Saikat **Banerjee**

STATISTICAL GENETICS · BAYESIAN METHODS · SYSTEMS MEDICINE · DATA SCIENCE

T4/103, Max Planck Institute for Biophysical Chemistry,
Am Faßberg 11, Göttingen 37077, Germany

(+49) 17621103442 | saikat.banerjee@mpibpc.mpg.de

saik.at | banskt | banskt

8 Sep. 1985 | Indian

Publications (Google Scholar)

Experience

Postdoctoral Fellow, Max Planck Institute for Biophysical Chemistry — *Göttingen, Germany*

ADVISOR: DR. JOHANNES SÖDING — *May 2015 – Present*

- Bayesian multiple logistic regression methodology for post-GWAS analyses including variable selection.
- Hypothesis test for accurate, powerful and large-scale identification of trans-eQTLs; Discovered more than 3000 trans-eQTLs from the GTEx data.
- Bayesian theory for integrating GWAS and eQTL data for identifying intrinsic causal mediations, work in progress.
- Presented our work at ISMB2019, Basel. Invited to speak at the University of Göttingen.

Co-founder, Beejig — *Bengaluru, India*

A B2B COMPANY FOR WORD-OF-MOUTH MARKETING — *Jan. 2012 - Sep. 2013*

- Extensively involved in conceptualization, market research, app development, fundraising and recruitment.

Education

PhD (Statistical Physics), Indian Institute of Science — *Bengaluru, India*

ADVISOR: PROF. BIMAN BAGCHI — *Aug. 2009 - Apr. 2014*

- Diffusion equation for a rugged potential energy landscape.
- Understanding the origin of long-range hydrophobic force.
- Role of biological water in the hydration shell of proteins.
- Hydrophobicity and composition-dependent anomalies in aqueous binary mixtures.
- Administration and maintenance of high performance computing (HPC) cluster from Sep. 2011 to Apr. 2015.

M.S. (Chemistry), Indian Institute of Science — *Bengaluru, India*

ADVISOR: PROF. BIMAN BAGCHI — *Aug. 2007 - Jun. 2009*

- Relevant Courses: Statistical Physics, Physical Chemistry, Thermodynamics, Basic probability theory.
- Class rank 2nd with a CGPA of 6.9 out of 8.

B.Sc., University of Calcutta — *Calcutta, India*

RAMAKRISHNA MISSION VIDYAMANDIRA — *Aug. 2004 - May 2007*

- Major in chemistry, with physics and mathematics as auxiliary subjects.
- Ranked 1st in the University of Calcutta.

Software

B-LORE Bayesian multiple logistic regression with variable selection.

TEJAAS L_2 regularized 'reverse' multiple linear regression for discovering trans-eQTLs.

Publications

- 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)
- 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)
- 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)
- 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]**
- 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)
- 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)
- 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)
- 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)
- 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]**
- 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)
- 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)
- 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)
- 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)

Select Presentations

Annual meeting of the International Society for Molecular Biology (ISMB 2019) *Basel, Switzerland*
Bayesian logistic regression for case-control GWAS *Jul. 2019*

Advanced seminar for statistical genetics *Göttingen, Germany*
Invited by Dr. Henner Simianer, Georg August Universität *Jan. 2017*

Skills

Programming	Python, FORTRAN, C++, Java
Bioinformatics	GWAS, EQTL, Finemapping, PrediXcan
Molecular Dynamics	LAMMPS, GROMACS
Web	HTML5, CSS, PHP, Node.JS
Languages	Bengali (native), English (fluent), Hindi (fluent), German (basic)
Others	Linux, Bash, LaTeX, Git, VMD, Adobe Illustrator, Adobe Photoshop, Inkscape

Honors & Awards

2015 **Best Poster**, Faraday Discussions FD177, Royal Society of Chemistry
2009 **Best Poster**, Frontier Meeting in Chemical Biology
2007 **Gold Medalist**, 1st position in B.Sc. Chemistry Honors at the University of Calcutta
2002 **National Merit Scholarship, Govt. of India**, 23rd rank in final school examination, West Bengal

Supervision / Teaching

Master's Thesis *Göttingen*
Anubhav Kaphle, Georg August Universität *2018*

- *Thesis title:* Statistical methods to discover trans-eQTLs for better prediciton of gene expression from genotype data.
- Anubhav is currently doing PhD with Prof. David Balding.

Internships *Göttingen, 2017 - 2019*

- Identifying novel cardiovascular disease risk loci from UK Biobank (Viola Tozzi).
- 'Reverse' multiple regression on a toy model with correlated variables (Raktim Mitra).
- EQTL analysis of GTEx data (Rahul Nagial).

Teaching Assistant *Bengaluru, 2011-2013*

- Non-equilibrium statistical mechanics: Application to biological systems (for advanced PhD students).
- Statistical mechanics of liquids and simple systems (for new PhD students).

Extracurricular Activity

Consultant, Z-Axis Labs *U.S.A., 2014*

- Led a team of two developers and a graphic designer to create an iOS app.

Graphic design and web development, Freelancer

- Curated award-winning logos and created web / brand identity for more than 20 startups.
- Designed two book covers for Oxford University Press

Hobbies

- Photography, Hiking, Long distance biking

References

Dr. Johannes Söding	Max Planck Institute for Biophysical Chemistry, Göttingen. soeding@mpibpc.mpg.de
Prof. Biman Bagchi	Indian Institute of Science, Bengaluru. profbiman@gmail.com
Dr. Suman Chakrabarty	S. N. Bose National Centre for Basic Sciences, Kolkata. sumanc@bose.res.in
Prof. Kazuhiko Seki	AIST, Tsukuba. k-seki@aist.go.jp