ANIRBAN GHOSH

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Phone- +91 8699173938
SENIOR RESEARCH FELLOW, IISER Mohali, Sector 81, Punjab-140306, India

PERSONAL DETAILS

Date of Birth	**22nd June, 1991**
Nationality	**Indian**
Sex	**Male**
Marital Status	**Married**
Permanent Address	**Vill-Uttar Sonapur, Panchkolguri, Alipurduar, 736121, WB**

PHD THESIS ADVISOR

Dr. Dipanjan Chakraborty
Associate Professor
Department of Physical Sciences
Indian Institute of Science Education and Research(IISER), Mohali
Punjab-140306, India
Email: chakraborty@iisermohali.ac.in

THESIS DETAILS

Field: Non-Equilibrium Statistical Physics
Thesis Title: "Study of Persistence in different non-equilibrium systems".
Thesis to be submitted

RESEARCH INTERESTS

- **Non-equilibrium Statistical Physics**
- **First Passage Problems**
- **Active Matter**
- **Stochastic Thermodynamics**
- **Soft Matter**

LIST OF PUBLICATION

2020

1. Anirban Ghosh, Dipanjan Chakraborty, "*Persistence of Brownian motion of an ellipsoidal particle in two dimensions*" J. Chem. Phys. 152, 174901 (2020)

Abstract: We investigate the persistence probability $p(t)$ of the position of a Brownian particle with shape asymmetry in two dimensions. The persistence probability is defined as the probability that a stochastic variable has not changed its sign in the given time interval. We explicitly consider two cases—diffusion of a free particle and that of a harmonically trapped particle. The latter is particularly relevant in experiments that use trapping and tracking techniques to measure the displacements. We provide analytical expressions of $p(t)$ for both the scenarios and show that in the absence of the shape asymmetry, the results reduce to the case of an isotropic particle. The analytical expressions of $p(t)$ are further validated against numerical simulation of the underlying overdamped dynamics. We also illustrate that $p(t)$ can be a measure to determine the shape asymmetry of a colloid and the translational and rotational diffusivities can be estimated from the measured persistence probability. The advantage of this method is that it does not require the tracking of the orientation of the particle.

2022

2. Anirban Ghosh and Dipanjan Chakraborty, "*Persistence of asymmetric active Brownian particle in two-dimensions*". (Manuscript prepared).

Abstract: We have studied the persistence probability $p(t)$ of the position of an active Brownian particle with shape asymmetry in two dimensions. The persistence probability is defined as the the probability of a stochastic variable that has not changed it's sign in the fixed given time interval. We have investigated two cases- diffusion of a free active particle and that of harmonically trapped particle. Active particle is now a days matter of importance as most of the living systems, colloids and flock of animals exhibit active dynamics. We have done analytical expressions of $p(t)$ for both the cases and the analytical expressions are further validated by the numerical simulation.

3. Anirban Ghosh, Dipanjan Chakraborty, "*Persistence of surface growth*" (Manuscript under preparation)

RESEARCH SKILLS

- **Rigorous Analytical Calculations on Stochastic Process, First Passage phenomena, study of correlation and persistence.**
- **Worked on Langevin Model, O-U Model**
- **Numerical simulation**

COMPUTER KNOWLEDGE

- **C PROGRAMING**
- **Basics of FORTRAN 77 and 90**
- **Basics of Python**
- **Mathematica**
- **GNU Plot**
- **LATEX**

EDUCATION

Indian Institute of Science Education and Research, Mohali (IISER M) *August 2015 - Present*
PhD in Physics — PhD thesis to be submitted
Supervisor — Dr. Dipanjan Chakraborty, Associate Professor, IISER Mohali

Banaras Hindu University, Varanasi (BHU) *2012-14*
Master of Science in Physics — CGPA 6.60/10 (Equivalent to 61.5%)
Faculty of Science, Physics Department — First Class

A.B.N Seal College, University of North Bengal *2009-12*
Bachelor of Science (Honours), Physics — Overall Score 60.6%
Physics(Honours), Chemistry, Mathematics — First Class

Higher Secondary Examination *2006-08*
West Bengal Council of Higher Secondary Education — Overall Score 89.2%

Secondary Examination *2006*
West Bengal Board of Secondary Education — Overall Score 92%

ACADEMIC AWARDS

- **Awarded Senior Research Fellowship (SRF), MHRD, Govt. of India**
- **Awarded Junior Research Fellowship (JRF),MHRD, Govt. of India (2014-2016)**
- **Qualified in Graduate Aptitude Test for Engineering (GATE) Examination (2014)**
- **Qualified in National Eligibility Test (NET) Examination (June, 2014)**
- **Awarded INSPIRE Scholarship (SHE), Govt. of India for B.Sc. and M.Sc. standard (2009-2014)**
- **Qualified Joint Entrance Screening Test (JEST)(All India PhD and Int-PhD entrance exam for Physics) Examination (2012)**
- **Qualified Joint Admission Test for Masters (JAM)(Entrance exam for IITs), (2012)**

TALK/SCHOOL/SEMINAR ATTENDED

- **Bangalore School of Statistical Physics-VIII, Organized by International Centre for Theoretical Sciences (ICTS), Bangalore, 2017**
- **NSCS seminars, Israeli Society of Nonlinear, Statistical, Complex, Biological and Soft-Matter Physics**

TEACHING EXPERIENCE

Three-year teaching assistant experience at Department of Physical Sciences, IISER Mohali.

PERSONAL SKILLS

Hard working, Sincere, Rapid at learning things, enjoy group teaching and tutoring of undergraduates.

LANGUAGE

Fluent in English, Bengali and Hindi.

HOBBIES

Music, Football, Reading novels etc.

REFERENCES

1. DR. DIPANJAN CHAKRABORTY
Associate Professor, IISER MOHALI
Email- ***chakraborty@iisermohali.ac.in***

2. DR. ABHISHEK CHAUDHURI
Associate Professor, IISER MOHALI
Email- ***abhishek@iisermohali.ac.in***

DECLARATION

I, Anirban Ghosh, solely declare that all the statements made in this bio-data are true, complete and correct to the best of my knowledge and belief.

Anirban Ghosh
Place: Mohali
Date: 10th March, 2022