Professor Arnab Halder

Department of Chemistry

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Education

- **Ph.D. (Chemistry)** (June, 2006), Department of Physical Chemistry, IACS, Kolkata (degree awarded by Jadavpur University)
- **M.Sc. (Specialization in Physical Chemistry)** (2001), Department of Chemistry, University of Calcutta (Percentage: 71.5, 1st Class)
- **B. Sc. (Hons.) Chemistry** (1999), Presidency College, University of Calcutta. (Percentage: 65.5, 1st class)

Research Experiences

- As a Professor of Presidency University (April, 2019 to till now), working on the spectral features of graphene based nanomaterials and biologically & environmentally relevant organic fluorophores

  Research topics: (i) Synthesis and investigation of Photoluminescence properties of carbon nanomaterials and quantum dots, (ii) Fluorescence sensing, (iii) Excited State Dynamics.
- As a Visiting Researcher in Molecular Photoscience Research Center, Kobe University, Japan, on Coherent Control by Pulse Shaping Technique from 2007 to 2008 (Supervisor: Professor A. Wada)
- As Ph.D. scholar (December, 2001 – June, 2006), Department of Physical Chemistry, Indian association for the Cultivation of Science, Jadavpur, Kolkata. *Thesis title:* "PROTON TRANSFER AND SOLVATION DYNAMICS IN ORGANIZED ASSEMBLIES", Thesis supervisor: Professor Kankan Bhattacharyya

Professional positions held

Professor and Head of the Department of Chemistry, Presidency University

Areas of Academic interests and Courses taught

Spectroscopy, Excited State Processes and Ultrafast Dynamics, Chemical Thermodynamics, Application of Fluorescence spectroscopy to study biomolecules and nanoparticles, Atomic Structure, Quantum Mechanics and Soft Materials

Teaching and Administrative Experiences

- Assistant Professor in Shibpur Dinobundhoo Institution (College) from March 1, 2004 to December 16, 2013
- Involved in various administrative work, e.g., convener of Admission Sub-Committee, member of IQAC, Nodal Officer of the College for AISHE at Shibpur Dinobundhoo Institution (College)
- Associate Professor in Presidency University from April 8, 2016 to April 7, 2019
- Professor in Presidency University from April 7, 2019 to Till now
- Head of the Department of Chemistry, Presidency University since November, 2020

- Served the Presidency University by involving many administrative works as member of Governing body, Finance Committee, Doctoral Committee, IQAC, SGRC, NAAC Steering Committee
- Involved and Given leadership in many Departmental Academic, Cultural and outreach Programmes apart from classroom teaching, beyond classroom interaction with students, students' counselling and research

Research Interests

- Synthesis and characterisation of carbon nanomaterials.
- Ultrafast dynamics for the excited state processes of organic fluorophores.
- Spectroscopic investigation of biomolecular interactions and protein folding as well as misfolding.
- Photoluminescence properties of graphene based nanoparticles and their applications in environment sciences.
- Fluorescence behaviour of transition metals and lanthanides incorporated quantum dots.
- Optical sensing of biomolecules and inorganic ions.

Postgraduate Supervision

Present Members:

- Mrs. Tuyan Biswas (UGC-SRF), thesis submitted for Ph.D. in Presidency University (2025)
- Mr. Somnath Bali (CSIR-SRF), registered for Ph.D. in Presidency University (2021)
- Mr. Injamamul Haque (UGC-JRF), registered for Ph.D. in Presidency University (2022)

Past Ph.D. Members:

- Dr. Dinesh Kumar Pyne (CSIR-SRF), awarded Ph.D. (Science) 2022
- Dr. Prosenjit Saha (CSIR), awarded Ph.D. (Science) in 2021

So far, twenty students of Presidency University and nine students from other Universities have successfully completed M.Sc. Project work under my supervision.

Expertise

Spectroscopic Techniques

- Femtosecond Transient Absorption
- Time-Correlated Single Photon Counting (TCSPC)
- Spectrophotometer and Fluorimeter

Synthesis and Characterization Techniques

- Synthesis of Graphene oxide-based nanomaterials
- Powder X-ray diffraction (PXRD)
- Transmission electron microscope (TEM)
- X-ray photoelectron spectroscopy (XPS)
- Fourier transform infrared spectroscopy (FTIR)
- Solution-state nuclear magnetic resonance spectroscopy (NMR)

Projects

- As PI: UGC –BSR Start-up Grant (2015-2017), FRPDF (Presidency University)
- As Co-PI: DST – SURE (ongoing)

Publications

As corresponding author

1. Urea-Assisted N-Doping of Nickel Sulfide for Enhanced Oxygen Evolution Reaction Performance. Bali, S.; **Halder, A.**; Mondal, A., ChemNanoMat (2025) e202500434 (Impact Factor: 2.6) https://doi.org/10.1002/cnma.202500434
2. Fluorescence and UV-vis spectrophotometry: a dual-mode competitive approach for selective sensing of dopamine. Bali, S.; **Halder, A.**; Mondal, A., Analytical Methods (2025), 17, 5150 (Impact Factor: 3.5)
3. Temperature-induced photoluminescence amplification of graphene oxide-polyaniline composite through interaction modulated charge transfer. Pyne, D. K.; Chatterjee, S.; Pramanik, S.; **Halder, A.**, Materials Chemistry and Physics, 2024, 318, 129241. (Impact Factor: 4.3) https://doi.org/10.1016/j.matchemphys.2024.129241
4. A facile approach for selective detection of arsenite ions using plasmonic behaviour of silver nanoparticles. Bali, S., Goswami, S., **Halder, A.**, Mondal. A., Anal. Methods, 2024, 16 (2), 170-174. (Impact Factor: 2.6) https://pubs.rsc.org/en/content/articlelanding/2023/ay/d3ay01701j
5. Unraveling the Interaction of Synthesized Thienoangelicin Derivative by Fluorescence Studies with Solvents Bovine Serum Albumin and Metal Ions. Biswas, T., Haque, I., Roy, S., Chakraborty, B., Mitra, D., Kar, G. K., **Halder. A.**, ChemistrySelect, 2023, 8 (28) e202300857. (Impact Factor: 1.9) https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/slct.202300857
6. Tuning of Photoluminescence of Graphene Oxide Based Nanomaterials in the UV-Visible Region: Formation of Aggregates by H-Bonding through Water Molecules. Pyne, D. K., Chatterjee, S., Pramanik, S., Saha, P., Biswas, T., Bali, S., Dutta, P., **Halder, A.**, ChemistrySelect 2022, 7, e202202707 (Impact Factor: 1.9). https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/slct.202202707
7. Interaction of Aromatic Nitro Compounds and Fluoride Ions with Photoluminescent GO-Ce Nanoparticles: Understanding the Role of Local Environment of Cerium. Pyne, D. K., Pramanik, S., Chatterjee, S., Bali, S., Biswas, T., Sengupta, S., **A. Halder**. ChemistrySelect 2022 , 7 (35), e202202095. (Impact Factor: 1.9) https://chemistry-europe.onlinelibrary.wiley.com/journal/23656549
8. Photoluminescence Amplification of Cerium Incorporated Graphene Oxide Nanoparticles by Photoinduced Reduction: A Mechanistic Study Highlighting Structural Orderness. Pyne, D, K.; Chatterjee, S.; Biswas, T; Saha, P; Dutta, P; **Halder. A.** Journal of Luminescence, 2021, 235, 118019. (Impact factor: 3.3) https://www.sciencedirect.com/science/article/abs/pii/S0022231321001356
9. Tunable Luminescence of a synthesised furophenanthraquinone derivative: Interactions with different solvents. Sarkar, A.; Pyne, D, K.; Biswas, T.; Das, R.; Kar, G, K.; **Halder, A.**, Luminescence: The Journal of Biological and Chemical Luminescence, 2020, 35,709. (Impact factor: 3.2) https://analyticalsciencejournals.onlinelibrary.wiley.com/doi/abs/10.1002/bio.3776

10. Tunable luminescence of graphene oxide-polyaniline nano-composite: Effect of an anionic surfactant. Saha, P.; Pyne, D. K.; Dutta, P.; **Halder, A.**; Journal of Luminescence, 2019, 206, 218. (Impact factor: 3.3) https://www.sciencedirect.com/science/article/abs/pii/S0022231318312201
11. Photoluminescence of Graphene Oxide: Effect of pH, Surfactant and Polymer. Pyne, D, K.; Saha, P.; **Halder, A.**, EPA News Letter, 2018, 94, 11. (ISSN 1011-4246)
12. Effect of an anionic surfactant (SDS) on the photoluminescence of graphene oxide (GO) in acidic and alkaline medium. Saha, P.; Pyne, D. K.; Ghosh, S.; Banerjee, S.; Das, S.; Ghosh, S.; Dutta, P.; **Halder, A.**, RSC Advances, 2018, 8, 584. (Impact Factor: 4.6) https://pubs.rsc.org/en/content/articlehtml/2018/ra/c7ra12024a
13. pH dependent tunable photoluminescence of Polyaniline grafte Graphene Oxide (GO–PANI) nanocomposite. Saha, P.; Pyne, D. K.; Pal, M.; Datta, S.; Das, P. K.; Dutta, P.; **Halder, A.** Journal of Luminescence, 2017, 181, 138. (Impact factor: 3.3) https://www.sciencedirect.com/science/article/abs/pii/S0022231316308511
14. Excitation wavelength dependent UV fluorescence of dispersed modified graphene oxide: Effect of pH. Dutta, P.; Nandi, D.; Datta, S.; Chakraborty, S.; Das, N.; Chatterjee, S.; Ghosh, U. C.; **Halder, A.** Journal of Luminescence, 2015, 168, 269. (Impact factor: 3.3) https://www.sciencedirect.com/science/article/abs/pii/S0022231315004731

As lead author or co-author

1. Temperature-Dependent Conductivity of Graphene Oxide and Graphene Oxide-Polyaniline Nanocomposites Studied by Terahertz Time-Domain Spectroscopy. Dutta, P.; Afalla, J.; **Halder, A.**; Datta, S.; Tominaga, K. J. Phys. Chem. C, 2017, 121, 1422. (Impact factor: 3.2) https://pubs.acs.org/doi/full/10.1021/acs.jpcc.6b10412
2. Study of partially folded states of cytochrome C by solvation dynamics. Mondal, S. K.; Roy, D.; Sahu, K.; Mukherjee, S.; **Halder, A.**; Bhattacharyya, K. Journal of Molecular Liquids, 2006, 124, 128. (Impact factor: 5.3) https://www.sciencedirect.com/science/article/abs/pii/S0167732205001935
3. Solvation dynamics in a worm-like CTAB micelle. Sen, P.; Mukherjee, S.; **Halder, A.**; Dutta, P.; Bhattacharyya, K. Res. Chem. Intermed., 2005, 31, 135. (Impact factor: 2.8) https://link.springer.com/article/10.1163/1568567053146922
4. Study of Solvation Dynamics in an Ormosil: CTAB in a Sol-Gel Matrix. Sahu, K.; Roy, D.; Mondal, S. K.; **Halder, A.**; Bhattacharyya, K. J. Phys. Chem. B, 2004, 108, 11971. (Impact factor: 2.9) https://pubs.acs.org/doi/abs/10.1021/jp049152x
5. Temperature dependence of solvation dynamics in a micelle.4-Aminophthalimide in Triton X-100. Sen, P.; Mukherjee, S.; **Halder, A.**; Bhattacharyya, K. Chem. Phys. Lett., 2004, 385, 357. (Impact factor: 2.719) https://www.sciencedirect.com/science/article/abs/pii/S0009261404000156
6. Solvation Dynamics in Dimyristoyl-Phosphatidylcholine Entrapped Inside a Sol-Gel Matrix. **Halder, A.**; Sen, S.; Das Burman, A.; Patra, A.; Bhattacharyya, K. J. Phys. Chem. B, 2004, 108, 2309. (Impact factor: 2.9) https://pubs.acs.org/doi/abs/10.1021/jp035685e

7. Solvation Dynamics of DCM in a Polypeptide-Surfactant Aggregate: Gelatin-Sodium Dodecyl Sulfate. **Halder, A.**; Sen, P.; Das Burman, A.; Bhattacharyya, K. Langmuir, 2004, 20, 653. (Impact factor: 3.9) https://pubs.acs.org/doi/10.1021/la035647m
8. Solvation Dynamics in the Water Pool of an Aerosol-OT Microemulsion. Effect of Sodium Salicylate and Sodium Cholate. Dutta, P.; Sen, P.; Mukherjee, S.; H**alder, A.**; Bhattacharyya K. J. Phys. Chem. B, 2003, 107, 10815. (Impact factor: 2.9) https://pubs.acs.org/doi/abs/10.1021/jp030083g
9. Solvation dynamics in a protein–surfactant aggregate. TNS in HSA–SDS. Mukherjee, S.; Sen, P.; **Halder, A.**; Sen, S.; Dutta, P; Bhattacharyya, K. Chemical Physics Letters, 2003, 379, 471. (Impact factor: 2.8) https://www.sciencedirect.com/science/article/abs/pii/S0009261403014982?via%3Dihub
10. Solvation Dynamics in the Molten Globule State of a Protein. Sen, P.; Mukherjee, S.; Dutta, P.; **Halder, A.**; Mandal, D.; Banerjee, R.; Roy, S.; Bhattacharyya, K. J. Phys. Chem. B, 2003, 107, 14563. (Impact factor: 2.9) https://pubs.acs.org/doi/abs/10.1021/jp036277d
11. Solvation dynamics in a protein–surfactant complex. Dutta, P.; Sen, P.; **Halder, A.**; Mukherjee, S.; Sen, S.; Bhattacharyya, K. Chemical Physics Letters, 2003, 377, 229. (Impact factor: 2.8) https://www.sciencedirect.com/science/article/abs/pii/S0009261403011436?via%3Dihub
12. Excited State Proton Transfer of 1-Naphthol in a Hydroxypropylcellulose/Sodium Dodecyl Sulfate System. Dutta, P.; **Halder, A.**; Mukherjee, S.; Sen, P.; Sen, S.; Bhattacharyya, K. Langmuir, 2002, 18, 7867. (Impact factor: 3.9) https://pubs.acs.org/doi/abs/10.1021/la020390y

Membership in Association

Life member of Indian association for the Cultivation of Sciences, Kolkata

Awards, Achievements

- Secured **All India Rank 3** in **Gate Examination – 2001**
- Qualified for National Eligibility Test (**CSIR NET JRF- 2001, top 20% of the awardees**) in Chemical Sciences

Seminars, conference, workshops (in last 10 years)

Name of the Seminar/ Workshop/ Symposium	Organizer	Date	Level	Venue	Presentation
QIP Short Term course on Fluorescence Spectroscopy	Department of Chemistry, IIT Kanpur	November 23-27, 2015	National	IIT Kanpur	Resource person

Trombay Symposium on Radiation & Photochemistry (TSRP-2016) Incorporating *6th* Asia Pacific Symposium on Radiation Chemistry (APSRC-2016)	BARC, Mumbai and Indian Society for Radiation & Photochemical Sciences (ISRAPS)	January 5-9, 2016	International	BARC, Mumbai	Poster presentation
Fourth International Conference on Nanostructured Materials and Nanocomposites (ICNM 2017)	International and Inter University Centre for Nanoscience and Nanotechnology (IIUCNN) Mahatma Gandhi University, Kerala	February 10-12, 2017	International	Mahatma Gandhi University, Kerala	Invited Speaker and Chairing of a session
International Conference on Nanotechnology Ideas, Innovations and Initiatives (ICN3I-2017)	Centre of Nanotechnology, IIT Roorkee	December 06 - 08, 2017	International	IIT Roorkee, Uttarakhand	Invited Speaker
One Day Webinar on Advance Level Study on Chemical Sciences	Department of Chemistry School of Science Netaji Subhas Open University	September, 23, 2020	National	Digital Platform	Invited Speaker
International Conference on Chemical and Environmental Sciences	IEM, KOLKATA	December 18-20, 2020	International	Digital Platform	Invited Speaker

Community Service

- Involved in different Social Welfare Organisations, Science Popularisation Association
- Delivered several lectures on Popular Science in different Colleges and Institutes

Extra-curricular Activities

- Passionate on reading books, culture and sports.
- Painting and Recitation

Disclaimer

I assert that the details furnished above are all true to the best of my knowledge.

(ARNAB HALDER)