

Bedartha Goswami

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Google Scholar h-Index 17 • Web of Science h-Index 16



BASIC INFORMATION

Date Of Birth	26 August, 1986
Place Of Birth	Guwahati, India
Nationality	Indian

CURRENT EMPLOYMENT STATUS

Assistant Professor	Oct 2024–ongoing
Department of Data Science Indian Institute of Science Education and Research (IISER) Pune	

PAST EMPLOYMENT DETAILS

Research Group Leader	Jan 2020–Sep2024
Independent Research Group “Machine Learning in Climate Science” Cluster of Excellence “Machine Learning,” University of Tübingen	
Post-Doc	Sep 2017–May 2020
RD IV Complexity Science, Potsdam Institute for Climate Impact Research	
Post-Doc	March 2016–Aug 2017
Institute of Geosciences, University of Potsdam	
Post-Doc	Jan 2015–Dec 2015
RD IV Complexity Science, Potsdam Institute for Climate Impact Research	

EDUCATIONAL QUALIFICATIONS

PhD, Climate Physics	May 2015
Potsdam Institute for Climate Impact Research, & Institute of Physics and Astronomy, University of Potsdam	
Master Of Science	June 2011
Indian Institute of Science Education and Research, Pune	
Bachelor Of Science	June 2011
Indian Institute of Science Education and Research, Pune	

Senior School Certificate Examination (Class 12th) May 2005

Faculty Higher Secondary School, Guwahati

High School Leaving Certificate Exam (Class 10th) June 2003

Don Bosco High School Guwahati

**FUNDING
SECURED**

**PI, Deep learning weather models for South Asia, 2025–2028
47 lakhs**

Funding secured for a Senior Project Associate (along with international travel & consumables) to work with me on developing deep learning based weather models that are high performing for South Asia.

Type: Research project

Funded by: ARNF (PMECRG)

Co-Applicant, REACT-EU, 2 000 000 € 2021–2022

Funding to expand the existing high performance computing facility, the ML Cloud to lead to the “Tübingen Machine Learning Cloud 2.0”

Type: Funding for purchase of computing hardware

Funded by: REACT-EU (Recovery Assistance for Cohesion and the Territories of Europe) and “Europäischen Fonds für regional Entwicklung (EFRE)”

PI, MUSTEIN, 140 000 € 2021–2024

“Modeling and understanding spatiotemporal environmental interactions (MUSTEIN)”

Type: Mini-graduate school

Funded by: Innovation Fund of the Cluster of Excellence “Machine Learning”

Co-PI, IBLACS, 140 000 € 2021–2024

“Inductive bias Of Learning Algorithms In Climate Science”

Type: Individual PhD Project

Funded By: Innovation Fund Of The Cluster Of Excellence “Machine Learning”

PI, MLCS, 715 000 € 2020–2023 + 2023-2026

Type: Junior Research Group (4+3 years, 2 PhDs)

Funded By: Cluster Of Excellence “Machine Learning”

Co-Investigator, TiPES, No Funding 2019–2023

“Tipping Points in the Earth System (TiPES);”

Type: ERC Consortium project

Funded by: the EU Horizon 2020 program call H2020-LC-CLA-2018-2; Grant No 820970

Co-Investigator, IuCliD, 297 200 € 2017– 2021

“Impacts of uncertainties in climate data analyses (IuCliD);”

Type: Individual Postdoc project

Funded by: DFG, Project No. DFG MA4759/8

CURRENT TEACHING LOAD @ IISER-P	Deep Learning	Aug–Nov each year
	Introductory course on deep learning course for 4 credits (3 lecture hours per week) for 3rd and 4th year students of the 5-year BS-MS dual degree program	
	Data Science Practice	Jan–Apr each year
	Introductory course on data science related programming and project management (including linux working environment, versioning, debugging, testing, etc.) for 4 credits (3 lecture hours per week) for 3rd and 4th year students of the 5-year BS-MS dual degree program	
POSTDOCS CURRENTLY IN MY GROUP	Pinak Mandal	Jan 2026 – present
	Funded as a Senior Project Associate via the ANRF PM ECRG grant that was secured by me in 2025. His project is to develop a deep learning medium range weather forecasting model for South Asia	
PHD STUDENTS CURRENTLY IN MY GROUP	Dheeraj Kr Gehlot	Aug 2025 – present
	Dheeraj is on an institute funded PhD fellowship and is working on quantifying the uncertainty of deep learning weather models and on designing a recipe for ensuring calibration in these models	
	Ankit Tiwari	Jan 2026 – present
	Ankit is also on an institute funded fellowship and has just joined in January this year. His project is going to focus on using a stretched grid to provide high-resolution weather forecasts over the Indian subcontinent	
PHD STUDENTS I HAVE GRADUATED	Jakob Schlör	July 2025
	Jakob secured a job at the European Centre for Medium Range Weather Forecasting, one of the world's leading weather forecasting agencies, right after his PhD. He continues to work there in the data-driven sub-seasonal prediction team.	
	Felix Strnad	December 2025
	Felix did a postdoc at the University of Tübingen after his PhD, after which he got hired at the Deutsche Wetterdienst (German Weather Service) as an AI Researcher earlier this year in April.	
AWARDS	DAAD WISE Scholarship	May–Jul 2010
	Summer internship with Prof Jürgen Kurths at the Potsdam Institute for Climate Impact Research, Potsdam	
LANGUAGE SKILLS	Native	Assamese
	Fluent	English, Hindi
	Conversational	German
	Basic	Bengali

PUBLICATIONS

JOURNAL ARTICLES

- 2025** F. Strnad, K. Hunt, N. Boers, & B. Goswami, Intraseasonal synchronization of extreme rainfall between North India and the Sahel. *Quarterly Journal of the Royal Meteorological Society*, e4946.
- 2024** F. Zhao, S. Lange, B. Goswami, & K. Frieler, Frequency bias causes overestimation of climate change impacts on global flood occurrence. *Geophysical Research Letters*, **51(16)**, e2024GL108855.
- J. Schlör, F. Strnad, A. Capotondi, & **B. Goswami**, Contribution of El Niño Southern Oscillation (ENSO) diversity to low-frequency changes in ENSO variance. *Geophysical Research Letters*, **51(14)**, e2024GL109179.
- 2023** J. Thümmel, M. Karlbauer, Sebastian Otte, Christiane Zarfl, Georg Martius, Nicole Ludwig, Thomas Scholten, Ulrich Friedrich, Volker Wulfmeyer, **B. Goswami**, Martin Butz, Inductive bias in deep learning based weather prediction
<https://arxiv.org/abs/2304.04664>
- F. Strnad, J. Schlör, R. Geen, N. Boers, **B. Goswami**, Propagation pathways of Indo-Pacific rainfall extremes are modulated by Pacific sea surface temperatures, *Nature Communications.*, **14(1)**, 5708
- M. Haas, **B. Goswami**, U. Luxburg, Pitfalls of Climate Network Construction - A Statistical Perspective, *J. Clim.*, **36**, 3321–3342.
- A. Banerjee, M. Kemter, **B. Goswami**, B. Merz, J. Kurths, N. Marwan, Spatial coherence patterns of extreme winter precipitation in the United States, *Theoretical & Applied Climatology*, **152**, 385–395.
- 2022** F. M. Strnad, J. Schlör, C. Fröhlich, **B. Goswami**, Teleconnection patterns of different El Niño types revealed by climate network curvature, *Geophysical Research Letters*, **49**, e2022GL098571
- 2021** A. Banerjee, **B. Goswami**, Y. Hirata, D. Eroglu, B. Merz, J. Kurths, N. Marwan, Recurrence analysis of extreme event like data, *Nonlinear Processes Geophysics* **28**, 213–229
- 2020** M. Singh, R. Krishnan, **B. Goswami**, A. D. Choudhury, P. Swapna, R. Vellore, A. G. Prajeesh, N. Sandeep, C. Venkataraman, R. V. Donner, N. Marwan, J. Kurths, Fingerprint of volcanic forcing on the ENSO–Indian monsoon coupling, *Science Advances* **6**, eaba8164.
- S. Prasad, N. Marwan, D. Eroglu, **B. Goswami**, P. Mishra, B. Gaye, A. Anoop, N. Basavaiah, M. Stebich, A. Jehangir Holocene climate forcings and lacustrine regime shifts in the Indian Summer Monsoon realm, *Earth Surface Processes and Landforms* **45**, 3842–3853.
- 2019** **B. Goswami**, A Brief Introduction to Nonlinear Time Series Analysis and Recurrence Plots, *Vibration* **2**, 332–368
- A. Rheinwalt, **B. Goswami**, B. Bookhagen, A Network-Based Flow Accumulation Algorithm for Point Clouds: Facet-Flow Networks (FFNs), *JGR Earth Surface* **124**, 2013–2033
- S. Breitenbach, B. Plessen, S. Waltgenbach, R. Tjallingii, J. Leonhardt, K. P. Jochum, H. Meyer, **B. Goswami**, N. Marwan, D. Scholz, Holocene interaction of maritime and continental climate in Central Europe: new speleothem evidence from Central Germany, *Global and Planetary Change* **176**, 144–161

- N. Boers, **B. Goswami**, A. Rheinwalt, B. Bookend, B. Hoskins, J. Kurths, Complex networks reveal global pattern of extreme-rainfall teleconnections, *Nature* **566**, 373–377
- 2018** **B. Goswami**, N. Boers, A. Rheinwalt, N. Marwan, J. Heitzig, S. F. M. Breitenbach, J. Kurths, Abrupt transitions in time series with uncertainties, *Nature Communications* **9**, 48
- 2017** **B. Goswami**, P. Schultz, B. Heinze, N. Marwan, B. Bodirsky, H. Lotze-Campen, J. Kurths, Inferring interdependencies from short time series, *Proceedings of the Conference on Perspectives in Nonlinear Dynamics - 2016* **1**, 51–50
- F. A. Lechleitner, S. F. M. Breitenbach, H. Cheng, B. Plessen, K. Rehfeld, **B. Goswami**, N. Marwan, D. Eroglu, J. Adkins, G. Haug, Climatic and in-cave influences on $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ in a stalagmite from northeastern India through the last deglaciation, *Quaternary Research* **88**, 458–471
- N. Boers, **B. Goswami**, M. Ghil, A complete representation of uncertainties in layer-counted paleoclimatic archives, *Climate of the Past* **13**, 1169–1180
- A. M. T. Ramos, A. Builes-Jaramillo, G. Poveda, **B. Goswami**, E. E. N. Macau, J. Kurths, Recurrence measure of conditional dependence and applications, *Physical Review E* **95**, 052206
- F. A. Lechleitner, S. F. M. Breitenbach, K. Rehfeld, H. E. Ridley, Y. Asmerom, K. M. Prufer, N. Marwan, **B. Goswami**, D. J. Kennett, V. V. Aquino, V. Polyak, G. H. Haug, T. I. Eglinton, J. U. L. Baldini, Tropical rainfall over the last two millennia: evidence for a low-latitude hydrologic seesaw, *Scientific Reports* **7**, 45809
- 2016** F. A. Lechleitner, J. U. L. Baldini, S. F. M. Breitenbach, J. Fohlmeister, C. McIntyre, **B. Goswami**, R. A. Jamieson, T. S. van der Voort, K. Prufer, N. Marwan, B. J. Culleton, D. J. Kennett, Y. Asmerom, V. Polyak, T. I. Eglinton, Hydrological and climatological controls on radiocarbon concentrations in a tropical stalagmite, *Geochimica et Cosmochimica Acta* **194**, 233–252
- D. Traxl, N. Boers, A. Rheinwalt, **B. Goswami**, J. Kurths, The size distribution of spatiotemporal extreme rainfall clusters around the globe, *Geophysical Research Letters* **43**, 9939–9947
- 2015** **B. Goswami**, S. M. Shekatkar, A. Rheinwalt, G. Ambika, J. Kurths, A random interacting network model for complex networks, *Scientific Reports* **5**, 18183
- S. Dey, **B. Goswami**, A. Joshi, A possible mechanism for the attainment of out-of-phase periodic dynamics in two chaotic subpopulations coupled at low dispersal rate, *Journal of Theoretical Biology* **367**, 100–110
- 2014** **B. Goswami**, J. Heitzig, K. Rehfeld, N. Marwan, A. Ambili, S. Prasad, J. Kurths, Estimation of sedimentary proxy records together with associated uncertainty, *Nonlinear Processes in Geophysics* **21**, 1093–1111
- S. Dey, **B. Goswami**, A. Joshi, Effects of symmetric and asymmetric dispersal on the dynamics of heterogeneous metapopulations: Two-patch systems revisited, *Journal of Theoretical Biology* **345**, 52–60
- 2013** **B. Goswami**, N. Marwan, G. Feulner, J. Kurths, How do global temperature drivers influence each other? A network perspective using recurrences, *European Physical Journal Special Topics* **222**, 861–873
- 2012** S. F. M. Breitenbach, K. Rehfeld, **B. Goswami**, J. U. L. Baldini, H. E. Ridley, D. J. Kennett, K. M. Prufer, V. V. Aquino, Y. Asmerom, V. J. Polyak, H. Cheng, J. Kurths, N. Marwan, COConstructing Proxy Records from Age models (COPRA), *Climate of the Past* **8**, 1765–1779

B. Goswami, G. Ambika, N. Marwan, J. Kurths, On interrelations of recurrences and connectivity trends between stock indices, *Physica A* **391**, 4364–4376

arXiv PREPRINTS (which have not been published in journals)

- 2024** J. Schloer, M. Newman, J. Thuemmel, A. Capotondi, & **B. Goswami**, A Hybrid Deep-Learning Model for El Niño Southern Oscillation in the Low-Data Regime. *arXiv preprint arXiv:2412.03743*.
- 2023** J. Thuemmel, M. Karlbauer, S. Otte, C. Zarfl, G. Martius, N. Ludwig, T. Scholten, U. Friedrich, V. Wulfmeyer, **B. Goswami**, and M. Butz, Inductive biases in deep learning models for weather prediction. *arXiv preprint arXiv:2304.04664*.

REFEREED CONFERENCE PROCEEDINGS

- 2015** A. Rheinwalt, **B. Goswami**, N. Boers, J. Heitzig, N. Marwan, R. Krishnan and J. Kurths, Teleconnections in Climate Networks: A Network of Networks Approach to Investigate the Influence of Sea Surface Temperature Variability on Monsoon Systems, *Machine Learning and Data Mining Approaches to Climate Science*, 23–33