

Resume

Name: Pradyut Roy

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Current Position: Integrated PhD student at Indian Institution of Science Education and Research (IISER), Pune.

Academic Record:

<i>Degree</i>	<i>Board/Institute</i>	<i>Year</i>	<i>Percentage/CGPA</i>
Integrated MS PhD (chemistry)	IISER Pune	2019	8.7 CGPA
B.Sc. Honours (Chemistry) Subsidiary-Maths, Physics. English. Bengali.	Garhbeta College, Vidyasagar University	2017	80 %
Higher Secondary	WBCHSE	2014	82 %
Secondary	WBBSE	2012	84 %

Awards/Scholarship:

1. Best Poster Award @LDM2022 by ACS Nanoscience Au: Low Dimensional Materials Conference at IISER Pune, held on 19-20th May 2022.
2. Best Poster Award @ChemSci2021: Leaders in the field symposium. Materials Chemistry #MatChem, held on 13-15th Dec 2021.
3. Recipient of Prestigious Prime Minister Research Fellowship (PMRF), Jan, 2020 - till date.

4. Cleared Joint CSIR-UGC NET (*All India Rank 18*).
5. Recipient of Integrated PhD scholarship from Indian Institute of Science Education and Research, Pune, MHRD (*August 2017 to July 2019*).
6. Qualified GATE, 2019 (*AIR 2007*).
7. Cleared Joint Admission for M.Sc. (IIT-JAM), 2017 (*AIR 289*).
8. Gold Medal for 1st class 1st position in B.Sc. Chemistry, Vidyasagar University, West Bengal.
9. Recipient of DST-INSPIRE Scholarship, 2014-2017.
10. Recipient of Merit-Cum-Means Scholarship from West Bengal State Government, 2012-2014.

Research Experience:

1. Currently, Pursuing Ph.D. on Material Science (supervisor: Dr. Pramod P. Pillai) in the Department of Chemistry, IISER Pune.
2. Successfully Defended Int. Ph.D. MS Thesis (Thesis Title: “*Electrostatically Driven Hetero-FRET between Eco-friendly Core-Shell QDs*”) under the guidance of Dr. Pramod P. Pillai, IISER Pune.
3. Worked on the “*Photophysical Properties of Harmine molecules as a function of pH*” as a part of Int. Ph.D. Coursework under the guidance of Dr. Partha Hazra.
4. Worked on “*synthesis and Catalytic Property of Pd based organometallic compound*” as a part of Int. Ph.D. coursework under the guidance of Dr. Boopathy Gnanaprakasam, IISER Pune.
5. One-month project on the “*Synthesis and Characterization of Water stable Metal Organic Framework MOFs*” under the guidance of Dr. Sujit Ghosh, IISER Pune.

Teaching Experience:

As *Teaching Assistant* conducted weekly tutorial sessions, conducted Quiz exams, corrected exam papers and graded the class for the following courses:

1. **IISER Pune, Fall 2019 (Aug to Dec)**
“*Principles of Inorganic Chemistry*, CHM 201” for ~220 of second year undergrad students (BSMS).
2. **IISER Pune, Spring 2020 (Jan to May)**
“*Principle of physical Chemistry*, CHM 1213”, for ~200 of second year undergrad students (BSMS).
3. **IISER Pune, Fall 2020 (Aug to Dec)**
“*Photochemistry & Photophysics*, CHM 433/632”, for a class of ~50 fourth year undergrad (CHM 433) & first year PhD students (CHM 632).

4. **Fergusson College, Pune (March to April) 2021**
“*Theories of Reaction Rates*, for a class of ~70 first year MSc students.
5. **Fergusson College, Pune (June to August) 2021**
“*Electrochemistry*, for a class of ~70 first year MSc students.
6. **Fergusson College, Pune (August to October) 2022**
“*Analytical Chemistry*, for a class of ~70 second year MSc students.

Experimental Skills:

My expertise lies in the following areas:

Materials synthesis, surface engineering of metal and semiconductor nanoparticles, Photophysics.

Metal Nanoparticle: Gold Nanoparticles, Gold Nanorods.

Semiconductor Nanoparticle: InP/ZnS, CuInS₂/ZnS, ZnS. CdSe, CdSe/ZnS, CdS, CdS/ZnS, CdSeS/ZnS QDs

I am experienced with the following characterization techniques:

Spectroscopic Tools: Ultraviolet-Visible Absorption Spectroscopy (UV-Vis), Photoluminescence (PL) spectroscopy, Photoluminescence Excitation (PLE) Spectroscopy, Time-Correlated Single Photon Count (TCSPC), Fourier-Transform Infrared (FTIR) Spectroscopy, Zeta Potential, Cyclic Voltammetry (CV), X-Ray Diffraction (XRD), Energy dispersive X-Ray Spectroscopy (EDAX), Nuclear Magnetic Resonance (NMR) Spectroscopy. High-Resolution Mass Spectroscopy (HRMS).

Microscopic Tools: Transmission Electron Microscopy (TEM).

Others Instrumentation: Thermogravimetric Analysis (TGA), Thermal Deposition Technique, Sputter Deposition Technique, Current-Voltage (IV) Measurement.

Software's: Chemdraw 20.1.1, MNova, OriginPro 8.5, DropView8400, ImageJ, DAS6, MS office.

List of Publications:

1. **Roy, P.**; Devatha, G.; Roy, S.; Rao, A.; Pillai, P. P. “Electrostatically Driven Resonance Energy Transfer in an All-Quantum Dot Based Donor-Acceptor System”. *J. Phys. Chem. Lett.*, **2020**, *11*, 5354-5360.

DOI: <https://doi.org/10.1021/acs.jpcllett.0c01360>

2. Devatha, G.; **Roy, P.**; Rao, A.; Roy, S.; Pillai, P. P. “Multicolor Luminescent Patterning via Photoregulation of Electron and Energy Transfer Processes in Quantum Dots”. *J. Phys. Chem. Lett.*, **2020**, *11*, 4099-4106.

DOI: <https://doi.org/10.1021/acs.jpcllett.0c01121>

3. **Roy, P.**; Chakraborty, I. N.; Rao, A.; Devatha, G.; Roy, S.; Pillai, P. P. “The unconventional role of surface ligands in dictating the light harvesting properties of quantum dots”. *J. Mater. Chem. A*, **2021**, *9*, 7422-7457.

DOI: <https://doi.org/10.1039/D0TA12623C>

4. Jain, V.; **Roy, P.**; Roy, S.; Pillai, P. P.* “When Design Meets Function: The Prodigious Role of Surface Ligands in Regulating Nanoparticle Chemistry” *Chem. Mater.* **2022**, *34*, 7579–7597.

DOI: <https://doi.org/10.1021/acs.chemmater.2c01941>

5. **Roy, P.**; Pillai, P. P.* “Blue Emitting InP Quantum Dots: Expanding the Spectrum of Environment Friendly QDs for FRET Studies”. (Submitted)
6. **Roy, P.**; Dhankhar, A.; Pillai, P. P.* “All QD-Based Light Harvesting Systems” (Submitted)

Poster Presentations:

1. Two-day Symposium on Low Dimensional Materials (LDM-2022) on 19-20-May-2022@ IISER Pune!
2. CHEMSCI2021: Leaders in the field symposium scheduled on 13-15 Dec-2021.
3. One-day symposium from the Center for Energy Science (CES) @ IISER Pune! Scheduled on 18-Oct-2019.
4. One-day symposium on Low Dimensional Materials (LDM-2020) on 11-March-2020 at the Department of Chemistry, Indian Institute of Science Education and Research (IISER) Pune.
5. A poster session on the day of Inauguration of Cipla Foundation-IISER Pune building at the Department of Chemistry, Scheduled on 29th Jan 2020.

Talks and Seminars:

1. International seminar: “**Electrostatically Driven Resonance Energy Transfer in an All–Quantum Dot Based Donor–Acceptor System**” at 11th Asian Photochemistry Conference 2021, November 1-4, 2021.
2. Departmental Seminar: “**Highly Efficient and Stable Cd-Free QD-LEDs for Next Generation Display**” at Department of Chemistry, Indian Institute of Science Education and Research (IISER), Pune, India (08.12.2020).
3. MS Thesis Defence: “**Electrostatically Driven Hetero-FRET between Eco-friendly Core-Shell QDs**” at Department of Chemistry, IISER Pune, India (2019).
4. Departmental Seminar: “**Colouration by Total Internal Reflection and Interference at Microscale Concave Interfaces**” at Department of Chemistry, IISER Pune, India (2019).

PhD Supervisor:

Dr. Pramod P. Pillai

Associate Professor, Dept. of Chemistry,

Indian Institute of Science Education and Research (IISER), Pune-411008.

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