

Jyoti Prasad Deka

PhD in Optical Complex Systems

Curriculum Vitae



Contact Details

NAME Jyoti Prasad Deka
DESIGNATION Assistant Professor, Department of Physics, Girijananda Chowdhury University
Date of Birth 17th August, 1990
EMAIL jyotiprasad_physics@gcuniversity.ac.in, jyotiprdeka@gmail.com,
jyoti.deka@alumni.iitg.ac.in
MOBILE +91 73996 97829
WEBSITE https://www.researchgate.net/profile/Jyoti_Deka3
SCOPUS <https://www.scopus.com/authid/detail.uri?authorId=57057355200>

Education

- 2019 **PhD in Nonlinear Optics and Complex Systems**, *IIT Guwahati*, CGPA - 8.46, Supervisor – Prof. Amarendra Kumar Sarma
Thesis Title - Nonlinear Dynamics in \mathcal{PT} -Symmetric Optical Systems
- 2013 **MSc Physics**, *University of Delhi*, Percentage - 62.65
Special Papers - *Nonlinear Dynamics, Complex Systems and Networks, Advanced Numerical Techniques, General Theory of Relativity, Astronomy and Astrophysics.*
- 2011 **BSc (Hons.) in Physics**, *Hans Raj College, University of Delhi*, Percentage - 82.88
- 2008 **12th Standard**, *Cotton College, Assam Higher Secondary Educational Council*, Percentage - 85.4
- 2006 **10th Standard**, *Pragjyotish English Medium High School, Secondary Education Board of Assam*, Percentage - 88.5

Research Interests

- Continuous-variable Quantum Entanglement.
- Nonlinear Dynamics in Time-Delayed Optical Systems.
- Input-Correlations Only (ICO) Learning in Interdisciplinary Fields.
- Physics beyond Exceptional Point (\mathcal{EP}) in non-Hermitian photonic systems.

- Reservoir Computing in nonlinear systems with time-delayed feedback.
- Neural Networks assisted Predictive Analytics.

Programming Proficiency

Intermediate R, PYTHON, XPPAUT, SQL
 Advanced MATLAB, GCC

Course completed in Data Science and Machine Learning

Udemy *Machine Learning, Data Science and Deep Learning with Python*
 Udemy *The Complete SQL Bootcamp 2022: Go from Zero to Hero*

Peer-Reviewed Publications

1. '*ICO Learning as a measure of In-phase and Anti-phase Synchronization in Parity-Time Symmetric Master-Slave Nonlinear Oscillators*'.
2. '*Input-Correlations Only (ICO) Learning rule as a measure of deviations in time-series*'.
3. '*Implications of the Input-Correlations Only Learning rule in Biomedical Conditions: Atrial Fibrillation, Epileptic Seizure and Alzheimer's Disease*'.
4. **J. P. Deka**, A. K. Sarma, '*Temporal Dynamics beyond the Exceptional Point in the Ikeda Map with Balanced Gain and Loss*'.
5. **J. P. Deka**, '*Noise-Assisted Control of Chaotic Dynamics in the Ikeda Map with Balanced Gain and Loss*' (under review in the Journal of Physics Conference Series).
6. **J. P. Deka**, A. Govindarajan and A. K. Sarma, '*Transient Chaos and Predictive Analytics in \mathcal{PT} -symmetric Liénard systems*' (under review in *Nonlinear Dynamics*).
7. **J. P. Deka**, '*Anti-Phase Synchronization of Chaos in \mathcal{PT} -Symmetric Nonlinear Oscillators*', arXiv:2310.12154v1 (under review in *Physica D: Nonlinear Phenomena*).
8. **J. P. Deka**, '*Onset of Identical Synchronization in the Spatial Evolution of Optical Power in Waveguide Coupler*' (under review in the *Indian Journal of Physics*).
9. **J. P. Deka**, A. K. Sarma, A. Govindarajan, and M. Kulkarni, '*Multifaceted nonlinear dynamics in \mathcal{PT} -symmetric coupled Liénard oscillators*', *Nonlin. Dyn.* 100, 1629 (2020).
10. **J. P. Deka** and A. K. Sarma, '*Chaotic Dynamics and Optical Power Saturation in Parity-Time (\mathcal{PT}) Symmetric Double Ring Resonator*', *Nonlin. Dyn.* 96, 565 (2019).
11. **J. P. Deka** and A. K. Sarma, '*Perturbative dynamics of stationary states in nonlinear parity-time symmetric coupler*', *Communications in Nonlinear Science and Numerical Simulation* 57, 26 (2018).
12. **J. P. Deka** and A. K. Sarma, '*Highly Amplified Light Transmission in Parity-Time Symmetric Multilayered Structure*', *Applied Optics* 57, 1119 (2018).
13. **J. P. Deka**, S. K. Gupta and A. K. Sarma, '*Controllable chaotic dynamics in a nonlinear fiber ring resonator with balanced gain and loss*', *Nonlin. Dyn.* 87, 1121, (2017).
14. S. K. Gupta, **J. P. Deka** and A. K. Sarma, '*Nonlinear Parity-Time (\mathcal{PT}) symmetric closed-form optical quadrimer waveguides: Attractor perspective*', *European Physical Journal D* 69, 199 (2015).

Research Experience

- 2022: I worked as a postdoctoral research scholar under the supervision of Prof. Claudio Mirasso and Dr. Miguel C. Soriano at the Institute for Cross-Disciplinary Physics and Complex Systems (*IFISC*), Universitat de les Illes Balears, Spain from April, 2022 to December, 2022 in the EU-funded project titled '*Adaptive Optical Dendrites*'.
- 2015 - 2019: I worked for my doctorate under the supervision of Prof. Amarendra Kumar Sarma at the Indian Institute of Technology, Guwahati. My PhD thesis had been submitted on 27th March, 2019 and I successfully defended my thesis on 2nd July, 2019.
- 2014 - 2015: I worked as a Junior Research Fellow in the project entitled 'Parity-time Symmetry in Nonlinear Optics' funded by the Department of Science and Technology - Science and Engineering Research Board, Government of India (DST-SERB).

Teaching Experience

- August 2023 onwards: Assistant Professor, Department of Physics, Girijananda Chowdhury University, Guwahati, Assam.
- 2020-2021: Assistant Professor (Temporary) in the Department of Physics, Pub Kamrup College, Baihata Chariali, Assam.
- 2018: Teaching Assistant for Undergrad Physics Lecture, IIT Guwahati.
- 2017: Teaching Assistant for Masters Advanced Physics Lab, IIT Guwahati.
- 2016: Teaching Assistant for Undergrad Physics Lab, IIT Guwahati.

Participation in Workshops and Conferences

- 2023 Oral presentation of the research titled '**Noise Assisted Control of Chaotic Dynamics in the Ikeda Map with Balanced Gain and Loss**' in the Symposium on Physics: Advances in Research and Knowledge, North Lakhimpur University.
- 2018 Poster titled '**Collective Behavior in the Spatial Evolution of Optical Power in Waveguide Coupler**' in the Conference on Nonlinear Systems and Dynamics 2018, Jawaharlal Nehru University.
- 2017 Poster titled '**Chaotic Spiking of Optical Power in a Double Ring Resonator with Balanced Loss and Gain**' in the International Conference on Complex Dynamical Systems and Applications 2017, IIT Guwahati.
- 2017 Poster titled '**Optical Power Saturation in Parity-Time (PT) Symmetric Double Ring Resonator**' in the Research Conclave 2017, IIT Guwahati.
- 2017 Presented a talk titled '**Butterfly Effect**' in the Annual Physics Meet 2017, Dept. of Physics, IIT Guwahati.

Referees

- Prof. Amarendra Kumar Sarma,
Department of Physics, IIT Guwahati
Email ID - aksarma@iitg.ac.in
- Prof. Girish Sampath Setlur,
Department of Physics, IIT Guwahati
Email ID - gsetlur@iitg.ac.in

National Exams Qualified

2014 GATE (Graduate Aptitude Test in Engineering) PHYSICS – AIR 226

Academic Achievements

- 2017-2019 Senior Research Fellowship, Indian Institute of Technology Guwahati.
- 2015-2017 Junior Research Fellowship, Indian Institute of Technology Guwahati.
- 2011 Recipient of the '**Science Academies' (IAS, NASI and INSA) Summer Research Fellowship 2011'**.
- 2008 - 2013 Recipient of the '**DST-INSPIRE SHE Scholarship'**.
- 2006 19th rank in 10th Standard State Board Exams.

Positions Held

- 2015 - 2019 Member of the SPIE IIT Guwahati Student Chapter
- 2014 - 2015 DST Junior Research Fellow (JRF) in the project titled '**Parity-time symmetry in Nonlinear Optics'** sponsored by the DST-SERB (Fast-track), Govt. of India.
- 2009 - 2010 Active Organizing Member of the Hans Raj College NSS (National Service Scheme) Team

Extra-Curricular Activities

- 2009 Volunteered for the 'Global Day of Climate Action' organized by the Green Peace International.
- 2006 Article published in 'SCIENCE REPORTER (Junior Scientist Section)', vol. 43, no. 11, pp. 50-51 (2006)', NISCAIR, CSIR, New Delhi.

Declaration

I hereby declare that the above mentioned information is true to the best of my knowledge and belief.

Dr. Jyoti Prasad Deka
Date: 23-02-2024