

Curriculum Vitæ for Mithun Biswas

December 4, 2018

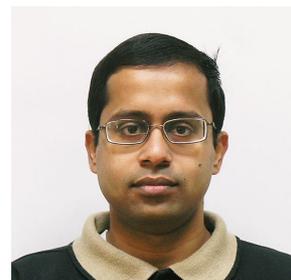
CONTACT DETAILS

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CURRENT POSITION

- Assistant Professor Grade-II, Department of Physics and Astronomy, NIT Rourkela.

RESEARCH INTEREST

I am interested to work on problems related to biophysics and soft matter. There are several intriguing questions related to protein folding, binding, signalling and allosteric regulation. In my lab, we investigate these questions using computer simulations and statistical models.

EDUCATION

- **Ph.D, August 2006 – January 2012**

Faculty of Biosciences , University of Heidelberg, Germany

Thesis title: Nucleosome Structural Stability and Mobility

Thesis supervisor: Prof. Jeremy C. Smith

- **Master of Science, 2004-2006**

Physics, Indian Institute of Technology Mumbai

Thesis title: The Effect of Hydrodynamic Interactions in the Escape Rate Theory of Polymers under Tension

Thesis supervisor: Prof. Anirban Sain

- **Bachelor of Science, 2001-2004**

Physics, Presidency College, University of Calcutta

POSTDOCTORAL TRAINING

- **University of Freiburg, Germany, July 2015 – November 2017**

Physics Institute, Workgroup: Prof. Gerhard Stock

Research focus: Langevin modeling of biomolecular dynamics

- **Goethe University Frankfurt, Germany, March 2012 – June 2015**

Institute of Physical and Theoretical Chemistry, Workgroup: Prof. Irene Burghardt

Research focus: Functional regulation of biomolecules

AREAS OF SPECIALIZATION

Molecular level biophysics, biomolecular simulation of protein and nucleic acids, Langevin modeling, functional regulation of biomolecules

STUDENT SUPERVISION:

- Suraj Kumar Sahu (M.Sc. Student, ongoing)
Project: Crowding Effects on Protein Stability
- Ajaya Kumar Sahoo (M.Sc. Student, ongoing)
Project: Temperature Rescaled Langevin Modeling.
- Benjamin Lickert (Master student, August 2015 – August 2016)
Publication: N. Schaudinnus, B. Lickert, **M. Biswas**, G. Stock, “Global Langevin model of Multidimensional Biomolecular Dynamics”, *J. Chem. Phys.* **145**, 184114 (2016).
- Dominique Rastädter (Doctoral student, March 2012 – June 2014)
Publication: D. Rastädter, **M. Biswas**, I. Burghardt, "Molecular Dynamics Study of the Controlled Destabilization of an RNA Hairpin Structure by a Covalently Attached Azobenzene Switch", *J. Phys. Chem. B* **118** (29), 8478–8488 (2014).
- Yovonne Ketteler (Bachelor thesis, March 2013 - July 2013)
Thesis: “Thermostability of a 6mer DNA-azobenzol-complex Studied by Replica Exchange Molecular Dynamics”
- Alfredo Jost Lopez (Bachelor thesis, May 2012- July 2012)
Thesis: “Molecular Dynamics Study of Photoinduced Conformational Switching in a Azobenzene-DNA Complex”

SUCCESSFUL GRANT APPLICATIONS

- **2016**: German Research Foundation (DFG) funded project “Langevin Modeling of Rare Biomolecular Processes” written with Prof. Gerhard Stock.

OTHER ACTIVITIES

- Co-organizer of *Heidelberg Graduate School Annual Colloquium*, 2011.
- Co-organizer of *Biophysics of Chromatin 2009* workshop.

FELLOWSHIPS & AWARDS

- Heidelberg Graduate School Fellowship at University of Heidelberg Germany, **2009**.
- CSIR-UGC Junior Research Fellowship (JRF) of University Grants Commission India, **2006**.
- Graduate Aptitude Test in Engineering qualified, **2006** (All India rank 36).
- Visiting Student Research Programme (VSRP) fellowship at Tata Institute of Fundamental Research Mumbai, **2005**.
- National Scholarship and State Merit Award, West Bengal Board of Secondary Education, **1999**.

PUBLICATIONS

1. **M. Biswas**, B. Lickert and G. Stock, "Metadynamics Enhanced Markov Modeling of Protein Dynamics", *J. Phys. Chem. B*, DOI: 10.1021/acs.jpcc.7b11800 (2018).
2. N. Schaudinnus, B. Lickert, **M. Biswas**, G. Stock, "Global Langevin model of Multidimensional Biomolecular Dynamics", *J. Chem. Phys.* **145**, 184114 (2016).
3. P. Mondal, **M. Biswas***, T. Goldau, A. Heckel, I. Burghardt, "In Search of an Efficient Photoswitch for Functional RNA: Design Principles from a Microscopic Analysis of Azobenzene-linker-RNA Dynamics with Different Linkers", *J. Phys. Chem. B*, **119** (34), 11275–11286 (2015).
[corresponding author]
4. T. Goldau, K. Murayama, C. Brieke, S. Steinwand, P. Mondal, **M. Biswas**, I. Burghardt, J. Wachtveitl, H. Asanuma & A. Heckel, "Reversible Photoswitching of RNA Hybridization at Room Temperature with an Azobenzene C-nucleoside", *Chemistry - A European Journal* **21** (7), 2845–2854 (2015).
5. **M. Biswas***, I. Burghardt, "Azobenzene Photoisomerization Induced Destabilization of B-DNA", *Biophys. J.* **107** (4), 932-940 (2014). **[corresponding author]**
6. D. Rastädter, **M. Biswas**, I. Burghardt, "Molecular Dynamics Study of the Controlled Destabilization of an RNA Tetraloop Structure by an Azobenzene Photoswitch", *J. Phys. Chem. B* **118** (29), 8478–8488 (2014).
7. **M. Biswas**, J. Langowski and T. Bishop, "Atomistic Simulation of Nucleosomes", *WIREs Computational Molecular Science* **3** (4), 378-392 (2013).
8. **M. Biswas**, T. Wocjan, J. Langowski and J. C. Smith, "DNA Bending Potentials for Loop-Mediated Nucleosome Repositioning", *EPL* **97**, 38004 (2012).
9. **M. Biswas**, J. Langowski and J. C. Smith, "Global Dynamics of Protein and DNA in Nucleosome Investigated by Molecular Dynamics Simulation", in *From Computational Biophysics to Systems Biology (CBSB11)* ed. by P. Carloni, U.H.E. Hansmann, T. Lippert, J.H. Meinke, S. Mohanty, W. Nadlar, O. Zimmermann, *IAS Series*, **8**, 25-28 (2012).
10. **M. Biswas**, K. Voltz, J. C. Smith and J. Langowski, "Role of Histone Tails in Structural Stability of the Nucleosome", *PLoS Comput. Biol.* **7** (12), e1002279 (2011).
11. S. G. Das, D. Pescia, **M. Biswas**, A. Sain, "Effect of hydrodynamic interaction on polymeric tethers", *Phys. Rev. E* **82**, 041910 (2010).

PROFESSIONAL VISITS

1. Tom Bishop's lab at Louisiana Tech University, USA - 2012.
2. Oak Ridge National Laboratory, Oak Ridge Tennessee USA – 2008, 2010.

SELECTED TALKS AND POSTERS

1. *Plumed Meeting 2017*; Trieste, Italy.
Poster: 'Metadynamics Enhanced Langevin Modeling: Long Timescale Protein Dynamics from Short Trajectories'
2. 'Long Timescale Protein Dynamics from Short Trajectories: A Langevin Approach', Invited Talk, Department of Chemical Sciences, IISER-Mohali, India, November 11, 2016.
3. 'Selective Regulation of Nucleic Acid Complexes from a Molecular Dynamics Simulation Perspective', Invited Talk, Computational Biology Division, The Institute of Mathematical Sciences, Chennai, India, January 4, 2016.
4. 'Functional Regulation of DNA/RNA with Azobenzene Photoswitch', Invited Talk, Department of Chemistry, IIT Delhi, India, January 9, 2015.
5. *RNA Methods Workshop 2013*; Bad Homburg Germany.
Talk: 'Conformational Changes in B-DNA upon Azobenzene Photoisomerization'
6. *Computer Simulation and Theory of Macromolecules 2013*; Huenfeld Germany.
Talk: 'Effect of Azobenzene Isomerization on DNA Stability'
7. *IPTC seminar 2012*, Institute of Physical and Theoretical Chemistry, Goethe University, Frankfurt.
Talk: 'Molecular modeling of protein/ligand-DNA interactions'
8. *From Computational Biophysics to Systems Biology 2011*; Julich Germany.
Poster: 'Structural Alterations in the Nucleosome upon H3 Tail Truncation Investigated by Molecular Dynamics Simulation '
9. *Oak Ridge National Laboratory*; Tennessee USA 2010.
Talk: 'Histone Tails in the Nucleosome'
10. *Biophysical Society 54th Annual Meeting 2010*; San Francisco California USA.
Poster: 'DNA Loop formation in Nucleosomes'