Curriculum Vitae

August 2025

Name: Dr. Subhadip Roy

Present address: Molecular Spectroscopy Laboratory, RIKEN,
2-1 Hirosawa, Wako, Saitama 351-0198, Japan

Permanent address: Professor Colony, Kenduadihi, Bankura,
722102, West Bengal, India

E-mail: subhadip.roy@riken.jp, r.subhadip@yahoo.com

Education and research

Postdoctoral Research Molecular Spectroscopy Laboratory, RIKEN, Japan. Project: Study of aqueous interfaces using advanced laser spectroscopy	2022-till date
Ph.D. Homi Bhabha National Institute (HBNI), Bhabha Atomic Research Centre (BARC) Mumbai, India Thesis title: Studies of metabolites and ions at aqueous interfaces by surface-sensitive spectroscopic technique	2016-2021
M.Sc. with Physical Chemistry specialization Sidho-Kanho-Birsha University (SKBU), West Bengal, India	2013-2015
B.Sc. in Chemistry The University of Burdwan, West Bengal, India	2010-2013

Research interests

Interface-selective nonlinear spectroscopy.

Structure and dynamics at aqueous interfaces.

Hydration shell structure of simple and complex molecular systems.

Skills and expertise

Developing heterodyne-detected vibrational sum-frequency generation (HD-VSFG) as well as HD electronic SFG (HD-ESFG) spectroscopic setup.

Developing time-resolved (or pump-probe) HD-VSFG and HD-ESFG setups.

Developing spontaneous Raman spectrometer.

Experienced in difference spectroscopy with simultaneous curve fitting (DS-SCF) analysis.

Experienced in handling lipids and surfactant monolayers.

Publications

1) Time-resolved heterodyne-detected electronic sum frequency generation (TR-HD-ESFG) spectroscopy: A new approach to explore interfacial dynamics.
Subhadip Roy, Mohammed Ahmed, Satoshi Nihonyanagi, Tahei Tahara
J. Chem. Phys., 161, **2024**, 174202

2) Origin of Strong Hydrogen Bonding and Preferred Orientation of Water at Uncharged Polyethylene Glycol Polymer/Water Interface.
Animesh Patra, Anisha Bandyopadhyay, **Subhadip Roy**, Jahur Alam Mondal
J. Phys. Chem. Lett., 14, **2023**, 11359

3) Unified view of the hydrogen-bond structure of water in the hydration shell of metal ions (Li^+, Mg^{2+}, La^{3+}, Dy^{3+}) as observed in the entire 100–3800 cm^{-1} regions.
Nishith Ghosh, Anisha Bandyopadhyay, **Subhadip Roy**, Gunomoni Saha, Jahur Alam Mondal
J. Mol. Liq., 389, **2023**, 122927

4) Adsorption of SARS-CoV-2 Spike (N501Y) RBD to Human Angiotensin-Converting Enzyme 2 at a Lipid/Water Interface.
Harison Rozak, Satoshi Nihonyanagi, Anton Myalitsin, **Subhadip Roy**, Mohammed Ahmed, Tahei Tahara, and Izabela I. Rzeznicka
J. Phys. Chem. B, 127, **2023**, 4406

5) Vibrational Raman Spectroscopy of the Hydration Shell of Ions.
Nishith Ghosh, **Subhadip Roy**, Anisha Bandyopadhyay and Jahur Alam Mondal
Liquids, 3, **2022**, 19

6) Headgroup-Specific Interaction of Biological Lipid Monolayer/Water Interface with Perfluorinated Persistent Organic Pollutant (f-POP): As Observed with Interface-Selective Vibrational Spectroscopy.
Nishith Ghosh, **Subhadip Roy** and Jahur Alam Mondal
J. Phys. Chem. B, 126, **2022**, 563

7) Interaction of Zwitterionic Osmolyte Trimethylamine N-oxide (TMAO) with Molecular Hydrophobes: An Interplay of Hydrophobic and Electrostatic Interactions.
Subhadip Roy, Animesh Patra, Dipak K. Palit and Jahur Alam Mondal
J. Phys. Chem. B, 125, **2021**, 10939

8) "Breaking" and "Making"of Water Structure at the Air/Water−Electrolyte ($NaXO_3$; X = Cl, Br, I) Interface.
Subhadip Roy and Jahur Alam Mondal
J. Phys. Chem. Lett., 12, **2021**, 1955-1960

9) Kosmotropic Electrolyte (Na_2CO_3, NaF) Perturbs the Air/Water Interface through Anion Hydration Shell without Forming a Well-Defined Electric Double Layer.
Subhadip Roy and Jahur Alam Mondal
J. Phys. Chem. B 125, **2021**, 3977-3985

10) Effects of Charge and Alkyl Chain Configuration on Hydrophobic Hydration: A Temperature-Dependent Raman Study.
Subhadip Roy and Jahur Alam Mondal
Asian Journal of Physics, 30, **2021**, 337-345

11) Interaction of α-Synuclein with Phospholipids and the Associated Restructuring of Interfacial Lipid Water: An Interface-Selective Vibrational Spectroscopic Study.
Biswajit Biswas, **Subhadip Roy**, Jahur Alam Mondal, Prashant Chandra Singh
Angew. Chem. Int. Ed. 59, **2020**, 22731-22737

12) Restructuring of Hydration Shell Water due to Solvent-Shared Ion Pairing (SSIP): A Case Study of Aqueous $MgCl_2$ and $LaCl_3$ Solutions.
Subhadip Roy, Animesh Patra, Subhamoy Saha, Dipak K. Palit, and Jahur Alam Mondal
J. Phys. Chem. B, 124, **2020**, 8141-8148

13) Adsorption of Iodine Species (I_3^-, I^-, and IO_3^-) at the Nuclear Paint Monolayer−Water Interface and Its Relevance to a Nuclear Accident Scenario.
Subhamoy Saha, **Subhadip Roy**, P. Mathi, and Jahur A. Mondal
J. Phys. Chem. A, 124, **2020**, 6726-6734

14) Dipolar small molecules at the air-water interface: A heterodyne-detected vibrational sum frequency generation (HD-VSFG) study.
Subhadip Roy and Jahur A. Mondal
Asian Journal of Physics, 29, **2020**, 287-294

15) On the Behavior of Perfluorinated Persistent Organic Pollutants (POPs) at Environmentally Relevant Aqueous Interfaces: An Interplay of Hydrophobicity and Hydrogen Bonding.
Nishith Ghosh, **Subhadip Roy**, and Jahur A. Mondal
Langmuir, 36, **2020**, 3720-3729

16) Observation of Extremely Weakly Interacting OH ($\sim$3600 cm^{-1}) in the Vicinity of High Charge Density Metal Ions (M^{z+}; z = 1, 2, 3): A Structural Heterogeneity in the Extended Hydration Shell.
Animesh Patra, **Subhadip Roy**, Subhamoy Saha, Dipak K. Palit, and Jahur A. Mondal
J. Phys. Chem. C, 124, **2020**, 3028-3036

17) Hydrophobic Hydration of Fluoroalkyl (C–F) is Distinctly Different from That of Its Hydrogenated Counterpart (C–H), as Observed by Raman Difference with Simultaneous Curve Fitting Analysis.
Subhadip Roy, Biswajit Biswas, Nishith Ghosh, P. C. Singh and Jahur A. Mondal
J. Phys. Chem. C, 123, **2019**, 27012-27019

18) Polyatomic Iodine Species at the Air-Water Interface and Its Relevance to Atmospheric Iodine Chemistry: An HD-VSFG and Raman-MCR Study.
Subhamoy Saha, **Subhadip Roy**, P. Mathi, and Jahur A. Mondal
J. Phys. Chem. A, 123, **2019**, 2924-2934

19) Heterodyne-Detected Vibrational Sum Frequency Generation Study of Air-Water-Fluoroalcohol Interface: Fluorocarbon Group-Induced Structural and Orientational Change of Interfacial Water.
Subhadip Roy, Biswajit Biswas, Jahur A. Mondal and Prashant Chandra Singh
J. Phys. Chem. C, 122, **2018**, 26928-26933

20) Water in the hydration shell of cryoprotectants and their non-cryoprotecting structural analogues as observed by Raman-MCR spectroscopy.
Nishith Ghosh, **Subhadip Roy**, Mohammed Ahmed, Jahur A. Mondal
J. Mol. Liq., 266, **2018**, 118-121

Chapters in books/bulletins

1) Classical- and Heterodyne-Detected Vibrational Sum Frequency Generation (VSFG) Spectroscopy and Its Application to Soft Interfaces.
   Subhadip Roy, Subhamoy Saha and Jahur Alam Mondal
   Modern Techniques of Spectroscopy, Progress in Optical Science and Photonics, Springer Singapore, 13, **2021**, 87-115

2) Hydration of Ions and Cosolvents in the Bulk Water and at the air-Water Interface: A Water's Perspective.
   Subhadip Roy and Jahur A. Mondal
   ISRAPS Bulletin, 32, **2020**, 43-54

Oral presentations

1) Oral presentation at "The 18th Annual meeting of the Japan Society for Molecular Science", **2024**, Kyoto, Japan
2) Oral presentation at "National Symposium on Radiation and Photochemistry", **2021**, BARC Mumbai, India

Other conferences/workshops attended

1) The 82nd Okazaki Conference on Recent Advances and Perspectives of Interfacial Materials and Molecular Sciences lead by Next-Generation Laser Techniques and Computational Science, **2025**, Institute for Molecular Science, Okazaki, Japan.
2) The 22nd International Conference on Time-Resolved Vibrational Spectroscopy (TRVS), **2025**, Shiga, Japan.
3) DAE-BRNS Theme Meeting on Ultrafast Sciences, **2021**, (Online).
4) ACS Science Connect: Langmuir, **2020**, (Online).
5) 15th DAE-BRNS Biennial Trombay Symposium on Radiation and Photochemistry, **2020**, BARC Mumbai, India.
6) DAE-BRNS Theme Meeting on Ultrafast Sciences, **2019**, IIT Bombay, India.
7) Global Initiative For Academic Networks (GIAN), **2019**, IIT Kanpur, India.
8) National Symposium on Radiation and Photochemistry, **2019**, Visva-Bharati, India.
9) DAE-BRNS Theme Meeting on Ultrafast Science, **2018**, RRCAT Indore, India.
10) 14th DAE-BRNS Biennial Trombay Symposium on Radiation and Photochemistry, **2018**, BARC Mumbai, India.

Academic awards

Dr. P. K. Bhattacharyya Memorial Award for the best-poster in Photochemistry, 15th DAE-BRNS Biennial Trombay Symposium on Radiation and Photochemistry, **2020**, BARC Mumbai, India.

Best poster award in DAE-BRNS Theme Meeting on Ultrafast Sciences, **2019**, IIT Bombay, India.

Best poster award in National Symposium on Radiation and Photochemistry, **2019**, Visva-Bharati, India.

Best poster award in DAE-BRNS Theme Meeting on Ultrafast Science, **2018**, RRCAT Indore, India.

Senior Research Fellowship from the Department of Atomic Energy (DAE), Government of India, **2018-2021**.

Junior Research Fellowship from the Department of Atomic Energy (DAE), Government of India, **2016-2018**.

Qualified in All-India CSIR-UGC test for Junior Research Fellowship and Eligibility for Lectureship (All India CSIR Rank-54).
