

CURRICULUM VITAE

Dr. UMAKANTA TRIPATHY

Associate Professor,

Department of Physics,

Indian Institute of Technology (Indian School of Mines),

Dhanbad, Jharkhand, 826004, India,

Tel: +91-9471192489 (Mobile),

+91-326-223-5180 (Office), +91-326-223-5171 (Home),

E-mail: utripathy@iitism.ac.in, tripathyu@gmail.com



PROFILE

- 24 years of experience in Research and Development.
- 14 years of laboratory teaching experience for UG and PG students.
- 10 years of teaching theory to UG and PG students.
- Knowledge of different types of Cell cultures.
- Working expertise in microfluidic channels, and *in vivo* imaging of Zebrafish & C. Elegans.
- Proficiency in aligning and working with femtosecond, picosecond, nanosecond, and continuous wave lasers.
- Working expertise in different microscopy systems like fluorescence microscopy, confocal microscopy, multi-photon microscopy, and nonlinear laser scanning microscopy.
- Trained in aligning femtosecond regenerative amplifiers (RegA 9000), optical parametric amplifiers (OPA), and optical parametric oscillators (OPO).
- Re-engineered the cavity of a femtosecond OPO to make it lase.
- Skilled in working with UV-visible spectrophotometers, fluorimeters, time-correlated single photon counting (TCSPC), pump-probe systems, etc.
- Contributed fully/partially to the development of a combined multi-photon/confocal microscope, a supercontinuum generation setup, a nonlinear laser scanning microscope, a fluorescence up-conversion setup, a triplet-triplet annihilation (TTA) setup, an autocorrelation setup, a fluorescence correlation spectroscopy (FCS) setup, and a Z-scan setup.

AREAS OF SPECIALIZATION:

Biophysics, Nonlinear optics, and Ultrafast laser spectroscopy.

RESEARCH PROJECTS:

Our **Biophysics Research Group** at IIT (ISM) Dhanbad focuses on the following research projects:

- Design of new *bio-medical devices* for early-stage disease diagnosis.
- Understanding protein energy landscape through nonlinear tools.
- Nonlinear studies of monoamine neurotransmitters related to neurodegeneration.
- Nonlinear studies of nanoparticles for drug delivery and cancer therapy.
- Understanding protein aggregation at the single-molecule level.
- Study of biomolecular interactions through spectroscopic tools.
- Molecular Docking and Molecular Dynamics (MD) simulation approach to comprehending biomolecular interactions.
- TD-DFT calculation of various biomolecules.

Future Goals:

- Multi-photon imaging, harmonic generation (SHG and THG) imaging, and super-resolution imaging of cells, tissues, organs, etc. in *ex vivo*, *in vitro*, and *in vivo* studies.
- Development and application of other novel optical microscopy techniques and optical devices.

EDUCATION:

Indian Institute of Technology Madras (IITM), Chennai, TN, India, 2001-2006.

- **Ph.D.** in Physics, 2006, Specialization: Ultrafast Laser Spectroscopy & Nonlinear Optics.
Thesis title: “*Dipole-dipole interaction-induced excitation energy migration and transfer in organic dye-pairs and their nonlinear photo-physics*”.

Khallikote (Autonomous) College (Berhampur University), Berhampur, OR, India, 1995-2000.

- **M.Sc.** in Physics, 2000, Specialization: Electronics.
- **B.Sc.** in Physics (Honors), Mathematics, and Environment & Water Management, 1998.

ACCOMPLISHMENTS

- Editorial Board Member, Nature Scientific Reports Journal, Since September 2025.
- Received recognition from national and international levels for our computational work towards drug development for CoVID-19, 2020.
- Received Govt. of India recognition for developing a novel tool to study alpha-Synuclein protein aggregation that has a crucial role in Parkinson’s disease, 2020.
- Best poster award at the Photonics North Conference, Montreal, Canada, 2012.
- Marquis Who’s Who in the World, 27th edition, USA, 2010.
- Best poster award at the ASME Summer Bioengineering Conference, CA, USA, 2009.

- Postdoctoral Fellowship from McGill University, Montreal, Canada, 2008-2011.
- Best poster award at the CSC, 91st Canadian Chemistry Conference and Exhibition, Edmonton, Canada, 2008.
- Postdoctoral Fellowship from the University of Saskatchewan, Saskatoon, Canada, 2006-2008.
- Senior Research Fellowship from the Council of Scientific and Industrial Research (CSIR), New Delhi, India, 2005-2006.
- Senior Research Fellowship from the IIT Madras, Chennai, India, 2003-2005.
- Best paper award at the International Conference on Optoelectronics and Technology, North Maharashtra University, Jalgaon, India, 2004.
- Best poster award at the Trombay Symposium on Radiation and Photochemistry, Bhaba Atomic Research Center (BARC), Mumbai, India, 2004.
- Junior Research Fellowship from the IIT Madras, Chennai, India, 2001-2003.
- Graduate Aptitude Test in Engineering (GATE), 2000.
- Held 1st position in the University during B.Sc. (1995-1998) & M.Sc. (1998-2000) programs.
- National merit scholarship awarded by the Ministry of Human Resources and Development (MHRD), Govt of India, 1993-2000.

ACADEMIC POSITIONS

- Associate Professor:** Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand, India. April 2021 - Till date.
- Assistant Professor:** Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand, India. December 2014 - April 2021.
- Visiting Scientist:** Department of Chemical Sciences, Tata Institute of Fundamental Research (TIFR), Mumbai, Maharashtra, India, January 2013 - April 2014
- Casual Employee:** Department of Physics, McGill University, Montreal, QC, Canada, September 2011 - August 2012.

STUDENT GUIDANCE

Postdoctoral Fellow

1. Dr. Manika Dandapat, March 2023 – Continuing.
2. Dr. Md. Mehkoom, March 2024 – June 2025.

Ph.D.

1. Mr. Bikash Chandra Swain, **Completed** (October 2020).
2. Miss. Sakshi, **Completed** (October 2020).
3. Mr. Janmejaya Rout, **Completed** (September 2022).
4. Mr. Nitesh Kumar Pathak, **Completed** (November 2024).
5. Mr. Priyadarshi Sahoo, **Completed** (November 2025).

6. Mr. Nandeshwar, August 2020 – Continuing.
7. Miss. Smita Manjari Panda, August 2021 – Continuing.
8. Mr. Tusar Kanti Rout, December 2023 – Continuing.
9. Mr. Subodha Kumar Sahu, December 2024 – Continuing.
10. Mr. Bhagirathi Panda, June 2025 – Continuing.

M.Sc.

1. Mr. Shams Asif Md. Ehsan Ul Mamdud, Completed (2015-2016).
2. Mr. Ajay Kumar, Completed (2015-2016).
3. Miss. Rashmita Deheri, Completed (2016-2017).
4. Miss. Dipali Nayak, Completed (2016-2017).
5. Miss. Dipanwita Ray, Completed (2017-2018).
6. Mr. Bibhuti Bhusan Mahan, Completed (2018-2019).
7. Mr. Saiswarup Satwarup, Completed (2018-2019).
8. Mr. Gopichand Meena, Completed (2019-2020).
9. Mr. Amit Vikram, Completed (2019-2020).
10. Mr. Mohan Singh, Completed (2020-2021).
11. Mr. Tshewalo Rhakho, Completed (2021-2022).
12. Mr. Yeeshu Behera, Completed (2022-2023).
13. Mr. Rajesh Kumar Nayak, Completed (2022-2023).
14. Mr. Rohan Kumar, Completed (2022-2023).
15. Mr. Rahul, Completed (2023-2024).
16. Ms. Bhawna Kumari, Completed (2024-2025).
17. Ms. Manisha Meena, Ongoing (2025-2026).

M.Tech.

1. Mr. MD. Haider Ansari, Completed (2021-2022).

B.Tech.

1. Mr. Dushyant Kumar Mahil, Completed (2016 – 2019).
2. Miss. Sagarika Bhagde, Completed (Dec 2017 – Jan 2018).
3. Mr. Vikas Meena, Completed (2017 – 2020).
4. Mr. Ranjan Yadav, Completed (2019 – 2020).
5. Mr. Shivang Mathur, Completed (2020 – 2021).
6. Miss. Priya Mondal, Completed (2020 – 2021).
7. Mr. Birjoy Krishnan Sonowal, Completed (2021-2022).
8. Mr. Sarthak Agrawal, Completed (2022 – 2024).
9. Ms. Shilpa Mahato, Completed (2022-2023).
10. Mr. Lele Nahush Kousthubh, Completed (2023-2024).
11. Mr. Patte Boya Eswar Sai, Completed (2023-2024).
12. Mr. Harshit Kumar, Completed (2024-2025).

13. Mr. Gyanendra Parmaar, Completed (2024-2025).
14. Mr. Uddagiri Jithendranadh, Completed (2024-2025).
15. Mr. Mohit Ghosh, Ongoing (2025-2026).
16. Mr. Rupendra Chungkrang, Ongoing (2025-2026).

RESEARCH PROJECTS (ONGOING/ COMPLETED)

1. “Introducing a novel optical device to study protein aggregation in real time for disease diagnosis”, **Anusandhan National Research Foundation (ANRF)**, New Delhi, India, **3 years (2025-2028)**, ~ **71.76480 Lakhs** (Value), **Principal Investigator (PI)**.
2. “Tunable Fluorescent Organic Nanoparticles, Based on the Scaffold of a Single Benzene-Based Fluorophore, 5-(tert-Butyl)-2-hydroxy-1,3-isophthalaldehyde, for Enhanced Emission, White Light Generation and Bioimaging: Syntheses and Spectroscopic Studies”, **Anusandhan National Research Foundation (ANRF)**, New Delhi, India, **3 years (2025-2028)**, ~ **87.24480 Lakhs** (Value), **Co-Principal Investigator (Co-PI)**.
3. “Exploring materials, plasmas, and biological systems through advanced spectroscopy, imaging, and computational techniques”, **DST-FIST**, New Delhi, India, **5 years (2024-2029)**, ~ **2.07 Crores** (Value), **Co-Principal Investigator (Co-PI)**.
4. “Bioscopy – Towards modern transdisciplinary education and research in microscopy” under Indo-Norwegian Cooperation Programme 2024 (INCP2), **University Grants Commission (UGC)**, New Delhi, India, **3 years (2025-2028)**, ~ **1.1466 Crores** (Value), **Co-investigator**.
5. “Monitoring the aggregation kinetics of Amyloid-beta and its inhibition”, **Department of Science and Technology (DST)**, New Delhi, India, **3 years (2022-2025)**, ~ **37 Lakhs** (Value), **Principal Investigator (PI)**.
6. “Development of a sensitive tool to study the nonlinear properties of monoamine neurotransmitters”, Science and Engineering Research Board (**SERB**), Department of Science and Technology (**DST**), New Delhi, India, **3 years (2018-2021)**, ~ **37 Lakhs** (Value), **Principal Investigator (PI)**.
7. “To study the nonlinear properties of norepinephrine by using Z-scan technique”, **TEQIP-III, IIT (ISM) Dhanbad**, India, **2 years (2018-2020)**, ~ **2 Lakhs** (Value), **Principal Investigator (PI)**.
8. “Faculty Development Center (FDC) under Pandit Madan Mohan Malavya National Mission on Teachers and Teaching (PMMMNTT)”, Ministry of Human Resources and Development (**MHRD**), New Delhi, India, **3 years (2015-2018)**, ~ **7.56 Crores** (value), **Co-Principal Investigator (Co-PI)**.
9. “Construction of a fluorescence correlation spectrometer, a single molecule bio-photonic tool for biophysical/ biochemical applications” under Faculty Research Scheme, **IIT (ISM) Dhanbad**, India, **3 years (2015-2018)**, ~ **11 Lakhs** (value), **Principal Investigator (PI)**.

ADMINISTRATIVE ROLES

1. Departmental Post Graduate Committee (DPGC) Convener: October 2022 – October 2024.

2. Vice-Chairman, JEE (Advanced): July 2022 – September 2023.
3. Institute Senate Member: Feb 2022 – Feb 2024.
4. Chief Hostel Warden: July 2022 – June 2024.
5. Institute House Allotment Committee (HAC) Member, December 2021 – Till date.
6. Hostel Warden: July 2020 – June 2022.
7. DPGC Member: July 2018 – October 2022.
8. Dept. Library Co-in-charge: May 2015 – Till date.
9. M.Sc. Dissertation In-Charge: Jan 2019 – June 2021.
10. Faculty Development Center (FDC) Co-coordinator: July 2016 – September 2021.
11. Anti-ragging Squad Member: July 2015 – July 2019.
12. B. Tech. Engg. Phys., Lab In-Charge: May 2015 – Jan 2019.
13. Int. M. Tech. AGP, Lab In-Charge: May 2015 – Jan 2019.
14. Micro-Observer in JH State Election: December 2019.
15. Mobile Micro-Observer in JH State Election: December 2019.
16. Micro-Observer in Parliamentary Election: May 2019.

COURSES DEVELOPED (Fully)

Biomedical Engineering
 Introduction to Biophysics
 Nonlinear Optics

PREVIOUS RESEARCH EXPERIENCE

Visiting Scientist: Biophotonics Laboratory, Department of Chemical Sciences, Tata Institute of Fundamental Research (TIFR), Mumbai, Maharashtra, India, January 2013 - April 2014 (Supervisor: Professor Sudipta Maiti)

- Construction of a Confocal/ Multi-photon microscope.
- Multi-photon imaging of vesicular neurotransmitters in live animals.

Postdoctoral Research: Biophysics laboratory, Department of Physics, McGill University, Montreal, QC, Canada, September 2008-August 2012 (Supervisor: Professor Paul W. Wiseman).

- The third harmonic generation (THG), second harmonic generation (SHG), and two-photon fluorescence (TPF) imaging of Bio and Nano materials by multi-modal nonlinear laser scanning microscopy (NLSM) technique. This includes:
 - Early detection and quantification of malaria pigments (hemozins) and development of a prototype malaria cell counter device to count the infected red blood cells by fluorescence correlation spectroscopy (FCS).
 - Development of a methodology for documenting the geometrical properties of the human and porcine vocal fold.
 - Investigating the structural remodeling of the human ascending aorta with dilation.
 - Multi-photon imaging of gold nanoparticles as a function of their size for cell tracking.

Postdoctoral Research: Ultrafast laser spectroscopy laboratory, Department of Chemistry, University of Saskatchewan, Saskatoon, SK, Canada, April 2006-September 2008 (Supervisor: Professor Ronald P. Steer).

- The study of the photo-physical properties of Tetrapyrroles (e.g. metalloporphyrins and their analogues (corroles)) excited in their Soret and higher energy UV absorption bands.
- Triplet-triplet annihilation (TTA) processes in metalloporphyrins under thin solid films as well as in liquid medium for noncoherent photon up-conversion studies.

Doctoral Research: Ultrafast laser spectroscopy laboratory, Department of Physics, IIT Madras, Chennai, TN, India, January 2001-April 2006 (Supervisors: Professor Prem B. Bisht and Professor A. Subrahmanyam).

- Dipole-dipole interaction-induced excitation energy migration and transfer in organic dye-pairs.
- Estimation of nonlinear photo-physical properties of organic dyes by Z-scan technique.

TEACHING EXPERIENCE

Instructor: I taught courses like: Biomedical Engineering, Introduction to Biophysics, Nonlinear Optics, Electrodynamics and Radiation Theory, Lasers and Nonlinear Optics, Energy Resources, Electrodynamics, Nonlinear Optical Processes and Devices, Physics-II (Preparatory), etc., Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad, India, July 2015 - Continuing.

Instructor: General Physics Laboratory (M.Sc. Physics, Preparatory, B. Tech common and B. Tech. Engg. Physics), Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad, India, January 2015 - Continuing.

Instructor: Experimental Physics 659 (Master and Graduate students), Department of Physics, McGill University, Canada, March 2012.

- Super Resolution Microscopy: Nanoscopy.

Instructor: General Physics Laboratory (M.Sc. Physics and B. Tech common and B. Tech. preparatory), Department of Physics, IIT Madras, India, January 2001 - April 2006.

JOURNAL REVIEWER:

For different journals under the following publishers:

American Institute of Physics (AIP), Institute of Physics (IoP), Optica, Royal Society of Chemistry (RSC), Wiley, Elsevier, Springer Nature, SPIE, American Chemical Society (ACS), American Physical Society (APS), etc.

PROJECT REVIEWER:

BIRAC-KIIT, India; SERB (DST), India; American University Beirut, Lebanon.

MEMBERSHIP OF SCIENTIFIC SOCIETIES:

Indian Photobiology Society (IPS)

Indian Physics Association (IPA)

Orissa Physical Society (OPS)

Indian Society for Radiation and Photochemical Sciences (ISRAPS)

Society for Interdisciplinary Research in Materials and Biology (SIRMB)

International Society on Optics Within Life Sciences (OWLS)

OUTREACH PROGRAMMES:

1. International Conference on Interdisciplinary Approach in Chemical and Biological Sciences (IACBS-2025), 1st-2nd Dec 2025, INRF, BRNS, & Others, **Co-Convener**.
2. A Physics Refresher Course with Special Focus on Material Science and Biophysics, 8th – 20th Feb 2021, TEQIP-III, **Coordinator**.
3. Induction Training/Orientation Programme, 15th Nov – 12th Dec 2019, MHRD, **Coordinator**.
4. Refresher programme in Chemistry, 8th – 28th June 2018, MHRD, Organizer.
5. Refresher programme in Physics (Bio-Photonics), 29th May – 18th June 2018, MHRD, **Coordinator**.
6. Induction Training/Orientation Programme, 28th Dec 2017 – 25th Jan 2018, MHRD, **Coordinator**.
7. National Training programme on Research Methodology, 18th – 23rd Dec 2017, MHRD, **Coordinator**.
8. National Training programme on Wireless Sensor Networks, 18th – 22nd Dec 2017, MHRD, Organizer.
9. National Training programme in Scientific computing with Mathematica, 4th – 9th Dec 2017, MHRD, Organizer.
10. National Training Programme on Mineral Processing: Principles, Processes & Practice, 26th June – 1st July 2017, MHRD, Organizer.
11. Refresher programme in Chemistry (Material Chemistry), 1st – 21st June 2017, MHRD, Organizer.
12. Refresher programme in Physics (Nano-Biotechnology), 25th May – 14th June 2017, MHRD, **Coordinator**.
13. Refresher programme in Mathematical Sciences, 16th May – 5th June 2017, MHRD, Organizer.
14. Refresher programme in Recent trends on microwave components and Antennas, 26th Dec 2016 – 15th Jan 2017, MHRD, Organizer.

15. National conference on Recent Advances in Science and Engineering (RASE), 28th – 29th Mar 2016, MHRD, **Co-convener**.
16. Orientation Programme, 9th – 29th Feb 2016, MHRD, **Coordinator**.

PUBLICATIONS

Journal Articles:

1. Nandeshwar, *Umakanta Tripathy*, “Diosgenin Reduces β -sheet Content in Mutated α -Syn Aggregation: Insights from Conformational Dynamics at Intracellular and Extracellular Neuronal Salt Concentrations,” **Journal of Molecular Graphics and Modelling**, 142, 109160 (2026).
2. Abhipsa Shekhar Biswal, Nandeshwar, *Umakanta Tripathy*, Soumit Chatterjee, “Restoring epigenetic balance for glioma: Targeting IDH1_R132H with phytocompounds and tracking their efficacy under various pH conditions,” **International Journal of Biological Macromolecules**, 333, 148571 (2025).
3. Nitesh Kumar Pathak, Nandeshwar, Priyadarshi Sahoo, Amit K. Pradhan, Tara Singha, Prasanta K. Datta, *Umakanta Tripathy*, “A novel insight into the femtosecond induced nonlinear response of monoamine neurotransmitters through experimental and in silico approaches,” **Scientific Reports**, 15, 34240 (2025).
4. Priyadarshi Sahoo, Nitesh Kumar Pathak, Sunil Kumar Verma, *Umakanta Tripathy*, “Z-scan as a hemoglobin sensor: A simple and sensitive optical tool for measuring hemoglobin concentration in human blood,” **Journal of Applied Physics**, 138, 074701-1-074701-12 (2025).
5. Debasish Paul, Priyadarshi Sahoo, Amit K. Pradhan, Prasanta K. Datta, Arunava Sengupta, *Umakanta Tripathy*, Soumit Chatterjee, “Revealing the Importance of the C(1) Position to Modulate the Photophysics and Z-Scan Responses of *o*-Locked GFP Chromophores,” **Journal of Chemical Physics**, 162, 234308-1-234308-24 (2025).
6. Mohd Mehkoom, Farman Ali, Amit K. Pradhan, Prasanta K. Datta, *Umakanta Tripathy*, “Enhanced ultrafast cubic nonlinearity in the carbazole-picric acid complex for potential applications in photonic devices: Kerr nonlinearity with two-photon absorption,” **Physical Chemistry Chemical Physics**, 27, 12331 (2025).
7. Rajat Kumar, Nitesh Kumar Pathak, Jayanta Kumar Sarkar, *Umakanta Tripathy*, Prasanta Kumar Datta, “Vibrational spectra of serotonin by terahertz time domain spectroscopy and DFT simulations,” **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 329, 125541 (2025).
8. Jyotsna Patra, Poulami Das, Subhankar Nanda, Manika Dandapat, *Umakanta Tripathy*, and Amitava Adak, “Nonclassical plasmonic response of laser-plasma-engineered ultrasmall nearly-monodispersed clean copper nanoparticles,” **Optics & Laser Technology**, 180, 111444 (2025).
9. Smita Manjari Panda, Nandeshwar, and *Umakanta Tripathy*, “In silico screening and identifying phytoconstituents of *Withania somnifera* as potent inhibitors of BRCA1 mutants:

- A therapeutic against breast cancer,” **International Journal of Biological Macromolecules**, 282, 136977 (2024).
10. Debasish Paul, Priyadarshi Sahoo, Arunava Sengupta, *Umakanta Tripathy*, and Soumit Chatterjee, “Revealing the Role of Electronic Effect to Modulate the Photophysics and Z-Scan Responses of *o*-Locked GFP Chromophores,” **Journal of Physical Chemistry B**, 129(2), 692-711 (2024).
 11. Kavyashree Nagappa Kummur, Smita Manjari Panda, Mahantesh Basangouda Patil, *Umakanta Tripathy*, Ashok H Sidarai, “Revealing the interaction mechanism between bovine serum albumin (BSA) and a fluorescent coumarin derivative: A multispectroscopic and in silico approach,” **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 318, 124466 (2024).
 12. Kanchan Negi, Nitesh Kumar Pathak, *Umakanta Tripathy*, Sourav Kumar Dey, and Sumanta Kumar Sahu, “Two-photon NIR-responsive carbon dots incorporated into NMOFs for targeted photodynamic therapy,” **Colloids and Surfaces A: Physicochemical and Engineering Aspects**, 694, 134163 (2024).
 13. Indrajit Pal, Nitesh Kumar Pathak, Santanu Majumdar, Gerald Lepcha, Amiya Dey, Suresh Kumar Yatirajula, *Umakanta Tripathy*, and Biswajit Dey, “Comparative Vision of Nonlinear Thermo-Optical Features and Third-Order Susceptibility of Mechanically Flexible Metallosupramolecular Self-Repairing Networks with Isomeric Organic Acids,” **Inorganic Chemistry**, 63(26), 12003-12016 (2024).
 14. Nitesh Kumar Pathak, Priyadarshi Sahoo, and *Umakanta Tripathy*, “Nonlinear study of indolamines: A hidden property that might have possible implications in neurodegeneration,” **Talanta**, 272, 125808 (2024).
 15. Priyadarshi Sahoo, Nitesh Kumar Pathak, D. Scott Bohle, Erin L. Dodd, and *Umakanta Tripathy*, “Hematin anhydride (β -hematin): An analogue to malaria pigment hemozoin possesses nonlinearity,” **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 310, 123902 (2024).
 16. Nandeshwar, Janmejaya Rout, Smita Manjari Panda, and *Umakanta Tripathy*, “Phytoconstituents of Ashwagandha as potential inhibitors of human islet amyloid polypeptide (hIAPP): An in-silico investigation”, **Journal of Biomolecular Structure and Dynamics**, 42, 11020-11036, (2024).
 17. Indrajit Pal, Nitesh Kumar Pathak, Santanu Majumdar, Gerald Lepcha, Amiya Dey, Suresh Kumar Yatirajula, *Umakanta Tripathy*, and Biswajit Dey, “Solvent-driven variations of third-order nonlinear thermo-optical features of glutaric acid-directed self-healing supramolecular Ni(II)-metallogels”, **Langmuir**, 39, 16584-16595 (2023).

18. Nitesh Kumar Pathak, Sunil Kumar Verma, and *Umakanta Tripathy*, “Effect of hemoglobin in the nonlinearity of O⁺ blood group”, **Asian Journal of Physics**, 31(1), 123-128 (2022).
19. Nitesh Kumar Pathak, Lata Sharma, Sakshi, Bijayalaxmi Panda, and *Umakanta Tripathy*, “Synthesis, characterization, and investigation of nonlinear property of fly ash-red mud-Ag: A low-cost sustainable nanocomposite”, **Optical Materials**, 126, 112230 (2022).
20. Sakshi, Bikash Chandra Swain, Anand Kant Das, Nitesh Kumar Pathak, and *Umakanta Tripathy*, “Z-scan analysis and theoretical studies of dopamine under physiological conditions”, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 271, 120890 (2022).
21. Bikash Chandra Swain, Janmejaya Rout, and *Umakanta Tripathy*, “Interaction of vitamin B12 with β -lactoglobulin: A computational study”, **Journal of Biomolecular Structure and Dynamics**, 40(5), 2146-2155 (2022).
22. Janmejaya Rout, Bikash Chandra Swain, and *Umakanta Tripathy*, “In Silico Investigation of Spice Molecules as Potent Inhibitor of SARS-CoV-2”, **Journal of Biomolecular Structure and Dynamics**, 40(2), 860-874 (2022).
23. Sakshi, Bikash Chandra Swain, Anand Kant Das, Nitesh Kumar Pathak, and *Umakanta Tripathy*, “Norepinephrine exhibits thermo-optical nonlinearity under physiological conditions”, **Physical Chemistry Chemical Physics**, 23, 23473-23477 (2021).
24. Janmejaya Rout, Bikash Chandra Swain, Suchismita Subadini, Padmaja Prasad Mishra, Harekrushna Sahoo, and *Umakanta Tripathy*, “Conformational dynamics of myoglobin in the presence of vitamin B12: A spectroscopic and in silico investigation,” **International Journal of Biological Macromolecules**, 192, 564-573 (2021).
25. Janmejaya Rout, Bikash Chandra Swain, Suchismita Subadini, Padmaja Prasad Mishra, Harekrushna Sahoo, and *Umakanta Tripathy*, “Spectroscopic and computational insight into the conformational dynamics of hemoglobin in the presence of vitamin B12”, **International Journal of Biological Macromolecules**, 189, 306-315 (2021).
26. Sunil Kumar Verma, Janmejaya Rout, Shrutidhara Biswas, and *Umakanta Tripathy*, “Association of the Types of Alcoholic Beverages and Blood Lipids: A Community-Based Study”, **Proceedings of the National Academy of Sciences, India Section B: Biological Sciences**, 91, 73-80 (2021).
27. Sabera Millan, Bikash Chandra Swain, *Umakanta Tripathy*, Padmaja Prasad Mishra, and Harekrushna Sahoo, “Effect of micro-environment on protein conformation studied by fluorescence-based techniques,” **Journal of Molecular Liquids**, 320, 114489 (2020).
28. Sumanta Ghosh, Sakshi, Bikash Chandra Swain, Ritobrita Chakraborty, *Umakanta Tripathy*, and Krishnananda Chattopadhyay, “A novel tool to investigate the early and late-stages of alpha-synuclein aggregation”, **ACS Chemical Neuroscience**, 11, 1610-1619 (2020).

29. Bikash Chandra Swain, Sandip Kumar Mukherjee, Janmejaya Rout, Sakshi, Padmaja Prasad Mishra, Mandira Mukherjee and ***Umakanta Tripathy***, “A Spectroscopic and Computational Intervention of Interaction of Lysozyme with 6-Mercaptopurine”, **Analytical and Bioanalytical Chemistry**, 412, 2565-2577 (2020).
30. Janmejaya Rout, Bikash Chandra Swain, Padmaja Prasad Mishra, and ***Umakanta Tripathy***, “Spectroscopic insight into the interaction of dopamine with spherical gold nanoparticles”, **Journal of Photochemistry and Photobiology B: Biology**, 203, 111770 (2020).
31. Bikash Chandra Swain, Suchismita Subadini, Janmejaya Rout, Sakshi, Padmaja Prasad Mishra, Harekrushna Sahoo and ***Umakanta Tripathy***, “Biophysical study on complex formation between β -Lactoglobulin and Vitamin B12”, **Food Chemistry**, 312, 126064 (2020).
32. Janmejaya Rout, Bikash Chandra Swain, Sakshi, Shrutidhara Biswas, Anand Kant Das and ***Umakanta Tripathy***, “A simulation study on the influence of energy migration and relative interaction strengths of homo- and hetero-FRET on the net FRET efficiency”, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 226, 117599 (2020).
33. Sakshi, Nitesh Kumar Pathak, Bikash Chandra Swain and ***Umakanta Tripathy***, “Analyzing nonlinear trends in curcumin: A comparative study”, **Optics & Laser Technology**, 121, 105822 (2020).
34. Sakshi, Bikash Chandra Swain, Anand Kant Das and ***Umakanta Tripathy***, “Probing third-order nonlinearity in serotonin: A Z-scan study”, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 223, 117319 (2019).
35. Srabani Karmakar, Shrutidhara Biswas, Kali. P. Das and ***Umakanta Tripathy***, “Surface plasmon resonance study of the interaction of 4,4'-Dianilino-1,1'-binaphthyl-5,5'-disulfonic acid dipotassium salt (bis-ANS) and adenosine triphosphate (ATP) with oligomeric recombinant human lens α A-crystallin”, **Canadian Journal of Chemistry**, 97, 504-511 (2019).
36. Navin Chandra, Shrutidhara Biswas, Janmejaya Rout, Gautam Basu, and ***Umakanta Tripathy***, “Stability of β -turn in LaR2C-N7 peptide for its translation-inhibitory activity against hepatitis C viral infection: A molecular dynamics study”, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 211, 26–33 (2019).
37. Bikash Chandra Swain, Padmaja P. Mishra, Hirdyesh Mishra, and ***Umakanta Tripathy***, “Monitoring the binding of Serotonin to Silver nanoparticles: A Fluorescence Spectroscopic investigation”, **Journal of Photochemistry and Photobiology A: Chemistry**, 367, 219-225 (2018).
38. ***Umakanta Tripathy***, S. Rallabandi, P. B. Bisht, “Switching the sign of nonlinear refraction in N, N'-Bis (2, 5,-di-tert-butylphenyl)-3, 4, 9, 10-perylenedicarboximide (DBPI),” **Optics & Laser Technology**, 99, 411-414 (2018).

39. A. K. Das, B. K. Maity, D. Surendran, *Umakanta Tripathy*, S. Maiti, "Label-Free Ratiometric Imaging of Serotonin in Live Cells," **ACS Chemical Neuroscience**, 8 (11), 2369-2373 (2017).
40. *Umakanta Tripathy*, Sailaja Rallabandi, and Prem B. Bisht, "Experimental and theoretical simulation studies on picosecond closed-aperture Z-scan profiles of N,N'-Bis(2,5,-di-*tert*-butylphenyl)-3,4,9,10-perylenedicarboximide (DBPI)," **Optical Materials**, 72, 233-240 (2017).
41. Bidyut Sarkar, Arkarup Bandyopadhyay, Anand K. Das, Suman Nag, Sanjeev K. Kaushalya, *Umakanta Tripathy*, Mohammed Shameem, Shubha Shukla, and Sudipta Maiti, "Label-free dopamine imaging in live rat brain slices," **ACS Chemical Neuroscience**, 5(5), 329-334 (2014).
42. Hossein K. Heris, Amir K. Miri, *Umakanta Tripathy*, Francois Barthelat, and Luc Mongeau, "Indentation of poroviscoelastic vocal fold tissue using atomic force microscopy," **Journal of the Mechanical Behavior of Biomedical Materials**, 28, 383-392 (2013).
43. Amir K. Miri, Hossein K. Heris, *Umakanta Tripathy*, Paul W. Wiseman, and Luc Mongeau, "Microstructural characterization of vocal folds toward a strain energy-model of collagen remodeling," **Acta Biomaterialia**, 9(8), 7957-7967 (2013).
44. *Umakanta Tripathy*, Maxime Giguère-Bisson, Mohammad Hussain Sangji, Marie-Josée Bellemare, D. Scott Bohle, Elias Georges, and Paul W. Wiseman, "Optimization of malaria detection based on third harmonic generation imaging of hemozoin," **Analytical and Bioanalytical Chemistry**, 405(16), 5431-5440 (2013).
45. Amir K. Miri, *Umakanta Tripathy*, Luc Mongeau, and Paul W. Wiseman, "Nonlinear Laser Scanning Microscopy of Human Vocal Folds," **The Laryngoscope**, 122(2), 356-363 (2012).
46. Jędrzej Szmytkowski, Sophie M. K. Brunet, *Umakanta Tripathy*, Jaclyn A. O'Brien, Matthew F. Paige, and Ronald P. Steer, "Photophysics and Halide Quenching of Soret-excited ZnTPPS⁴⁻ in Aqueous Media," **Chemical Physics Letters**, 501(4-6), 278-282 (2011).
47. Sunish K. Sugunan, *Umakanta Tripathy*, Sophie M. K. Brunet, Matthew F. Paige, and Ronald P. Steer, "Mechanisms of low-power Noncoherent Photon Upconversion in Metalloporphyrin-Organic Blue Emitter Systems in solution," **Journal of Physical Chemistry A**, 113(30), 8548-8556 (2009).
48. Dorota Kowalska, Xia Liu, *Umakanta Tripathy*, Atif Mahammad, Zeev Gross, Satoshi Hirayama, and Ronald P. Steer, "Ground- and Excited State Dynamics of Aluminum and Gallium Corroles," **Inorganic Chemistry**, 48(6), 2670-2676 (2009).
49. Jaclyn O'Brien, Sailaja Rallabandi, *Umakanta Tripathy*, Matthew F. Paige, and Ronald P. Steer, "Efficient S₂ state production in ZnTPP-PMMA thin films by triplet-triplet annihilation: Evidence of solute aggregation in photon upconversion systems," **Chemical Physics Letters**, 475(4-6) 220-222 (2009).

50. Xia Liu, *Umakanta Tripathy*, Sheshanath V. Bhosale, Steven J. Langford, and Ronald P. Steer, "Photophysics of Soret-Excited Tetrapyrroles in Solution. II. Effects of Perdeuteration, Substituent Nature and Position, and Macrocycle Structure and Confirmation in Zinc (II) Porphyrins," **Journal of Physical Chemistry A**, 112(38), 8986-8998 (2008).
51. Xia Liu, Atif Mahammad, *Umakanta Tripathy*, Zeev Gross, and Ronald P. Steer, "Photophysics of Soret-Excited Tetrapyrroles in Solution. III. Porphyrin Analogues: Aluminum and Gallium Corroles," **Chemical Physics Letters**, 459(1-6), 113-118 (2008).
52. *Umakanta Tripathy*, Dorota Kowalska, Xia Liu, Suresh Velate, and Ronald P. Steer, "Photophysics of Soret-Excited Tetrapyrroles in Solution. I. Metalloporphyrins: MgTPP, ZnTPP and CdTPP," **Journal of Physical Chemistry A**, 112(26), 5824-5833 (2008).
53. *Umakanta Tripathy*, and Prem B. Bisht, "Influence of pulsed and cw pumping on optical nonlinear parameters of laser dyes probed by a closed-aperture Z-scan technique," **Journal of Optical Society of America B**, 24(9), 2147-2156 (2007).
54. *Umakanta Tripathy*, and Prem B. Bisht, "Effect of donor-acceptor interaction strength on excitation energy migration and diffusion at high donor concentrations," **Journal of Chem. Physics**, 125(14), 144502-1-144502-8 (2006).
55. *Umakanta Tripathy*, and Prem B. Bisht, "Simultaneous estimation of optical nonlinear refractive and absorptive parameters by solvent induced changes in optical density," **Optics Communications**, 261(2), 353-358 (2006).
56. *Umakanta Tripathy*, Prem B. Bisht, and Krishna K. Pandey, "Excitation energy transfer efficiency of dipole-dipole interaction in a dye pair in polymer medium," **Research in Chemical Intermediates**, 31(7-8), 649-660 (2005).
57. *Umakanta Tripathy*, Prem B. Bisht, and K. K. Pandey, "Study of excitation energy migration and transfer in 3,3'-dimethyloxacarbocyanine iodide (DMOCI) and o-(6-diethylamino-3-diethylimino-3H-xanthen-9-yl) benzoic acid (RB) in thin films of polyvinyl alcohol," **Chemical Physics**, 299(1), 105-112 (2004).
58. *Umakanta Tripathy*, R. Justin Rajesh, Prem B. Bisht, and A. Subrahmanyam, "Optical nonlinearity of organic dyes as studied by Z-scan and transient grating techniques," **Proceedings of the Indian Academy of Sciences (Chemical Science)**, 114(6), 557-564 (2002).

Review Articles:

1. Smita M. Panda, Hossein Goodarzi Hosseinabadi, Hoda Fattel, *Umakanta Tripathy*, Amir K. Miri, "Ink Formulation and Selection for Biological Applications of Two-Photon Polymerization", **ACS Applied Optical Materials**, 1 (9), 501-512 (2023).
2. Sakshi Choudhary, Bikash Chandra Swain, and *Umakanta Tripathy*, "Applications of lasers in biophotonics", **Materials Focus**, 5, 496-510 (2016).

3. **Umakanta Tripathy** and Ronald P. Steer, “The photophysics of metalloporphyrins excited in their Soret and higher energy uv absorption bands,” **Journal of Porphyrins and Phthalocyanines**, 11(3-4), 228-243 (2007).

Books / Book Chapters:

1. **Umakanta Tripathy** (Editor), Biochemical and Biophysical Methods in Molecular and Cellular Biology. Springer, Singapore (2025). DOI: <https://doi.org/10.1007/978-981-96-2088-3>.
2. Nitesh Kumar Pathak, Priyadarshi Sahoo, **Umakanta Tripathy**, "Z-Scan as a Novel Tool for Disease Diagnosis". In: U. Tripathy (eds) Biochemical and Biophysical Methods in Molecular and Cellular Biology. Springer, Singapore (2025). DOI: https://doi.org/10.1007/978-981-96-2088-3_5.
3. Bikash Chandra Swain, Anand Kant Das, Janmejaya Rout, Shrutidhara Biswas, and **Umakanta Tripathy**, (2022) “Fluorescence Correlation Spectroscopy: A Highly Sensitive Tool for Probing Intracellular Molecular Dynamics and Disease Diagnosis.” In: Sahoo H. (eds) Optical Spectroscopic and Microscopic Techniques. Springer, Singapore. https://doi.org/10.1007/978-981-16-4550-1_8.
4. Shrutidhara Biswas, Vlad Bogdan Gavra, Anand Kant Das and **Umakanta Tripathy**, (2019) “Biophotonics in Disease Diagnosis and Therapy.” In: Paul S. (eds) Biomedical Engineering and its Applications in Healthcare. Springer, Singapore. https://doi.org/10.1007/978-981-13-3705-5_3.
5. **Umakanta Tripathy**, “Energy migration and transfer in dye-pairs and their nonlinear photophysics”, **Lambert Academic Publishing**, ISBN No. 978-3-659-89946-1 (2016).

Patents:

1. Priyadarshi Sahoo, **Umakanta Tripathy**, “A method of detection and quantification of myoglobin in urine by negative Kerr nonlinearity effect”, Indian Patent Application No. **202531046002** dated **13.05.2025**.
2. Manika Dandapat, Priyadarshi Sahoo, **Umakanta Tripathy**, “A method based on self-focusing and self-defocusing effects to monitor protein aggregation in real-time”, Indian Patent Application No. **202531021632** dated **11.03.2025**.
3. Nitesh Kumar Pathak, Priyadarshi Sahoo, **Umakanta Tripathy**, “A nonlinear optical tool to measure hemoglobin concentration in human ABO blood types”, Indian Patent Application No. **202531005520** dated **23.01.2025**, Granted on **31-07-2025** (Patent No. **569624**).

Conference Proceedings:

1. Sakshi and **Umakanta Tripathy**, “Nonlinear property of neurotransmitter dopamine probed by Z-scan technique”, **Proc. SPIE 11205**, Seventh International Conference on Optical and

Photonic Engineering (icOPEN 2019), 112052L (16 October 2019); <https://doi.org/10.1117/12.2542163>.

2. Bikash Chandra Swain, Padmaja P. Mishra and **Umakanta Tripathy**, “Binding interaction Study of Lysozyme with 6-Mercaptopurine by Spectroscopic Tools”, **Proceedings of International Conference on Fiber Optics and Photonics**, IIT, Delhi, 12- 15 December, **2018**, SP007.
3. Sakshi and **Umakanta Tripathy**, “Nonlinear Study of Serotonin by a Single Closed Aperture Z-Scan Technique”, **Proceedings of International Conference on Fiber Optics and Photonics**, IIT, Delhi, 12- 15 December, **2018**, TP022.
4. Janmejaya Rout, Bikash Chandra Swain, Padmaja P. Mishra and **Umakanta Tripathy**, “Spectroscopic Investigation of Interaction between Dopamine and Gold nanoparticles”, **Proceedings of International Conference on Fiber Optics and Photonics**, IIT, Delhi, 12- 15 December, **2018**, Session- G, TG1.
5. Sakshi and **Umakanta Tripathy**, “Nonlinearity study of Curcumin by Z-scan technique”, **Proceedings of 26th DAE-BRNS National Laser Symposium (NLS-26)**, BARC, Mumbai, 20 - 23 December, **2017**, CP-04-43, P-57.
6. S. L. Meadley, **Umakanta Tripathy**, P. W. Wiseman, R. L. Leask, “Multiphoton Microscopy of Healthy and Aneurismal Human Ascending Aorta,” ASME, **Proceedings of Summer Bioengineering Conference**, 803-804 (**2009**).
7. **Umakanta Tripathy** and Prem B. Bisht, “Study of nonlinear optical parameters by solvent induced changes in the optical density”, **Proceedings of PHOTONICS 2004**, CUSAT, Cochin, Dec. 9-11, **2004**, nlo3.7.
8. **Umakanta Tripathy** and Prem B. Bisht, “Experimental and theoretical simulations on Z-scan profile under ps time scale”, **Proceedings of International Conference on Optoelectronics and Technology**, North Maharashtra University Jalgaon, Jan. 12-14, **2004**, pp. 30-35. [Received best paper award].
9. **Umakanta Tripathy** and Prem B. Bisht, “Evaluation of excited singlet state absorption cross sections by ps pulse transmission technique”, **Proceedings of National Laser Symposium**, IIT Kharagpur, Dec. 22-23, **2003**, pp. 441-442.
10. **Umakanta Tripathy** and Prem B. Bisht, “Simultaneous calculation of nonlinear absorption and refraction parameters by using a single closed-aperture Z-scan technique”, **Proceedings of PHOTONICS 2002**, TIFR Mumbai, Dec. 16-18, **2002**, NLOP28.

List of papers presented at various scientific conferences

1. Smita Manjari Panda, Kalpanarani Dash, Devi Prashanna Behera, Monalisa Mishra, Harekrushna Sahoo, and **Umakanta Tripathy**, “Withanolide A Mitigates Amylin Aggregation: A Multiscale Computational and Experimental Study”, National Workshop on Fluorescence

- and Raman Spectroscopy (FCS XVI) and Conference, SINP, Kolkata, 06-10 December **2025**, PP58.
2. Smita Manjari Panda, Nandeshwar, and ***Umakanta Tripathy***, “Computational Screening and Identifying Potent Inhibitors of BRCA1 Mutants: A Therapeutic Against Breast Cancer”, Interdisciplinary Approach in Chemical and Biological Sciences (IACBS-2025), IIT (ISM) Dhanbad, 01-02 December **2025**, P36. [Received Best Poster Award]
 3. Subodha Kumar Sahu, Tusar Kanti Rout, Priyadarshi Sahoo, Soumit Chatterjee, and ***Umakanta Tripathy***, “Linear and Nonlinear Photophysical Study of Bilirubin: Towards Optical Diagnostic Applications”, Interdisciplinary Approach in Chemical and Biological Sciences (IACBS-2025), IIT(ISM) Dhanbad, Jharkhand, 01-02 December, 2025, PC-15.
 4. Tusar Kanti Rout, Abhipsha Biswal, Nandeshwar Bharti, Subodh Kumar Sahu and ***Umakanta Tripathy***, “Drug candidates Targeting Tau Tubulin Kinase1 (TTBK1) in Tauopathy” Interdisciplinary Approach in Chemical and Biological Sciences (IACBS-2025), IIT (ISM) Dhanbad, Jharkhand, December 1-2, **2025**, PC-37.
 5. Subodha Kumar Sahu, Tusar Kanti Rout, Priyadarshi Sahoo, Soumit Chatterjee, and ***Umakanta Tripathy***, “Linear and Nonlinear Photophysical Study of Bilirubin: Towards Optical Diagnostic Applications”, Recent Advances and New Challenges in Physics (RANCP-2025), RIHS, Bhograi, Odisha, 5th – 6th September **2025**, OP-3.
 6. Tusar Kanti Rout, Smita Manjari Panda, Subodha Kumar Sahu and ***Umakanta Tripathy***, “Benzgalantamine as a Therapeutic Candidate Targeting Tau Tubulin Kinase1 (TTBK1) in Tauopathy”, National Seminar on Recent Advances and New Challenges in Physics (RANCP-2025), RIHS, Bhograi, Odisha, 5th -6th September **2025**, OP-1.
 7. Smita Manjari Panda, and ***Umakanta Tripathy***, “Withacoagulin as a Potential Therapeutic: Bridging Cancer Pathways by Targeting EGFR and BRCA1 Variant”, Physics for Sustainability: Health, Energy, and Environment (SPHERE), PCCP Symposium, IISc Bangalore, 16-18 October **2025**, P9.
 8. Smita Manjari Panda, and ***Umakanta Tripathy***, "Unveiling a Novel Inhibitor of EGFR Tyrosine Kinase: An In-Silico study", 47th Indian Biophysical Society Meeting (IBS2025), IIT Madras, 06-09 March **2025**, PP- 15. [Received Best Poster Award]
 9. Nandeshwar and ***Umakanta Tripathy***, “Diosgenin: A Potential Candidate for Inhibiting the Nucleation of Aggregation-prone Conformations of E46K α -Synuclein”, National Conference on Atomic and Molecular Physics (NCAMP 2025), Indian Institute of Technology (ISM) Dhanbad, 8-11 January, **2025**, T2P_009.

10. Mohd Mehkoom, Amit K. Pradhan, S. M. Afzal, Prasanta K. Datta, **Umakanta Tripathy**, “Third-order optical Nonlinearities of A Novel Schiff Base System With Thermal And Electronic Responses For Photonic Applications”, 1st International Conference on Emerging Trends in Optical Technologies (ETOT-I), SRM University AP, Amaravati India, 02-04 January, **2025**.
11. Mohd Mehkoom, **Umakanta Tripathy** “Ultrafast optical nonlinear quest in a carbazole-picric acid complex for photonic applications” Two Days National Workshop on Green Steel Production via Decarbonization for Sustainable and Circular Economy, IIT (ISM) Dhanbad, Dhanbad India, 16 – 17 December, **2024**, OP03.
12. Nandeshwar and **Umakanta Tripathy**, “Molecular Dynamics Simulations Reveal Inhibitory Effects On α -Synuclein Aggregation”, Optics Within Life Sciences (OWLS-17), Indian Institute of Technology Bombay Powai, Victor Menezes Convention Centre (VMCC), 18-21 November, **2024**, PC-78.
13. Mohd Mehkoom, **Umakanta Tripathy**, Amit K. Pradhan, Farman Ali, Prasanta K. Datta, “Femtosecond pulse intensity impact on optical nonlinearity of a carbazole-picric acid complex for photonic applications”, International Conference on Optics Within Life Sciences (OWLS-17), IIT Bombay, Mumbai India, 18-21 November, **2024**, P75.
14. Mohd Mehkoom, **Umakanta Tripathy**, “Thermally and Electronic -Kerr induced cubic nonlinearities in novel Schiff base system for photonic applications”, International Conference on Advances in Optics and Photonics Instrumentation (OPTOIn-2024), CSIR-CSIO Chandigarh Chandigarh India, 23-25 October, **2024**, LNO_40.
15. Nitesh Kumar Pathak, Amit Kumar Pradhan, Prasanta Kumar Datta and **Umakanta Tripathy**, “A comprehensive analysis of the linear and nonlinear response of serotonin by integrating experimental and in silico methods”, *International Conference On Advances In Spectroscopic Techniques And Materials (ASTM 2024)*, IIT(ISM) Dhanbad, January 18-20, **2024**, OL-16.
16. Priyadarshi Sahoo, Manika Dandapat, and **Umakanta Tripathy**, "Nonlinear photophysics of Polydopamine Nanoparticles (PDANPs): A bio-inspired polymer", *International Conference On Advances In Spectroscopic Techniques And Materials (ASTM 2024)*, IIT(ISM) Dhanbad, India, 18-20 January, 2024, PP-32.
17. Smita Manjari Panda, and **Umakanta Tripathy**, “Phytoconstituents of Withania Somnifera as multi-target inhibitors for the cancer-associated receptors: An in-silico investigation”, *International Conference On Advances In Spectroscopic Techniques And Materials (ASTM 2024)*, IIT (ISM), Dhanbad, 18-20 January 2024, PP-50.

18. Priyadarshi Sahoo, and **Umakanta Tripathy**, "Application of z-scan tool to investigate the nonlinear properties of myoglobin", *Physical Chemistry Symposium - 2023 (SoPhyC - 2023)*, IIT Kanpur, Kanpur, 29-31 October, 2023, CP-44.
19. Smita Manjari Panda, Nandeshwar and **Umakanta Tripathy**, "An in-silico approach to finding a potent inhibitor against mutated BRCA1", *Structure and Dynamics of Chemical and Biomolecular Systems (SDCBS23)*, IIT Kanpur, Kanpur, 26-28 October, **2023**, PC-9.
20. Nandeshwar, Janmejaya Rout, Smita Manjari Panda and **Umakanta Tripathy**, "Phytoconstituents of Ashwagandha as potential inhibitors of human islet amyloid polypeptide (hIAPP): An in-silico investigation", *Structure and Dynamics of Chemical and Biomolecular Systems (SDCBS23)*, IIT Kanpur, 26-28 October, **2023**, PC-7.
21. Nitesh Kumar Pathak, Amit Kumar Pradhan, Prasanta Kumar Datta and **Umakanta Tripathy**, "Swapping the sign of nonlinearity in epinephrine: a monoamine neurotransmitter", *Photonics*, J. N. TATA Auditorium, IISc Bengaluru, 5-8 July, **2023**, P198.
22. Nitesh Kumar Pathak and **Umakanta Tripathy**, "Nonlinear study of epinephrine under pulsed laser excitation", *15th National Symposium on Radiation & Photochemistry (NSRP-2023)*, Birla Institute of Technology & Science, Pilani, K K Birla Goa Campus, Goa, 5-7 January, **2023**, PC-46.
23. Priyadarshi Sahoo and **Umakanta Tripathy**, "Investigation of nonlinear properties of β -hematin using Z-Scan technique", *15th National Symposium on Radiation & Photochemistry (NSRP-2023)*, Birla Institute of Technology & Science, Pilani, K K Birla Goa Campus, Goa, 5-7 January, **2023**, PC-82.
24. Janmejaya Rout, Bikash Chandra Swain, Suchismita Subadini, Sakshi, Padmaja Prasad Mishra, Harekrushna Sahoo and **Umakanta Tripathy**, "Investigating the binding interaction between β -Lactoglobulin and Vitamin B12: A Spectroscopic and Computational approach", *65th Biophysical Society Annual Meeting 2021 (BPS2021)*, 22-26 February, **2021**, 995-Pos. [Biophysical Journal, volume 120, issue 3, supplement 1, page 205a, February 12, 2021. DOI: <https://doi.org/10.1016/j.bpj.2020.11.1399>].
25. Janmejaya Rout, Bikash Chandra Swain and **Umakanta Tripathy**, "Investigation of binding interaction of Vitamin B12 with Hemoglobin", *Trombay Symposium on Radiation & Photochemistry (TSRP)*, BARC, Mumbai, 5-9 January, **2020**, PC-070.
26. Nitesh Kumar Pathak, Sakshi, Bijayalaxmi Panda, and **Umakanta Tripathy**, "Nonlinear study of silver-coated fly ash/red mud composite (FA/RM-Ag) by Z-scan Technique", *National Symposium on Light - Matter Interactions (NSLIMI-2019)*, IIT Madras, 26 December, **2019**, NLO-9.

27. Sakshi, and **Umakanta Tripathy**, “Thermally-induced nonlinear property of Norepinephrine by a single closed-aperture (CA) Z-scan technique”, *National Symposium on Light - Matter Interactions (NSLIMI-2019)*, IIT Madras, 26 December, **2019**, NLO-6.
28. Bikash Chandra Swain, Janmejaya Rout, and **Umakanta Tripathy**, “Investigation of inhibition property of Vitamin B12 with β -Lactoglobulin Fibrils”, *National Symposium on Light - Matter Interactions (NSLIMI-2019)*, IIT Madras, 26 December, **2019**, SP-7.
29. Janmejaya Rout, Bikash Chandra Swain and **Umakanta Tripathy**, "Unveiling the interaction between Amyloid Beta (1-40) with Cuminaldehyde: A Molecular Dynamics Study", *National Symposium on Light-Matter Interactions (NSLIMI-2019)*, IIT, Madras, 26 December, **2019**, SP-5.
30. Bikash Chandra Swain, Janmejaya Rout, Padmaja P. Mishra, and **Umakanta Tripathy**, “Spectroscopic and computational investigation of the interaction of Vitamin B12 with Myoglobin”, *National workshop on fluorescence and Raman Spectroscopy (FCS-2019)*, TIFR, Hyderabad, 16-21 December, **2019**, P-9.
31. Sakshi and **Umakanta Tripathy**, “Nonlinear property of neurotransmitter dopamine probed by Z-scan technique”, *Seventh International conference on optical and photonics engineering (icOPEN-2019)*, Phuket, Thailand, 16 - 20 July, **2019**, PE0055.
32. Bikash Chandra Swain, Padmaja P. Mishra, Hirdyesh Mishra and **Umakanta Tripathy**, “Interaction Study of Serotonin and Silver Nanoparticles by Spectroscopic tools”, *13th National Symposium on Radiation and Photochemistry*, Visva-Bharati Santiniketan, West Bengal, 7 - 9 February, **2019**, PC-03.
33. Bikash Chandra Swain, Padmaja P. Mishra and **Umakanta Tripathy**, “Binding interaction Study of Lysozyme with 6-Mercaptopurine by Spectroscopic Tools”, *International Conference on Fiber Optics and Photonics*, IIT, Delhi, 12 - 15 December, **2018**, SP007.
34. Sakshi and **Umakanta Tripathy**, “Nonlinear Study of Serotonin by a Single Closed Aperture Z-Scan Technique”, *International Conference on Fiber Optics and Photonics*, IIT, Delhi, 12 - 15 December, **2018**, TP022.
35. Janmejaya Rout, Bikash Chandra Swain, Padmaja P. Mishra and **Umakanta Tripathy**, “Spectroscopic Investigation of Interaction between Dopamine and Gold nanoparticles”, *International Conference on Fiber Optics and Photonics*, IIT, Delhi, 12 - 15 December, **2018**, Session- G, TG1.
36. Janmejaya Rout and **Umakanta Tripathy**, “Study of Structural and Optical properties of Epinephrine by using Density Functional Theory”, *National workshop on fluorescence and Raman Spectroscopy (FCS-2018)*, JNU and IIT, Delhi, 12 - 17 November, **2018**, P-42.
37. Bikash Chandra Swain, Padmaja P. Mishra and **Umakanta Tripathy**, “Interaction of β -Lactoglobulin with Vitamin B12: A Biophysical Study”, *National workshop on fluorescence and Raman Spectroscopy (FCS-2018)*, JNU and IIT, Delhi, 12 - 17 November, **2018**, P-25.

38. Janmejaya Rout and **Umakanta Tripathy**, “Structural and Optical properties of a monoamine Neurotransmitter: A DFT Study”, *Evolution of Electronic Structure Theory and Experimental Realisation (EESTER)*, SRM Institute of Science and Technology and IIT, Madras, 11 - 15 September, **2018**, P-093.
39. Sakshi and **Umakanta Tripathy**, “Nonlinearity study of Curcumin by Z-scan technique”, *26th DAE-BRNS National Laser Symposium (NLS-26)*, BARC, Mumbai, 20 - 23 December, **2017**, CP-04-43, P-57.
40. Bikash Chandra Swain and **Umakanta Tripathy**, “Interaction of fluorescent carbon dots with Bovine Serum Albumin (BSA)”, *FCS 2017, National workshop on fluorescence and Raman techniques*, IIT Guwahati, 17 - 21 December, **2017**, P023, P-66.
41. Bikash Chandra Swain and **Umakanta Tripathy**, “Interaction study of Serotonin with Silver nanoparticles by using Fluorescence Spectroscopy”, *4th International conference on Nanoscience and nanotechnology (ICONN-2017)*, SRM University, Kattankulathur, Chennai, 9 - 11 August, **2017**, P-204-205.
42. Bikash Chandra Swain and **Umakanta Tripathy**, “Study of Biophysical Parameters Under Physiological Conditions”, *National conference on liquid crystals (NCLC)*, IIT(ISM) Dhanbad, 7 - 9 December, **2016**, P-58.
43. Sakshi Choudhary and **Umakanta Tripathy**, “Estimation of Effective Pixel Size in Image Correlation Spectroscopy”, *National conference on liquid crystals (NCLC)*, IIT(ISM) Dhanbad, 7 - 9 December, **2016**, P-60.
44. Sakshi Choudhary and **Umakanta Tripathy**, “Aggregation state study by Image Correlation Spectroscopy”, *IONS, International OSA Network of Students*, IIT(ISM) Dhanbad, 7 - 10 September, **2016**, IONS-DHN/2K16/122.
45. Bikash Chandra Swain and **Umakanta Tripathy**, “Fluorescence Correlation Spectroscopy: An innovative tool for single molecule study”, *IONS, International OSA Network of Students*, IIT(ISM) Dhanbad, 7 - 10 September, **2016**, IONS-DHN/2K16/104.
46. **Umakanta Tripathy**, Parul Sood, Sandhya Koushika, and Sudipta Maiti, “Label-free imaging of Serotonin in live *C. elegans*”, *Optics Within Life Sciences (OWLS) 2016*, Tata Institute of Fundamental Research (TIFR) & Indian Institute of Technology (IIT) Bombay, Mumbai, March 16 – 19, IL91 (BIC) **2016**.
47. Rucha Pandit, Anand Kant Das, **Umakanta Tripathy**, and Sudipta Maiti, “Measuring intravesicular serotonin concentration changes by ratiometric intrinsic fluorescence imaging”, *FCS 2014, National workshop on fluorescence and Raman techniques*, IISER, Pune, Maharashtra, India, December 15 - 19, **2014**, P-13.
48. Bidyut Sarkar, Arkarup Banerjee, Anand Kant Das, Suman Nag, Sanjeev Kumar Kaushalya, **Umakanta Tripathy**, Mohammed Shameem, Shubha Shukla, and Sudipta Maiti, “Label-free dopamine imaging using two-photon ultraviolet microscopy”, *6th Special Conference of the*

International Society of Neurochemistry (INS), Tokyo, Japan, September 20 - 22, **2014**, PS5-06.

49. **Umakanta Tripathy**, Ananya Rakshit, Rucha Pandit, Anand Kant Das, Bidyut Sarkar, Parul Sood, Sandhya Kaushika, and Sudipta Maiti, “Label free imaging of neurotransmitters *in vivo*”, *Biophysics Paschim 2014*, Indian Institute of Science Education and Research (IISER) Pune, Maharashtra, India, March 1, **2014**.
50. Ananya Rakshit, Anand Kant Das, **Umakanta Tripathy**, and Sudipta Maiti, “In vivo monoamine imaging in live Zebrafish”, *FCS 2013, National fluorescence workshop, Fluorescence methods in single molecule spectroscopy*, Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India, November 24 - 28, **2013**, P-67.
51. **Umakanta Tripathy**, Amir K. Miri, Luc Mongeau, and Paul W. Wiseman, “Nonlinear imaging of human and porcine vocal fold tissues”, *Neurophysics Annual Meeting 2012*, La Forêt Montmorency, Quebec, Canada, June 14 - 15, **2012**.
52. Nageswara R. Ghattamaneni, **Umakanta Tripathy**, Jean-Francois Desjardins, Sonia Ines Edaye, Elias Georges, and Paul W. Wiseman, “Microfluidic and Nonlinear Optical device for Malaria Detection”, *Photonics North 2012*, Hilton Montreal Bonaventure, Montreal, Canada, June 6 - 8, **2012**, 87, BIO-MED-6-P-4. [Received best poster award]
53. Amir K. Miri, **Umakanta Tripathy**, Hossein K. Heris, Luc Mongeau and Paul W. Wiseman, “Structural Characterization of Porcine Vocal Folds using Multi-photon Microscopy”, *4th International Conference on the Mechanics of Biomaterials and Tissues 2011*, Marriott Waikoloa Beach Resort and Spa, Hawaii, USA, December 11 - 15, **2011**.
54. Amir K. Miri, **Umakanta Tripathy**, Luc Mongeau and Paul W. Wiseman, “Structural characterization of vocal fold tissues using multi-photon microscopy”, *9th Pan European Voice Conference 2011*, Marceille, France, August 31 - September 3, **2011**.
55. **Umakanta Tripathy**, Stacey L. Meadley, Richard L. Leask, and Paul W. Wiseman, “THG, SHG and TP imaging of biological samples by Nonlinear laser scanning Microscopy”, *Neurophysics Annual Meeting 2011*, La Forêt Montmorency, Quebec, Canada, June 16 - 17, **2011**.
56. Jędrzej Szmytkowski, Sophie M.K. Brunet, **Umakanta Tripathy**, Jaclyn A. O’Brien, Matthew F. Paige and Ronald P. Steer, “Influence of Halides on the fluorescence Quenching in ZnTPPS⁴⁻ aqueous solution”, *Proceedings of CSC, 94th Canadian Chemistry Conference and Exhibition 2011*, Montreal, QC, Canada, June 5 - 9, **2011**, 2067, PTpos.
57. **Umakanta Tripathy**, and Paul W. Wiseman, “Third harmonic generation (THG) imaging of hemozins: Effect of wavelength, power and polarization”, *Neurophysics Annual Meeting 2010*, La Forêt Montmorency, Quebec, Canada, June 3 - 4, **2010**.
58. Stacey L. Meadley, **Umakanta Tripathy**, Paul W. Wiseman and Richard L. Leask, “Multiphoton microscopy of healthy and aneurismal human ascending aorta”, *Proceedings of*

ASME Summer Bioengineering Conference 2009, Resort at Squaw Creek, Lake Tahoe, CA, USA, June 17 - 21, **2009**, 29, MS37. Paper No. SBC2009-206152, pp. 803-804. [**Secured 3rd place in the student paper competition award**].

59. Ronald P. Steer, Xia Liu, Sunish K. Sugunan, **Umakanta Tripathy**, Matthew F. Paige, “Fast upper singlet state relaxation in metalloporphyrins: implications for NIR solar energy harvesting”, *Proceedings of CSC, 92nd Canadian Chemistry Conference and Exhibition 2009*, Hamilton, ON, Canada, May 30 - June 3, **2009**, 745, PT13.
60. Ronald P. Steer, Xia Liu, **Umakanta Tripathy** and Dorota Kowalska, “Upper Singlet State Dynamics of Metalloporphyrins”, *Proceedings of CSC, 91st Canadian Chemistry Conference and Exhibition 2008*, Edmonton, AB, Canada, May 24 - 28, **2008**, 1121, PT7.
61. **Umakanta Tripathy**, Xia Liu and Ronald P. Steer, “Photophysics of Soret-Excited Corroles in Solution”, *Proceedings of CSC, 91st Canadian Chemistry Conference and Exhibition 2008*, Edmonton, AB, Canada, May 24 - 28, **2008**, 1137, PTP.
62. Sunish K. Sugunan, **Umakanta Tripathy**, Matthew F. Paige and Ronald P. Steer, “Low Power Fluorescence Upconversion in a Zinc metalloporphyrin via triplet- triplet annihilation”, *Proceedings of CSC, 91st Canadian Chemistry Conference and Exhibition 2008*, Edmonton, AB, Canada, May 24 - 28, **2008**, 1139, PTP.
63. Xia Liu, **Umakanta Tripathy** and Ronald P. Steer, “Effect of substitutions on the photophysics of Soret-excited states of Metalloporphyrins”, *Proceedings of CSC, 91st Canadian Chemistry Conference and Exhibition 2008*, Edmonton, AB, Canada, May 24 - 28, **2008**, 1141, PTP. [**Winner of student poster competition**].
64. Ronald P. Steer, Dorota Kowalska, Xia Liu, **Umakanta Tripathy** and Suresh Velate, “Photophysics of Soret-Excited Metalloporphyrins”, *Proceedings of CSC, 90th Canadian Chemistry Conference and Exhibition 2007*, Winnipeg Convention Centre, Manitoba, Canada, May 26 - 30, **2007**, 488, IN4.
65. **Umakanta Tripathy** and Prem B. Bisht, “Study of nonlinear optical parameters by solvent induced changes in the optical density”, *Proceedings of PHOTONICS 2004*, CUSAT, Cochin, Dec. 9 - 11, **2004**, nlo3.7.
66. **Umakanta Tripathy** and Prem B. Bisht, “Separation of contributions of optical and thermal nonlinearity by ps and cw Z-scan measurements”, *Proceedings of 59th International Symposium on Molecular Spectroscopy*, Ohio State University Columbus, Ohio, USA, June 21 - 25, **2004**, pp. 229 (RG02).
67. **Umakanta Tripathy** and Prem B. Bisht, “Experimental and theoretical simulations on Z-scan profile under ps time scale”, *Proceedings of International Conference on Optoelectronics and Technology*, North Maharashtra University Jalgaon, Jan. 12 - 14, **2004**, pp. 30-35. [**Received best paper award**].

68. **Umakanta Tripathy** and Prem B. Bisht, “Energy transfer efficiency of dipole-dipole interaction in a dye pair in polymer medium”, *Proceedings of Trombay Symposium on Radiation and Photochemistry*, BARC Mumbai, Jan. 8 - 12, **2004**, pp. 149-150. [**Received best poster award**].
69. **Umakanta Tripathy** and Prem B. Bisht, “Evaluation of excited singlet state absorption cross sections by ps pulse transmission technique”, *Proceedings of National Laser Symposium*, IIT Kharagpur, Dec. 22 - 23, **2003**, pp. 441-442.
70. **Umakanta Tripathy**, Prem B. Bisht and A. Subrahmanyam, “Energy and wavelength dependence of pico second laser pumped Z-scan profiles”, *National Symposium on Mathematical Methods and Applications*, IIT Madras, Dec. 21, **2002**, pp. 30-31.
71. **Umakanta Tripathy** and Prem B. Bisht, “Simultaneous calculation of nonlinear absorption and refraction parameters by using a single closed-aperture Z-scan technique”, *Proceedings of PHOTONICS 2002*, TIFR Mumbai, Dec. 16 - 18, **2002**, NLOP28.
72. **Umakanta Tripathy**, R. Justin Rajesh, Prem B. Bisht and A. Subrahmanyam, “Optical nonlinearity of organic dyes as studied by Z-scan and transient grating techniques”, *Proceedings of Third Asian Photochemistry Conference (APC-3)*, BARC Mumbai, Jan. 6 - 11, **2002**, pp. 157.
73. **Umakanta Tripathy**, Prem B. Bisht and A. Subrahmanyam, “Calculations on excited state absorption cross section of laser dyes”, *National Symposium on Mathematical Methods and Applications*, IIT Madras, Dec. 22, **2001**, pp. 14-15.

INVITED TALKS

1. **Umakanta Tripathy**, “Inhibition of hIAPP Aggregation by Natural Molecules: Integrated In-Silico, In-Vivo, and Multi-Spectroscopic Approach”, National workshop of fluorescence, and Raman spectroscopy (FCS XVI), A workshop-cum international conference, SINP, Kolkata, West Bengal, 6th – 10th December **2025**.
2. **Umakanta Tripathy**, “Sensing heme proteins in real time through the Z-scan technique”, International Workshop on Lasers and Z-scan Experiments (LAZE-2025), Bharathidasan University, Tiruchirappalli, Tamil Nadu, 5th – 6th December **2025**.
3. **Umakanta Tripathy**, “Z-scan as a novel tool to sense heme proteins in real time”, National Seminar on Recent Advances and New Challenges in Physics (RANCP-2025), RIHS, Bhograi, Odisha, 5th – 6th September **2025**.
4. **Umakanta Tripathy**, “Z-scan as a Biomolecular Sensor for Disease Diagnosis”, Refresher Course on Physics, MMTTC, IIT(ISM), Dhanbad, Jharkhand, 1st – 12th August **2025**.
5. **Umakanta Tripathy**, “Phytoconstituents of Natural Products as Potent Inhibitors of Mutated Proteins: An In Silico Study”, Refresher Course on Physics, MMTTC, IIT(ISM), Dhanbad, Jharkhand, 1st – 12th August **2025**.

6. ***Umakanta Tripathy***, “Sensing biomolecules for disease diagnosis through a novel optical device”, 1st International Conference on Emerging Trends in Optical Technologies (ETOT-I), SRM University, Amaravati, Andhra Pradesh, 2nd – 4th January **2025**.
7. ***Umakanta Tripathy***, “Introducing a novel optical device to study protein aggregation in real-time”, International Conference on Optics Within Life Sciences (OWLS-2024), Indian Institute of Technology Bombay (IITB), Mumbai, Maharashtra, 18th – 21th November **2024**.
8. ***Umakanta Tripathy***, “Presenting A Nonlinear Switch To Identify The Toxic Species In Parkinson’s Disease”, International Conference on Smart Materials for Sustainable Technology (SMST-2024) Institute of Nano Science and Technology (INST), Mohali, Punjab, 24th – 27th October **2024**.
9. ***Umakanta Tripathy***, “Nonlinear Magic in Soft Matter Physics”, Refresher Course on Advanced Concepts in Biophysics and Soft Matter: Foundations and Frontiers, IIT (ISM) Dhanbad, Jharkhand, 18th – 29th October **2024**.
10. ***Umakanta Tripathy***, “Phytoconstituents of Ashwagandha as potent inhibitors of BRCA1 Mutants: A Therapeutic against Breast Cancer”, Refresher Course on Advanced Concepts in Biophysics and Soft Matter: Foundations and Frontiers, IIT (ISM) Dhanbad, Jharkhand, 18th – 29th October **2024**.
11. ***Umakanta Tripathy***, “A Potential Therapeutic Against Breast Cancer From Natural Resources”, International Conference on Recent Developments in Functional Materials for Sustainable Applications (RDFMSA-2024), GIET University, Gunupur, Odisha, 20th – 21st April **2024**.
12. ***Umakanta Tripathy***, “A Novel Approach For Disease Diagnosis Through Nonlinear Magic”, National Conference on Recent Trends in Chemical Sciences (RETICS-2024), Sambalpur University, Sambalpur, Odisha, 1st – 3rd March **2024**.
13. ***Umakanta Tripathy***, “Applications of Nonlinear Optics in Biophysics”, Dept. of Physics, Mahila Maha Vidyalaya (MMV), BHU, Varanasi, Uttar Pradesh, 3rd February **2024**.
14. ***Umakanta Tripathy***, “Withania somnifera as a potent inhibitor of mutant BRCA1: A therapeutic against breast cancer”, International Conference on Translational Materials for Sustainable Research (TransMat 2k24), Dept. of Physics, IIT(BHU) Varanasi, Uttar Pradesh, 1st – 4th February **2024**.
15. ***Umakanta Tripathy***, “Applications of the Z-scan Technique in Soft Condensed Matter Physics”, One Week Training Programme on Synthesis and Characterization of Nanomaterials for Energy, Lighting & Bio-imaging Applications under STUTI, IIT(ISM) Dhanbad, Jharkhand, 7th – 13th November **2022**.
16. ***Umakanta Tripathy***, “Z-scan Technique: A Novel Tool for Biomedical Applications”, National Workshop on Lasers and Z-scan Experiments (LAZE-2022), Bharathidasan University, Tiruchirappalli, Tamil Nadu, 26th – 27th August **2022**.

17. **Umakanta Tripathy**, “Interaction Between Spice Molecules and SARS-Cov-2 Proteins: A Computational Study”, 38th Annual Convention of Odisha Physical Society and National seminar on Physics in sustainable development, GIET University, Gunupur, Odisha, 4th -5th June **2022**.
18. **Umakanta Tripathy**, “Spice molecules: Potential inhibitors of SARS-CoV-2”, One Day Seminar, Baghmara College, Baghmara, Jharkhand, 26th March **2022**.
19. **Umakanta Tripathy**, “Parkinson’s disease Pathology: Introducing a novel optical device for diagnostics”, National Science Day, GIET University, Gunupur, Odisha, 28th February **2022**.
20. **Umakanta Tripathy**, “A novel drug for covid19: an In Silico Investigation”, A Physics Refresher Course with special focus on Material Science and Biophysics under TEQIP-III, IIT(ISM) Dhanbad, 8 - 20 February **2021**.
21. **Umakanta Tripathy**, “A novel tool to study the aggregation kinetics of Alpha-Synuclein Protein”, One day national E-conference on Recent Progress in Physical Sciences, Department of Physics, Tarakeswar Degree College, West Bengal, 31 August **2020**.
22. **Umakanta Tripathy**, “A novel tool to help gain deeper insight into Parkinson’s disease”, Webinar by Society of Physics, Department of Physics, IIT(ISM) Dhanbad, 09 July **2020**.
23. **Umakanta Tripathy**, “An Overview of Nonlinear Optical Tools in Neurodegenerative Diseases”, Science Seminar, NAC Nayagarh, 12 – 13 February **2020**.
24. **Umakanta Tripathy**, “Nonlinear Magic with Monoamine Neurotransmitters”, National Symposium on light-matter interactions, IIT Madras, 26 December **2019**.
25. **Umakanta Tripathy**, “Pros and Cons in Power Point Presentation”, Induction Training / Orientation Programme for teachers, IIT(ISM) Dhanbad, 15 November – 12 December **2019**.
26. **Umakanta Tripathy**, “Nonlinear Techniques in Biomaterials”, Faculty development programme on design and development of materials for technological applications, VSSUT Burla, 21 - 26 October **2019**.
27. **Umakanta Tripathy**, “Fundamentals and Applications of Spectroscopic Tools”, Faculty development programme on design and development of materials for technological applications, VSSUT Burla, 21 - 26 October **2019**.
28. **Umakanta Tripathy**, “Nonlinear Techniques in Biophotonics”, Refresher programme in Physics (Biophotonics) for teachers, IIT(ISM) Dhanbad, 29 May – 18 June **2018**.
29. **Umakanta Tripathy**, “Art of Slide Presentation”, National Training programme on Research Methodology for research scholars, IIT(ISM) Dhanbad, 18 – 23 December **2017**.
30. **Umakanta Tripathy**, “Sensitive detection of malaria infection by using nonlinear imaging”, 22nd Biennial Indian Photobiology Society (IPS) Conference on Biomolecular Dynamics- Experimental and Theoretical Perspectives (BDETP-2017), NIT Rourkela, 18 - 20 December **2017**, IL2, P-19.

31. ***Umakanta Tripathy***, “Nonlinear Laser Scanning Microscopy (NLSM) for Bio-imaging”, Refresher programme in Physics (Nano-Biotechnology) for teachers, IIT(ISM) Dhanbad, 25 May – 14 June **2017**.
32. ***Umakanta Tripathy***, “Origin of Maxwell’s equations and its magic in linear media”, Refresher programme in recent trends on microwave components and Antennas for teachers, IIT(ISM) Dhanbad, 26 December **2016** – 15 January **2017**.
33. ***Umakanta Tripathy***, “An Innovative Tool For Disease Diagnosis”, Orientation Programme for teachers, IIT(ISM) Dhanbad, 9 – 29 February **2016**.