

Shraddha Gupta

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Doctoral researcher



ABOUT MYSELF

"I am a final year PhD student with a strong interest in dynamical systems, data science and climate. I have a flair for scientific writing and editing."

EDUCATION

Oct 2019–Present	Doctoral Studies in Physics , Humboldt-Universität (HU) zu Berlin, Germany.
Jul 2017–Jul 2019	Master of Science in Physics , Indian Institute of Technology (IIT) Madras, Chennai, India, CGPA: 9.15.
Jul 2014–May 2017	Bachelor of Science (Hons.) in Physics , St. Xavier's College (Autonomous), University of Calcutta, Kolkata, India, CGPA: 8.79, Grade: A+.

ACADEMIC POSITIONS

Sep 2019–Present	Early Stage Researcher , Potsdam-Institut für Klimafolgenforschung (PIK), Germany, funded by the EU H2020 MSCA ITN CAFE project, Grant Agreement No. 813844. Project title: Multilayer networks for sub-seasonal prediction. Supervisors: Prof. Jürgen Kurths, PIK and HU Berlin, Germany, and Prof. Florian Pappenberger, European Centre for Medium-Range Weather Forecasts (ECMWF), Reading, UK.
May 2017–Aug 2019	Research associate , Saha Institute of Nuclear Physics, Kolkata, India. Project title: Measure Synchronization in nonlinearly coupled Hamiltonian systems.
May 2015–Apr 2017	Undergraduate associate , Saha Institute of Nuclear Physics, Kolkata, India. Project title: Study of Gamma-ray sources and extensive air showers by analysis of data from Fermi-LAT detector.

SKILLS

Programming language	Python (intermediate), Matlab (intermediate), C/C++ (intermediate), Fortran (intermediate), Java (beginner), Parallel computing, Cluster computing, Climate data operators (CDO), \LaTeX , HTML.
Time series analysis	Linear/non-linear time series analysis, Hilbert transform, Continuous Wavelet Transform analysis.
Research experience	Synchronization and Chaos, Causal Analysis, Complex Network, Climate processes.
Data handling	Climate data, Astronomical data, Finance data, etc.

PUBLICATIONS

Peer-reviewed Journal

- **Gupta, S.**, De, S., Janaki, M. S., and Iyengar, A. N. Sekar. "Exploring the route to measure synchronization in non-linearly coupled Hamiltonian systems", *Chaos* 27, 113103 (2017) (Paper selected as Featured and Scilight).
- De, S., **Gupta, S.**, Janaki, M. S., and Iyengar, A. N. Sekar. "Frequency and wavelet based analyses of partial and complete measure synchronization in a system of three nonlinearly coupled oscillators", *Chaos* 28, 113108 (2018).
- **Gupta, S.**, De, S., Janaki, M. S., and Iyengar, A. N. Sekar. "Using wavelet analysis to investigate synchronization", *Physical Review E* 100, 022218 (2019).
- **Gupta, S.**, Boers, N., Pappenberger, F., and Kurths, J. "Complex network approach for detecting tropical cyclones", *Climate Dynamics* 57, 3355–3364 (2021).
- **Gupta, S.**, Mastrantonas, N., Masoller, C., and Kurths, J. "Perspectives on the importance of complex systems in understanding our climate and climate change—The Nobel Prize in Physics 2021", *Chaos* 32, 052102 (2022) (Paper selected as Featured and Scilight).
- **Gupta, S.**, Su, Z., Boers, N., Kurths, J., et al. "Interconnection

- between the Indian and the East Asian Summer Monsoon: spatial synchronization patterns of extreme rainfall events". Under Review in *International Journal of Climatology* (2022).
- De, S., **Gupta, S.**, Unni, V. R., Ravindran, R., et al. "Study of Interaction and Complete Merging of Binary Cyclones Using Complex Networks", Under Review in *Chaos* (2022).

Conference Abstracts

- *ECC15 15th Experimental Chaos and Complexity Conference. Book of Abstracts.* Madrid, Spain, June 2018, ISBN: 978-84-697-0441-7, p. 55-56, Posters P05 and P06.
- *EGU General Assembly 2020*, Sharing Geoscience Online, May 2020, Display EGU2020-5916.
- *AGU Fall Meeting 2020*, Online, Dec 2020, Poster GC083-0010.
- *EGU General Assembly 2021*, Gather Online, Apr 2020, vPICO EGU21-8740.
- *EGU General Assembly 2021*, Gather Online, Apr 2020, vPICO EGU21-8964.
- *EGU General Assembly 2022*, Vienna, Austria & Online, May 2022, Short Oral EGU22-8626.
- *Asia Oceania Geoscience Society (AOGS) 2022, 19th Annual Meeting*, Online, Aug 2022, Oral AS03-A012 (Accepted).

SCHOLARLY ACHIEVEMENTS

- **Prof. Chilukury Ramasastry Memorial Prize Gold Medal**, IIT Madras, India, Best academic record in M.Sc. Physics 2017-19.
- **Chilukuri Ramasastry Memorial Prize**, IIT Madras, India, Highest CGPA in the first two semesters in M.Sc. Physics 2017-18.
- **Swati/Jayalakhmi Memorial Award**, IIT Madras, India, Best academic record (female) in M.Sc. Programme 2017-18.
- **Parpati Chandumal Shahani Memorial Gold Medal**, St. Xavier's College (Autonomous), Kolkata, India, Best Lady Physicist in B.Sc. Physics (Hons.) 2014-17.
- **INSPIRE Scholarship** (2014-2019), Dept. of Science and Technology, Govt. of India, Among top 1% scorers in Grade 12 at the National Board Examinations 2014 in India.