

BIODATA

ABHIJIT PATRA

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PROFESSIONAL EXPERIENCE:

- April 2018 – present **Associate Professor**, Department of Chemistry, Indian Institute of Science Education and Research Bhopal (IISERB), Bhopal, India
- July 2012
– March 2018 **Assistant Professor**, Department of Chemistry, Indian Institute of Science Education and Research Bhopal (IISERB), Bhopal, India
- September 2010
– June 2012 **Alexander von Humboldt fellow**, working on **Polymeric materials**
Host: Prof. U. Scherf
Dept. of Macromolecular Chemistry, University of Wuppertal, Germany
- June 2009
– June 2010 **Post-doctoral research in Organic Photochromism**
Supervisor: Prof. K. Nakatani
PPSM, Ecole Normale Supérieure de Cachan, Paris-Saclay, France

ACADEMIC QUALIFICATIONS :

- 2003 – 2009 **Ph.D. in the general area of Materials Chemistry**
Supervisor: Prof. T. P. Radhakrishnan
School of Chemistry, University of Hyderabad, Hyderabad

Dissertation: *Optical and Nonlinear Optical Materials based on Molecular Nano, Micro and Bulk Crystals*

- 2001 – 2003 **Master of Science (M.Sc.) in Chemistry**
Burdwan University, West Bengal
Awarded First Class, 78.33%
- 1998 – 2001 **Bachelor of Science (B.Sc.) in Chemistry**
Bankura Christian College, Bankura
Burdwan University, West Bengal
Awarded First Class, 68.75%

ACADEMIC DISTINCTIONS AND FELLOWSHIPS:

- **Alexander von Humboldt Post-doctoral Fellowship** awarded June 2009 in Materials Science; Fellowship period: September 2010 – June 2012
- Qualified UGC-CSIR NET for JRF (2003) and SRF (2005)
- Qualified GATE (2003), Percentile Score: 97.58 & All India Rank: 69

RESEARCH PUBLICATIONS:**From IISERB**

44. A. Giri, S. Biswas, T. K. Dutta, M. W. Hussain, A. Patra,* Nanospheres to Nanosheets: Unfolding the Morphological Influence of Microporous Organic Polymers on Micropollutants Removal, *ChemRxiv*. 2021 Preprint. <https://doi.org/10.26434/chemrxiv.14333936.v1>
43. A. Giri, N. N. Patil, A. Patra,* Porous Noria Polymer: A Cage-to-Network Approach toward a Robust Catalyst for CO₂ Fixation and Nitroarene Reduction, *Chem. Commun.* 2021, 57, 4404-4407. [Link](#)
42. S. Kundu, A. Chowdhury, S. Nandi, K. Bhattacharyya,* A. Patra,* Deciphering the Evolution of Supramolecular Nanofibers in Solution and Solid-state: A Combined Microscopic and Spectroscopic Approach, *Chem. Sci.* 2021, 12, 5874-5882. [Link](#)
41. S. Jaiswal, J. Pathak, S. Kundu, A. Patra,* One-pot Phosphine-free Route for Single-component White Light Emitting CdSe_xS_y Alloy Nanocrystals, *ACS Sustain. Chem. Eng.* 2021, 9, 5613–5622. [Link](#)
40. S. Jaiswal, S. Kundu, S. Bandyopadhyay, A. Patra,* Hybrid Upconversion Nanoprobe for Ratiometric Detection of Aliphatic Biogenic Amines in Aqueous Medium, *Nanoscale Adv.* 2021, Advance Article: [10.1039/D0NA00995D](https://doi.org/10.1039/D0NA00995D).
39. T. K. Dutta, A. Patra,* Post-synthetic Modification of Covalent Organic Frameworks through in situ Polymerization of Aniline for Enhanced Capacitive Energy Storage, *Chem Asian J.* 2021, 16, 158-164. [Link](#)
38. A. Giri*, A. Sahoo, T. K. Dutta, A. Patra,* Cavitand and Molecular Cage-Based Porous Organic Polymers, *ACS Omega* 2020, 5, 28413–28424 ([Invited Minireview](#)).
37. B. Sk, S. Sharma, A. James, S. Kundu, A. Patra,* N-rich Electron Acceptors: Triplet Harvesting in Multichromophoric Pyridoquinoxaline and Pyridopyrazine-based Organic Emitters, *J. Mater. Chem. C* 2020, 8, 12943-12950. [Link](#)
36. M. W. Hussain, V. Bhardwaj, A. Giri, A. Chande,* A. Patra,* Multifunctional Ionic Porous Frameworks for CO₂ Conversion and Combating Microbes, *Chem. Sci.* 2020, 11, 7910-7920. [Link](#)
35. S. Kundu, B. Sk, P. Pallavi, A. Giri, A. Patra,* Molecular Engineering Approaches towards All-organic White Light Emitting Materials, *Chem. Eur. J.* 2020, 26, 5557-5582 ([Review](#)).
34. V. Kumar,* S. Kundu, B. Sk, A. Patra, Naked-eye Colorimetric Sensor for Methanol and ‘Turn-on’ Fluorescence Detection of Al³⁺, *New J. Chem.* 2019, 43, 18582-18589. [Link](#)
33. A. Giri, M. W. Hussain, B. Sk, A. Patra,* ‘Connecting the Dots’: Knitting C-phenylresorcin[4]arenes with Aromatic Linkers for Task-specific Porous Organic Polymers, *Chem. Mater.* 2019, 31, 8440-8450. [Link](#)
32. M. W. Hussain, A. Giri, A. Patra,* Organic Nanocage: A Promising Testbed for Catalytic CO₂ Conversion, *Sustainable Energy Fuels* 2019, 3, 2567-2571. [Link](#)
31. P. Pallavi, V. Kumar, M. W. Hussain, A. Patra,* Excited-State Intramolecular Proton Transfer-Based Multifunctional Solid-State Emitter: A Fluorescent Platform with “Write-Erase-Write” Function, *ACS Appl. Mater. Interfaces* 2018, 10, 44696–44705. [Link](#)
30. V. Kumar, B. Sk, S. Kundu, A. Patra,* Dynamic and Static Excimer: A Versatile Platform for Single Component White-light Emission and Chelation-enhanced Fluorescence, *J. Mater. Chem. C* 2018, 6, 12086–12094 (*featured in emerging investigator issue*). [Link](#)
29. S. Bandyopadhyay, S. Kundu, A. Giri, A. Patra,* A Smart Photosensitizer based on a Red Emitting Solution Processable Porous Polymer: Generation of Reactive Oxygen Species, *Chem. Commun.* 2018, 54, 9123–9126 (*inside cover page*). [Link](#)

28. S. Bandyopadhyay, C. Singh, P. Jash, M. W. Hussain, A. Paul,* A. Patra,* Redox-active, Pyrene-based Pristine Porous Organic Polymers for Efficient Energy Storage with Exceptional Cyclic Stability, *Chem. Commun.* **2018**, *54*, 6796–6799 (*highlighted in emerging investigator issue*). [Link](#)
27. B. Sk, S. Khodia, A. Patra,* T and V-shaped Donor-Acceptor-Donor Molecules Involving Pyridoquinoxaline: Large Stokes Shift, Environment-sensitive Tunable Emission and Temperature-induced Fluorochromism, *Chem. Commun.* **2018**, *54*, 1786–1789. [Link](#)
26. P. Pallavi, B. Sk, P. Ahir, A. Patra,* Tuning the Förster Resonance Energy Transfer through a Self-Assembly Approach for Efficient White-Light Emission in an Aqueous Medium, *Chem. Eur. J.* **2018**, *24*, 1151 – 1158. [Link](#)
25. M. W. Hussain, S. Bandyopadhyay, A. Patra,* Microporous Organic Polymers Involving Thiadiazolopyridine for High and Selective Uptake of Greenhouse Gases at Low Pressure, *Chem. Commun.* **2017**, *53*, 10576-10579. [Link](#)
24. B. Sk, P. K. Thakre, R. S. Tomar,* A. Patra,* A Pyridoindole based Multifunctional Bioprobe: pH-induced Fluorescence Switching and Specific Targeting of Lipid Droplets, *Chem. Asian J.* **2017**, *12*, 2501-2509 (*inside cover page*). [Link](#)
23. P. Pallavi, S. Bandyopadhyay, J. Louis, A. Deshmukh, A. Patra,* Soluble Conjugated Porous Organic Polymer: Efficient White Light Emission in Solution, Nanoparticles, Gel and Transparent Thin Film, *Chem. Commun.* **2017**, *53*, 1257-1260. [Link](#)
22. S. Bandyopadhyay, A. G. Anil, A. James, A. Patra,* Multifunctional Porous Organic Polymers: Tuning of Porosity, CO₂, and H₂ Storage and Visible-Light-Driven Photocatalysis, *ACS Appl. Mater. Interfaces* **2016**, *8*, 27669-27678. [Link](#)
21. A. Deshmukh, S. Bandyopadhyay, A. James, A. Patra,* Trace Level Detection of Nitroanilines by a Solution Processable Fluorescent Porous Organic Polymer, *J. Mater. Chem. C* **2016**, *6*, 3775-3780. [Link](#)
20. B. Sk, A. Patra,* C-C Coupling Over Schiff Base Condensation: A Rational Design Strategy for a Strongly Fluorescent Molecular Material, *CrystEngComm* **2016**, *18*, 4290-4294. [Link](#)
19. S. Bandyopadhyay, R. Métivier, P. Pallavi, E. Preis, K. Nakatani, K. Landfester, A. Patra,* U. Scherf, Conjugated Polymer Nanoparticle-Triplet Emitter Hybrids in Aqueous Dispersion: Fabrication and Fluorescence Quenching Behavior, *Macromol. Rapid Commun.* **2016**, *37*, 271-277. [Link](#)
18. S. Bandyopadhyay, P. Pallavi, A. Anil, A. Patra*, Fabrication of Porous Organic Polymers in the Form of Powder, Soluble in Organic Solvents and Nanoparticles: a Unique Platform for Gas Adsorption and Efficient Chemosensing, *Polym. Chem.* **2015**, *6*, 3775-3780 (*inside cover page, One of the most downloaded articles in the journal in Apr-May 2015*). [Link](#)
17. S. Samala, P. Pallavi, R. Kumar, R. K. Arigela, G. Singh, R. S. Ampapathi, A. Priya, S. Datta, A. Patra,* B. Kundu* One-pot Synthesis of Highly Fluorescent Pyrido[1,2-*a*]indole Derivatives via C-H/N-H Activation: Photophysical Investigations and Application in Cell Imaging, *Chem. Eur. J.* **2014**, *20*, 14344 – 14350. [Link](#)

From Post-Doctoral Research

16. F. G. Erko, J. Berthet, A. Patra, R. Guillot, K. Nakatani, R. Métivier, S. Delbaere,* Spectral, Conformational and Photochemical Analyses of Photochromic Dithienylethene: cis-1,2-Dicyano-1,2-bis(2,4,5-trimethyl-3-thienyl)ethene Revisited, *Eur. J. Org. Chem.* **2013**, *34*, 7809-7814.
15. A. Patra,* U. Scherf,* Fluorescent Microporous Organic Polymers: Potential Testbed for Optical Applications, *Chem. Eur. J.*, **2012**, *18*, 10074-10080.

14. **A. Patra**,* R. Métivier,* F. Brisset, K. Nakatani, Photochromic One-Dimensional Nanostructures Based on Dithienylethene: Fabrication by Light Induced Precipitation and Reversible Transformation in the Nanoparticle State, *Chem. Commun.*, **2012**, 48, 2489-2491 (*inside cover page*).
13. J. Koenen, S. Jung, **A. Patra**, A. Helfer, U. Scherf,* Dye-terminated, Hyperbranched Polytruxenes and Polytruxene-b-polythiophene Multiblock Copolymers Made in an “AB₂+A” Approach, *Adv. Mater.*, **2012**, 24, 681-686.
12. L. Liu, **A. Patra**, U. Scherf, T. Kissel,* Polyfluorene Nanoparticles Coated with Folate-Conjugated Triblock Co-polymer: Effective Agents for Targeted Cell Imaging, *Macromol. Biosci.*, **2012**, 12, 1384-1390.
11. **A. Patra**,* J. Koenen, U. Scherf, Fluorescent Nanoparticles Based on Microporous Organic Polymer Network: Fabrication and Efficient Energy Transfer to Surface-bound Dyes, *Chem. Commun.*, **2011**, 47, 9612-9614.
10. **A. Patra**, R. Métivier, J. Piard, K. Nakatani,* SHG-Active Molecular Nanorods with Intermediate Photochromic Properties Compared to Solution and Bulk Solid States, *Chem. Commun.*, **2010**, 46, 6385-6387.
9. A. Spangenberg, J. A. P. Perez, **A. Patra**, J. Piard, A. Brosseau, R. Métivier* K. Nakatani,* Probing Photochromic Properties by Correlation of UV-Visible and Infra-Red Absorption Spectroscopy: A Case Study with *Cis*-1,2-dicyano-1,2-bis(2,4,5-trimethyl-3-thienyl)ethene, *Photochem. Photobiol. Sci.*, **2010**, 9, 188-193.

From Doctoral Research

8. **A. Patra**,* Ch. G. Chandaluri, T. P. Radhakrishnan,* Optical Materials Based on Molecular Nanoparticles, *Nanoscale*, **2012**, 4, 343-359 (*Review article*).
7. Ch. G. Chandaluri, **A. Patra**, T. P. Radhakrishnan,* Polyelectrolyte-Assisted Formation of Molecular Nanoparticles Exhibiting Strongly Enhanced Fluorescence, *Chem. Eur. J.*, **2010**, 16, 8699-8706.
6. **A. Patra**, T. P. Radhakrishnan,* Molecular Materials with Contrasting Optical Responses from a Single Pot Reaction and Fluorescence Switching in a Carbon Acid, *Chem. Eur. J.*, **2009**, 15, 2792-2800.
5. **A. Patra**, N. Venkatram, D. N. Rao, T. P. Radhakrishnan,* Optical Limiting in Organic Molecular Nano/microcrystals: Nonlinear Optical Effects Dependent on Size Distribution, *J. Phys. Chem. C*, **2008**, 112, 16269-16274.
4. **A. Patra**, K. Rajesh, T. P. Radhakrishnan,* Optical Materials Based on Molecular Nano/microcrystals and Ultrathin Films, *Bull. Mater. Sci.*, **2008**, 31, 421-427.
3. **A. Patra**, N. Hebalkar, B. Sreedhar, T. P. Radhakrishnan,* Formation and Growth of Molecular Nanocrystals Probed by their Optical Properties, *J. Phys. Chem. C*, **2007**, 111, 16184-16191.
2. **A. Patra**, S. P. Anthony, T. P. Radhakrishnan,* Tris(4-cyanophenyl)amine: Simple Synthesis via Self-assembly and Strong Fluorescence in Solution, Nano/microcrystals and Solid, *Adv. Funct. Mater.*, **2007**, 17, 2077-2084.
1. **A. Patra**, N. Hebalkar, B. Sreedhar, M. Sarkar, A. Samanta, T. P. Radhakrishnan,* Tuning the Size and Optical Properties in Molecular Nano/microcrystals: Manifestation of Hierarchical Interactions, *Small*, **2006**, 2, 650-659.

List of Patents:

1. A. Patra, A. Chande, M. W. Hussain, V. Bhardwaj, Nanoporous Organic Framework of Metal Chelated Triaminoguanidinium, Complete specifications for patent (IPR) submitted on 19.03.2019, Application No. 201921010663.
2. A. Patra, B. Sk, M. Sarkar, S. Kundu, Dibenzopyridoquinoxaline based Derivatives, Complete specifications for patent (IPR) submitted on 11.10.2019, Application No. 201921041228.

List of Projects Implemented:

6. Project title: Cavitand-based Porous Organic Polymer to Molecular Nanocage: Catalysts for Metal-free CO₂ Conversion (File No.: STARS/APR2019/CS/560/FS)

Funding agency: MHRD-STARS; Duration: 15.05.2020 – 15.05.2023

5. Project title: Centre for Sustainable Treatment, Reuse and Management for Efficient, Affordable and Synergistic solutions for Water (File No.: DST/TM/WTI/WIC/2K17/82(G))

Funding agency: DST; Duration: 11.10.2018 – 11.10.2023

4. Project title: Multifunctional Conjugated Porous Organic Polymers: Emerging Materials for Light Harvesting, Photocatalysis and Energy Storage (File No.: EMR/2017/000233)

Funding agency: DST-SERB; Duration: 19.03.2018 – 19.06.2021

3. Project title: Stimuli-responsive Multifunctional Polymeric Micelles: Potential Scaffold for Drug Loading, Sensing and Light Harvesting (File No.: 01(2878)/17/EMR-II)

Funding agency: CSIR; Duration: 19.05.2017 – 19.05.2020

2. Project title: Exploration of Novel Aggregation Induced Emissive Molecules, Polymers and Nanoassemblies (File No.: 37(2)/14/06/2016-BRNS/37020)

Funding agency: DAE-BRNS; Duration: 08.08.2016 – 08.08.2019

1. Project title: Fluorescent Microporous Organic Polymers: Fabrication and Tuning the Optical Properties (File No.: SB/FT/CS-081/2013); Funding agency: DST-Fast Track; Duration: 30.05.2014 – 30.05.2017

Teaching at IISERB

S. No.	Course name and details	Academic Calendar
18	CHM 224: Physical Chemistry Lab I	2019-20 Sem II
17	CHM 324: Physical Properties of Matter	2019-20 Sem I
16	CHM 637: Chemistry and Physics of Materials	2018-19 Sem II
15	CHM 221: Basic Physical Chemistry-I (Core course)	2018-19 Sem I
14	CHM 324: Physical Properties of Matter	2017-18 Sem II
13	CHM 637: Chemistry and Physics of Materials	2017-18 Sem I
12	CHM 422: Molecular spectroscopy	2016-17 Sem II
11	CHM 632: Physical Chemistry of Polymers	2016-17 Sem I
10	CHM 321: Physical Chemistry of Solutions	2015-16 Sem II
9	CHM 423: Physical Chemistry Laboratory II	2015-16 Sem I
8	CHM222: Classical Thermodynamics (Core course, Tutorial)	2014-15 Sem II
8	CHM222: Classical Thermodynamics (Core course)	2014-15 Sem II
7	CHM 423: Physical Chemistry Laboratory II	2014-15 Sem I
6	CHM 632: Physical Chemistry of Polymers	2013-14 Sem II
5	CHM 224: Physical Chemistry Lab I	2013-14 Sem II
4	CHM 321: Physical Chemistry of Solutions	2013-14 Sem I
3	CHM 103: General Chemistry Laboratory	2012-13 Sem II
2	CHM 324: Physical Properties of Matter	2012-13 Sem II
1	CHM 261: Basic Chemistry (Core Course)	2012-13, Sem-I
