# Saptarshi Ghosh

Researcher

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## Research Interests

Computational Neuroscience, Spiking Neural Networks, Graph Theory, Non-linear Dynamics, large-scale Neural Dynamics

## Appointments

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| 2020 – Present | **Researcher**<br>*PI:* Prof.Yaseer Roudi | Kavli Institute for Systems Neuroscience<br>Trondheim, Norway |

## Education

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| 2014 – 2020 | **Ph.D. in Network Science**<br>**Title:** Chimera State in Multiplex Networks<br>*Supervisor:* Prof. Sarika Jalan | Indian Institute of Technology Indore<br>Indore, India |

- Demonstrated Chimera States in Multiplex Networks with delay and inhibition
- Developed a guidance scheme to design chimera state without special prerequisites

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| 2012 – 2014 | **Master of Science in Physics**<br>**CGPA:** 7.7 | Indian Institute of Technology Kanpur<br>Kanpur, India |
| 2009 – 2014 | **Bachelor of Sciences**<br>**Percentage:** 61.6% | Asutosh College, University of Calcutta<br>Kolkata, India |

## Experiences

2020 Article reviewer
   **E** Chaos, Solitons & Fractals, Elsevier
   **A** Chaos, AIP

2018 Project Asistant in DST-DAAD Collaborative Grant with German Research Group
   Advisor: Dr. Anna Zakarova, TU Berlin, Berlin, Germany
- Collaborative Research Visit to TU Berlin, Berlin, Germany
- Applied the guidance Scheme to design Solitary States

2015 Teaching Assistant
- Physics -I : Modern Physics (PH 105)
- Physics Lab (PH 156)

2017 Mentor
- 2 M.Sc Students in their M.Sc. thesis Work
- Bihabasu Patra (Summer Intern), resulted in a publication

2014 M.Sc. Project on "'Making Physically Useful Nanostructures with Focused Ion Beam"

Advisor: Prof. H.C. Verma, Indian Institute of Technology Kanpur, kanpur, India
- Fabricated micro- and nano- scale capacitors of various thickness and separation using Focused Ion Beam to investigate geometrical correction to the Child-Langmuir law
- Designed a micro- and nano- scale radiation detector

2013 Summer Project on "Different aspects of Quantum Communication"

Advisor: Dr. Ujjwal Sen, Harish-Chandra Research Institute, Prayagraj, India
- Investigated quantum cryptographic protocols (BB-84, EK-91) for secured communications

# Publications

**Dissertation Work**

1. **S Ghosh**, L Schülen, AD Kachhvah, A Zakharova and S Jalan (2019) Taming chimeras in networks through multiplexing delays, EPL (Europhysics Letters) 127 (3), 30002
2. **S Ghosh** and S Jalan (2018) Engineering chimera patterns in networks using heterogeneous delays, Chaos (Fast Track) 28, 071103 (Selected as Editor's Pick article)
3. **S Ghosh**, A Zakharova and S Jalan (2018) Non-identical multiplexing promotes chimera states, Chaos, Solitons & Fractals, 106, 56-60
4. S Jalan, **S Ghosh** and B Patra (2017) Is repulsion good for the health of chimeras?, Chaos (Fast Track) 27 (10), 101104
5. **S Ghosh**, A Kumar, A Zakharova and S Jalan (2016) Birth and death of chimera: Interplay of delay and multiplexing, EPL (Europhysics Letters) 115 (6), 60005
6. **S Ghosh**, S. K. Dwivedi, MV Ivanchenko, Sarika Jalan (2016) Interplay of inhibition and multiplexing: Largest eigenvalue statistics, EPL (Europhysics Letters) 115 (1), 10001
7. **S. Ghosh**, S. Jalan (2016) Emergence of Chimera in Multiplex Network, International Journal of Bifurcatio and Chaos 26 (07), 1650120

**Collaborative Work**

1. MA Ganaie, **S Ghosh**, N Mendola, M Tanveer and S Jalan (2020) Identification of chimera using machine learning, Chaos 30 (6), 063128
2. L Schülen, **S Ghosh**, AD Kachhvah, A Zakharova and S Jalan (2019) Delay engineered solitary states in complex networks, Chaos, Solitons & Fractals 128, 290-296
3. J Sawicki, **S Ghosh**, S Jalan and A Zakharova (2019) Chimeras in multiplex networks: interplay of inter-and intra-layer delays, Frontiers in Applied Mathematics and Statistics 5, 19
4. A Singh, **S Ghosh**, S Jalan and J Kurths (2015) Synchronization in delayed multiplex networks, EPL (Europhysics Letters) 111 (3), 30010 (Selected as Editor's Pick Article)

# Talks and Posters

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| September, 2019 | **Delivered a talk on "Taming chimera state using heterogeneousde Delays"** |
| | Dynamic Days Europe, Rostock, New Germany |
| September, 2019 | **Delivered a talk on "Taming chimera state in Networks"** |
| | Research Visit to Kavli-NTNU, Trondheim, Norway |
| August, 2019 | **Delivered a talk on "Taming chimera state in Networks"** |
| | Research Visit to ICS-CAS, Prague, Czech Republic |
| July, 2019 | **Presented a Poster on "Taming chimera state using heterogeneousde Delays"** |
| | INSPIRE meet, New Delhi, India |
| December, 2018 | **Delivered a talk on "Chimera in Networks"** |
| | DDST-DAAD collaborative visit to TU Berlin, Berlin, Germany |
| October, 2018 | **Delivered a talk on "Chimera in Multiplex Networks"** |
| | Conference on Non-linear Systems and Dynamics, JNU, New Delhi |
| March 2015 | **Presented a poster on "Delay enhances synchronization in distant entities"** |
| | Conference on Non-linear Systems and Dynamics, IISER Mohali, Punjab |

# Merits

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| 2015 – 2020 | **INSPIRE Fellowship** |
| | Depatment of Science and Technology , Govt. of India |
| 2009 – 2014 | **INSPIRE Scholarship** |
| | Depatment of Science and Technology , Govt. of India |
| March, 2015 | **MCM Scholarship** |
| | Govt. of West Bengal |

# Organization Experiences

- Member of the organizing team for Global Initiative of Academic Networks (GIAN) workshop on "Network Science and Multi-Agent Systems" held during May 30 - June 10, 2016 at Indian Institute of Technology Indore
- Aided in organizing GIAN workshop on "Biomathematics: from gene expression to bone mechanics" during August 15 - 19, 2016 at Indian Institute of Technology Indore.
- Organizing team member of short-term course on "Statistics in Systems Biology and Programming in R" under GIAN scheme of MHRD, Government of India, held during August 22 - 27, 2016 at Indian Institute of Technology Indore.
- Coordinator of Weekly Journal Club and other academic activities at Complex Systems Lab
- Active member of Mystic Hues (Photography Club, IIT-Indore)

# Technical Skills

| Programming | | Software | |
|---|---|---|---|
| Julia, Python, Latex | Extensive User | MATLAB, Octave, Office/G-Suite | Extensive User |
| C,C++,git,bash | competent | Linux, Github | Daily User |
| R | Novice | Cytoscape, Gephi, Networkx, Xpp-Auto | competent |

# Other Skills

| Language | | Hobbies | |
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| Bengali | Mother Tongue | DSLR Photography | Intra IIT-I Winner |
| English | Fluent | Digital Drawing | competent |
| Hindi | Intermediate | Reading | Stories/SciFi |

## Personal Information

- **Date of Birth:** 15th February, 1992
- **Nationality:** Indian
- **Permanent Address:** Ward No : 4 , Ghosh Para, P.O.: Mekhliganj, Dist. : Koch Bihar (West Bengal) 735304 India

## References

**Prof. Yaseer Roudi**
Kavli Institute of Systems Neuroscience
Norwegian University of Science and Technology
Trondheim, Norway
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**Prof. Sarika Jalan**
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[sarika@iiti.ac.in](mailto:sarika@iiti.ac.in)