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ACADEMIC QUALIFICATION

- **Ph.D.** (Physics) in Optoelectronics and Photonics from Tezpur University (a Central University), Assam, India.
- **M. Sc.** in Physics from Dibrugarh University, Assam, India.
- **B. Sc.** Physics Honors from Cotton College, Guwahati, Assam, India.

AREAS OF INTEREST

- Light scattering studies, experimentation and simulation
- Nano photonics
- Bio-photonics
- Quantum Photonics

ACHIEVEMENTS

- **Mentor** of the project titled “*Innovative solar lighting system for sunlight deprived buildings*”, NSTEDB- DST project sanctioned by **DST, Government of India**, March 2021- 2022.
- **Principal Investigator** of **Women Scientist-A** project titled “*Laser-based characterizations of small particles using computational techniques*” sponsored by Department of Science and Technology (DST) , **Ministry of Science and Technology, Government of India**, 2008-2012.
- **CSIR Foreign travel grant**, 2010 from **CSIR, Government of India**.
- **Supervisor** of **03** Ph.D. research scholars.
- Supervised **49** M. Sc. students during **M. Sc. project** since 2017 till date and **01** project Students of B.Sc.
- “**Dayawati Rastogi National Award**” for Best Research paper in the “**National Conference on Laser and Optical Sciences**” at DHSK College, Dibrugarh, Assam, India in 2010.
- “**TATA Excellence Award**” from TATA group for Socio-welfare activities in teaching

students in Nonoi T.E., Tata Tea, Nagaon, Assam, India in the year 2004.

PATENTS:

1. Patent Grant: “IOT AND SOLAR BASED REAL TIME SMART TRAFFIC CONTROL MANAGEMENT”, application no. 42223600, **Indian patent grant** on 04/07/2024.

2. Patent published: “POLAR- AZIMUTHAL TEMPERATURE DEPENDENT LIGHT SCATTERING DEVICE (PATLS)”, application no. 202331056367, **published** on 01/03/2024.

3. Patent published: “A PORTABLE SYSTEM INVOLVING METHOD AIDED WITH TUNABLE LASER-BASED LIGHT SCATTERING DEVICE (TLLS)”, application no. 202531008522, **published** on 27/06/2025.

4. Patent filed: “A METHOD TO FABRICATE BLACK TURMERIC STARCH- BASED BIOPLASTIC REINFORCED WITH ZnO AND GRAPHENE NANOPARTICLES”, application no. 202531044857, **filed** on 09/05/2025.

5. Patent filed: “ A SYSTEM AND METHOD FOR IDENTIFYING MICROPLASTICS AMONG ORGANICS PARTICLES USING STATIC LASER SCTTERING”, application no.: 202531079328, **filed** on 21/08/2025.

MEMBERSHIPS

- Life member of **Optica** (formerly **OSA** (Optical Society of America))
- Life member of **OSI** (Optical Society of India)
- Life member of the **American Physical Society**.
- Life member of **PANE** (Physics Academy of North-East)

PUBLICATIONS

<i>Citation score: 72</i>	<i>h-index: 8</i>	<i>i10- index: 7</i>
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1. **Roy, Sanchita** et al., “Understanding the potential of Black Garlic as an antibacterial agent by quantifying volume scattering function”, Discover Applied Sciences, 2025.
2. Sarkar Rashel , Raibag Mohammad Asif, **Roy Sanchita** and Gorikhan Irshad Ahmed, “Machine learning for the analysis and prediction of COVID-19”, 119-128, RGU Journal of Social Science and Research, 2025.
3. Hussain F. and **Roy, Sanchita**, “Radiative transfer of *Black turmeric* and its interpretation of antibacterial property by light scattering”, European Physical Journal Plus, **139**,687, 2024.
4. Hussain, F., Jaishi, H. P. and **Roy, Sanchita**, “Attribute of antibacterial response of Black turmeric at different temperatures supported by light scattering signature”, Journal of Physics: conference series, 2919, 012046, 2024.
5. **Roy, Sanchita** et al., “Possibilities of simulation of coronavirus SARS-CoV-2 by using light scattering approach”, Lasers in Medical Sciences, **38**, 107, 2023.

6. S. Yadav, V. Bhatt, A. B. Bhattacharjee, P. K. Jha and **Roy, Sanchita**, “Optical bistability and absorption characteristic of an optomechanical system embedded with double quantum dot and nonlinear medium”, *Optical and Quantum Electronics*, **54**,781, 2022.
7. **Roy, Sanchita** et al., “Influence of refractive index in light scattering measurements of biological particles” arXiv:2204.04038 (physics), <https://doi.org/10.48550/arXiv.2204.04038>, 2022.
8. **Roy, Sanchita** et al., “Measurement of static light scattering of bioparticles”, arXiv:2204.04037 (physics), <https://doi.org/10.48550/arXiv.2204.04037>, 2022.
9. **Roy, Sanchita**, Barua, N., Buragohain, A. K. and Ahmed, G. A., Study of ZnO nanoparticles: Antibacterial property and light depolarization property using light scattering tool, *J. Quant. Spectrosc. Radiat. Transfer*, **118**, 8- 13, 2013.
10. **Roy, Sanchita** and Ahmed, G. A., Design considerations of a θ , ϕ - dependent laser-based light scattering set up for monitoring small particles, *International Journal of laser and optical sciences*, **2**(1), 35- 40, 2012.
11. **Roy, Sanchita**, Mohanta, D. and Ahmed, G. A. Modeling of Light Scattering from Size distributed ZnSe Nanoparticles, *International Journal of Nanotechnology and Applications*, **5** (4), 471 - 476, 2011.
12. **Roy, Sanchita**, Barua, N., Buragohain, A. K. and Ahmed, G. A. Light scattering study of ZnO nanoparticles for the application of its anti-bacterial property, *AAPP| Journal of Mathematical, Physical and Natural Sciences*, DOI: 10.1478/C1V89S1P001, 2011.
13. **Roy, Sanchita**, Mahatta, R., Barua, N., Buragohain, A. K. and Ahmed, G. A. Monitoring of pathogen carrying air-borne tea dust particles by light scattering, *J. Quant. Spectrosc. Radiat. Transfer*, **112** 1784 - 1791, 2011.
14. **Roy, Sanchita**, and Ahmed, G. A. Monte Carlo simulation of light scattering from size distributed sub-micron spherical CdS particles in a volume element, *Optik-Int. J. Light Electron Opt.* , **122**, 1000 - 1004, 2011.
15. **Roy, Sanchita**, Gogoi, A. and Ahmed, G. A. Size Dependent Optical Characterization of CdS semiconductor particles embedded in dielectric polymer matrix, *Indian J. Phys.*, **84** (10), 1405 – 1411, 2010.
16. **Roy, Sanchita**, and Ahmed, G.A. Investigation of light scattering properties of laboratory synthesized sub-micron CdS semiconductor particles, *J. Opt.*, **39**(4), 181-184, 2010.
17. **Roy, Sanchita**, Boro, M., Mohanta, D., Choudhury, A. and Ahmed, G. A. Size quantification of sub-micron ZnSe semiconductor particles by laboratory scattering methods, *Indian J. Phys.*, **84** (6), 705 - 709, 2010.
18. **Roy, Sanchita**, and Ahmed, G. A. Computation of Mueller scattering matrices of spherical particles with a Gamma size distribution, *J. Opt.*, **39** (2), 76 – 81, 2010.

CONFERENCE PROCEEDINGS

1. **Roy, Sanchita** Ahmed, G. A. Clues and findings of morphology of *Staphylococcus*

aureus by light scattering and Monte Carlo technique, International Conference on Interstellar Dust, Molecules and Chemistry, Tezpur University and co- organized by IUCAA, Pune, India, 2014.

2. **Roy, Sanchita**, Boruah, M., Barua, N., Buragohain, A. K., and Ahmed, G. A. Investigations on antibacterial property of ZnO nanoparticles applying optical techniques, AIP Conf. Proc. 1391, 721, 2011; doi: 10.1063/1.3643660.
3. **Roy, Sanchita**, Mahatta, R., Barua, N., Buragohain, A. K. and Ahmed, G. A. Monitoring of pathogen carrying air-borne *Camellia Sinensis* dust particles by light scattering, 250-253; Editors: Muinonen, K., Penttila, A., Lindqvist, H., Nousiainen, T. and Videen, G. Proc. Of 12th Electromagnetic and Light Scattering Conference, June 28-July 2, 2010, University of Helsinki, Finland.
4. **Roy, Sanchita**, Simulation of Light Scattering from Spherical Particles in a Volume Element, ICOP 2009-in Proc. of International Conference on Optics and Photonics, CSIO, Chandigarh, India, 30 Oct.-1 Nov., 2009.

BOOK CHAPTERS

1. Hussain F., Jaishi H. P. and **Roy, Sanchita**, Polystyrene microsphere exploration using light scattering tool at different temperatures, ISBN: 978-93-90706-80-8, 2024.
2. Hussain F. and **Roy, Sanchita**, Scattering Phase Functions and Polarimetric Responses of Selected bioparticles, Optical Polarimetric Modalities for Biomedical Research, Springer Nature, https://doi.org/10.1007/978-3-031-31852-8_7, 2023.
3. **Roy, Sanchita**, Biswas, L., Chettri, S. Novelty of Light Scattering Technique over Other Conventional Techniques for Characterization of Bio-Particles. In: Singh, V., Sharma, R., Mohan, M., Mehata, M.S., Razdan, A.K. (eds) Proceedings of the International Conference on Atomic, Molecular, Optical & Nano Physics with Applications. Springer Proceedings in Physics, vol 271. Springer, Singapore. https://doi.org/10.1007/978-981-16-7691-8_30, 2022.
4. **Roy, Sanchita**, Ahmed, G. A., Computation of Mueller Scattering Matrices of Spherical Particles with size distribution, in Contemporary Optics and Optoelectronics, 98-100, ISBN 9780070248885, Authors: Sahu P P. Publisher, Tata McGraw Hill Publishing Company Limited, 2008.
5. **Roy, Sanchita**, Ikbali Farid Ali and Rakesh Ghimire Chetry, Light scattering: a potent tool for quantification of morphological properties of small particles, in 'Recent Trends in Basic Science and Research' ISBN 978-81-933-69005, 2017.

PRESENTATION/ PARTICIPATIONS IN INTERNATIONAL AND NATIONAL CONFERENCES

1. Presented **02 Oral talks** in the XXIst Electromagnetic and Light scattering conference organized by **University of Messina, Milazzo, Italy**, 23- 27th June 2025.
2. Presented Oral talk at the International Conference on Advances in Optics and Photonics, jointly organized by CSIR, OSI and CSIO Chandigarh, 23-25th October at TAJ Chandigarh, 2024.
3. Presented **Invited talk** in the event of "International Day of Light", organized by **PDDUAM Eraligool Govt. College in association with UNESCO**, on 16th May, 2024, Eraligool, Karimganj District, India.
4. Presented **Invited talk** in the event of "International Day of Light", organized by **Patharkandi Govt. College in association with UNESCO**, on 13th May, 2024, Patharkandi, India.
5. Presented **INVITED TALK** at the 8th International Conference on Nanotechnology for Better Living held at NIT Srinagar, jointly organized by **NIT Srinagar & IIT (BHU)**, 25th – 29th May, 2023, Srinagar, Kashmir, India.
6. Presented **INVITED TALK** in the 1st International Conference on Convergence in Interdisciplinary Science, organized by Science Dialectica, 19 to 20 February, 2022.
7. Presented **POPULAR INVITED TALK** at the Department of Physics, Pandit

Deendayal Upadhyay Adarsha Mahavidyalaya Amjonga, Goalpara, Govt. of Assam, 4th February, 2022.

8. Contributed Oral presentation (virtual mode) in the XIXth Electromagnetic and Light scattering conference organized by Department of Physics and Engineering, **ITMO University, St. Petersburg, Russia**, 13- 15 July, 2021.
9. Participated in the 2020 **International Conference in Signal Processing and Communications** (SPCOM 2020), organized by **Indian Institute of Science, Bangalore** from 19th July to 24th July, 2020.
10. Participated in the **International Conference on Dust in Astrophysics** (ICDA 2020), organized by **Assam University Silchar** from 1st August to 1st September, 2020.
11. Presented poster at the International Conference on ‘Conference on Atomic, Molecular, Optical and Nano Physics with Applications’, organized by **Delhi Technological University**, 18- 20 December 2019, New Delhi, India.
12. Presented **INVITED TALK** at the 5th International Conference on Nanotechnology for Better Living held at NIT Srinagar, jointly organized by **NIT Srinagar & IIT Kharagpur**, 7- 11 March, 2019, Srinagar, Kashmir, India.
13. Contributed Oral presentation in the XVIIth Electromagnetic and Light scattering conference organized by **NASA, USA** and **Texas A & M University**, at Texas A & M University, College Station, U.S.A, 04- 09 March 2018.
14. Contributed Oral presentation in the National conference on Nanomaterials and Applications sponsored by DST, Govt. of India, Golaghat, Assam, India, 22- 23rd September, India, 2017.
15. Contributed Oral presentation in the Xth Biennial National conference of Physics Academy of North- East, St. Anthony’s College, Shillong, Meghalaya, India, 2016.
16. Contributed Oral presentation in the **LAMP talks** (Laser, Atomic and Molecular Physics talks) at **The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy**, 09- 20 February, 2015.
17. Contributed Poster presentation in the international conference on “Interstellar Dust Molecules and Chemistry (IDMC)”, at Tezpur University, India 15- 17th December, 2014.
18. Contributed Oral presentation in the 13th Electromagnetic and Light Scattering Conference, **University of Messina**, held at **Taormina, Italy**, 26-30th September, 2011.
19. Contributed Oral presentation in the National conference on “Nuclear and Atomic Techniques based Pure and Applied Physics”, at Tezpur University, India, 1-3rd February, 2011.
20. Contributed Poster presentation in the National conference on Smart Nanomaterials, at Tezpur University, India, 18th-20th January, 2011.
21. Contributed Oral presentation in the National Conference on Laser and Optical Sciences, DHSK College, Dibrugarh, India, 11 -13th October 2010.
22. Contributed Oral presentation in the 7th National Conference of Physics Academy of North East, Manipur University, India, 5-6th October 2010.
23. Contributed Oral presentation in the 12th Electromagnetic and Light Scattering Conference, **University of Helsinki, Finland**, 27th June-3rd July 2010.
24. Contributed Oral presentation in 6th National Conference of Physics Academy of North East, Tripura University, India, 4-6th April, 2010.
25. Contributed Oral presentation in the International Conference Optics and Photonics,

at Central Scientific and Industrial Research Organization (CSIO), Chandigarh, India, 30th October-2nd November, 2009.

26. Contributed Oral presentation in the 13th National conference on “Condensed Matter days”, Viswa Bharati University, Shantiniketan, India, 29th August- 1st September, 2008.
27. Contributed Poster presentation on the XXXIII OSI (Optical Society of India) Symposium on Optics and Optoelectronics, 18-22nd December 2007, at Tezpur University.

WORKSHOPS ATTENDED

1. **Resource person** in the event of “International Day of Light”, organized by **PDDUAM Eraligool in association with UNESCO**, on 16th May, 2024, Eraligool, Karimganj District, India.
2. **Resource person** in the event of “International Day of Light”, organized by **Patharkandi College in association with UNESCO**, on 13th May, 2024, Patharkandi, India.
3. Presented **INVITED TALK** on the event of “**Galileo Galilie Talk 2024**” organized by **ICFAI University**, on 20th February 2024, Tripura, India.
4. Attended workshop on **Aditya-L1: Solar Ultraviolet Imaging Telescope (SUIT) Science and Data Analysis Workshop'** jointly organized by **Tezpur University** and **IUCAA, Pune** Tezpur University, 6th – 7th March, 2024.
5. Attended workshop in “**INUP-i2i Familiarization Workshop on Nanofabrication Technologies**” organized by **IIT Bombay**, Mumbai, 22nd- 24th January 2024.
6. Attended one-day workshop on “**PRISM scheme**” organized by HRDC, The Assam Royal Global University on 23rd April 2024.
7. Attended one-day National Webinar on “**Artificial Intelligence and future of Education**” on 9th March 2024.
8. Resource person of **DST- INSPIRE program**, USTM, 2019.
9. Attended workshop in “Popular talks on Astronomy” in the theme “Comet: the spectacular vision to the Solar System”, organized by Assam University, Silchar on, 25th July, 2020.
10. Workshop on LaTeX, 28th – 29th March 2019, at Assam Don Bosco University, Assam, India.
11. DIT sponsored workshop on "Possibilities of Electronics R&D and Application in the North East", 29th July 2011, at Tezpur University, India.
12. National Science Academics Lecture Workshop on Non-Linear Dynamics, 26th- 28th April 2011, at Tezpur University, India.

13. Contributed Oral presentation in the National Seminar on Photon and Quantum Structures, 4th -6th November, Tezpur University, India.
14. Workshop on Recent Trends on Astronomy & Astrophysics, 21st- 23rd October, 2009 at Tezpur University, India.
15. Technical Session of Assam Science Society, February 4th, 2009 at Tezpur University, India.

CONFERENCES/ WORKSHOPS ORGANIZED:

1. **Convenor** of the “**National Exhibition cum Seminar on Plasma Physics**”, organized by the Department of Physics, USTM in association with Institute of Plasma Physics, Govt. of India, Ahmedabad from 1st to 5th August, 2022.
2. Organizing committee member of **98th DAE-BRNS IANCAS National workshop on “Radiochemistry and Applications of Radiochemistry”** organized by the Department of Physics, USTM in association with Department of Atomic Energy, Govt. of India, 1st to 6th October, 2018.