Saikat Banerjee

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

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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 Bayesian methods for integrating GWAS and eQTL data, developing methods for detecting trans-eQTLs, new approaches for sparse regression

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 in-house Linux-based HPC system

2012 – 2013   **Co-founder**, *Beejig*, Bangalore.
Beejig used to develop Android apps for business owners / store retailers to promote word-of-mouth marketing. Currently defunct.

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
   PLOS Genetics, DOI:10.1371/journal.pgen.1007856 (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, (currently doing PhD with Prof. David Balding).
- *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*