**Amit Ghosh** *Curriculum Vitae*

Address : Department of Chemistry and Biology, University of Siegen Adolf Reichwein Straße 2, 57068 Siegen, Germany

Telephone : +49 176 56926976

E-mail : amit.ghosh@uni-siegen.de

**Personal profile:**

* Father’s Name: Ajit Kumar Ghosh.
* Mother’s Name: Kakuli Ghosh.
* Date of Birth: 1st September, 1992.
* Place of Birth: Bongaon, West Bengal, India.
* Nationality: Indian
* Gender: Male

**Permanent address:**

* Village: Sikira.
* Post Office: Hishabi.
* Police Station: Amdanga.
* District: North 24 Parganas.
* State: West Bengal.
* Country: India.
* Pin code: 743221

**Research Experience**

Sep 2015 – Present PhD Student, [Universität Siegen](https://www.uni-siegen.de/start/index.html.en), Germany.

Advisor: **Prof. Dr. Michael Schmittel**

* Design of stand-alone and networked (supra)molecular devices/machines.
* Fabrication of molecular machines for functions.
* Construction of out-of-equilibrium (supra)molecular devices/machines.
* Making and operating functional out-of-equilibrium (supra)molecular devices/machines.

May 2015 – Aug 2015 Summer project at Indian Institute of Technology ([IIT Kanpur](http://www.iitk.ac.in/chm/)), India.

 Advisor: Prof. Dr. Manas K. Ghorai

* Memory of Chirality Concept in Asymmetric Intermolecular Michael Reaction

Jan 2015 – Apr 2015 Master Research Project at [IIT Kanpur](http://www.iitk.ac.in/chm/), India.

 Advisor: Prof. Dr. Manas K. Ghorai

* Imino Aldol and Aldol Reactions via Memory of Chirality

Apr 2014 – Jul 2014 Summer project at University of Calcutta, India.

 Advisor: Prof. Dr. Dilip Kumar Maiti.

* Additive-free NiII-salt catalyzed activation of primary amine-sp3C**-**H and cyclization to tetrasubstituted and polycyclic imidazoles

**Education**

Sep 2015 – Present PhD (Chemistry), [Universität Siegen](https://www.uni-siegen.de/start/index.html.en), Germany.

 Advisor: Prof. Dr. Michael Schmittel

 **Thesis**: Towards Networked Out-of-Equilibrium Molecular Devices and

 Machines.

Aug 2013 – June 2015 MSc, first class (9.2/10), [IIT Kanpur](http://www.iitk.ac.in/chm/), Kanpur, India.

**Thesis**: Enantioselective Synthesis of α,β-Diamino Esters Via Memory of Chirality concept.

Jul 2010 – Jun 2013 BSc (Chemistry), first class with distinction, West Bengal State University, India.

**Publications**

1. **A. Ghosh**, I. Paul, M. Schmittel

Cooperative Effects in Switchable Catalysis: Enhancing Double-Click Reaction Yield of Symmetrical Rotaxanes

*Angew.Chem. Int. Ed.* **2021**, *60*, 20558–20562. [[Link](https://onlinelibrary.wiley.com/doi/full/10.1002/anie.202108269)]

1. A. Goswami, S. Saha, E. Elramadi, **A. Ghosh,** M. Schmittel

Off-Equilibrium Speed Control of a Multistage Molecular Rotor: 2-Fold Chemical Fueling by Acid or Silver(I)

*J. Am. Chem. Soc.* **2021**, *143*, 14926–14935. [[Link](https://pubs.acs.org/doi/abs/10.1021/jacs.1c08005)]

1. **A. Ghosh**, I. Paul, M. Schmittel

Multitasking with Chemical Fuel: Dissipative Formation of a Pseudorotaxane Rotor from Five Distinct Components

*J. Am. Chem. Soc*. **2021**, *143*, 5319–5323. [[Link](https://pubs.acs.org/doi/abs/10.1021/jacs.1c01948)]

1. Y.-F. Li, **A. Ghosh**, P. K. Biswas, S. Saha, M. Schmittel

Exchange Speed of Four-Component Nanorotors Correlates with Hammett Substituent Constants

*Chemistry*, **2021**, *3*, 116–125. [[Link](https://www.mdpi.com/2624-8549/3/1/9)]

1. **A. Ghosh**, M. Schmittel

Using Multiple Self-sorting for Switching Functions in Discrete Multicomponent Systems

*Beilstein J. Org. Chem*. **2020**, *16*, 2831–2853. [[Link](https://www.beilstein-journals.org/bjoc/articles/16/233)]

1. S. Saha, **A. Ghosh**, Thomas Paululat, Michael Schmittel

Allosteric Regulation of Rotational, Optical and Catalytic Properties within Multicomponent Machinery

*Dalton Trans.* **2020**, *49*, 8693–8700. [[[Link](https://pubs.rsc.org/en/content/articlelanding/2020/DT/D0DT01961E#!divAbstract)]

1. **A. Ghosh**, I. Paul, M. Schmittel

Time-Dependent Pulses of Lithium Ions in Cascaded Signaling and Out-of-Equilibrium (Supra)molecular Logic

*J. Am. Chem. Soc*. **2019**, *141*, 18954–18957*.* [[Link](https://pubs.acs.org/doi/10.1021/jacs.9b10763)]

1. I. Paul, **A. Ghosh**, M. Bolte, M. Schmittel

Remote Control of the Synthesis of a [2]Rotaxane and Its Shuttling via Metal-Ion Translocation, (special issue: 80th birthday of J.-M. Lehn)

*ChemistryOpen.* **2019**, *8*, 1355–1360*.* [[Link](https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/open.201900293)]

1. **A. Ghosh**, I. Paul, S. Saha, T. Paululat, M. Schmittel

Machine Metathesis: Thermal and Catalyzed Exchange of Piston Rods in Multicomponent Nanorotor/Nanoslider Ensemble

 *Org. Lett*. **2018**, *20*, 7973–7976. [[Link](https://pubs.acs.org/doi/abs/10.1021/acs.orglett.8b03541)]

1. **A. Ghosh**, I. Paul, M. Adlung, C. Wickleder, M. Schmittel

Oscillating Emission of [2]Rotaxane Driven by Chemical Fuel

 *Org. Lett.* **2018**, *20*, 1046–1049. [[Link](https://pubs.acs.org/doi/abs/10.1021/acs.orglett.7b03996)]

**Manuscripts in Preparation**

* **A. Ghosh**, S. Kundu, I. Paul, M. Schmittel

Continuous Out-of-Equilibrium Operation of Networked Catalytic Machinery

* **A. Ghosh**, M. Schmittel

Recent Progress and the Future of Self-sorting: From Discrete Supramolecular Architectures to Catalytic Machinery (Review article)

* S. Kundu,+ **A. Ghosh**,+ I. Paul, M. Schmittel (+Equal contribution)

Three-State Switchable Multicomponent Pseudorotaxane as Dual-Way Logic AND Gate with Two Catalytic Outputs

* I. Valiyev,+ **A. Ghosh**,+ I. Paul, M. Schmittel (+Equal contribution)

Concurrent Dissipative Base and Silver(I) Catalysis Ignited by Fuel Acid

* D. Mondal,+ **A. Ghosh**,+ I. Paul, M. Schmittel (+Equal contribution)

Chemical Fuel Drives Base Catalysis and Supramolecular Cage-to-Device Transformation

* E. Elramadi,+ **A. Ghosh**,+ P. K. Biswas, M. Schmittel (+Equal contribution)

Control and Adaptability of an Artificial Nano-Slider with Catalytic Output

* I. Paul, **A. Ghosh**, M. Schmittel

Programmed Dynamic Negative Allosteric Catalysis: Controlled by Multicomponent Machine Speed

* I. Paul, **A. Ghosh**, M. Schmittel

Directional Three State Reversible Molecular Shuttle

* I. Valiyev, **A. Ghosh**, M. Schmittel

Acid Triggered Organobase Catalysis: Networking Aza-crowns for Smart Catalysis Using Silver Signaling

* I. Paul, I. Valiyev, **A. Ghosh**, M. Schmittel

A Four Input Networking Combinational Fluorescent Logic (AND) Gate

* P. K. Biswas, **A. Ghosh**, N. Mittal, M. Schmittel

 Chemically fueled molecular biped walking on a linear platform

**Academic achievements**

* Qualified All India IIT Entrance Exam (JAM), April 2013 (Rank-149).
* Qualified Council for Scientific and Industrial Research (CSIR) NET in India held on 22nd June 2014 (Rank-75).
* Qualified all India Graduate Aptitude Test in Engineering (GATE) examination in March 2015 (Rank-49)
* Recipient of Merit Cum Means Scholarship from IIT Kanpur in MSc (2012-2015)
* Recipient of Merit Cum Means Scholarship from West Bengal Govt. in BSc (2010-2013)
* Attained 8th Rank at BSc Honours at West Bengal State University.

**Oral Presentations**

March 2019 Oscillating Emission of [2]Rotaxane Driven by Chemical Fuel

 "Building and Probing Small" International Symposium, Brussels, Belgium.

**Poster Presentations**

Feb 2019 Machine Metathesis: Thermal and Catalyzed Exchange of Piston Rods in Multicomponent

 Nanorotor/Nanoslider Ensemble

 SupraChem 2019, Universität Würzburg, Germany.

Aug 2017 Rapid shuttling of a macrocycle between two degenerated stations in a fluorescent [2]rotaxane

 Conjugated Oligomers and Polymers (KOPO-2017), Bad Honnef, Germany.

Feb 2017 Multicomponent Nanorotors based on different types of noncovalent interaction

 SupraChem 2017, RWTH Aachen University, Germany.

April 2016 Multicomponent Nanorotors based on different types of noncovalent interaction

 7. "Münster Symposium on Cooperative Effects in Chemistry", Universität Münster, Germany

**Technical Skills**

Organic Chemistry • Multi-step organic synthesis

 • Rotaxane synthesis

 • C-C Coupling reactions (Sonogashira, Heck, Suzuki, Negishi)

 • Enantioselective synthesis

 • *n*-BuLi, *t*-Buli reactions

 • Condensation reactions

 • Conjugate addition reactions

 • Cycloaddition reaction

 • Cu(I) catalyzed Click reaction

Supramolecular Chemistry • Molecular switches • Interlocked molecules

 • Supramolecular Walker • Self-sorting

 • Multi-component Rotors • Cybernetic Communication

Dissipative system • Chemical Fuel • Out-of-Equilibrium molecular Logic

 • Dissipative Catalysis • Transient Rotor

Energy optimization • Molecular mechanics • Semiemperical (PM3, PM6, AM1)

 • DFT

Analytical Chemistry • UV/vis spectroscopy • NMR spectroscopy

 • Fluorescence spectroscopy • Mass-spectrometry (ESI-MS)

 • IR spectroscopy • Cyclic voltammetry

Instruments handled • Bruker Avance 400 MHz NMR • Thermo-Quest LCQ DECA ESI-MS

 • Cary Win 50 UV Spectometer • Cary Eclipse Fluorescence

 • Chiral HPLC instrument • Perkin Elmer Spectrum-Two FT-IR

Software/IT • Hyperchem • Sci-Finder • Microsoft Office

 • HypSpec2014 • ChemDraw • Isopro

 • Chemcraft • Gauss view • WinDNMR

 • Origin • Mercury

 • Mestrenova • Mestrec

**Languages Known**

Bengali: Native Language

English: Speaking, Writing, Reading

Hindi: Speaking, Writing, Reading

German: B1

**References**

* Prof. Dr. Michael Schmittel

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* Prof. Dr. Heiko Ihmels

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* Prof. Dr. Manas Kumar Ghorai,

 Department of Chemistry,

 IIT Kanpur,Kanpur, UP-208016, India

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**Declaration**

 I hereby declare that the above written particulars are true to the best of my knowledge and belief.

