

CURRICULUM VITAE

Dr. PARTHA ROY

Assistant Professor

Department of Chemistry

School of Chemical Science and Pharmacy

Central University of Rajasthan

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Research Interest:

- # Develop and explore the different type of nanostructures of TiO₂ and utilizing these structures in fundamental and Application based research.
- # Understand the fundamental of electron and energy transfer process in Organic-Inorganic Nano hybrid systems.

Research Specialization:

- # Magnetic field effect on spin dynamics in solution phase.
- # Organic-Inorganic interfacial chemistry.
- # Growing TiO₂ nanostructures.

Professional Experience:

➤ May 2017 – till date

Assistant Professor

Department of Chemistry

School of Chemical Science and Pharmacy

Central University of Rajasthan, Rajasthan, India

➤ **July 2016 – February 2017 Postdoctoral Fellow**

Department of Computer and Electrical Engineering
University of Alberta, Alberta, Canada.

Research Area:

“Growing TiO₂ Nanotubes and Nanowires Array and Exploiting this Micro/Nano Structures, the Superhydrophobic Surface was Engineered by Functionalized the Surface with different Organic Molecules.”

Advisor: Dr. Karthik Shankar

➤ **October 2013 – April 2016 – Postdoctoral Fellow**

Department of Chemical Science
Weizmann Institute of Science, Rehovot, Israel

Research Area:

"Temperature Dependent Electron and Energy Transfer Study on Inorganic-Organic Nano-hybrid Systems and Probing the Chiral Induced Spin Selectivity (CISS) effect using Photo-luminescence Measurement"

Advisor: Prof. Ron Naaman

Teaching Experience:

At Central University of Rajasthan:

Theory:

M.Sc. Chemistry (2Y), Integrated M.Sc. Chemistry (5Y) Integrated M.Sc. B.Ed. (3Y)

- ❖ CHM-201 (Physical Chemistry-I)
- ❖ CHM-303 (Physical Chemistry-II)
- ❖ CHM-617 (Electro Chemistry and Kinetics)
- ❖ CHM-407 (Thermodynamics)
- ❖ CHM-503 (Solid State, Surface and Material Chemistry) **(Act as a Subject Matter Expert (SME) of the same course in MOOCs (December to May, 2018-19)**

- ❖ CHM-404 (Group theory and spectroscopy)
- ❖ BCHT-403 Seminar (Elective)

Ph.D. Chemistry (Course)

- ❖ CHM-702 (Topic in Chemistry) Physical Chemistry

Practical:

- ❖ CHM-210 Basic Physical Chemistry Laboratory-I
- ❖ CHM-330 Basic Physical Chemistry Laboratory-II
- ❖ CHM-450 Physical Chemistry Laboratory-I
- ❖ CHM-480 Physical Chemistry Laboratory-II
- ❖ CHM-550 Physical Chemistry Laboratory-III

Ph.D. Students Enrolled:

Sl.No.	Name of the Ph.D. Students	Date of Registration	Title of the thesis	Status
1.	Suneel Gangada (as a joint supervisor) (2014PHDCH003)	27/10/2014	Cost Effective Metal and Metal-Free Dyes for Solar Energy Harvesting	Completed (10-12-2020)
2.	Sunil Kumar (2020PHDCH006)	25/12/2020	Molecular Rotors and Metal Nanostructures: Design, Synthesis and Applications in Catalysis of Organic Reactions	Ongoing
3.	Neha Mathur (2021PHDCH005)	13/09/2021	Synthesis and Characterization of Metal, Metal oxides and Metal chalcogenide Nanocomposite	Ongoing

Funding:

Sl.No.	Project Title	Duration	Funding Agency	Status	Amount (in lakhs)
1.	Development of the various One-Dimensional TiO ₂ nanostructure	2018-20	UGC Start-up	Completed	10
2.	Probing the Charge Transfer Mechanism in Exciplex System using Lifetime Measurement	2019-2022	DST-SERB (EEQ)	Completed	19.08
3.	Engineering of Resilient Superhydrophobic Coating using TiO ₂ Nanostructured in combination with Ultrathin Conformal Layer of Organic Molecules	2019-2022	DST-SERB (ECR)	Completed	49.97

M.Sc. Project Supervised:

Sl. No.	Academic Session	Name of the M.Sc. Students	Title of the Project	Status
1.	2017-18	Manish Kumar Verma (Enrollment No.- 2013IMSBCH011)	Effect of Viscosity on the Morphology of 1D-TiO ₂ Nanostructures	Completed
2.	2017-18	Hansraj Gurjar (Enrollment No.- 2015IMSBCH002)	Monitor the Energy Transfer in CdSe/ZnS Core-Shell Quantum Dots in presence Organic Dyes	Completed
3.	2018-19	Ishan Sinha (2014IMSCH007)	Synthesizing TiO ₂ Nanowires in Different Dimensions by Hydrothermal Process and Using them to form Transparent Hydrophobic Glass Surface	Completed
4.	2018-19	Dipshi Bhardwaj (2017MSCH002)	Systematic Study of Photocatalytic Activity of 1D-TiO ₂	Completed
5.	2018-19	Komal (2016IMSBCH016)	Study the Inter-molecular	Completed

			Energy Transfer between Core-Shell Quantum Dots and Organic compounds	
6.	2018-19	Biswaranjan Sahu (2016IMSBCH003)	Phase Transfer of CdSe/ZnS Quantum dots by using Capping Agents	Completed
7.	2019-20	Bharat Kaushik (2015IMSCH004)	Study the Intermolecular Electron and Energy Transfer between Core-Shell Quantum Dots and 2-(4-aminophenyl)-N-cyclohexylimidazo[1,2-a]pyrazine-3-amine	Completed
8.	2019-20	Guddan Dhakar (2014IMSCH006)	Method and Strategies for the Synthesizing of TiSe ₂ Nanostructure	Completed
9.	2019-20	Deepak Kumar (2017IMSBCH002)	Doping of metal/nonmetal into TiO ₂ nanostructure	Completed
10.	2019-20	Shankar Lal Saini (2017IMSBCH007)	Effect of pH & Temperature on Formation of TiO ₂ nanoparticles via sol-gel method	Completed
11.	2020-21	Manish Chauhan (2016IMSCH005)	Investigation of ZnO nanostructures on glass slides	Completed
12.	2020-21	Neha Mathur (2019MSCH013)	Synthesis of CdSe Quantum Dot and Investigate Its Photophysical Properties	Completed
13.	2020-21	S Iniyam (2019MSCH006)	Investigation of Anodised TiO ₂ Nanostructure at Various Conditions	Completed

14.	2021-22	Devendra kumar (2019IMSBCH003)	Oxidized Charcoal Stabilized Nickel Nanoparticles as Catalyst for Synthesis of 1,2-di Substituted Benzimidazole Derivatives	Completed
15.	2021-22	Rohit Yadav (2019IMSBCH020)	Design and Synthesis of Palladium Chalcogenide Nanoparticles and their Application in Catalytic Organic Synthesis	Completed
16.	2021-22	Bhawna Rathor (2020MSCH008)	Growth and Surface Applications of TiO ₂ Nanomorphology on FTO coated Glass	Completed
17.	2021-22	Kushal Bairagi (2020MSCH012)	Study of Catalytic Activity o Thiol Stabilized Palladium Nanoparticles Grafted on TiO ₂ Nanorods	Completed
18.	2021-22	Neeru Dahiya (2020MSCH014)	Synthesis and Application of Pd@MUA@TiO ₂ Nanocomposite System	Completed
19.	2022-23	Raushan Kumar (2020IMSBCH019)	Synthesis and Characterization of Ni _x S _y Nanoparticles and its Applications	Completed
20.	2022-23	Somyaranjan Jena (2020IMSBCH022)	Preparation of Thiol Stabilized Ni Nanoparticles Assembled on TiO ₂ Nanorods and its Applications	Completed
21.	2022-23	Hammraj (2020IMSBCH010)	Synthesis and Applications of Alloy and Metal Nanoparticles	Completed

22.	2022-23	Jagadish Bordoloi (2021MSCH007)	Exploration of TiO ₂ Surface for Various Applications.	Completed
23.	2022-23	Nitendra Kumar (2021MSCH015)	Transition Metal Chalcogenide: Design and Implementation	Completed

Education:

✓ **Ph.D. (2006 - 2013)** – Department of Physical Chemistry

Indian Association for the Cultivation of Science (IACS),
Jadavpure, Kolkata, India

Research Area:

*“Monitoring the Spin Dynamics under the Influence of Small
Magnetic Field Strength in Liquid Phase”*

Title of the Thesis:

**Studies of Pyrene Fluorescence and Magnetic Field
Effect on Pyrene-N,N-Dimethylaniline Exciplex
Emission in Various Solvents**

Thesis Supervisor: Prof. Deb Narayan Nath

✓ **M.Sc. (2004-2006)** - University of Calcutta, India Specialization in *“Physical
Chemistry”*

✓ **B.Sc. (2001-2004)** – Presidency College (Now, Presidency University) Kolkata
Under University of Calcutta, India

List of Publication:

20. *Macrocyclic Sulfur Ligand Stabilized Trans-Palladium Dichloride Complex: Syntheses, Structure, Chlorine Rotation, and Application in α -Olefination of Nitriles by Primary Alcohols*

Sunil Kumar, Ashutosh Sharma, Suman Mahala, K. Gaatha, S. Rajagopala Reddy, Tanmay Rom, Avijit Kumar Paul, Partha Roy, Hemant Joshi
Chem Asian J. 2024, 19, e202300935 (1 of 10) **(IF-4.1)**

19. *Transition-metal-free synthesis of 2-arylphenol via S_NAr reaction of dibenzothiophene dioxide with KOH*

Mamta Yadav, Ram Singh Jat, Sonu Kumari, Penke Vijaya Babu, **Partha Roy**, M. Bhanuchandra
Tetrahedron Lett. (2023) 119, 154430-154433. **(IF-2.415)**

18. *A palladium complex of a macrocyclic selenium ligand: catalyst for the dehydroxymethylation of dihydroxy compounds*

Sunil Kumar, Sohan Singh, Suman Mahala, Prachi Janjani, S. Rajagopala Reddy, Tanmay Rom, Avijit Kumar Paul **Partha Roy** and Hemant Joshi
Dalton Trans., (2023) **52**, 5110-5118 **(IF-4.569)**

17. *Titania Nanorod-Supported Mercaptoundecanoic Acid-Grafted Palladium Nanoparticles as a Highly Reusable Heterogeneous Catalyst for Substrate-Dependent Ullmann Coupling and Debromination of Aryl Bromides*

Sunil Kumar, Sohan Singh, Neha Mathur, **Partha Roy***, and Hemant Joshi*
Inorg. Chem. (2023) 62, 3993–4002. **(IF-5.08)**

16. *Oxidized Charcoal-Supported Thiol-Protected Palladium Nanoparticles for Cross Dehydrogenative Coupling of Heteroarenes*

Sunil Kumar, Sonu Kumari, Sohan Singh, Palash Jyoti Boruah, Amit Kumar Paul, **Partha Roy***, and Hemant Joshi*
ACS Appl. Nano Mater. (2022) 5, 2644–2654. **(IF-6.241)**

15. *Excitation-Wavelength-Dependent Light-Induced Electron Transfer and Twisted Intramolecular Charge Transfer in N,N -Bis(4'-tertbutylbiphenyl-4-yl)aniline Functionalized Borondipyrrromethenes.*

Suneel Gangada, Ramya Athira Ramnagar, Akanksha Ashok Sangolkar, Ravinder Pawar, Jagadeesh Babu Nanubolu, **Partha Roy**, Lingamallu Giribabu, and Raghu Chitta.
J. Phys. Chem. A. (2020), 124, 9738–9750. **(IF-2.41)**

14. *Spin Selectivity in Photoinduced Charge-Transfer Mediated by Chiral Molecules*

John M. Abendroth, Dominik M. Stemer, Brian P. Bloom, **Partha Roy**, Ron Naaman, David H. Waldeck, Paul S. Weiss and Prakash Chandra Mondal
ACS Nano, (2019), 13, 4928-4946 **(IF-18.143)**

13. *“Resistance of Superhydrophobic Surface-Functionalized to Corrosion and Intense Cavitation”*

Weidi Hua, Piyush Kar, **Partha Roy**, Lintong Bu, Lian C. T. Shoute, Pawan Kumar, Karthik Shankar
Nanomaterials (2018), 783, 1-15 **(IF-5.086)**

12. *"Dark and photo-induced charge transport across molecular spacers"*
Nirit Kantor-Uriel, **Partha Roy**, Ketil Lerman, Chaim N. Sukenik and Hagai Cohen
J. Vac. Sci. Technol. B (2018), 36, 04H104-(1-8) (IF-1.564)
11. *"All-solution processed, Scalable Superhydrophobic Coating on Stainless Steel Surfaced based on functionalized titania Nanotubes"*
Partha Roy, Ryan Kisslinger, Samira Farsinezhad, Najia Mahdi, Advaita Bhatnagar, Arezoo Hosseini, Lintong Bu, Weidi Hua, Benjamin D. Wiltshire, Andrew Eisenhawer, Piyush Kar, Karthik Shankar *Chem. Eng. J.* (2018) 351, 482–489 (IF-16.164)
10. *"Nanoscale Defolding Influence of Polypeptide in the Charge-Transfer Process through Inorganic-Organic Nanohybrid System"*
Partha Roy*, Nirit Kantor-Uriel and Anurag Prakash Sunda*
Nanoscale, (2018) 10, 11143 – 11149 (IF-8.425)
9. *"Photospintronics: Magnetic Field-Controlled Photoemission and Light-Controlled Spin Transport in Hybrid Chiral Oligopeptide-Nanoparticle Structures"*
Prakash Chandra Mondal, **Partha Roy**, Dokyun Kim, Eric E. Fullerton, Hagai Cohen, Ron Naaman*
Nano Lett., (2016) 16 (4), 2806-2811. (IF-12.425)
8. *"Spin controlled photoluminescence in hybrid nanoparticle-purpule membrane system"*
Partha Roy, Nirit Kantor, Debabrata Mishra, Sansa Dutta, Noga Friedman, Mordechai Sheves, Ron Naaman*
ACS Nano, (2016) 10 (4) 4525-4531 (IF-18.143)
7. *"Establishment of the concept of relaxed and unrelaxed exciplexes: Magnetic field effect in pyrene-N,N-dimethylaniline system in benzene-acetonitrile binary solvents"*
Amit Kumar Jana, **Partha Roy**, Subrata Das and Deb Narayan Nath*
J. Phys. Chem. Biophys. 5(2015) 1000194(1-5) (IF-2.143)
6. *"Evidence for enhanced electron transfer by multiple contacts between self-assembled organic monolayers and semiconductor nanoparticles"*
Nirit Kantor-Uriel, **Partha Roy**, Sergio Saris, Vankayala Kiran, David H. Waldeck, Ron Naaman*
(The two first authors contribute equally)
J. Phys. Chem. C 119 (2015) 15839–15845 (IF-4.834)
5. *"Role of Viscosity in the Magnetic Field Effect on Pyrene-DMA Exciplex Emission at Different Permittivity"*
Amit Kumar Jana, **Partha Roy** and Deb Narayan Nath*
Chem. Phys. Letts. 593 (2014) 145 – 149. (IF-2.143)
4. *"Studies on $B_{1/2}$ value on Pyrene-N,N-Dimethylaniline radical pair system in single and binary solvents"*
Partha Roy, Amit Kumar Jana, Ghanavi M.B. and Deb Narayan Nath*
Chem. Phys. Letts. 554 (2012) 82 – 85. (IF-2.143)
3. *"Evidence of dual channel electron transfer induced negative magnetic field effect on pyrene-DMA exciplex emission at very high permittivity of medium"*
Amit Kumar Jana, **Partha Roy** and Deb Narayan Nath*
Chem. Phys. Letts. 535 (2012) 63 – 68. (IF-2.143)

2. *“Evidence for bi-exponential decay of pyrene in condensed phase: Possibility of complex formation with solvent molecules”*
Partha Roy, Amit Kumar Jana, Subrata Das, Deb Narayan Nath*
Chem. Phys. Letts. 516 (2011) 182–185. (IF-2.143)
1. *“Study of magnetic field effect on Py-DMA exciplexluminescence in THF–DMF binary solvents: Evidence of multiple exciplex formation at higher bulk dielectric constant”*
Partha Roy, Amit Kumar Jana, Doyel Das, Deb Narayan Nath*
Chem. Phys. Letts., 474 (2009) 297–301. (IF-2.143)

Book published:

“Studies of exciplex system in condensed phase: Magnetic field effect”

Deb Narayan Nath , **Partha Roy** and Amit Kumar Jana

LAMBERT Academic Publishing: **ISBN: 978-3-659-64777-2**, January-2015

Presentations, Symposiums and Workshops attended:

□ *Titania Nanorod-Supported Mercaptoundecanoic Acid-Grafted Palladium Nanoparticles as a Highly Reusable Heterogeneous Catalyst for Substrate-Dependent Ullmann Coupling and Debromination of Aryl Bromides:*

34th AGM of MRSI and 5th Indian material Conclave, December 12-15, 2023 at IIT-BHU (Contribution: Poster Presentation).

□ *“Nanoscale defolding influence of polypeptides in the charge-transfer process through an organic–inorganic nanohybrid system”* : **Partha Roy**

Spin in Molecular Systems: Experiment, Theory and Applications” Dec 2-4, 2019 at IISc Bangalore, India (Contribution: Poster Presentation) (Awarded: Best Poster)

□ *“Spin Controlled Photoluminescence in Hybrid CdSe Nanoparticles and Purple Membrane System”* : **Partha Roy**

Recent Advance in Material and Sustainable Energy (RAMSE), March 3-5, 2018, IIT-ISM Dhanbad, India (Contribution: Oral Presentation)

□ *“Evidence for Enhanced Electron Transfer by Multiple Contacts between Self-assembled Organic Monolayers and Semiconductor Nanoparticles”*: **Partha Roy**

**Photochemistry Gordon Research Conference July 19-24, 2015 Stonehill College
Easton, MA, USA (Contribution: Poster Presentation)**

□ *“Studies on $B_{1/2}$ value of pyrene–dimethylaniline radical pair system in single and binary solvents” : Partha Roy*

**13th International Symposium on Spin and Magnetic Field Effects in Chemistry
and Related Phenomena (SCM2013), April 22 - 26, 2013, Bad Hofgastein, Austria
(Contribution: Poster Presentation).**

□ *“Evidence for bi-exponential decay of pyrene in condensed phase: Possibility of complex formation with solvent molecules” : Partha Roy*

**International Symposium on Chemistry and Complexity, December 6 – 8, 2011,
Kolkata, India (Contribution: Poster Presentation).**

□ *“Study of magnetic field effect on Py-DMA exciplex luminescence in THF–DMF binary solvents: Evidence of multiple exciplex formation at higher bulk dielectric constant” : Partha Roy*

**3rd Asia Pacific Symposium on Radiation Chemistry and DAE-BRNS 10th
Biennial Trombay symposium on Radiation & Photochemistry, September 14-17,
2010, Lonavala, India (Contribution: Poster Presentation).**

□ **National Symposium on Quantum Chemistry, Soft Computation & Optimization,
April 04-05, 2008, IACS, Kolkata, India.**

□ **Workshop on Radiation & Photochemistry, Indian Society for Radiation &
Photochemical Science (ISRAPS), January 3 – 5, 2008 BARC, Mumbai, India.**

□ **Asian Spectroscopy conference & Asian Biospectroscopy Conference (ASC-
07), 29th January – 2nd February, 2007, IISC, Bangalore, India**

□ **New Perspectives In Physical Chemistry Curriculum, February 08, 2006**

Department of Chemistry University of Calcutta

Administrative position/Responsibilities:

- Member, Purchase committee, School of Chemical Science and Pharmacy, Central University of Rajasthan since, 2017
- Member, Library Committee, School of Chemical Science and Pharmacy, Central University of Rajasthan since, 2017
- Member, syllabus committee School of Chemical Science and Pharmacy, Central University of Rajasthan, 2018-19
- President, Football Club, Central University of Rajasthan since 2018
- Vice-president, Handball Club, Central University of Rajasthan, 2017-18
- Member, Cultural committee, Central University of Rajasthan, 2017-18
- Member, Departmental Budget Monitoring, Central University of Rajasthan since 2018
- Member, Departmental Internal Quality Assurance Cell (IQAC), Central University of Rajasthan since 2018
- Faculty Coordinator, M.Sc. (2Y) program, Central University of Rajasthan, 2017-18