

Dr. Palas Roy

Department of Chemistry, Indian Institute of Technology Bhubaneswar, Argul 752050, Odisha, India

Contact: +917477680691, palasroy@iitbbs.ac.in, palas.1989@gmail.com

RESEARCH EXPERIENCE

- 2023-Till date **Assistant Professor**, IIT Bhubaneswar (IITBBS), Odisha, India
Research Area: “*Photodynamics of Optoelectronic Molecules and Materials*”
- 2019-2023 **Senior Research Associate**, University of East Anglia (UEA), Norwich, UK
Project: “*Ultrafast Dynamics of Molecular Dimers and Photoswitches*”
Supervisor: Prof. Steve Meech, UEA, Norwich
- 2018-2019 **Postdoctoral Research Fellow**, Northwestern University (NU), Illinois, US
Project: “*Unraveling Vibronic Coupling driving Ultrafast Generation of Polarons*”
Supervisor: Prof. Elad Harel, NU, Illinois
- 2011-2017 **PhD Chemistry**, Tata Institute of Fundamental Research (TIFR), Mumbai, India
Dissertation: “*Probing the Fate of Excitons in Organic Semiconductors*”
Supervisor: Dr. Jyotishman Dasgupta, TIFR, Mumbai
Thesis External: Prof James Durrant, Imperial College, London

RESEARCH INTERESTS

Developing advanced time-resolved electronic and vibrational spectroscopy
Photodynamics of emerging materials for energy and photobiology
Novel ways to enhance efficiency of photomaterials

EDUCATION

- 2009-2011 **MSc Physical Chemistry**, Indian Institute of Technology- Kharagpur, India, CGPA 8.32
- 2006-2009 **BSc Chemistry (Honours)**, Physics and Mathematics, University of Kalyani, India
Marks 73%, University topper

GRANT WRITING EXPERIENCE

- 2025 *ANRF* Grant for Organizing International Conference on ‘*Advanced Materials for Energy, Environment & Sustainability 2025*’ (*AMEES 2025*) at IITBBS during 16-18th May, 2025; Value: INR 2.0 Lakhs
- 2025 *Prime Minister Early Career Research Grant* by *ANRF*; Project: ‘Resolving the Role of Environment in Thermally Activated Delayed Fluorescence’; Value: INR 71.94 Lakhs
- 2023 *Seed Grant* by IITBBS; Project: ‘Harvesting Singlet Fission-borne Triplets through Electron Transfer at the Acene:Perovskite Interface’; Value: INR 25.95 Lakhs
- 2016 *Travel Grant* by Royal Society of Chemistry (RSC) for attending international conference on Hybrid and Organic Photovoltaics-2016 (HOPV-16), Swansea, UK.

HONOURS & AWARDS

- 2025 Research artwork selected for Inside Back Cover, Chemical Science Journal.
- 2025-till date *Mentor*, BIS Chemistry Student Chapter
- 2025 Invited *talk*, AOSC 2025, Goa, India.
- 2025 Invited *talk*, NSRP 2025, NISER Bhubaneswar, India.
- 2024 Invited *talk*, First Materials Chemistry Symposium2024, ICT-IOC Bhubaneswar, India.
- 2023 Invited *Hot-topic talk*, International Conference on Molecular Energy Transfer in Complex Systems, Jaipur, India.
- 2023 Invited *talk*, Kaleidoscope: A Discussion Meeting in Chemistry, Udaipur, India.
- 2023 Selected for *Oral presentation*, International conference on TRVS, The Netherlands.
- 2022 Selected for *Oral presentation*, International conference on ICORSXXVII, Rome.
- 2021 *Special Merit in Research Award*, University of East Anglia, UK
(<https://sites.google.com/view/2021researchersummit/special-merit-winners>).
- 2019 *Best PhD Thesis*, Department of Chemical Sciences (DCS), TIFR, India.

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- 2018 *IUPAC-Solvay International Award for Young Chemists*, One of the five winners worldwide for my PhD thesis at TIFR, India (<https://iupac.org/winners-2018-iupac-solvay-international-award-young-chemists/>).
- 2016 *Best Poster Prize*, Annual Meeting of Department of Chemical Sciences (DCS), TIFR, India (judged by Prof. Martin Gruebele, University of Illinois-Urbana Champaign).
- 2016 Selected for *Oral presentation*, International conference on HOPV16, Swansea, UK.
- 2016 *Invited talk*, Recent Advances in Optical Sciences-II conference, University of Hyderabad, India.
- 2014 *1-year membership award* by Royal Society of Chemistry for winning TIFR-DCS logo contest.
- 2012 *Rank- JRF 57*, 'National Eligibility Test' Research Fellowship in Chemical Sciences, India.
- 2011 *Rank-9*, 'Graduate Aptitude test in Engineering' in Chemistry, India.
- 2009 *University Gold Medal, First class First* in BSc Chemistry (Hons), University of Kalyani, India.
- 2008 *Medal & Certificate of Merit In Memory of Prof. D.N. Roy*, University of Kalyani, India.
- 2008 *Medal & Certificate of Merit for Excellence in Chemistry Hons.*, University of Kalyani, India.
- 2008 *Medal & Certificate of Merit In Memory of Prof. Khagendra Chandra Karmakar*, University of Kalyani, India.

TEACHING EXPERIENCE

MSc Spring 2023-25	<i>Group Theory and Spectroscopy (CY5L008)</i>
MSc Autumn 2024-25	<i>Application of Fluorescence Spectroscopy (CY7L017)</i>
ITEP Autumn 2024	<i>Thermodynamics and Colligative Properties (CY2L301)</i>
ITEP Spring 2025-26	<i>Chemical Equilibrium & Electrochemistry (CY2L304)</i>
BTech Spring 2023-25	<i>Chemistry (Physical) (CY1L001, CY1L002)</i>
BTech Autumn 2023-24	<i>Chemistry Laboratory (CY1P001)</i>

PUBLICATIONS

(*Most significant publications; #equal contribution; @corresponding author)

After Joining IITBBS:

1. Sushree Suhani Puhan, Laxmipriya Dash and **Palas Roy**@; "Hydrogen-Bonding Environment Suppresses Thermally Activated Delayed Fluorescence" *Chem. Sci.* (2025 *Just Accepted*) DOI: 10.1039/D5SC05548B
2. **Palas Roy**, Andy S. Sardjan, Wojciech Danowski, Wesley R. Browne, Ben. L. Feringa@ and Stephen R. Meech@; "Substituent effects on first generation photochemical molecular motors probed by femtosecond stimulated Raman" *J. Chem. Phys.* 161, 074504 (2024) DOI: 10.1063/5.0216442
- *3. **Palas Roy**, Andy S. Sardjan, Wesley R. Browne, Ben. L. Feringa@ and Stephen R. Meech@; "Excited State Dynamics in Unidirectional Photochemical Molecular Motors" *J. Am. Chem. Soc.* 146, 18, 12255 (2024) DOI: 10.1021/jacs.4c01019
- *4. **Palas Roy**, # Andy S. Sardjan, # Wojciech Danowski, Wesley R. Browne, Ben. L. Feringa@ and Stephen R. Meech@; "Control of Photoconversion Yield in Unidirectional Photomolecular Motors by Push-Pull Substituents" *J. Am. Chem. Soc.* 145, 36, 19849 (2023) DOI: 10.1021/jacs.3c06070 (#equal contribution)
- *5. **Palas Roy**, Wesley R. Browne, Ben. L. Feringa@ and Stephen R. Meech@; "Ultrafast Motion in a Third Generation Photomolecular Motor" *Nat. Commun.* 14, 1253 (2023) DOI: 10.1038/s41467-023-36777-6 (Editors' Highlight)
6. Kiri Addison, **Palas Roy**, Giovanni Bressan, Karolina Skudaite, Josh Robb, Philip B. C. Page, Eleanor K. Ashworth, James N. Bull and Stephen R. Meech@; "Photophysics of the Red-form Kaede Chromophore" *Chemical Science*, 14, 3763 (2023) DOI: 10.1039/D3SC00368J

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Before Joining IITBBS:

7. Pragya Verma, Mariusz Tasior, **Palas Roy**, Stephen R. Meech[@], Daniel T. Gryko, and Eric Vauthey[@]; “Excited-state Symmetry Breaking in Quadrupolar Pull-push-pull Molecules: Dicyanovinyl vs. Cyanophenyl Acceptors” *Phys. Chem. Chem. Phys.* (2023 Advance Article) DOI: 10.1039/D3CP02810K
- *8. **Palas Roy**, Faisal Al-Kahtani, Andrew N. Cammidge, and Stephen R. Meech[@]; “Solvent Tuning Excited State Structural Dynamics in a Novel Bianthryl”, *J. Phys. Chem. Lett.* 14, 253 (2023) DOI: 10.1021/acs.jpcclett.2c03469
9. **Palas Roy**, Gokul T. Anandan, Nagaraj Nayak, Anil Kumar, and Jyotishman Dasgupta[@]; “Raman Snapshots of Side-Chain Dependent Polaron Dynamics in PolyThiophene Films” *J. Phys. Chem. B* 127, 567 (2023). DOI: 10.1021/acs.jpccb.2c06185
10. Giovanni Bressan, Michael Jirasek, **Palas Roy**, Harry Anderson, Stephen R. Meech[@] and Ismael Heisler[@]; “Population and Coherence Dynamics in Large Conjugated Porphyrin Nanorings”, *Chem. Sci.* 13, 9624 (2022). DOI: 10.1039/D2SC01971J
- *11. **Palas Roy**, Andy S. Sardjan, Arjen Cnossen, Wesley R. Browne, Ben. L. Feringa[@] and Stephen R. Meech[@]; “Excited State Structure Correlates with Efficient Photoconversion in Unidirectional Motors” *J. Phys. Chem. Lett.* 12, 3367 (2021). DOI: 10.1021/acs.jpcclett.1c00710
- *12. **Palas Roy**, Giovanni Bressan, Jacob Gretton, Andrew N. Cammidge, and Stephen R. Meech[@]; “Ultrafast Excimer Formation and Solvent Controlled Symmetry Breaking Charge Separation in the Excitonically Coupled Subphthalocyanine Dimer” *Angew. Chem. Int. Ed.* 60, 10568 (2021). DOI: 10.1002/anie.202101572
13. **Palas Roy**, Andy S. Sardjan, Wojciech Danowski, Wesley R. Browne, Ben. L. Feringa[@] and Stephen R. Meech[@]; “Photophysics of First-Generation Photomolecular Motors: Resolving Roles of Temperature, Friction, and Medium Polarity” *J. Phys. Chem. A.* 125, 1711 (2021). DOI: 10.1021/acs.jpca.0c11050
14. **Palas Roy**[@] “Hot-carriers in Organic Photovoltaics” *Pure Appl. Chem.* 93, 223 (2021). DOI: 10.1515/pac-2020-1001 (Invited article)
15. Dale Green, **Palas Roy**, Christopher R. Hall, James N. Iuliano, Garth A. Jones, Andras Lukacs, Peter J. Tonge and Stephen R. Meech[@]; “Excited State Resonance Raman of Flavin Mononucleotide: Comparison of Theory and Experiment” *J. Phys. Chem. A.* 125, 6171 (2021). DOI: 10.1021/acs.jpca.1c04063
16. **Palas Roy**[@], and Jyotishman Dasgupta; “Temporal Probing of Excitons in Organic Semiconductors” *Pure Appl. Chem.* 92, 707 (2020). DOI:10.1515/pac-2018-1230 (Invited article)
17. Andy S. Sardjan, **Palas Roy**, Giovanni Bressan, Laura Comprido, Wesley R. Browne, Ben. L. Feringa[@] and Stephen R. Meech[@]; “Ultrafast Excited State Dynamics in a First Generation Photomolecular Motor” *ChemPhysChem* 21, 594 (2020). DOI: 10.1002/cphc.201901179 (Journal Cover Feature)
18. Shawn Irgen-Gioro, **Palas Roy**, Suyog Padgaonkar, and Elad Harel[@]; “Low Energy Excited State Vibrations Revealed in Conjugated Co-Polymer PCDTBT” *J. Chem. Phys.* 152, 044201 (2020). DOI:10.1063/1.5132299
- *19. KC Krishnapriya[‡], **Palas Roy**[‡], Ulrike Salzner, Jyotishman Dasgupta[@] and Satish Patil[@]; “Spin Density Encodes Intramolecular Singlet Fission in Pentacene Dimers” *Nat. Commun.* 10, 1 (2019). DOI: 10.1038/s41467-018-07736-3 (equal contribution)

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20. **Palas Roy**, Shreetama Karmakar, and Jyotishman Dasgupta[@]; “Femtosecond Stimulated Raman Spectroscopy” Book Chapter-9 in “Molecular and Laser Spectroscopy: Advances and Applications” by Prof. V. P. Gupta, *Elsevier* 193-215 (2018). DOI:10.1016/B978-0-12-849883-5.00009-7
- *21. **Palas Roy**, Ajay Jha, Vineeth B. Yasarapudi, Thulasi Ram, Boregowda Puttaraju, Satish Patil and Jyotishman Dasgupta[@]; “Ultrafast bridge planarization in donor- π -acceptor copolymers drives intramolecular charge transfer” *Nat. Commun.* 8, 1 (2017). DOI: 10.1038/s41467-017-01928-z
22. Melby Johny, K. Vijayalakshmi, Ankita Das, **Palas Roy**, Aseem Mishra and Jyotishman Dasgupta[@]; “Modulating Phe-Phe dipeptide aggregation landscape by covalent attachment of an Azobenzene photoswitch” *Chem. Commun.* 53, 9348 (2017). DOI: 10.1039/C7CC04106C
23. Tushita Mukhopadhyay, Boregowda Puttaraju, **Palas Roy**, Jyotishman Dasgupta, Andreas Meyer, Alexander Rudnick, Steffen Tscheuschner, Frank-Julian Kahle, Anna Köhler, and Satish Patil[@]; “Facile Synthesis and Chain-length Dependent Optical and Structural Properties of Diketopyrrolopyrrole-based Oligomers” *Chem. Eur. J.* 23, 13718 (2017). DOI: 10.1002/chem.201702131
- *24. **Palas Roy**, Ajay Jha, and Jyotishman Dasgupta[@]; “Photoinduced Charge Generation Rates in Soluble P3HT:PCBM Nano-aggregates Predict the Solvent-dependent Film Morphology” *Nanoscale* 8, 2768 (2016). DOI: 10.1039/C5NR06445G

Selected Manuscripts under preparation

1. **Palas Roy**, Lucas Muriarte, Michel Silwa[@] and Stephen R. Meech[@]; “Ultrafast Raman Snapshot of the Photoconvertible Fluorescent Proteins”
2. **Palas Roy**, Srikant Kumar Sethi, Nita Ghosh, Tushita Mukhopadhyay, Boregowda Puttaraju, Satish Patil, [@] and Jyotishman Dasgupta [@]; “Singlet Exciton Fission in Diketopyrrolopyrrole Nanoparticles”.
3. Gokul T. Anandan, **Palas Roy**, Anil Kumar and Jyotishman Dasgupta[@]; “Stimulated Raman Captures Distinct Polaron Signatures of Pristine and Blended Polythiophenes:PCBM Film”

MENTORING EXPERIENCE

PhD: Sushree Suhani Puan (July2024-till date), Shubhendu Sekhar Patra (Dec2024-till date), Satyasmita Swain (Jul2025-till date)

MSc: Allisha Panigrahi (2025-26), Pushkar Suman (2025-26), Rittik Das (2024-25), Kaibalya Moharana (2024-25), Chandan Kumar (2023-24), Aniket Kapri (2023-24)

Intern: Hitanshu Kar (Summer 2024), Lingampalli Likhith (Summer 2024, Summer 2025), Rudranarayan Pradhan (Winter 2025)

MAJOR COLLABORATIONS

Project- *Probing the fate of excitons in organic semiconductors*

Collaborators: Dr. Satish Patil (IISC Bangalore, India); Dr. Anil Kumar (IIT-Bombay, India); Dr. Aseem Mishra (KIIT-Bhubaneswar, India); Prof. Ulrike Salzner (Bilkent University, Turkey); Dr. Andrew J. Musser (Cornell University, USA).

Project- *Ultrafast dynamics of unidirectional molecular motors*

Collaborators: Prof. Ben Feringa (Nobel Laureate 2016, University of Groningen, Netherlands); Prof. Wesley R. Browne (University of Groningen, Netherlands).

Project- *Symmetry breaking charge separation in molecular dimers*

Collaborators: Prof. Andrew N. Cammidge (University of East Anglia, UK).

Project- *Structural dynamics of photoconvertible fluorescent proteins*

Collaborators: Prof. Peter Tonge (Stony Broke University, US), Prof. Michel Silwa (University of Lille, France) and Prof. Garth Jones (University of East Anglia, UK).

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PROFESSIONAL ACTIVITIES

Department/Institute Level

- 2025 Moderator for *Interaction Meeting, Chemistry Faculty Recruitment under Special Drive, IITBBS*
- 2025-28 *Chemistry Teaching Assistant Duty Coordinator*
- 2025-28 *Incharge of UG/PG Chemistry Laboratories, IITBBS*
- 2025 *Indenter for High-end equipments (UV-Vis, Fluorescence, Cryostat, Raman Laser) for IITBBS*
- 2024-25 *Teacher at JNV's Science Teachers Training program, IITBBS*
- 2024 *Organizing Committee member for 12th & 13th Convocation at IITBBS*
- 2024-Till Date *Faculty Coordinator for visits of school/college student at IITBBS*
- 2024 *JAM Selection Chemistry, IITBBS*
- 2024 *IIT JEE Duty, Kolkata*
- 2024 *Faculty in Charge of Raman Spectrometer, SBS, IITBBS*
- 2024 *Faculty Coordinator for preparing BTech in Chemical Technology Syllabus*
- 2023 *IIT JEE (Advanced) 2024 Question Vetting (10-20th Dec)*
- 2023-Till Date *Faculty Advisor (ITEP Chemistry), IITBBS*
- 2023-24 *Faculty Advisor (BTech), IITBBS*
- 2023 *Faculty Advisor (MSc Chemistry), IITBBS (July-Sep)*
- 2023 *Faculty Coordinator for ITEP for preparing Chemistry syllabus and ITEP administration*
- 2023 *School Exam Coordinator (School of Basic Sciences) for Spring end-semester BTech exam*
- 2023 *Faculty Coordinator for G20-Open Day Exhibition at IITBBS*
- 2023 *Faculty Trainer for improving presentation skill of final year PhD students at IITBBS*

Ministry Level

- 2023 *Liaison Officer for Hon'ble MP Shri Biplab Kumar Deb during IIT Council Meeting 2023, IITBBS*

Conference/Workshop/Seminar Organizing Committee

- 2025 *Convenor for organizing World Standard Day-2025 at IITBBS on 11th Oct, 2025*
- 2025-28 *National Organizing Committee for ICORS-2028, IACS Kolkata*
- 2025 *Convenor for organizing AMEES-2025 at IITBBS during 16-18th May, 2025*

Outreach Activities

- 2025 *Honorable Judge for the School-level Bal Vaigyanik Science Exhibition at KV IITBBS*
- 2025 *Teaching and Guidance talk in Chemistry for Class X students at KV IITBBS*
- 2013-17 *Demonstrated science experiments using femtosecond laser to school students at the annual science outreach programme 'Frontiers of Sciences' at TIFR-Mumbai.*

Journal/Grant Review Activities

- 2025 *Reviewer for the Journal of Chemical Physics (Apr) and ACS Applied Energy Materials (Jun, Aug)*
- 2024 *Reviewer for the Journal of Physical Chemistry (Jan)*
- 2024 *Reviewed research grant proposal from The Leverhulme Trust, UK*
- 2023 *Reviewer for the Journal of Physical Chemistry (Mar, May, Aug)*

Other Activities

- 2025 *Question moderator for Odisha Staff Selection Commission Test*
- 2024 *Question setter for Odisha Staff Selection Commission Test*
- 2020 *Made journal cover picture for ChemPhysChem 2020. DOI: 10.1002/cphc.202000179*
- 2016 *Student coordinator for organizing the international conference on 'Optics within Life sciences 2016' at TIFR*

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SELECTED CONFERENCES AND SEMINARS

- 2025 AOSC-2025 International Conference, Goa, India; Invited talk “*Hydrogen-Bonding Environment Suppresses Thermally Activated Delayed Fluorescence*”
- 2025 NSRP-2025 Symposium, NISER Bhubaneswar, India; Invited talk “*Resolving the role of solvent polarity, viscosity and hydrogen-bonding in thermally activated delayed fluorescence*”
- 2024 First Materials Chemistry Symposium 2024, ICT-IOC Bhubaneswar, India; Invited talk “*Controlling Unidirectional Motor Performance through Push-Pull Substituents*”
- 2023 International Conference on Molecular Energy Transfer in Complex Systems, Jaipur, India; Invited Hot-topic talk “*Controlling Unidirectional Motor Performance through Push-Pull Substituents*”.
- 2023 Kaleidoscope: A Discussion Meeting in Chemistry, Udaipur, India; Invited talk “*Can Ultrafast Science Help Optimise Unidirectional Motor Performance?*”
- 2023 International Conference on Time-resolved Vibrational Spectroscopy, The Netherlands; Online participation.
- 2022 Chemistry Research Day, UEA; Oral presentation “*Ultrafast Charge Separation in Covalently Linked Anthracene Dimer*”.
- 2021 Chemistry Research Day, UEA; Oral presentation “*Ultrafast Raman Snapshot of Unidirectional Motors in Motion*”.
- 2021 Chemistry Seminar Series, UEA; Oral presentation “*Ultrafast photophysics of molecular dimers*”.
- 2020 Chemistry Research Day, UEA; Oral presentation “*Excited state structural correlation for efficient photoconversion in artificial motors*”.
- 2019 IUPAC World Chemistry Congress, Paris; Posters presentation “*Probing the Fate of Exciton in Organic Semiconductors*”.
- 2016 TIFR-DCS annual talks, India; Posters presentations “*Ultrafast Exciton and Charge Dynamics in Organic Semiconductors*” and “*Tracking Singlet Fission in Semiconducting Organic Nanoparticles*”.
- 2016 International Conference on Hybrid and Organic Photovoltaics-2016, Swansea, UK; Oral presentation “*Tracking Exciton Dynamics in Low-Bandgap Conjugated Polymers using Femtosecond Stimulated Raman Spectroscopy*”.
- 2016 National Conference on Recent Advances in Optical Sciences-II, Hyderabad, India; Oral presentation “*Photoinduced Charge Generation Rates in Soluble P3HT:PCBM Nano-aggregates Predict the Solvent Dependent Film Morphology*”.
- 2016 International Conference on Optics Within Life Sciences, TIFR/IITB, India
- 2016 National Workshop on Fluorescence and Raman Techniques, TIFR, India
- 2016 Modern Trends in Electron Transfer Chemistry: From Molecular Electronics to Devices, ICTS, Bangalore, India; Poster presentation “*Tracking Exciton Dynamics in Low Band-gap Conjugated Polymers using Femtosecond Stimulated Raman Spectroscopy*”.
- 2014 Advances in Spectroscopy and Ultrafast Dynamics-2014 symposium, IACS, Kolkata, India; Poster presentation “*Capturing Photoinduced Charge Transfer States of P3HT:PCBM Mixtures in Solution*”.
- 2013 FCS Satellite Confocal Workshop-2013, IISC-Bangalore, India
- 2012 Workshop at 23rd International Conference on Raman Spectroscopy, IISC-Bangalore, India