

Ambaresh Sahoo

Curriculum Vitae



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PERSONAL INFORMATION

Name	Sahoo, Ambaresh
Date of Birth	February 24, 1992
Nationality	Indian
Language Known	Bengali, English, Hindi
Present Address	Department of Physics, Harimohan Ghose College, J-206 & 208A, Paharpur Road, Garden Reach, Kolkata - 700024, West Bengal, India
Email	sahoo.ambaresh@gmail.com

EMPLOYMENT

December 2023 – Present	Assistant Professor at the Department of Physics, Harimohan Ghose College (Affiliated to the University of Calcutta), Kolkata, India
August 2022 – December 2023	Postdoctoral researcher at the Department of Physical and Chemical Sciences, University of L'Aquila, Italy
October 2020 – June 2022	Postdoctoral researcher at the Indian Institute of Technology Guwahati, India

RESEARCH INTERESTS

- Nonlinear and Ultrafast Optics, Silicon Photonics.
- Optical Dissipative Solitons and Cavity Solitons.
- Non-Hermitian (\mathcal{PT}) optics, Cavity Optomechanics.
- Plasmonics, Graphene Optoelectronics.
- Quantum Optics.

PHD THESIS

Thesis title	Temporal dissipative solitons in active and passive waveguides: Model, Dynamics and Perturbative analysis (Thesis supervisor: Dr. Samudra Roy) <i>Date of Thesis Submission: October 03, 2019</i> <i>Date of Thesis Defense/Award of PhD degree: January 28, 2020</i>
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COMPUTATIONAL SKILLS

Languages	C, Python
Softwares	MATLAB, MATHEMATICA, COMSOL, Origin
Typesetting and graphics	LaTeX (MiKTeX, TexMaker), MS-Office, Gnuplot

EDUCATION

June 2014 – January 2020	Ph.D in Physics Indian Institute of Technology Kharagpur Advisor: Dr. Samudra Roy
2012 – 2014	M.Sc. in Physics Completed M.Sc. with first class, Indian Institute of Technology Kharagpur

- 2009 – 2012 **B.Sc. in Physics(Hons)**
Completed with first class,
Maulana Azad College, affiliated to The University of Calcutta
Kolkata, West Bengal
- 2007 – 2009 **Higher Secondary in Pure science**
Bakhrabad Bharati Bidyapith, affiliated to West Bengal Council of Higher Secondary Education (WBSCHE)
Paschim Medinipur, West Bengal
- 2001 – 2007 **Secondary**
Kushbasan High School, affiliated to West Bengal Board of Secondary Education (WBBSE)
Paschim Medinipur, West Bengal

EDUCATIONAL ACHIEVEMENTS

- 2015 Qualified in CSIR-NET (National Eligibility Test, an all-India based examination for Junior Research Fellowship for Ph.D.)
All India Rank 77 (CSIR-JRF) December 2015.
- 2015 Qualified in GATE (Graduate Aptitude Test in Engineering, an all-India based examination for admission to M.Tech and PhD program at Indian research institutes)
All India Rank 148.
- 2012 Qualified in JAM (Joint Admission test for M. Sc., an all-India based examination for admission to MSc and Integrated PhD program at Indian Institutes of Technology)
All India Rank 76.

AWARDS AND SCHOLARSHIP

- 2022 – 2023 EIC Pathfinder Open Postdoctoral Fellowship, European Union
PRIN-2020 Project Fellowship, Italian Government
- 2020 – 2022 Postdoctoral Fellowship, Ministry of Human Resource Development, Govt. of India
- 2014 – 2019 Institute Research Fellowship, Ministry of Human Resource Development, Govt. of India
- 2009 – 2014 Merit-cum-Means Scholarship, Govt. of West Bengal, India

SCHOOLS AND CONFERENCES

- September 2021 **XLIV OSI Symposium on Frontiers in Optics and Photonics**
Indian Institute of Technology, Delhi, India
- July 2018 **Advanced Photonics Congress 2018**
ETH Zurich, Switzerland
- April 2018 **SPIE Photonics Europe 2018**
Strasbourg, France
- September 2017 **Frontiers in Optics and Laser Science 2017**
Washington, USA
- December 2016 **The International Conference on Fiber Optics and Photonics**
Indian Institute of Technology, Kanpur, India
- December 2015 **IEEE - 2015 Workshop on Recent Advances in Photonics (WRAP)**
Indian Institute of Science, Bangalore, India
- December 2015 **International Workshop on Emerging Areas in Photonics and Future Applications (IWPFA-2015)**
CSIR-Central Glass and Ceramic Research Institute (CGCRI) Kolkata - 700 032, India
- November 2015 **National Workshop on Advances in Photonics**
Dept. of Physics, Indian Institute of Technology Kharagpur, India
- December 2014 **The International Conference on Fiber Optics and Photonics**
Indian Institute of Technology, Kharagpur, India
- December 2014 **OSA IONS-Asia 6 Conference on Optics**
Indian Institute of Technology, Kharagpur, India

TALKS

- September 2021 Title: **Stability of cavity solitons in a resonator with frequency-dependent Kerr nonlinearity**
XLIV OSI Symposium on Frontiers in Optics and Photonics 2021, IIT Delhi, India
- December 2016 Title: **Formation of Cascaded Dispersive Wave in Active Silicon-Based Waveguides**
International Conference on Fiber Optics and Photonics 2016, IIT Kanpur, India
- November 2016 Title: **Optical solitons from conservative to dissipative systems**
One-day Seminars on Light-matter interaction, IIT Kharagpur, India

POSTERS PRESENTED

- April 2018 Title: **Dissipative soliton dynamics in non-Kerr and Kerr type nonlinear media**
SPIE Photonics Europe 2018, Strasbourg, France
- December 2015 Title: **Dissipative soliton mediated dispersive wave in silicon-based waveguides**
IEEE WRAP 2015, IISc Bangalore, India
- November 2015 Title: **Generation of dispersive waves in a perturbed saturable nonlinear medium**
Dept. of Physics, IIT Kharagpur, India
- November 2016 Title: **Optical solitons from conservative to dissipative systems**
One-day Seminars on Light-matter interaction, IIT Kharagpur, India

TEACHING EXPERIENCE

- Jul – Nov 2021 Teaching Assistant, Computational Physics for PhD students
- Mar – Jun 2021 Teaching Assistant, Physics-II for second year undergraduate students
- Nov 2020 – Feb 2021 Teaching Assistant, Physics-I for first year undergraduate students
- Jul – Oct 2018 Teaching Assistance for the NPTEL online certificate course
Introduction to Non-linear Optics And Its Applications
- Jul – Oct 2017 Teaching Assistance for the NPTEL online certificate course
Mathematical Methods in Physics-I
- Jul – Nov 2018 Teaching Assistant, Electronics Lab for first year MSc. students
- Jan – Apr 2018 Teaching Assistant, Nuclear and Particle Physics Lab I for first year MSc students,
Physics Lab for first year undergraduate students
- Jul – Nov 2017 Teaching Assistant, Physics-II for second year undergraduate students
- Jan – Apr 2017 Teaching Assistant, Nuclear and Particle Physics Lab I for first year MSc students,
Electromagnetism and Optics Lab I for second year undergraduate students
- Jul – Nov 2016 Teaching Assistant, Mathematical Methods I, Electronics Lab
for first year MSc. students
- Jan – Apr 2016 Teaching Assistant, Nonlinear Optics for second year MSc students,
Electromagnetism and Optics Lab III/B for first year MSc students
- Jul – Nov 2015 Teaching Assistant, Mathematical Methods I, Electromagnetism and Optics Lab II/A
for first year MSc. students
- Jan – Apr 2015 Teaching Assistant, Modern Physics Lab for second year MSc. students

PEER REVIEW ACTIVITIES

Referee for: Science Advances, Phys. Rev. A, Optics Express, Results in Physics.

PUBLICATION

Journal Publications

— Communicated —

19. Doubly-resonant third-harmonic generation in near-zero index heterogeneous nanostructures
Matteo Silvestri, **Ambaresh Sahoo**, Paola Benassi, Carino Ferrante, Alessandro Ciattoni, and Andrea Marini
Communicated.
18. Radiation families emitted by a discrete soliton in parity-time-symmetric waveguide arrays
Anuj P. Lara, **Ambaresh Sahoo**, and Samudra Roy
Communicated.
arXiv:2310.19434 [physics.optics]
17. Variational approach to study solitary waves in PT -symmetric nonlinear couplers
Ambaresh Sahoo and Amarendra K. Sarma
Communicated.
arXiv:2206.09468 [physics.optics]
16. Effects of ultrafast free-carrier dynamics on frequency comb generation in graphene-based microresonators
Ambaresh Sahoo
Communicated.
arXiv:2201.01223 [physics.optics]

— Published —

15. Resonant third-harmonic generation driven by out-of-equilibrium electron dynamics in sodium-based near-zero index thin films
Matteo Silvestri, **Ambaresh Sahoo**, Luca Assogna, Paola Benassi, Carino Ferrante, Alessandro Ciattoni, and Andrea Marini
Nanophotonics (2024).
DOI:10.1515/nanoph-2023-0743
14. Plasmon-enhanced circular dichroism spectroscopy of chiral drug solutions
Matteo Venturi, Raju Adhikary, **Ambaresh Sahoo**, Carino Ferrante, Isabella Daidone, Francesco Di Stasio, Andrea Toma, Francesco Tani, Hatice Altug, Antonio Mecozzi, Massimiliano Aschi, and Andrea Marini
J. Chem. Phys. **159**, 154703 (2023).
DOI:10.1063/5.0169826
13. Theoretical investigations on Kerr and Faraday rotations in topological multi-Weyl Semimetals
Supriyo Ghosh, **Ambaresh Sahoo**, and Snehasish Nandy
SciPost Phys. **15**, 133 (2023).
DOI:10.21468/SciPostPhys.15.4.133
(Equally contributed first author)
12. Switching dynamics of femtosecond solitons in parity-time-symmetric coupled optical waveguides
Ambaresh Sahoo Dipti Kanika Mahato, A. Govindarajan, and Amarendra K. Sarma
Phys. Rev. A **106**, 043502 (2022).
DOI:10.1103/PhysRevA.106.043502

11. Two-way enhancement of sensitivity by tailoring higher-order exceptional points
Ambaresh Sahoo and Amarendra K. Sarma
Phys. Rev. A **106**, 023508 (2022).
DOI:10.1103/PhysRevA.106.023508
10. Bistable soliton switching dynamics in a \mathcal{PT} -symmetric coupler with saturable nonlinearity
Ambaresh Sahoo, Dipti Kanika Mahato, A. Govindarajan, and Amarendra K. Sarma
Phys. Rev. A **105**, 063503 (2022).
DOI:10.1103/PhysRevA.105.063503
9. Free-carrier-induced nonlinear dynamics in hybrid graphene-based photonic waveguides
Ambaresh Sahoo, Andrea Marini, and Samudra Roy
Phys. Rev. A **104**, 063501 (2021).
DOI:10.1103/PhysRevA.104.063501
8. Microresonator dynamics with frequency-dependent Kerr nonlinearity
Ambaresh Sahoo and Amarendra K Sarma
Phys. Rev. A **104**, 023513 (2021).
DOI:10.1103/PhysRevA.104.023513
7. Ground-state cooling of a mechanical oscillator via a hybrid electro-optomechanical system
Roson Nongthombam, **Ambaresh Sahoo**, and Amarendra K Sarma
Phys. Rev. A **104**, 023509 (2021).
DOI:10.1103/PhysRevA.104.023509
6. Stability and variational analysis of cavity solitons under various perturbations
Ambaresh Sahoo and Samudra Roy
Phys. Rev. A **100**, 053814 (2019).
DOI:10.1103/PhysRevA.100.053814
5. Heat-induced soliton self-frequency redshift in the ultrafast nonlinear dynamics of active plasmonic waveguides
Ambaresh Sahoo, Andrea Marini, and Samudra Roy
Phys. Rev. A **100**, 013848 (2019).
DOI:10.1103/PhysRevA.100.013848
4. Dynamics of dissipative solitons near zero-nonlinearity frequency under higher order perturbations
Ambaresh Sahoo and Samudra Roy
J. Opt. Soc. Am. B **36**, 2352-2359 (2019).
DOI:10.1364/JOSAB.36.002352
3. Dissipative soliton mediated radiations in active silicon-based waveguides
Ambaresh Sahoo and Samudra Roy
J. Opt. Soc. Am. B **35**, 257-265 (2018).
DOI:10.1364/JOSAB.35.000257
2. Perturbed dissipative solitons: A variational approach
Ambaresh Sahoo, Samudra Roy, and Govind P. Agrawal
Phys. Rev. A **96**, 013838 (2017).
DOI:10.1103/PhysRevA.96.013838

1. Implications of a zero-nonlinearity wavelength in photonic crystal fibers doped with silver nanoparticles
Surajit Bose, **Ambaresh Sahoo**, Rik Chattopadhyay, Samudra Roy, Shyamal K. Bhadra, and Govind P. Agrawal
Phys. Rev. A **94**, 043835 (2016).
DOI:10.1103/PhysRevA.94.043835

Conference Proceedings

8. Nanophotonics-based chiroptical sensing of drug solutions;
R. Adhikary, **Ambaresh Sahoo**, M. Aschi, I. Daidone, M. Silvestri, M. Venturi, C. Ferrante, A. Mecozzi, and A. Marini
Invited talk and Abstract
The 13th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 2023), Paris, France (2023).
7. Cavity soliton dynamics under lossy phase modulated driving field: A variational approach;
Ambaresh Sahoo and Samudra Roy
Advanced Photonics (OSA), **JTu5A.54**, Zurich, Switzerland (2018).
6. Dissipative soliton dynamics in non-Kerr and Kerr type nonlinear media;
Ambaresh Sahoo and Samudra Roy
Nonlinear Optics and its Applications **10684**, 106841L, (SPIE Photonics Europe) Strasbourg, France (2018).
5. Effect of two-photon absorption on cavity soliton: Stability and perturbation analysis;
Ambaresh Sahoo and Samudra Roy
Frontiers in Optics (OSA), **JW4A.118**, USA (2017).
4. Frequency downshifting of perturbed dissipative solitons: A variational approach;
Ambaresh Sahoo, Samudra Roy, and Govind P. Agrawal
Frontiers in Optics (OSA), **JTu3A.66**, USA (2017).
3. Controlling Dispersive Waves through Zero-Nonlinearity Wavelength in Silver Doped Photonic Crystal Fiber;
Surajit Bose, **Ambaresh Sahoo**, Rik Chattopadhyay, Samudra Roy, Shyamal K. Bhadra, and Govind P. Agrawal
Photonics (OSA), **Th3A.35**, IIT Kanpur, India (2016).
2. Formation of Cascaded Dispersive Wave in Active Silicon-Based Waveguides;
Ambaresh Sahoo and Samudra Roy
Photonics (OSA), **Tu5D.3**, IIT Kanpur, India (2016).
1. Dissipative soliton mediated dispersive wave in silicon-based waveguides;
Ambaresh Sahoo and Samudra Roy
IEEE WRAP, **7805996**, pp. 1-3, IISc Bangalore, India (2015).