

# Dipanjan Ghosh

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## CONTACT INFORMATION

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## RESEARCH INTERESTS

Fluid Dynamics, Soft Condensed Matter, Bayesian Data Analysis

## EDUCATION

### **Jadavpur University**

*July 2014 – present*

Bachelor of Engineering, Chemical Engineering

- Cumulative Grade Point Average (CGPA): **9.24/10.0**

### **West Bengal Council of Higher Secondary Education (+2 Intermediate)**

*May 2014*

- Scored **93.2%** aggregate, **97%** in Sciences and Mathematics

### **West Bengal Board of Secondary Education**

*May 2012*

- Scored **90.4%** aggregate, **97%** in Sciences and Mathematics

## PERSONAL ACHIEVEMENTS

- Recipient of **I. Putatunda & S. Putatunda medal** for academic excellence in the year 2015-16
- Secured **11<sup>th</sup>** rank among approximately 1 million candidates in the +2 Intermediate Examination conducted by the West Bengal Council of Higher Secondary Education in 2014
- Currently ranked **1<sup>st</sup>** among 90 students in the Department of Chemical Engineering, Jadavpur University

## RESEARCH PROJECTS

### ***Soft Matter Group, The Institute Of Mathematical Sciences, Chennai, India***

#### ***Bayesian parameter estimation for overdamped Brownian motion***

*Supervised by Prof. Ronojoy Adhikari*

*Summer 2016*

- This project involved modelling the overdamped Brownian motion of a particle confined in an optical trap as an Ornstein-Uhlenbeck process and estimating the mean regression rate and volatility of the process using Bayesian statistics.
- Exact likelihoods and sufficient statistics were used to arrive at simple analytical expressions for the optical trap stiffness and particle diffusion coefficient, and the advantage of this method over traditional power spectrum based methods were demonstrated.
- Devised a microscopic method of viscometry under the guidance of my supervisor, for determination of viscosity of fluids samples in the nanoliter range using the Bayesian estimate of particle diffusion coefficient.
- Familiarized myself with physical applications of stochastic processes and Bayesian data analysis.

## INDUSTRIAL TRAINING

### ***Rashtriya Chemicals and Fertilizers Limited, Mumbai***

*December 2015 - January 2016*

#### ***Student Trainee at Sulfuric Acid Plant and Ammonia Plant***

- Acquainted myself with the detailed process parameters for the production of Sulfuric Acid using DCDA process.
- Developed a detailed understanding of the process parameters involved in the production of Ammonia and worked on a problem concerning the design of chillers and compressors in the Ammonia Refrigeration Circuit, under the supervision of the chief engineer.

RELEVANT  
COURSES

- **Chemical Engineering:** Fundamentals of Chemical Engineering, Chemical Process Calculations, Chemical Engineering Thermodynamics, Heat Transfer, Separation Processes- I&II, Chemical Reaction Engineering- I&II, Chemical Technology- I&II, Process Dynamics and Control.
- **Fluid Dynamics:** Mechanics of Fluids, Introduction to Transport Phenomena.
- **Computational Techniques:** Introduction to Computer Programming, Numerical Methods, Optimization Methods.
- **Mathematics:** Real Analysis and Multivariate Calculus (Mathematics- I), Linear Algebra and Vector Calculus (Mathematics- II), Ordinary and Partial Differential Equations (Mathematics- III).
- **Physics:** Optics and thermal physics, Basic Electronics.
- **Chemistry:** Introduction to Quantum Mechanics (Inorganic Chemistry), Organic Chemistry, Electrochemistry and Surface Chemistry (Physical Chemistry), Materials Science and Engineering.

SKILLS

- **Computational Tools:** MATLAB, GNU Octave
- **Probabilistic Programming:** Stan
- **Programming Languages:** C, C++, Python
- **Other Tools:** L<sup>A</sup>T<sub>E</sub>X

PUBLICATIONS

***Fast Bayesian inference of optical trap stiffness and particle diffusion [arXiv:1610.00315]***  
S. Bera, S. Paul, R. Singh, **D. Ghosh**, A. Kundu, A. Banerjee, R. Adhikari  
***[Scientific Reports 7, 41638 (2017)]***