiv Nadar University, India, 10th July 2019 (**seminar talk**)
5. *Magnetic ordering in the mixed valent iridate $Ba_3LuIr_2O_9$* , Deutsche Physikalische Gesellschaft (DPG) spring meeting, 14th March 2018, Berlin, Germany (contributed talk)
6. *Search for Kitaev spin liquid materials*, Department of Physics, IIT Ropar, India, 9th Nov 2017 (**seminar talk**)
7. *Search for Kitaev spin liquid materials*, Department of Physical Sciences, IISER Mohali, India, 6th Nov 2017 (**seminar talk**)
8. *Search for Kitaev spin liquid materials*, Department of Physics, IIT Bombay, India, 3rd Nov 2017 (**seminar talk**)
9. *Magnetic properties of the mixed valent iridates $Ba_3MIr_2O_9$ ($M=In,La,Lu$)*, EKM workshop on 'Frontiers in correlated materials', Soellerhaus, Hirschegg, Austria, 27th Sept, 2017 (contributed talk)
10. *Spin liquid behavior in the triangular lattice iridate $Ba_3InIr_2O_9$* , Deutsche Physikalische Gesellschaft (DPG) spring meeting, 21st Mar 2017, Dresden, Germany (contributed talk)
11. *Possible materials for realization of (i) Heisenberg-Kitaev physics in triangular lattice and (ii) excitonic magnetism*, Seminar of the CRC 1238, Institute of Physics II, University of Cologne, Germany, 19th Oct 2016 (**seminar talk**)
12. *Synthesis and magnetic properties of $Ba_3InIr_2O_9$* , EKM workshop on 'Frontiers in correlated materials', Soellerhaus, Hirschegg, Austria, 27th Sept, 2016 (contributed talk)
13. *Novel magnetism in some iridium based oxides*, Department of Applied Physics, ISM Dhanbad, India, 27th Oct 2015 (**seminar talk**)
14. *Novel magnetism in some iridium based oxides*, Department of Physics, IIT Kharagpur, India, 14th Oct 2015 (**seminar talk**)
15. *Crystal growth of new Iridium based oxides*, EKM workshop on 'Frontiers in correlated materials', Kleinwalsertal, Austria, 24th Sept, 2015 (contributed talk)
16. *Novel magnetism in Ir-based oxides*, TRR-80 Seminar, Institute for Physics, University of Augsburg, Germany, 29th July 2014 (**seminar talk**)
17. *Novel magnetism in the spin-orbit driven Mott insulator Ba_2YIrO_6* , Deutsche Physikalische Gesellschaft (DPG) spring meeting, 30th Mar - 4th Apr, 2014, Dresden, Germany (contributed talk)

Awards and Achievements

- IFW research fellowship (2013-2014)
- Indo Swiss Joint Research Programme (ISJRP) fellowship for research visit to EPFL (2012)
- Recipient of 'Nature Travel Fellowship' to attend Gordon Research Conference (2011)
- Secured 45th all India rank in JAM-2005 (conducted by all IITs) among more than 4000 students
- Recipient of National Scholarship based on performance in 10th and 10+2 level board exam