Saikat Banerjee

Postdoctoral Scientist at Max Planck Institute for Biophysical Chemistry, Göttingen, Germany
Machine Learning | Bayesian Statistics | Systems Medicine | Statistical Genetics

Personal Data

Date of Birth	September 08, 1985
Place of Birth	Kolkata, India
Current Address	Room T4/103, Max Planck Institute for Biophysical Chemistry, Am Faßberg 11, Göttingen 37077, Germany
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URLs	Homepage | MPIBPC | Google Scholar | Github | LinkedIn | Twitter
Nationality	Indian
Languages	Bengali (native), Hindi (fluent), English (fluent), German (conversational)

Experience

Research

2015 – **Research Associate**, *Max Planck Institute for Biophysical Chemistry*, Göttingen.
Developing a Bayesian method for integrating GWAS and eQTL data

2014 – 2015 **Research Associate**, *Indian Institute of Science*, Bangalore.
Understanding the origin of long-range hydrophobic force; Role of biological water in the hydration shell of proteins

Miscellaneous

2010 – 2015 **HPC Admin**, *Bagchi Group*, IISc, Bangalore.
Administration and maintenance of Linux-based HPC system

2012 – 2013 **Co-founder**, *Beejig*, Bangalore.
Entrepreneurial skills with first-hand experience of business management, human resource, technical solutions, application development, marketing, etc.

Education

2009 – 2014 **Ph.D**, *Indian Institute of Science*, Bangalore.

- *Advisor:* Prof. Biman Bagchi
- *Thesis title:* Hydrophobicity and composition-dependent anomalies in aqueous binary mixtures, along with some contribution to diffusion on rugged energy landscape
- *Awarded on:* March 28, 2015

2007 – 2009 **M.S. Chemistry**, *Indian Institute of Science*, Bangalore.

- *Advisor:* Prof. Biman Bagchi
- *Thesis title:* Computer simulation of model systems: Diffusion in a rough potential & ripples in graphene
- *CGPA (Cumulative Grade Point Average):* 6.9 / 8.0
- *Class Rank:* 2nd

2004 – 2007 **B.Sc. (Honors)**, *Ramakrishna Mission Vidyamandira*, Belur Math (under University of Calcutta).

- *Subjects:* Major in chemistry, with physics and mathematics as auxiliary subjects
- *Marks:* 78% in chemistry (first class)
- *University rank:* 1st

Awards and distinctions

Jan, 2015 Best Poster Award | Faraday Discussions FD177, Royal Society of Chemistry

Dec, 2009 Best Poster Award | Frontier Meeting in Chemical Biology

2007 Gold Medal, University of Calcutta | For securing 1st position in B.Sc. Chemistry Honors at the university

2004 National Merit Scholarship, Govt. of India | For securing 167th serial no. in the merit list of candidates appearing in 10+2 examination, WBBHSE

2002 National Merit Scholarship, Govt. of India | For securing 23rd rank among the candidates appearing in Secondary Examination, WBCSE

Invited talks

2017 **Advanced seminar on statistical genetics**, *Georg August Universität*, Göttingen.

- *Invited by:* Dr. Henner Simianer
- *Date:* January 27, 2017
- *Title:* A novel Bayesian method for prediction of disease risk of individuals and finemapping causal variants in GWAS

Publications

1 Bayesian multiple logistic regression for case-control GWAS
SAIKAT BANERJEE, LINGYAO ZENG, HERIBERT SCHUNKERT AND JOHANNES SÖDING
bioRxiv, DOI:10.1101/198911 (2018)

2 Study of distance dependence of hydrophobic force between two graphene-like walls and a signature of pressure induced structure formation in the confined water
TUHIN SAMANTA, RAJIB BISWAS, SAIKAT BANERJEE AND BIMAN BAGCHI
The Journal of Chemical Physics, **149**, 044502 (2018)

3 Orientational order as the origin of the long-range hydrophobic effect
SAIKAT BANERJEE, RAKESH S. SINGH AND BIMAN BAGCHI
The Journal of Chemical Physics, **142**, 134505 (2015)

4 Composition dependent non-ideality in aqueous binary mixtures as a signature of avoided spinodal decomposition
SARMISTHA SARKAR, SAIKAT BANERJEE, SUSMITA ROY, RIKHIA GHOSH, PARTHA PRATIM RAY AND BIMAN BAGCHI
Journal of Chemical Sciences, 127:49 (2015) **[Cover Article]**

5 Sensitivity of polarization fluctuations to the nature of protein-water interactions: Study of biological water in four different protein-water systems
RIKHIA GHOSH, SAIKAT BANERJEE, MILAN HAZRA, SUSMITA ROY AND BIMAN BAGCHI
The Journal of Chemical Physics, **141**, 22D531 (2014)

6 Spatio-temporal correlations in aqueous systems: Computational studies of static and dynamic heterogeneity by 2D-IR spectroscopy
BIMAN BAGCHI, RIKHIA GHOSH, TUHIN SAMANTA, SAIKAT BANERJEE AND RAJIB BISWAS
Faraday Discussions, **FD177**, DOI:10.1039/C4FD00201F (2014)

7 Diffusion on a rugged energy landscape with spatial correlation
SAIKAT BANERJEE, RAJIB BISWAS, KAZUHIKO SEKI AND BIMAN BAGCHI
The Journal of Chemical Physics, **141**, 124105 (2014)

8 Stability of fluctuating and transient aggregates of amphiphilic solutes in aqueous binary mixtures: Studies of dimethyl sulfoxide, ethanol, and tert-butyl alcohol
SAIKAT BANERJEE AND BIMAN BAGCHI
The Journal of Chemical Physics, **139**, 164301 (2013)

9 Fluctuating micro-heterogeneity in water–tert-butyl alcohol mixtures and lambda-type divergence of the mean cluster size with phase transition-like multiple anomalies
SAIKAT BANERJEE, JONATHAN FURTADO AND BIMAN BAGCHI
The Journal of Chemical Physics, **140**, 194502 (2014) **[Featured Article]**

10 Structural transformations, composition anomalies and a dramatic collapse of linear polymer chains in dilute ethanol–water mixtures
SAIKAT BANERJEE, RIKHIA GHOSH, AND BIMAN BAGCHI
The Journal of Physical Chemistry B, **116**, 3713–3722 (2012)

11 Anomalous behavior of linear hydrocarbon chains in water–DMSO binary mixture at low DMSO concentration
RIKHIA GHOSH, SAIKAT BANERJEE, SUMAN CHAKRABARTY, AND BIMAN BAGCHI
The Journal of Physical Chemistry B, **115**, 7612–7620 (2011)

12 Theoretical and computational analysis of static and dynamic anomalies in water–DMSO binary mixture at low DMSO concentrations
SUSMITA ROY, SAIKAT BANERJEE AND BIMAN BAGCHI
The Journal of Physical Chemistry B, **115**, 685–692 (2011)

13 Enhanced pair hydrophobicity in the water–dimethyl sulfoxide (DMSO) binary mixture at low DMSO concentrations
SAIKAT BANERJEE, SUSMITA ROY AND BIMAN BAGCHI
The Journal of Physical Chemistry B, **114**, 12875–12882 (2010)

Supervision/Teaching experience

2018 **Master's Thesis**, *Anubhav Kaphle*, GGNB, Georg August Universität, Göttingen.
- *Thesis title:* Statistical method to discover trans-eQTLs for better prediciton of gene expression from genotype data
- *Submitted on:* March 31, 2018

2018 **Internship**, *Raktim Mitra*, IIT Kanpur.
- *Project title:* A novel method for discovery of trans-eQTLs using reverse regression

2017 **Internship**, *Rahul Nagial*, IIT Kanpur.
- *Project title:* Identifying new coronary artery disease risk regions using eQTL analysis of GTEx data

2012 **Teaching Assistant**, *Graduate level course SS207*, SSCU, IISc.
- *Course title:* Non-equilibrium statistical mechanics: Application to biological systems
- *Instructor:* Prof. Biman Bagchi

2011 **Teaching Assistant**, *Graduate level course SS206*, SSCU, IISc.
- *Course title:* Statistical mechanics of liquids & simple systems
- *Instructor:* Prof. Biman Bagchi

Conferences

Sep 2018 **17th European Conference on Computational Biology**, ECCB, Athens.
Poster title: B-LORE: Bayesian multiple logistic regression for case-control GWAS

Apr 2017 **GTEx Project Community Meeting**, *Enhancing the Usage of Human Genomics for the benefit of all*, GTEx, Barcelona.
Poster title: A Bayesian multivariate meta-analysis method in GWAS

Jan 2015 **Faraday Discussions (FD177)**, *Temporally and spatially resolved molecular science*, Royal Society of Chemistry, Bangalore.
Poster title: Diffusion on a rugged energy landscape with spatial correlation

Dec 2014 **13th Eurasia Conference on Chemical Sciences**, Indian Institute of Science, Bangalore.
Poster title: Diffusion in a rough potential revisited

Nov 2014 **The Second International Symposium on Protein Folding and Dynamics**, National Centre for Biological Sciences, Bangalore.
Poster title: Diffusion on a rugged energy landscape with spatial correlation

Sep 2013 **Current Trends in Theoretical Chemistry**, Bhaba Atomic Research Centre, Mumbai.
Poster title: Orientational patterns and hydrophobic force law in 2D water-like molecular systems

Dec 2011 **International Symposium on Chemistry and Complexity**, Indian Association for the Cultivation of Science, Kolkata.
Poster title: Percolation transition in aqueous binary mixture of amphiphilic molecules

Jul 2009 **Frontiers in Chemical Biology: Proteins Structure, Function & Dynamics**, jointly organized by IISc and JNCASR, Bangalore.
Poster title: Self-organization of n-alkane chains in water

Other interests

- Long distance biking
- Android app development
- Web development
- Mountains
- Graphic design
- Photography

References

- **Dr. Johannes Söding**, *Max Planck Institute for Biophysical Chemistry*, Göttingen, Germany.
  soeding@mpibpc.mpg.de

- **Prof. Biman Bagchi**, *Indian Institute of Science*, Bangalore, India.
  profbiman@gmail.com

- **Dr. Suman Chakrabarty**, *S. N. Bose National Centre for Basic Sciences*, Kolkata, India.
  sumanc@bose.res.in

- **Prof. Kazuhiko Seki**, *AIST*, Tsukuba, Japan.
  k-seki@aist.go.jp