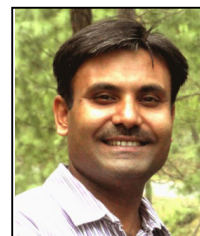


Sobhan Sen

Spectroscopy Laboratory
Room No. 202 (Lab# 215)
School of Physical Sciences
Jawaharlal Nehru University
New Delhi 110067, India
Phone: +91-11-26738803
Cell Phone: +91-9999191840
E-mail: sens@mail.jnu.ac.in; sobhan.sen@gmail.com
Web: <https://www.jnu.ac.in/content/sens>
DOB: September 30, 1975



Education

Ph.D. Indian Association for the Cultivation of Science (IACS), Kolkata (Supervisor: Kankan Bhattacharyya; Degree from Jadavpur University) Thesis Title: <i>Effect of Restricted Environments on Ultrafast Processes</i>	2003
M.Sc. (1st Class) ; Calcutta University (Rajabazar Science College, Kolkata)	1998
B.Sc. (1st Class) , Calcutta University (Krishnath College, Berhampore, WB)	1996

Professional Experience

Associate Professor School of Physical Sciences Jawaharlal Nehru University New Delhi	2014–Present
Assistant Professor School of Physical Sciences Jawaharlal Nehru University New Delhi	2007 – 2014
JSPS Postdoctoral Fellow RIKEN Wako, Saitama 351-0198, Japan (Advisor: Tahei Tahara)	2005 – 2007
Postdoctoral Fellow Department of Chemistry and Biochemistry University of South Carolina, SC 29208, USA (Advisor: Mark A. Berg)	2003 – 2005

Research Interests

- Ultrafast laser spectroscopy and its application in biological and physicochemical systems
- Single molecule spectroscopy, fluorescence correlation spectroscopy, fluorescence imaging and their application in biophysics and chemistry
- Spectroscopy at interfaces and surfaces
- Molecular dynamics simulation of bio-macromolecules

Awards/Honours/Fellowships

1. Editorial Board Member of *Chemical Physics Impact* (2020-2023) (<https://www.journals.elsevier.com/chemical-physics-impact/editorial-board>)
2. Member of Review Editor Board of *Frontiers* (Biophysics section), 2020 (<https://www.frontiersin.org/journals/all/sections/biophysics#editorial-board>)
3. Invited Colloquium at Tata Institute of Fundamental Research, Mumbai on August 26, 2015. Title: *Water around DNA: What's so Special About It?*
4. Asian and Oceanian Photochemistry Association (APA) Young Scientist Prize 2012.
5. Best Poster Prize at 'Annual Symposium of Nano/Micro Spectroscopy Division of the Spectroscopy Society of Japan', Tokyo, Japan in 2007.
6. Japanese Society for the Promotion of Science (JSPS) fellowship in 2005.
7. Best Poster Prize at '7th Annual Southeast High Resolution Spectroscopy and Ultrafast Conference' held at University of Alabama-Huntsville, Alabama, USA in 2004.
8. Council of Scientific and Industrial Research (CSIR-NET) Fellowship.

Students Mentoring

Ph.D. Students: Current - 05; Awarded - 05

Ph.D. Theses (Awarded)

1. Title: "*Study of Molecular Interactions and Ultrafast Dynamics in DNA*"
Author: Sachin Dev Verma, Year of Award: 2012
2. Title: "*Study of Solvation Dynamics in DNA and Size-Parameters of Microemulsion Droplets in Solution*"
Author: Nibedita Pal, Year of Award: 2013

3. Title: *“Study of Depth-Dependent Static and Dynamic Properties of Water-Lipid Bilayer Interface using Series of Fluorescent Probes of Different Hydrophobicity”*
Author: Moirangthem Kiran Singh, Year of Award: 2015
4. Title: *“Study of Molecular Interactions and Diffusion Kinetics of Microemulsion Droplets and of G- Quadruplex DNA in Solution”*
Author: Mohammad Firoz Khan, Year of Award: 2015
5. Title: *“Understanding Solvation Dynamics and Ligand Interactions in DNA and Lipid-Bilayer Using Experiment and Simulation”*
Author: Him Shweta, Year of Award: 2018

Current Ph.D. Students

Mrs. Kavita Yadav (2014 – present)
 Mr. Avinash Kuman Singh (2015 – present)
 Mr. Ndege Simisi Clovis (Foreign National) (2017 – present)
 Ms. Deepika Sardana (2017 – present)
 Mr. Parvez Alam (2018 – present)

Positions Held by Former Ph.D. Students

1. Dr. Sachin Dev Verma

2019 - Present: Assistant Professor, Department of Chemistry, Indian Institute of Science Education and Research (IISER) Bhopal.

2017 – 2019: Marie Skłodowska-Curie Fellow, Department of Physics, University of Cambridge, UK (with Akshay Rao).

2016 – 2017: Postdoctoral Scholar, Department of Chemistry, University of California Irvine, USA (with Nien-Heu Ge).

2013 – 2016: Postdoctoral Researcher, Department of Chemistry and Biochemistry, University of South Carolina, USA (with Mark A Berg).

2. Dr. Nibedita Pal

2018 - Present: Assistant Professor, Department of Biology, Indian Institute of Science Education and Research (IISER) Tirupati.

2016 – 2018: Postdoctoral Research Fellow, Department of Chemistry, University of Michigan, Ann Arbor, USA (with Nils G Walter).

2014 – 2016: Postdoctoral Research Associate, Department of Chemistry, Bowling Green State University, Ohio, USA (with H. Peter Lu).

3. Dr. Moirangthem Kiran Singh

2019 – Present: Postdoctoral Fellow, University of Texas Medical Branch, USA (with Linda Kenny).

2017 – 2019: Research Fellow, Mechanobiology Institute (MBI), National University of Singapore, Singapore (with Linda Kenny).

4. Dr. Mohammad Firoz Khan

2019 – Present: Experimental Quantum Physicist, *QuantLaseLab*, Abu Dhabi, United Arab Emirates (<https://www.quantlaselab.com/>).

2017 – 2019: SERB-National Postdoctoral Fellow, Department of Chemistry, Indian Institute of Technology Delhi, India (with Pramit K Choudhury).

5. Dr. Him Shweta

2018 – Present: Postdoctoral Scholar, School of Medicine, University of Pennsylvania, Philadelphia, USA (with Yale E Goldman).

Master's Project Students: 12

Mr. Rajkumar Sahoo (2020)

Mr. Paominthang Haokip (2018)

Mr. Khemchand Rawat (2016)

Ms. Geeta (2016)

Mr. Vikas Arora (2015)

Ms. Reshmi GS (2014)

Ms. Saloni Sharma (2013)

Ms. Neelam Punia (2013)

Mr. Niraj Aryal (2012)

Mr. Debabrata Saha (2011)

Mr. Mohammad Kamran (2010)

Ms. Karuna Nidhi Tirky (2010)

Publications

Number of Research Papers: 50, Book Chapter: 02

Citation: 1466 (Scopus), 1718 (Google Scholar)

h-Index: 23 (Scopus), 26 (Google Scholar)

Book Chapter

1. *"Dynamics of Water and Ions near DNA: Perspective from Time-Resolved Fluorescence Stokes Shift Experiments and Molecular Dynamics Simulation"*

Him Shweta, Nibedita Pal, Moirangthem Kiran Singh, Sachin Dev Verma and **Sobhan Sen***

Book Chapter in ***Reviews in Fluorescence* 2017**, Springer (DOI: <https://doi.org/10.1007/978-3-030-01569-5>).

2. *"New Family of Fluorescent Probes for Characterizing Depth-Dependent Static and Dynamic Properties of Lipid/Water Interfaces"*

Moirangthem Kiran Singh, Him Shweta and **Sobhan Sen***

Book Chapter in ***Analysis of Membrane Lipids* 2020**, Springer (DOI: https://doi.org/10.1007/978-1-0716-0631-5_10)

Peer-Reviewed Research Papers

1. "Structure of an Unfolding Intermediate of an RRM Domain of ETR-3 Reveals Its Native-like Fold"
Harshesh Bhatt, Akshay Kumar Ganguly, Sonam Sharma, Gajraj Singh Kushwaha, Mohammad Firoz Khan, **Sobhan Sen** and Neel Sarovar Bhavesh*
Biophys. J. 2020, vol. 118, Page 352. (Cover Article)
2. "Cdr1p Highlights the Role of the Non-Hydrolytic ATP-Binding Site in Driving Drug Translocation in Asymmetric ABC Pumps"
Atanu Banerjee, Alexis Moreno, Mohammad Firoz Khan, Remya Nair, Suman Sharma, **Sobhan Sen**, Alok Kumar Mondal, Jorgaq Pata, Cédric Orelle, Pierre Falson* and Rajendra Prasad*
BBA-Biomembrane 2019, vol. 1862, Page 183131.
3. "Origin of Slow Solvation Dynamics in DNA: DAPI in Minor Groove of Dickerson-Drew DNA"
Deepika Sardana, Kavita Yadav, Him Shweta, Ndege Simisi Clovis, Parvez Alam and **Sobhan Sen***
J. Phys. Chem. B 2019, vol. 102, Page 10202. (Cover Article)
4. "Role of Ser65, His148 and Thr203 in the Organic Solvent-dependent Spectral Shift in Green Fluorescent Protein"
Jasvir Kaur, Neetu Singh Yadav, Moirangthem Kiran Singh, Mohd Jahir Khan, **Sobhan Sen**, Aparna Dixit,* Debapriya Choudhury*
Photochem. Photobiol. 2018, vol. 95, Page 543.
5. "Dynamics of Water and Ions around DNA: What is So Special About Them?"
Him Shweta and **Sobhan Sen***
J. Biosciences 2018, vol. 43, page 499. (Review article for special issue – "Fluorescence in Biology")
6. "Ras Hyperactivation Versus Overexpression: Lessons from Ras Dynamics in *Candida Albicans*"
Vavilala A. Pratyusha, Guiliana Soraya Victoria, Mohammad Firoz Khan, Dominic T. Haokip, Bhawna Yadav, Nibedita Pal, Subhash Chandra Sethi, Priyanka Jain, Sneha Lata Singh, **Sobhan Sen*** and Sneha Sudha Komath*
Sci. Rep. 2018, vol. 8, page 5248.
7. "Effect of T·T Mismatch on DNA Dynamics Probed by Minor Groove Binders: Comparison of Dynamic Stokes Shifts of Hoechst and DAPI"
Him Shweta, Moirangthem Kiran Singh, Kavita Yadav, Sachin Dev Verma, Nibedita Pal and **Sobhan Sen***
J. Phys. Chem. B 2017, vol. 121, page 10735. (Cover Article)
8. "Probe-location Dependent Resonance Energy Transfer at Lipid/Water Interfaces: Comparison between the Gel- and Fluid-Phase of Lipid Bilayer"
Moirangthem Kiran Singh*, Mohammad Firoz Khan, Him Shweta and **Sobhan Sen***
Phys. Chem. Chem. Phys. 2017, vol. 19, page 25870. (Inside Front Cover Article)

9. "Multidrug ABC Transporter Cdr1 of *Candida Albicans* Harbors Specific and Overlapping Binding Sites for Human Steroid Hormones Transport"
Pratima Baghel, Manpreet Kaur Rawal, Mohammad Firoz Khan, **Sobhan Sen**, Mohammed Haris Siddiqui, Vincent Chaptal, Pierre Falson and Rajendra Prasad*
BBA-Biomembrane 2017, vol. 1859, page 1778.
10. "Dispersed Dynamics of Solvation in G-quadruplex DNA: Comparison of Dynamic Stokes Shifts of Probes in Parallel and Antiparallel Quadruplex Structures"
Moirangthem Kiran Singh, Him Shweta, and **Sobhan Sen***
Methods Appl. Fluoresc. 2016, vol. 4, page 034009. (Invited Article for Optics Within Life Sciences -2016 special issue)
11. "New insight into probe-location dependent polarity and hydration at lipid/water interfaces: comparison between gel- and fluid-phases of lipid bilayers"
Moirangthem Kiran Singh, Him Shweta, Mohammad Firoz Khan and **Sobhan Sen***
Phys. Chem. Chem. Phys. 2016; vol. 18, page 24185 (Inside Front Cover Article)
12. "Newly identified motifs in *Candida albicans* Cdr1 protein nucleotide binding domains are pleiotropic drug resistance subfamily-specific and functionally asymmetric"
Manpreet Kaur Rawal, Atanu Banerjee, Abdul Haseeb Shah, Mohammad Firoz Khan, **Sobhan Sen**, Ajay Kumar Saxena, Brian C. Monk, Richard D. Cannon, Rakesh Bhatnagar, Alok Kumar Mondal, and Rajendra Prasad*
Sci. Rep. 2016, vol. 6, page 27132.
13. "Quantifying Size Parameters of Water-in-Oil Microemulsion Droplets: Why Fluorescence Correlation is Advantageous over Light Scattering Correlation?"
Mohammad Firoz Khan, Moirangthem Kiran Singh, and **Sobhan Sen***
ISRAPS Bulletin 2016, vol. 28, page 40.
14. "Measuring Size, Size Distribution, and Polydispersity of Water-in-Oil Microemulsion Droplets using Fluorescence Correlation Spectroscopy: Comparison to Dynamic Light Scattering"
Mohammad Firoz Khan, Moirangthem Kiran Singh and **Sobhan Sen***
J. Phys. Chem. B 2016, vol. 120, page 1008.
15. "Sequence-Dependent Solvation Dynamics of Minor-Groove Bound Ligand inside Duplex-DNA"
Sachin Dev Verma, Nibedita Pal, Moirangthem Kiran Singh and **Sobhan Sen***
J. Phys. Chem. B 2015, vol. 119, page 11019. (Invited Article in Biman Bagchi Festschrift special issue)
16. "Power-Law Solvation Dynamics in G-quadruplex DNA: Role of Hydration Dynamics on Ligand Solvation inside DNA"
Nibedita Pal, Him Shweta, Moirangthem Kiran Singh, Sachin Dev Verma and **Sobhan Sen***
J. Phys. Chem. Lett. 2015, vol. 6, page 1754.

17. *"The Potent Anti-Malarial Activity of Acriflavine in Vitro and in Vivo"*
Srikanta Dana, Dhaneswar Prusty, Devender Dhayal, Mohit Kumar Gupta, Ashraf Dar, **Sobhan Sen**, Pritam Mukhopadhyay, Tridibesh Adak, and Suman Kumar Dhar*
ACS Chem. Biol. **2014** vol. 9, page 2366.
18. *"Insight into Pleiotropic Drug Resistance ATP-binding Cassette Pump Drug Transport through Mutagenesis of Cdr1p Transmembrane Domain"*
Manpreet Kaur Rawal, Mohammad Firoz Khan, Khyati Kapoor, Neha Goyal, **Sobhan Sen**, Ajay Kumar Saxena, Andrew M. Lynn, Joel D. A. Tyndall, Brian C. Monk, Richard D. Cannon, Sneha Sudha Komath, and Rajendra Prasad*
J. Biol. Chem. **2013**, vol. 288, page 24480.
19. *"Understanding Growth of Nanorods in Microemulsion: A Combined Fluorescence Correlation Spectroscopy, Dynamic Light Scattering and Electron Microscopy Study"*
Soma Sharma, Nibedita Pal, Pramit Choudhury, **Sobhan Sen*** and Ashok K Ganguli*
J. Am. Chem. Soc. **2012**, vol. 134, page 19677.
20. *"Probe Position-Dependent Counterion Dynamics in DNA: Comparison of Time-Resolved Stokes Shift of Groove-Bound to Base-Stacked Probes in the Presence of Different Monovalent Counterions"*
Sachin Dev Verma, Nibedita Pal, Moirangthem Kiran Singh, and **Sobhan Sen***
J. Phys. Chem. Lett. **2012**, vol. 3, page 2621.
21. *"Understanding Ligand Interaction with Different Structures of G-Quadruplex DNA: Evidence of Kinetically Controlled Ligand Binding and Binding-Mode Assisted Quadruplex Structure Alteration"*
Sachin Dev Verma, Nibedita Pal, Moirangthem Kiran Singh, Him Shweta, Mohammad Firoz Khan, and **Sobhan Sen***
Anal. Chem. **2012**, vol. 84, page 7218.
22. *"Fluorescence Correlation Spectroscopy: An Efficient Tool for Measuring Size, Size-Distribution and Polydispersity of Microemulsion Droplets in Solution"*
Nibedita Pal, Sachin Dev Verma, Moirangthem Kiran Singh, and **Sobhan Sen***
Anal. Chem. **2011**, vol. 83, page 7736.
23. *"Probe Position Dependence of DNA Dynamics: Comparison of the Time-Resolved Stokes Shift of Groove-Bound to Base-Stacked Probes"*
Nibedita Pal, Sachin Dev Verma and **Sobhan Sen***
J. Am. Chem. Soc. **2010**, vol. 132, page 9277.
24. *"Current Perspective on Ultrafast Solvation Dynamics in DNA"*
Sobhan Sen,* Sachin Dev Verma, and Nibedita Pal.
ISRAPS Bull. **2010**, vol. 22, page 53 – 62. (Invited Review)
25. *"Half-hydration" at the air/water interface revealed by heterodyne-detected electronic sum frequency generation spectroscopy, polarization second harmonic generation, and molecular dynamics simulation"*
Hidekazu Watanabe, Shoichi Yamaguchi, **Sobhan Sen,[†]** Akihiro Morita, and Tahei Tahara*
J. Chem. Phys. **2010**, vol. 132, page 144701.

26. "Different Molecules Experience Different Polarities at the Air/Water Interface".
Sobhan Sen, Shoichi Yamaguchi and Tahei Tahara
Angew. Chem. Int. Ed. **2009**, vol. 48, page 6439.
27. "Dynamics of Water and Ions Near DNA: Comparison of Simulation to Time-Resolved Stokes Shift Experiments".
Sobhan Sen,[†] Daniele Andreatta, Sergei Y. Ponomarev, Devid L. Beveridge and Mark A. Berg*.
J. Am. Chem. Soc. **2009**, vol. 131, page 1724.
28. "Ultrafast Dynamics in DNA: "Fraying" at the End of the Helix".
Daniele Andreatta, **Sobhan Sen**, J. Louis Pérez Lustres, Sergey A. Kovalenko, Nikolaus P. Ernsting, Catherine J. Murphy, Robert S. Coleman and Mark A. Berg*.
J. Am. Chem. Soc. **2006**, vol. 128, page 6885.
29. "Role of Monovalent Counterions in the Ultrafast Solvation Dynamics of DNA".
Sobhan Sen, Latha Gearheart, Evan Rivers, Robert S. Coleman, Catherine J. Murphy and Mark A. Berg*.
J. Phys. Chem. B **2006**, vol. 110, page 13248.
30. "Effect of Protein Binding on Ultrafast DNA Dynamics: Characterization and Measurement of a Complex with APE1".
Sobhan Sen, Nicole A. Paraggio, Latha Gearheart, Ellen E. Connor, Ala Issa, Robert S. Coleman, David M. Wilson III, Michael Wyatt and Mark A. Berg*.
Biophys. J. **2005**, vol. 89, page 4129.
31. "Solvation Dynamics in Dimyristoyl-Phosphatidylcholine Entrapped Inside a Sol-Gel Matrix".
Arnab Halder, **Sobhan Sen**, Anupam Das Burman, Amitava Patra and Kankan Bhattacharyya*.
J. Phys. Chem. B **2004**, vol. 108, page 2309.
32. "Solvation Dynamics in Protein-Surfactant Aggregate. TNS in HSA-SDS".
Saptarshi Mukherjee, Pratik Sen, Arnab Halder, **Sobhan Sen**, Partha Dutta and Kankan Bhattacharyya*.
Chem. Phys. Lett. **2003**, vol. 379, page 471.
33. "Solvation Dynamics in Protein-Surfactant Complex".
Partha Dutta, Pratik Sen, Arnab Halder, Saptarshi Mukherjee, **Sobhan Sen** and Kankan Bhattacharyya*.
Chem. Phys. Lett. **2003**, vol. 377, page 229.
34. "Solvation Dynamics of 4-amiophthalimide in a Polymer (PVP)-Surfactant (SDS) Aggregate".
Partha Dutta, Dipankar Sukul, **Sobhan Sen**, and Kankan Bhattacharyya*.
Phys. Chem. Chem. Phys. **2003**, vol. 5, page 4875.

35. "Isomerization and Fluorescence Depolarization of Merocyanine 540 in Polyacrylic Acid. Effect of pH".
Dipankar Sukul, **Sobhan Sen**, Partha Dutta and Kankan Bhattacharyya*.
Proc. Indian Acad. Sci. (Chem. Sci.) **2002**, vol. 114, page 501.
36. "Solvation Dynamics of a Probe Covalently Bound to a Protein and in an AOT Microemulsion: 4-(N-Bromoacetyl-amino)-Phthalimide".
Debabrata Mandal, **Sobhan Sen**, Dipankar Sukul, Kankan Bhattacharyya*, Amit Kumar Mandal, Rajat Banerjee and Siddhartha Roy*.
J. Phys. Chem. B **2002**, vol. 106, page 10741.
37. "Excited State Proton Transfer of 1-Naphthol in Hydroxypropylcellulose/Sodium Dodecyl Sulfate System".
Partha Dutta, Arnab Halder, Saptarshi Mukherjee, Pratik Sen, **Sobhan Sen** and Kankan Bhattacharyya*.
Langmuir **2002**, vol. 18, page 7867.
38. "Solvation Dynamics in Bile Salt Aggregates".
Sobhan Sen, Partha Dutta, Saptarshi Mukherjee and Kankan Bhattacharyya*.
J. Phys. Chem. B **2002**, vol. 106, page 7745.
39. "Femtosecond studies of solvation dynamics of DCM in micelles".
Debabrata Mandal, **Sobhan Sen**, Kankan Bhattacharyya* and Tahei Tahara*.
Chem. Phys. Lett. **2002**, vol. 359, page 77.
40. "Solvation dynamics of TNS in polymer (PEG)-surfactant (SDS) aggregate".
Partha Dutta, **Sobhan Sen**, Saptarshi Mukherjee and Kankan Bhattacharyya*.
Chem. Phys. Lett. **2002**, vol. 359, page 15.
41. "Solvation Dynamics in the Water Pool of Aerosol Sodium Dioctylsulfosuccinate Microemulsion: Effect of Polymer".
Sobhan Sen, Partha Dutta, Dipankar Sukul and Kankan Bhattacharyya*.
J. Phys. Chem. A **2002**, vol. 106, page 6017.
42. "Solvation Dynamics in Aqueous Polymer Solution and in Polymer-Surfactant Aggregate".
Sobhan Sen, Dipankar Sukul, Partha Dutta and Kankan Bhattacharyya*.
J. Phys. Chem. B **2002**, vol. 106, page 3763.
43. "Photoisomerization of merocyanine 540 in polymer-surfactant aggregate".
Sobhan Sen, Dipankar Sukul, Partha Dutta and Kankan Bhattacharyya*.
Proc. Indian Acad. Sci. (Chem. Sci.) **2002**, vol. 114, page 83.
44. "Slow Solvation Dynamics of Dimethylformamide in a Nanocavity. 4-Aminophthalimide in β -Cyclodextrin".
Sobhan Sen, Dipankar Sukul, Partha Dutta and Kankan Bhattacharyya*.
J. Phys. Chem. A **2001**, vol. 105, page 10635.
45. "Fluorescence Anisotropy Decay in Polymer-Surfactant Aggregates".
Sobhan Sen, Dipankar Sukul, Partha Dutta and Kankan Bhattacharyya*.
J. Phys. Chem. A **2001**, vol. 105, page 7495.

46. "Solvation dynamics of DCM in Human Serum Albumin".
Samir Kumar Pal, Debabrata Mandal, Dipankar Sukul, **Sobhan Sen** and Kankan Bhattacharyya*.
J. Phys. Chem. B **2001**, vol. 105, page 1438.
47. "Solvation Dynamics of DCM in Dipalmitoyl Phosphatidylcholine Lipid".
Samir Kumar Pal, Dipankar Sukul, Debabrata Mandal, **Sobhan Sen** and Kankan Bhattacharyya*.
Tetrahedron **2000**, vol. 56, page 6999.
48. "Solvation Dynamics of DCM in Micelles"
Samir Kumar Pal, Dipankar Sukul, Debabrata Mandal, **Sobhan Sen** and Kankan Bhattacharyya*.
Chem. Phys. Lett. **2000**, vol. 327, page 91.
49. "Excited State Proton Transfer as a Probe for Polymer – Surfactant Interaction".
Dipankar Sukul, Samir Kumar Pal, Debabrata Mandal, **Sobhan Sen** and Kankan Bhattacharyya*.
J. Phys. Chem. B **2000**, vol. 104, page 6128.
50. "Solvation Dynamics of Coumarin 480 in Sol – Gel Matrix".
Samir Kumar Pal, Dipankar Sukul, Debabrata Mandal, **Sobhan Sen** and Kankan Bhattacharyya*.
J. Phys. Chem. B **2000**, vol. 104, page 2613.

Research Projects

1. PI: "Probing the Interplay of Conformational and Dynamical Spaces of Nucleic Acids: Design and Application of Single Molecule and Ensemble Fluorescence Spectroscopy and Computer Simulation" (2020 – 2023); SERB, Funding: INR 91,42,372.
2. PI: "Understanding Role of Water in Ligand-Interactions with DNA and Lipid-Membrane using Single Molecule and Time-resolved Fluorescence Spectroscopy and Computer Simulation" (2014-19); UPE-II, Jawaharlal Nehru University, Funding: INR 11,00,000
3. Co-PI (total 20 co-pi): "From Molecules to Systems: Exploring the Biological Space using Chemical and Synthetic Biology" (Under DBT-BUILDER, Group-project) (2012 – 2017 + 2 years till 2019); Department of Biotechnology, Funding: INR 17,30,32,000.
4. Co-PI: "Construction and Multisite Commissioning of Multiple Fluorescence Correlation Spectrometer" (2009 – 2012); Department of Information Technology, Funding: INR 12,00,000 per group.
5. PI: "Study of Ultrafast Photophysical Processes in Bio- and Nano-materials" (2007 – 2010); Department of Science & Technology, Funding: INR 14,40,000

Invited Talks

1. Invited (teaching) Talk in “**National Workshop in Fluorescence and Raman Spectroscopy (FCS-2020)**” organized (online) by Indian Institute of Technology Bombay during December 7-12, 2020. Title: “*Fluorescence Upconversion Technique.*”
2. Invited (webinar) Talk in E-Workshop on “**Spectroscopic Techniques: Basics & Applications**”, organized by CSIR-National Physical Laboratory during December 3-4, 2020. Title: “*Quantifying Molecular Diffusion and Reaction Kinetics at Single Molecule Level*”
3. Invited (webinar) Talk in “**First National Students’ Conference on Spectroscopy (NSCoS-2020)**”, organized by Guru Nanak Dev University and Chemical Research Society of India during October 16-17, 2020. Title: “*Fluorescence Spectroscopy and its Utility in Biology and Chemistry: A Primer*”
4. Invited (webinar) Talk in “**First National Students’ Conference on Spectroscopy (NSCoS-2020)**”, organized by Guru Nanak Dev University and Chemical Research Society of India during October 16-17, 2020. Title: “*FCS: A Tool for Quantifying Molecular Diffusion and Reaction Kinetics at Single Molecule Level*”
5. Invited (webinar) Talk on **National Technology Day**, organized by Department of Physics and Electronics & IQAC, Hansraj College, University of Delhi on May 11, 2020. Title: “*Observing the Wonder World using Fluorescence Spectroscopy and Microscopy*”
6. Invited Talk in “**One Day Discussion Meeting on Spectroscopy, Photonics & Dynamics (SPD-2020)**” held at Indian Institute of Science Education and Research (IISER) Kolkata on March 7, 2020. Title: “*What new we learn from extended dynamic Stokes shift measurements and large-scale atomistic simulation in DNA?*”
7. Invited Talk in “**International Conference on Ultrafast Spectroscopy (ICUS2020)**” held at Indian Institute of Science Education and Research (IISER) Thiruvananthapuram during February 21-22, 2020. Title: “*Unity of Slow Solvation Dynamics in DNA: From Small Oligonucleotide in Solution to DNA inside Cells.*”
8. Invited Talk in “**A Day Out with Chemical Dynamics**” held at Indian Institute of Science Bangalore during February 3-4, 2020. Title: “*Unity of Slow Solvation Dynamics in DNA: From Oligonucleotide in Solution to DNA inside Cells.*”
9. Invited Talk in “**National Workshop in Fluorescence and Raman Spectroscopy (FCS-2019)**” held at Tata Institute of Fundamental Research Hyderabad during December 16-21, 2019. Title: “*Origin of Slow Solvation Dynamics in DNA: What is the Biological Significance?*”

10. Invited (teaching) Talk in "**National Workshop in Fluorescence and Raman Spectroscopy (FCS-2019)**" held at Tata Institute of Fundamental Research Hyderabad during December 16-21, 2019. Title: "*Fluorescence Upconversion Technique.*"
11. Invited Talk in International Symposium on "**2nd Lipids in the Forefront: A Lot More to Discover**" held at Amity University Gurgaon, Haryana during December 12-13, 2019. Title: "*New Family of All-in-One Fluorescent Probes for Spectroscopy and Imaging of Lipid Membrane.*"
12. Invited Talk in "**Let There Be Light - A Discussion Meeting in Spectroscopy & Microscopy**" held in Udaipur during November 7-9, 2019. Title: "*Understanding interaction kinetics of ligands with DNA using FCS.*"
13. Invited Talk in "**Ultrafast Sciences Symposium (UFS-2019)**" held at Indian Institute of Technology Bombay during November 7-9, 2019. Title: "*Origin of Slow Solvation Dynamics in DNA: What is the Biological Significance?*"
14. Invited Talk in "**Role of Chemistry in Interdisciplinary Research**" held at Dibrugarh University during October 22-23, 2019. Title: "*Quantifying Molecular Diffusion and Reaction Kinetics in Solution and Biological Cells at Single Molecule Level.*"
15. Invited Talk in "**Role of Chemistry in Interdisciplinary Research**" held at Dibrugarh University during October 22-23, 2019. Title: "*Fluorescence Spectroscopy and its Utility in Biology and Chemistry: A Primer.*"
16. Invited Talk in "**Fluorescence Microscopy – FluoMicro@ICGEB**" held at International Centre for Genetic Engineering and Biotechnology (ICGEB) Delhi during October 2-4, 2019. Title: "*FCS: An Efficient Tool for Quantifying Molecular Diffusion and Reaction Kinetics in Solution and Biological Cells at Single Molecule Level.*"
17. Invited Talk in "**Fluorescence Microscopy – FluoMicro@ICGEB**" held at International Centre for Genetic Engineering and Biotechnology (ICGEB) Delhi during October 2-4, 2019. Title: "*Fluorescence Spectroscopy and its Utility in Biology and Chemistry: A Primer*"
18. Invited Talk in **Workshop on India-University of Strasbourg** held at University of Strasbourg, France during September 23-25, 2019. Title: "*Dynamics of Water and Ions near DNA: What is so special about them?*"
19. Invited Talk at **S. N. Bose National Centre for Basic Sciences**, Kolkata on August 19, 2019. Title: "*FCS: An Efficient Tool for Quantifying Molecular Diffusion and Reaction Kinetics in Solution and Biological Cells at Single Molecule Level.*"
20. Invited Talk in Indo-Japan meeting on "**Structural Dynamics at Different Time and Length Scale**" held at Indian Institute of Technology Kanpur, on March 25, 2019. Title: "*Dynamics of Water and Ions near DNA: What is so special about them?*"
21. Invited Talk in "**Recent Advances in Dynamics at the Interface of Chemistry and Biology (DICB-2019)**" held at Indian Institute of Science, Bangalore, during February 18 - 20, 2019. Title: "*New Insight of Location Dependent Polarity, Energy Transfer and Hydration Dynamics at Lipid/Water Interfaces*".

22. Invited Talk in "**Multiscale Simulations and Mathematical Modelling of Complex Biological Systems (MSMM-2019)**" held at Jawaharlal Nehru University, New Delhi during January 30 – February 1, 2019. Title: "*Dynamics of Water and Ions near DNA: What is so special about them?*"
23. Invited Talk in "**From Genes to Network: Recent Trends in Cell Signaling**" held at Amity University Gurgaon during December 14 - 15, 2018. Title: "*New Fluorescent Probes for Measuring Position Dependent Polarity, Energy Transfer and Hydration Dynamics across Lipid/Water Interfaces*".
24. Invited Talk in "**Inter-Disciplinary Explorations in Chemistry (I-DEC 2018)**" held at Indian Institute of Science Education and Research Bhopal, India, during December 6 - 8, 2018. Title: "*New Insight of Position Dependent Polarity, Energy Transfer and Hydration Dynamics at Lipid/Water Interfaces*".
25. Invited Talk at **Amity University Gurgaon**, Haryana, India, on April 24, 2018. Title: "*New Insights of Molecular Interactions and Dynamics in Lipid Bilayer and DNA from Ensemble and Single Molecular Fluorescence Spectroscopy and Computer Simulation*".
26. Invited Talk in "**RCB BioImaging School**" held at Regional Centre for Biotechnology, Faridabad, Haryana, India, on March 24, 2018. Title: "*Observing and Quantifying Molecular Diffusion and Interaction Kinetics at Single Molecule Level*".
27. Invited Talk in "**Conference on Electronic Structure, Spectroscopy and Dynamics (CESSD-2018)**" held at Indian Association for the Cultivation of Science, Kolkata, India, during February 22 - 25, 2018. Title: "*New Insight of Location Dependent Polarity, Energy Transfer and Hydration Dynamics at Lipid/Water Interfaces*".
28. Invited Talk at **National Institute of Science Education & Research (NISER)** Bhubaneswar, India, on February 8, 2018. Title: "*Dynamics of Water and Ions around DNA: What's so Special About Them?*"
29. Invited Talk in "**National Workshop of Fluorescence and Raman Spectroscopy (FCS-2017)**" held at Indian Institute of Technology Guwahati, India, during December 17 - 21, 2017. Title: "*New Insight into Probe-Location Dependent Polarity, Energy Transfer and Hydration Dynamics at Lipid/Water Interfaces*".
30. Invited (Teaching) Talk in "**National Workshop of Fluorescence and Raman Spectroscopy (FCS-2017)**" held at Indian Institute of Technology Guwahati, India, during December 17 - 21, 2017. Title: "*Fluorescence Up-Conversion*".
31. Invited **Institute Seminar** at **S. N. Bose National Centre for Basic Sciences**, Kolkata, India, on December 1, 2017. Title: "*Dynamics of Water and Ions around DNA: What's so Special About Them?*"
32. Invited Talk in "**TEQIP Short Term Course on Fluorescence Spectroscopy and its Application**" held at Department of Chemistry, Indian Institute of Technology Kanpur, India, during November 13 – 19, 2017. Title: "*Trends in Molecular Spectroscopy: Its Utility in Everyday Life*".

33. Invited (Technical) Talk in **“TEQIP Short Term Course on Fluorescence Spectroscopy and its Application”** held at Department of Chemistry, Indian Institute of Technology Kanpur, India, during November 13 – 19, 2017. Title: *“Trends in Ultrafast Fluorescence Spectroscopy: Techniques and Applications”*.
34. Invited (Technical) Talk in **“TEQIP Short Term Course on Fluorescence Spectroscopy and its Application”** held at Department of Chemistry, Indian Institute of Technology Kanpur, India, during November 13 – 19, 2017. Title: *“Single Molecule Spectroscopy: Techniques and Applications”*.
35. Invited Talk in **“Marie Curie Sesquicentennial Conference-2017 (MCSC-2017)”** held at Jawaharlal Nehru University, New Delhi, India, during November 5 – 7, 2017. Title: *“Observing Diffusion and Reaction Kinetics in Solution at Single Molecule Level”*.
36. Invited Talk in **“Spectroscopy of Emerging Functional Materials”** held at Indian Institute of Technology Mandi, India, during October 9 - 10, 2017. Title: *“Quantifying Reaction Kinetics in Solution at Single Molecule Level”*.
37. Invited (Technical) Talk in Workshop on **“Time Resolved Fluorescence Spectroscopy (TRFS), Femtosecond Fluorescence Up-conversion and Their Research Applications”** held at Advanced Instrumentation Research Facility, Jawaharlal Nehru University, New Delhi, India, on October 6, 2017. Title: *“Time-Resolved Fluorescence Techniques: Femtosecond Fluorescence Up-conversion”*.
38. Invited Talk in **“National Seminar on Biophysics (Biophysika-2017),”** held at Jamia Milia Islamia, New Delhi, India, on March 16, 2017. Title: *“Quantifying Ligand Interaction Kinetics with DNA at Single Molecule Level”*.
39. Invited Talk in **“VIth National Symposium on Advances in Chemical Sciences,”** held at Guru Nanak Dev University (GNDU), Amritsar, India, during March 6-7, 2017. Title: *“New Insight of Probe-Position Dependent Environment Polarity, Energy Transfer and Hydration Dynamics at Lipid/Water Interfaces”*.
40. Invited Talk in **“Guha Research Conference (GRC-2016),”** held at Diu Island, India, during December 8-12, 2016. Title: *“Role of DNA Structure and Hydration on Ligand-DNA Interactions: Toward Understanding Structure-Dynamics Relationships of Ligand-DNA Complexes and their Biological Implications”*.
41. Invited Talk in **“4th annual DAE-BRNS theme meeting on Ultrafast Science (UFS-2016),”** held at Bhabha Atomic Research Centre, Mumbai, India, during November 24-26, 2016. Title: *“New Insight of Probe-Location Dependent Polarity, Energy Transfer and Hydration Dynamics at Lipid/Water Interfaces”*.
42. Invited Talk in **“Fundamentals and Applications in Biomolecular Spectroscopy-2016 (FABS-2016)”** held at National Institute of Technology Patna, India, during October 25-26, 2016. Title: *“Observation and Quantification of Molecular Diffusion and Reaction Kinetics in Solution at Single Molecule Level”*.
43. Invited Talk in **Gargi College, New Delhi, India, on October 18, 2016**. Title: *“Basics of Molecular Spectroscopy and its Utility in Everyday Life”*.

44. Invited Talk in “**Recent Developments in Chemistry-2016 (RDC-2016)**” held at Department of Chemistry, National Institute of Technology Durgapur, India, during October 4-6, 2016. Title: “*Observing and Quantifying Molecular Diffusion and Reaction Kinetics in Solution at Single Molecule Level*”.
45. Invited Talk in “**Optics Within Life Sciences (OWLS-2016)**” held in Tata Institute of Fundamental Research, Mumbai, India, during March 16-19, 2016. Title: “*Power-law Solvation Dynamics in G-quadruplex DNA: Role of Water Dynamics in Stabilization of Ligand inside DNA*”.
46. Invited Talk in “**Lecture workshop on Modern Chemistry and its Applications**” held in Guru Nanak Dev University, Amritsar, India, during March 3 – 5, 2016. Title: “*Fluorescence Spectroscopy: An Overview*”.
47. Invited Talk in “**Lecture workshop on Modern Chemistry and its Applications**” held in Guru Nanak Dev University, Amritsar, India, during March 3 – 5, 2016. Title: “*How Can we Observe Molecular Diffusion and Reaction at Single Molecule Level?*”
48. Invited Talk in “**Recent Advances in Molecular Spectroscopy**” held in University of Hyderabad, India, during March 2-4, 2016. Title: “*Understanding Growth Kinetics of Nanorods inside Microemulsion Droplets: Direct Observation of Coalescence and Separation of Droplets*”.
49. Invited (Technical) Talk in Workshop on “**Time Resolved Fluorescence Spectroscopy and Laser Femtosecond**” held at Advanced Instrumentation Research Facility, Jawaharlal Nehru University, New Delhi, India, on October 29, 2015. Title: “*Time-Resolved Fluorescence Techniques*”.
50. Invited **Colloquium** at **Tata Institute of Fundamental Research**, Mumbai on August 26, 2015. Title: *Water around DNA: What’s so Special About It?*
51. Invited Talk at “**National Symposium on Radiation and Photochemistry 2015 (NSRP-2015)**” held in Indian Institute of Technology -Kanpur, India during March 9 – 11, 2015. Title: “*Power-law Solvation Dynamics in G-quadruplex DNA: Role of Water Dynamics in Stabilization of Ligand inside DNA*”.
52. Invited Talk at “**National Symposium on Biophysics and Golden Jubilee Meeting of the Indian Biophysical Society**” held in Jamia Millia Islamia, Delhi, India during February 14 – 17, 2015. Title: “*Monitoring Ligand Association and Dissociation Kinetics with G-quadruplex-DNA in Solution at Single Molecule Level: Role of Water on Ligand Binding to DNA*”.
53. Invited Talk at “**National Fluorescence Workshop: FCS-2014**” held in Indian Institute of Science Education and Research-Pune, India during December 15 – 22, 2014. Title: “*Water and Ion Dynamics near G-quadruplex DNA: Comparison of Time-Resolved Stokes Shift Experiments to MD simulation*”.

54. Invited (Technical) Talk at “**National Fluorescence Workshop: FCS-2014**” held in Indian Institute of Science Education and Research-Pune, India during December 15 – 22, 2014. Title: “*Merging Fluorescence Up-conversion and Time-correlated Single Photon Counting Data (Teaching Talk)*”.
55. Invited Talk at “**FICS-2014 (Frontiers in Chemical Sciences)**” held in Indian Institute of Technology Guwahati, India during December 4 - 6, 2014. Title: “*Dynamics of Water and Ions near G-quadruplex DNA: Comparison of Time-resolved Experiments to MD simulation*”.
56. Invited Talk in “**TEQIP Short Term Course on Advanced Fluorescence Spectroscopy**” held at Department of Chemistry, Indian Institute of Technology Kanpur, India, during November 10 – 15, 2014. Title: “*Fluorescence Spectroscopy: An overview*”.
57. Invited (Technical) Talk in “**TEQIP Short Term Course on Advanced Fluorescence Spectroscopy**” held at Department of Chemistry, Indian Institute of Technology Kanpur, India, during November 10 – 15, 2014. Title: “*Fluorescence lifetime: TCSPC and Up-Conversion*”.
58. Invited (Technical) Talk in “**TEQIP Short Term Course on Advanced Fluorescence Spectroscopy**” held at Department of Chemistry, Indian Institute of Technology Kanpur, India, during November 10 – 15, 2014. Title: “*Principle of Single Molecule fluorescence Spectroscopy*”.
59. Invited Talk in workshop on “**Fluorescence Studies of Organic Structures**” held in **Hans Raj College**, New Delhi, India, during September 26 – 27, 2014. Title: “*Fluorescence Spectroscopy: An Overview*”.
60. Invited Talk at “**Light in Chemistry, Materials and Biology**” held in Indian Institute of Technology Kharagpur, India during February 24 - 25, 2014. Title: “*Observing Coalescence and Redistribution of Microemulsion Droplets in Solution in Real-Time*”.
61. Invited Talk at “**Dynamics of Complex Chemical and Biological Systems**” held in Indian Institute of Technology Kanpur, India during February 13 - 15, 2014. Title: “*Dynamics of Water and Ions near DNA*”.
62. Invited Talk at “**National Conference on Photosciences (NCP -2013): Contemporary Challenges & Future Perspective**” held in Jadavpur University, Kolkata, India during December 12 - 14, 2013. Title: “*Understanding Growth of Nanorods in Microemulsion Droplets using Combination of Fluorescence Correlation Spectroscopy, Light Scattering and Electron Microscopy*”.
63. Invited Talk at “**National Fluorescence Workshop: FCS-2013**” held in Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India during November 24 - 28, 2013. Title: “*How to Merge Fluorescence Up-conversion and Time-correlated Single Photon Counting Data to Obtain Large Dynamic-Range?*”

64. Invited Talk at “**National Fluorescence Workshop: FCS-2013**” held in Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India during November 24 - 28, 2013. Title: “*Understanding Growth of Nanorods in Microemulsion Droplets using Combination of Fluorescence Correlation Spectroscopy, Light Scattering and Electron Microscopy*”.
65. Invited Talk at “**National Fluorescence Workshop: FCS-2012**” held in Saha Institute of Nuclear Physics, Kolkata, India on December 3 - 7, 2012. Title: “*Time-resolved Fluorescence Up-conversion Technique: An Overview*”.
66. Invited Talk at “**7th Asian Photochemistry Conference (APC-2012)**” held in Osaka University, Japan on November 12 - 15, 2012. Title: “*Understanding Dynamics and Molecular Interactions in DNA*”.
67. Invited Talk in **RIKEN**, Wako, Japan on November 06, 2012. Title: “*Understanding Molecular Interactions and Dynamics in DNA and Growth of Nanorods*”.
68. Invited Talk at “**Recent Trends in Nanoscience and Nanotechnology**” held in Delhi University, India on October 15 – 16, 2012. Title: “*How to Understand Formation of Nanostructures using Single Molecule Fluorescence Spectroscopy?*”
69. Invited Talk at “**Bio-Imaging and Signal Processing**” held in Indian Institute of Technology Delhi, New Delhi, India on October 12, 2012. Title: “*Understanding Interactions at Single Molecule Level: Signal Processing in Fluorescence Correlation Spectroscopy*”.
70. Invited Talk in **St. Stephens College**, New Delhi, India, on August 23, 2012. Title: “*Molecular Spectroscopy: An Overview*”.
71. Invited Talk in **St. Stephens College**, New Delhi, India, on August 23, 2012. Title: “*Seeing the Unseen with Molecular Spectroscopy*”.
72. Invited Talk at **Indian Institute of Scientific Research and Education Bhopal**, India on June 14, 2012. Title: “*Its All About Time and Space...*”.
73. Invited Talks at **Banaras Hindu University**, Banaras, India on March 12, 2012. Titles: (a) “*Overview of Absorption and Emission Spectroscopy in Molecules*” and (b) “*Lasers and Laser-based Spectroscopic Techniques and their Applications*”.
74. Invited Talk at “**Bioepoch-2012**” held in Jawaharlal Nehru University, New Delhi, India on February 25, 2012. Title: “*Looking at the Ligand Interaction with G-Quadruplex DNA at Single Molecule Level: A Fluorescence Spectroscopic Study*”.
75. Invited Talk at **Tata Institute of Fundamental Research**, Mumbai, India on January 10, 2012. Title: “*Looking at Ultrafast DNA dynamics and Particle Diffusion in Solution using Fluorescence-based Time-Resolved and Correlation Spectroscopy*”.

76. Invited Talk at the celebration of **International Year of Chemistry: Recent Trends in Spectroscopy and Dynamics of Chemical Systems** held in Hyderabad Central University, India during December 7-8, 2011. Title: *“Understanding DNA Dynamics and Particle Diffusion with Fluorescence-based Time-resolved and Correlation Spectroscopy”*.
77. Invited Talk at the celebration of **International Year of Chemistry** held in Indira Gandhi National Open University, New Delhi, India during October 13-14, 2011. Title: *“Understanding Dynamics and Molecular Interaction in DNA”*.
78. Invited Talk at **SPS@25: Looking Forward** held in Jawaharlal Nehru University, New Delhi, India during March 10-11, 2011. Title: *“Understanding Dynamics and Molecular Interaction in DNA”*.
79. Invited Talk at **Biosparks** held in Jawaharlal Nehru University, New Delhi, India during March 11-12, 2011. Title: *“Understanding Dynamics and Molecular Interaction in DNA”*.
80. Invited Talk at **Spectroscopy and Dynamics of Molecules and Clusters** held in Jim Corbett Park, Uttarakhand, India (Organized by Indian Institute of Technology Kanpur) during February 18-20, 2011. Title: *“Probe Position Dependent Dynamics in DNA: A New Insight about the Role of Water and Ion Dynamics near DNA”*.
81. Invited Talk at **Indian Institute of Technology Kanpur**, India on December 24, 2010. Title: *“Ultrafast Dynamics and Molecular Interactions in DNA: New Insights revealed by Fluorescence-based Time-resolved and Correlation Spectroscopy”*.
82. Invited Talk at **National Fluorescence Workshop: FCS2010** held in North Eastern Hill University, Shillong, India during November 09-12, 2010. Title: *“Application of Fluorescence-Based Time-resolved and Correlation Spectroscopy to Study Dynamics and Interactions in Bio-Macromolecules”*.
83. Invited Talk at **3rd Asia Pacific Symposium on Radiation Chemistry and 10th Biennial Trombay Symposium on Radiation & Photochemistry (APSRC-TSRP-2010)** held in Lonavala, Maharashtra (Organized by Bhabha Atomic Research Centre, Mumbai), India during September 14-17, 2010. Title: *“Probe Position Dependent Dynamics in DNA over Five Decades in Time: A New Insight”*.
84. Invited Talk at **Nation Workshop on Advanced Analytical Instrumentation and Applications** held at Jawaharlal Nehru University, New Delhi, India during January 5-7, 2009. Title: *“It’s all About Ultrafast Fluorescence Spectroscopy: Applications in DNA and Lipid Vesicles”*.
85. Invited Talk at **National Symposium on “Modern Trends in Chemistry: Molecules to Materials”** held at Jawaharlal Nehru University, New Delhi, India during March 14-15, 2008. Title: *“Probing Heterogeneous Picosecond Dynamics inside Single Biological Assembly by Fluorescence Lifetime Imaging”*.

Presentations in Conference / Symposium / Workshop

Presentations by Ph.D. Students of Sobhan Sen

1. Poster Presented at online “**International Conference on Chemical and Environmental Sciences**” organized by Institute of Engineering & Management, Kolkata during December 18-20, 2020. Title “Origin of Slow Solvation Dynamics in DNA: DAPI in Dickerson-DNA” **Deepika Sardana**, Kavita Yadav, Him Shweta, Ndege Simisi Clovis, Parvez Alam and Sobhan Sen*. (**Best Poster Prize**)
2. Poster Presented at online “**National Workshop on Fluorescence and Raman Spectroscopy (FCS-2020)**” organized by Indian Institute of Technology Bombay during December 7-12, 2020. Title “Unity of Slow Solvation Dynamics in DNA: From Oligonucleotides in Solution to DNA inside Biological Cells” **Deepika Sardana**, Nibedita Pal, Anjali Khatri, Moirangthem Kiran Singh, Sachin Dev Verma, Aseem Mishra and Sobhan Sen*.
3. Poster Presented at online “**NSCoS-2020: First National Students’ Conference on Spectroscopy; Virtual Conference**” organized by Guru Nanak Dev University and Chemical Research Society of India during October 16-17, 2020. Title “Origin of Slow Solvation Dynamics in DNA: DAPI in Dickerson-DNA” **Deepika Sardana**, Kavita Yadav, Him Shweta, Ndege Simisi Clovis, Parvez Alam and Sobhan Sen*. (**ACS Outstanding Poster Prize**)
4. Poster Presented at “**National Workshop on Fluorescence and Raman Spectroscopy (FCS-2019)**” held at Tata Institute of Fundamental Research Hyderabad, India during December 16-21, 2019. Title “Origin of Slow Solvation Dynamics in DNA: DAPI in Dickerson-DNA” **Deepika Sardana**, Kavita Yadav, Him Shweta, Ndege Simisi Clovis, Parvez Alam and Sobhan Sen*. (**OWLS Best Poster Prize**)
5. Poster presented at “**ISCBSC – RSG India Student Symposium 2019**”, held at Jawaharlal Nehru University, New Delhi on November 24, 2019. Title “Origin of Slow Solvation Dynamics in DNA: DAPI in Dickerson-DNA” **Deepika Sardana**, Kavita Yadav, Him Shweta, Ndege Simisi Clovis, Parvez Alam and Sobhan Sen*. (**Best Poster Prize**)
6. Poster presented at “**Ultrafast Sciences – 2019 (UFS-2019)**”, held at Indian Institute of Technology, Bombay during November 7-9, 2019. Title “Origin of Slow Solvation Dynamics in DNA: DAPI in Dickerson-DNA” **Deepika Sardana**, Him Shweta, Kavita Yadav, Ndege Simisi Clovis, Parvez Alam and Sobhan Sen*.
7. Poster presented at “**March Meeting 2019**”, held at School of Physical Sciences, Jawaharlal Nehru University, New Delhi during March 8-9, 2019. Title “Dynamic Signatures of DNA Base Mismatches” Him Shweta, Kavita Yadav, **Deepika Sardana**, Avinash Kumar Singh and Sobhan Sen*.

8. Poster presented at “**March Meeting 2019**”, held at School of Physical Sciences, Jawaharlal Nehru University, New Delhi during March 8-9, 2019. Title: “Ligand Interactions with G-quadruplex DNA Structures: Effect of Dehydration” Mohammad Firoz Khan, **Ndege Simisi Clovis**, Moirangthem Kiran Singh, Him Shweta, Deepika Sardana and Sobhan Sen*.
9. Poster Presented at “**National Science Day**”, organized by Department of Science and Technology and Jawaharlal Nehru University, New Delhi on February 28, 2019. Title “Dynamic Signatures of DNA Base Mismatches” Him Shweta, Kavita Yadav, **Deepika Sardana**, Avinash Kumar Singh and Sobhan Sen*.
10. Poster Presented at “**International Conference-cum-Workshop on Multiscale Simulation and Mathematical Modelling of Complex Biological Systems - MSMM2019**”, organized by Jawaharlal Nehru University, New Delhi on January 28-February 1, 2019. Title: “Dynamic Signatures of DNA Base Mismatches” Him Shweta, Kavita Yadav, **Deepika Sardana**, Avinash Kumar Singh and Sobhan Sen*. (**Best Poster Prize**)
11. Poster Presented at “**Inter-Disciplinary Explorations in Chemistry (I-DEC 2018)**” organized by Indian Institute of Science Education and Research Bhopal, Madhya Pradesh, India during December 6-8, 2018. Title: “Ligand Interactions with G-quadruplex DNA Structures: Effect of Dehydration” Mohammad Firoz Khan, **Ndege Simisi Clovis**, Moirangthem Kiran Singh, Him Shweta, Deepika Sardana and Sobhan Sen*.
12. Poster Presented at “**National Workshop on Fluorescence and Raman Spectroscopy: FCS-2018**” held at Jawaharlal Nehru University, New Delhi, India during November 12-17, 2018. Title: “*Ultrafast Dynamical Signatures of DNA Mismatched Base-Pairs.*” Him Shweta, **Kavita Yadav**, Avinash Kumar Singh and Sobhan Sen*.
13. Poster Presented at “**National Workshop on Fluorescence and Raman Spectroscopy: FCS-2018**” held at Jawaharlal Nehru University, New Delhi, India during November 12-17, 2018. Title: “Ligand Interactions with G-quadruplex DNA Structures: Effect of Dehydration” Mohammad Firoz Khan, **Ndege Simisi Clovis**, Moirangthem Kiran Singh, Him Shweta, Deepika Sardana and Sobhan Sen*
14. Poster Presented at “**National Workshop on Fluorescence and Raman Spectroscopy: FCS-2018**” held at Jawaharlal Nehru University, New Delhi, India during November 12-17, 2018. Title: “*Effect of Dehydration on Dynamics of Water and Ions around G-Quadruplex DNA*” Kavita Yadav, **Deepika Sardana** and Sobhan Sen*.
15. Poster presented at “**Recent Advances in Responsive Molecules and Materials - March Meeting 2018**”, held at School of Physical Sciences, Jawaharlal Nehru University, New Delhi during March 16-17, 2018. Title: “*Effect of T.T Mismatch on DNA Dynamics Probed by Minor Groove Binders: Comparison of Dynamic Stokes Shifts of Hoechst and DAPI*” Him Shweta, Moirangthem Kiran Singh, **Kavita Yadav**, Sachin Dev Verma, Nibedita Pal and Sobhan Sen*.

16. Poster Presented at “**Recent Advances in Responsive Molecules and Materials - March Meeting 2018**” held at School of Physical Sciences, Jawaharlal Nehru University, New Delhi during March 16-17, 2018. Title “*New Insights of Solvation Dynamics in DNA: Hoechst in A_nT_n Rich Minor Groove of DNA*” **Him Shweta** and Sobhan Sen*.
17. Poster Presented at “**National Science Day**”, organized by Department of Science and Technology and Jawaharlal Nehru University, New Delhi on February 28, 2018. Title: “*Effect of T.T Mismatch on DNA Dynamics Probed by Minor Groove Binders: Comparison of Dynamic Stokes Shifts of Hoechst and DAPI*” Him Shweta, Moirangthem Kiran Singh, **Kavita Yadav**, Sachin Dev Verma, Nibedita Pal and Sobhan Sen*. (**Best Poster Prize**)
18. Poster Presented at “**National Science Day**”, organized by Department of Science and Technology and Jawaharlal Nehru University, New Delhi on February 28, 2018. Title “*New Insights of Solvation Dynamics in DNA: Hoechst in A_nT_n Rich Minor Groove of DNA*” **Him Shweta** and Sobhan Sen*.
19. Poster Presented at “**ACS-Meeting 2018**” held at Delhi University, North Campus, India on February 05, 2018. Title: “*Dispersed Dynamics of Solvation in G-Quadruplex DNA: Comparison of Dynamic Stokes Shifts of Probes in Parallel and Antiparallel Quadruplex Structures*” **Him Shweta**, Moirangthem Kiran Singh and Sobhan Sen*.
20. Poster Presented at “**National Workshop on Fluorescence and Raman Spectroscopy: FCS-2017**” held at Indian Institute of Technology, Guwahati, India during December 17-21, 2017. Title: “*Effect of T.T Mismatch on DNA Dynamics Probed by Minor Groove Binders: Comparison of Dynamic Stokes Shifts of Hoechst and DAPI*” Him Shweta, Moirangthem Kiran Singh, **Kavita Yadav**, Sachin Dev Verma, Nibedita Pal and Sobhan Sen*.
21. Poster Presented at “**National Workshop on Fluorescence and Raman Spectroscopy: FCS-2017**” held at Indian Institute of Technology, Guwahati, India during 17 to 21 December, 2017. Title “*New Insights of Solvation Dynamics in DNA: Hoechst in A_nT_n Rich Minor Groove of DNA*” **Him Shweta** and Sobhan Sen*.
22. Poster presented at “**March Meeting 2017**”, held at School of Physical Sciences, Jawaharlal Nehru University, New Delhi during March 17-18, 2017. Title: “*Dispersed Dynamics of Solvation in G-Quadruplex DNA: Comparison of Dynamic Stokes Shifts of Probes in Parallel and Antiparallel Quadruplex Structures*” **Him Shweta**, Moirangthem Kiran Singh and Sobhan Sen*. (**Best Poster Prize**)
23. Poster presented at “**National Science Day**”, organized by Department of Science and Technology and Jawaharlal Nehru University, New Delhi on February 28, 2017. Title: “*Dispersed Dynamics of Solvation in G-Quadruplex DNA: Comparison of Dynamic Stokes Shifts of Probes in Parallel and Antiparallel Quadruplex Structures*” **Him Shweta**, Moirangthem Kiran Singh and Sobhan Sen*. (**Best Poster Prize**)

24. Poster Presented at “**DAE-BRNS Theme Meeting on Ultrafast Science - 2016**” held at Bhabha Atomic Research Centre, Mumbai, India during November 24-26, 2016. Title: “*Dispersed Dynamics of Solvation in G-Quadruplex DNA: Comparison of Dynamic Stokes Shifts of Probes in Parallel and Antiparallel Quadruplex Structures*” **Him Shweta**, Moirangthem Kiran Singh and Sobhan Sen*.
25. Poster Presented at “**DAE-BRNS Theme Meeting on Ultrafast Science - 2016**” held in Bhabha Atomic Research Centre, Mumbai, India during November 24-26, 2016. Title: “*Probing Location-Dependent Polarity, Solvation Dynamics and Energy Transfer at Lipid/Water Interfaces: Comparison between Gel- and Fluid- Phases of Lipid Bilayers*” **Moirangthem Kiran Singh**, Him Shweta, Mohammad Firoz Khan and Sobhan Sen*. (**Best Poster Prize**)
26. Poster presented at “**Optics Within Life Sciences (OWLS) 2016**”, held at Tata Institute of Fundamental Research, Mumbai during March 16-19, 2016. Title: “*Dynamics of Water and Ions around G-Quadruplex DNA: Comparison of Molecular Dynamic Simulation to Time-Resolved Fluorescence Stokes-Shift Experiments*” **Him Shweta**, Nibedita Pal, Moirangthem Kiran Singh, Sachin Dev Verma and Sobhan Sen*.
27. Poster presented at “**Trombay Symposium on Radiation and Photochemistry (TSRP)**” incorporating 6th Asia Pacific Symposium on Radiation Chemistry (APSRC), held at BARC, Mumbai during January 5-9, 2016. Title: “*Dynamics of Water and Ions around G-Quadruplex DNA: Comparison of Molecular Dynamic Simulation to Time-Resolved Fluorescence Stokes-Shift Experiments*” **Him Shweta**, Nibedita Pal, Moirangthem Kiran Singh, Sachin Dev Verma and Sobhan Sen*. (**Best Poster Prize**)
28. Poster presented at “**Advances in Spectroscopy and Ultrafast Dynamics (ASUD-2014)**” held at Indian Association for the Cultivation of Science, Kolkata during December 12-14, 2014. Title: “*Dynamics of Water and Ions around G-Quadruplex DNA: Comparison of Molecular Dynamic Simulation to Time-Resolved Fluorescence Stokes-Shift Experiments*” **Him Shweta**, Nibedita Pal, Moirangthem Kiran Singh, Sachin Dev Verma and Sobhan Sen*.
29. Poster Presented at “**Light in Chemistry, Material and Biology**” held at Indian Institute of Technology Kharagpur, India during February 24-25, 2014. Title: “*Dynamics of Water and Ions around G-Quadruplex DNA: Comparison of Molecular Dynamic Simulation to Time-Resolved Fluorescence Stokes-Shift Experiments*” **Him Shweta**, Nibedita Pal, Moirangthem Kiran Singh, Sachin Dev Verma and Sobhan Sen*. (**Best Poster Prize**)
30. Poster Presented at “**Light in Chemistry, Material and Biology**” held in Indian Institute of Technology Kharagpur, India during February 24-25, 2014. Title: “*Probing Depth-Dependent Polarity and Dynamics at Phospholipid Bilayer Interface using Fluorescent Molecular Rulers*” **Moirangthem Kiran Singh**, Him Shweta, Mohammad Firoz Khan and Sobhan Sen*.

31. Poster Presented at “**National Fluorescence Workshop: FCS-2013**” held in Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India during November 24 - 28, 2013. Title: “*Probing Depth Dependent Dynamics at Phospholipid Bilayer Interface using Fluorescent Molecular Rulers*” **Moirangthem Kiran Singh**, Him Shweta, Mohammad Firoz Khan, Nibedita Pal and Sobhan Sen*.
32. Poster Presented at “**National Fluorescence Workshop (FCS 2013)**” held at Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India during November 24-28, 2013. Title: “*Ultrafast Dynamics in DNA: From in-vitro Artificial Oligomer to DNA inside Biological Cells*” **Nibedita Pal**, Anjali Khatri, Moirangthem Kiran Singh, Sachin Dev Verma, Aseem Mishra and Sobhan Sen*.
33. Poster Presented at “**Condensed Matter-Nanoscience Interface - March Meeting 2013**” held in School of Physical Sciences, Jawaharlal Nehru University, India during March 7-8, 2013. Title: “*Probe Position Dependent Counterions Stokes Shift of Groove-Bound to Base-Stacked Probes in Presence of Different Monovalent Counterions*” **Moirangthem Kiran Singh**, Him Shweta, Mohammad Firoz Khan and Sobhan Sen*.
34. Poster Presented at “**National Fluorescence Workshop: FCS-2012**” held in Saha Institute of Nuclear Physics, Kolkata, India on December 3 - 7, 2012. Title: “*Probe Position Dependent Counterions Stokes Shift of Groove-Bound to Base-Stacked Probes in Presence of Different Monovalent Counterions*” Sachin Dev Verma, Nibedita Pal, **Moirangthem Kiran Singh** and Sobhan Sen*.
35. Poster Presented at “**Foundations and Frontiers in Supramolecular Chemistry (March Meeting 2012)**” held at School of Physical Science, Jawaharlal Nehru University, New Delhi, India during March 1-2, 2012. Title: “*Ultrafast Dynamics in DNA from femtosecond to nanosecond: A New Molecular Level Insight*” **Nibedita Pal**, Sachin Dev Verma, Moirangthem Kiran Singh, and Sobhan Sen*. (**Best Poster Prize**)
36. Poster Presented at “**Foundations and Frontiers in Supramolecular Chemistry (March Meeting 2012)**” held at School of Physical Science, Jawaharlal Nehru University, New Delhi, India during March 1-2, 2012. Title: “*Looking at Single Particle Diffusion in Solution: Fluorescence Correlation vs Light Scattering Correlation*” Nibedita Pal, Sachin Dev Verma, **Moirangthem Kiran Singh** and Sobhan Sen*.
37. Poster Presented at “**DAE-BRNS 11th Biennial Trombay Symposium on Radiation & Photochemistry (TSRP-2012)**” held at Bhabha Atomic Research Center, Mumbai, India during January 4 - 7, 2012. Title: “*Looking at Single Particle Diffusion in solution: Fluorescence Correlation vs Light Scattering Correlation*” **Nibedita Pal**, Sachin Dev Verma, Moirangthem Kiran Singh, and Sobhan Sen*. (**Best Poster Prize**)

38. Poster Presented at “**DAE-BRNS 11th Biennial Trombay Symposium on Radiation & Photochemistry (TSRP-2012)**” held at Bhabha Atomic Research Centre, Mumbai, India during January 4 – 7, 2012. Title: “*Understanding the Molecular Origin of Probe-position Dependent Dynamics in DNA*” **Sachin Dev Verma**, Nibedita Pal, and Sobhan Sen*.
39. Poster Presented at “**International Symposium on Chemistry and Complexity (2011)**” held at Indian Association for the Cultivation of Sciences, Kolkata, India during December 6 – 8, 2011. Title: “*Looking at Single Particle Diffusion in solution: Fluorescence Correlation vs Light Scattering Correlation*” **Nibedita Pal**, Sachin Dev Verma, Moirangthem Kiran Singh, and Sobhan Sen*.
40. Poster Presented at “**National Fluorescence Workshop: Spectroscopy and Microscopy in Biology and Chemistry (FCS–2011)**” held at International Centre for Genetic Engineering and Biotechnology, Jawaharlal Nehru University and Indian Institute of Technology, New Delhi, India during November 14 – 18, 2011. Title: “*Looking at Single Particle Diffusion in solution: Fluorescence Correlation vs Light Scattering Correlation*” **Nibedita Pal**, Sachin Dev Verma, Moirangthem Kiran Singh, and Sobhan Sen*. (**Best Poster Prize**)
41. Poster Presented at “**National Fluorescence Workshop: Spectroscopy and Microscopy in Biology and Chemistry (FCS 2011)**” held at International Centre for Genetic Engineering and Biotechnology, Jawaharlal Nehru University and Indian Institute of Technology, New Delhi, India during November 14 – 18, 2011. Title: “*Understanding the Molecular Origin of Probe-position Dependent Dynamics in DNA*” **Sachin Dev Verma**, Nibedita Pal, and Sobhan Sen*. (**Best Poster Prize**)
42. Poster Presented at “**March Meeting: SPS@25 (2011)**” held at School of Physical Science, Jawaharlal Nehru University, New Delhi, India during March 10 – 11, 2011. Title: “*Measurement of Size and Size-Distribution of AOT-Reverse Micelles by Fluorescence Correlation Spectroscopy*” **Nibedita Pal**, Sachin Dev Verma, Moirangthem Kiran Singh, and Sobhan Sen*. (**Best Poster Prize**)
43. Poster Presented at “**National Workshop on Fluorescence Correlation Spectroscopy & Biophotonics (FCS–2010)**” held at North Eastern Hill University, Shillong, India during November 8 – 13, 2010. Title: “*Measurement of Size and Size-Distribution of AOT-Reverse Micelles by Fluorescence Correlation Spectroscopy*” **Nibedita Pal**, Sachin Dev Verma, Moirangthem Kiran Singh, and Sobhan Sen*.
44. Poster Presented at “**National Workshop on Fluorescence Correlation Spectroscopy & Biophotonics (FCS–2010)**” held at North Eastern Hill University, Shillong, India during November 8 – 13, 2010. Title: “*Observation of Molecular Interactions of G-quadruplex with Ligand at the Single Molecule Level*” **Sachin Dev Verma**, Nibedita Pal, Moirangthem Kiran Singh, and Sobhan Sen*. (**Best Poster Prize**)

45. Poster Presented at “**3rd Asia Pacific Symposium on Radiation Chemistry and DAE-BRNS 10th Biennial Trombay Symposium on Radiation and Photochemistry, (APSRC-TSRP-2010)**” held at Lonavala, India during September 14 – 17, 2010. Title: “*Ultrafast Dynamics in DNA from Femtosecond to Nanosecond: A New Molecular Insight*” **Nibedita Pal**, Sachin Dev Verma and Sobhan Sen*.
46. Poster Presented at “**3rd Asia Pacific Symposium on Radiation Chemistry and DAE-BRNS 10th Biennial Trombay Symposium on Radiation and Photochemistry, (APSRC-TSRP-2010)**” held at Lonavala, India during September 14 – 17, 2010. Title: “*Observation of Molecular Interactions of G-quadruplex with Ligand at the Single Molecule Level*” **Sachin Dev Verma**, Nibedita Pal, Moirangthem Kiran Singh, and Sobhan Sen*. (**Best Poster Prize**).
47. Poster Presented at “**Fluorescence 2009**” held at Tata Institute of Fundamental Research, Mumbai, India during March 20 – 24, 2009. Title: “*Solvation Dynamics in DNA over Five Decades in Time: DAPI in Minor Grooves of DNA with Different Sequences*” **Nibedita Pal**, Sachin Dev Verma and Sobhan Sen*.

Presentations by Sobhan Sen

48. Our research group (I and one of my Ph.D. students) from Jawaharlal Nehru University, New Delhi was selected for **National Workshop on Fluorescence Correlation Spectroscopy (FCS)** held in TIFR, Mumbai, India during March 7-24, 2009, where we build a FCS setup from scratch and then taken to our research laboratory at JNU. This project is sponsored by Department of Information Technology, India.
49. Poster presented at **Trombay Symposium on Radiation and Photochemistry (TSRP-2009)** held at Pune, India during January 7-11, 2008. Title: “*Multiplex Electronic Sum Frequency Generation Study of Solvatochromic Coumarins at Air-Water Interface: New Insight into Interfacial Polarity*” **S. Sen**, S. Yamaguchi, T. Tahara*.
50. Poster presented at the **Annual Symposium of Nano/Micro Spectroscopy Division of the Spectroscopy Society of Japan** held at Tokyo University, Japan on October 26, 2007. Title: “*Site-Specific Ultrafast Dynamics in Single Lipid Vesicle: Picosecond Fluorescence Microscopy*” **S. Sen**, K. Ishii, T. Tahara*. (**Best Poster Prize**)
51. Poster presented at the **Annual Autumn Conference on Spectroscopy (Bonzee Kozo)** held at Tohoku University, Sendai, Japan on September 17-20, 2007. Title: “*Interferometric Heterodyne ESFG and Polarization Dependent SHG Study at Liquid Interface: Coumarins at Air-Water Interface*” **S. Sen**, S. Yamaguchi, T. Tahara*.
52. Oral Presentation at the **Annual Autumn Conference on Spectroscopy (Bonzee Kozo)** held at Granship, Shizuoka, Japan in September, 2006. Title: “*Broadband ESFG Study of Coumarins at Air-water Interface: New Insight into Interfacial Polarity and Molecular Property*” **S. Sen**, S. Yamaguchi, T. Tahara*.

53. Poster presented at the **International Workshop on Time-resolved Spectroscopy** held at RIKEN, Wako, Saitama, Japan during August 18-19, 2006. Title: "*Molecular Orientation of Coumarins at Air-water Interface: Multiplex ESFG Study of Interfacial Polarity*" **S. Sen**, S. Yamaguchi, T. Tahara*.
54. Paper presented at the **American Physical Society (APS) March Meeting** held in Los Angeles, USA during March 21-25, 2005. Title: "*Power-Law Dynamics in DNA*" **S. Sen**, D. Andratta, C. J. Murphy, R. S. Coalman, N. Ernsting, M. A. Berg*.
55. Oral presentation at the **Workshop on Spectroscopy** held at Department of Chemistry and Biochemistry, University of South Carolina, Columbia, South Carolina in December, 2004. Title: "*Ultrafast Dynamics in DNA: Effect of Protein and Counterion Binding*" **S. Sen**, L Gearhart, C. J. Murphy, R. S. Coalman, M. A. Berg*.
56. Poster presented at the **7th Annual Southeast High Resolution Spectroscopy and Ultrafast Conference** held at University of Alabama-Huntsville, Alabama, USA in March, 2004. Title: "*Counterion dependence on ultrafast DNA dynamics*" **S. Sen**, C J. Murphy, R. S. Coalman, M. A. Berg*. (**Best Poster Prize**)

Teaching and Course Development

School of Physical Sciences, Jawaharlal Nehru University

Started New **Pre-Ph.D./Ph.D. Chemical Sciences Program in Jawaharlal Nehru University in 2007**

Started New **M.Sc. Chemistry Program in Jawaharlal Nehru University in 2017**

Courses Developed and Taught

PS454C: Quantum Chemistry (New Course)

Semesters Taught

- Monsoon Semester 2019
- Monsoon Semester 2018
- Monsoon Semester 2017

Course Description: This course is developed for first year Master's students of Chemistry. This course introduces the students the fundamental aspects of quantum mechanics.

PS455C: Mathematical Methods for Chemists (New Course)

Course Description: This course is developed for first year Master's students of Chemistry to refresh and introduce the fundamentals of mathematical concepts.

PS458C: *Molecular Spectroscopy* (New Course)

Semesters Taught

- Winter Semester 2020
- Winter Semester 2019
- Winter Semester 2018

Course Description: This course is developed for first year Master's students of Chemistry. This course introduces the students the fundamentals of molecular spectroscopy and applications. This course also covers some parts of atomic spectroscopy, and spin resonance spectroscopy.

PS613C: *Computational Chemistry and its Applications* (New Course)

Semesters Taught

- Winter Semester 2016
- Winter Semester 2013
- Winter Semester 2012
- Winter Semester 2010

Course Description: This course is intended for the incoming Ph.D. students to provide the basic knowledge about computational chemistry methods and its use in connection to the experimental research. The aim of this course is to provide students with basic background on computational methods and molecular modeling, including some hands-on experiences to get started in modeling the physicochemical properties of molecules. The basic theoretical background is provided in this course, and the emphasis is given on hand-on application of the computational methods to model molecular properties.

PS614C: *Advanced Spectroscopy and its Applications* (New Course)

Semesters Taught

- Monsoon Semester 2016
- Monsoon Semester 2015
- Monsoon Semester 2014
- Monsoon Semester 2013
- Monsoon Semester 2012
- Monsoon Semester 2011
- Monsoon Semester 2009
- Monsoon Semester 2008

Course Description: This course is designed as a refresher course for incoming Ph.D. students with Physics or Chemistry background. It reviews some materials that may have been taught in the M.Sc. courses, and also includes material designed to familiarize students with some of the advanced spectroscopic techniques and their applications. This course is beneficial also for students of Biophysics or Biochemistry who want to gain further knowledge about the application of some advanced spectroscopic techniques to study biological macromolecules.

PS451C: Laboratory-1 (New Course – few experiments developed)

Semester Taught

- Monsoon Semester 2019
- Monsoon Semester 2018
- Monsoon Semester 2017

Course Description: This laboratory course is developed for first year Master's students of Chemistry. This course includes several experiments in physical chemistry/spectroscopy along with other experiments in organic and inorganic chemistry.

PS460C: Laboratory-2 (New Course – few experiments developed)

Semesters Taught

- Winter Semester 2019
- Winter Semester 2018

Course Description: This laboratory course is developed for first year Master's students of Chemistry. This course includes several advanced level experiments in physical chemistry/spectroscopy along with other experiments in organic and inorganic chemistry.

Common Course for Dual Engineering Degree: Chemistry-I (Physical Chemistry)

Semester Taught

- Winter Semester 2020
- Winter Semester 2019

Guest Lectures

Course 610: Physical and Computational Biology in International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi.

Semesters Taught

- Winter Semester 2020, Parts (Fluorescence Imaging and Super Resolution Imaging) are taught
- Winter Semester 2019, Parts (Fluorescence Imaging and Super Resolution Imaging) are taught
- Winter Semester 2018, Parts (Fluorescence Imaging and Super Resolution Imaging) are taught
- Winter Semester 2017, Parts (Fluorescence Imaging and Super Resolution Imaging) are taught
- Guest Lectures on Single Molecule Spectroscopy in "Molecular Spectroscopy Course" of Department of Chemistry, Banaras Hindu University (2020)
- Guest Lectures in Refresher Course in Physics, UGC-Human Resource Development Centre, University of Allahabad (2020)
- Guest Lecture in 18th Refresher Course in Physical Sciences & Nano Sciences, UGC-Human Resource Development Centre, Jawaharlal Nehru University (2020)

- Guest Lecture in 17th Refresher Course in Physical Sciences & Nano Sciences, UGC-Human Resource Development Centre, Jawaharlal Nehru University (2019)
- Guest Lectures in 1st Refresher Course in Chemistry, UGC-Human Resource Development Centre, Jawaharlal Nehru University (2017)
- Guest Lectures in 1st Refresher Course in Physics, UGC-Human Resource Development Centre, Jawaharlal Nehru University (2015)
- Guest Lectures in 14th Refresher Course in Physics at the Academic Staff College, Jawaharlal Nehru University (2014)
- Guest Lectures in 16th Refresher Course in Biotechnology at the Academic Staff College, Jawaharlal Nehru University (2014)
- Guest Lectures in 13th Refresher Course in Physics at the Academic Staff College, Jawaharlal Nehru University (2013)
- Guest Lectures in 12th Refresher Course in Physics at the Academic Staff College, Jawaharlal Nehru University (2012)
- Guest Lectures in 11th Refresher Course in Physics at the Academic Staff College, Jawaharlal Nehru University (2011)
- Guest Lectures in 10th Refresher Course in Physics at the Academic Staff College, Jawaharlal Nehru University (2010)

Professional Activities / Services / Outreach

1. Reviewer of Journal Articles
 - Journal of American Chemical Society
 - ACS Nano
 - Journal of Physical Chemistry
 - Journal of Physical Chemistry Letters
 - Analytical Chemistry
 - Langmuir
 - Scientific Reports
 - Physical Chemistry Chemical Physics
 - ACS Omega
 - Chemical Physics Letters
 - Chemical Physics Impact
 - Journal of Chemical Sciences

- RSC Advances
 - Current Science
 - Journal of Molecular Liquids
 - New Journal of Chemistry
 - The European Physical Journal E
 - Methods and Applications in Fluorescence
 - Biopolymers
2. Joint-Secretary of Fluorescence Society (<http://fluorescenceindia.org/>) (2013 – present)
 3. Editorial Board Member of *Chemical Physics Impact* (2020-2023) (<https://www.journals.elsevier.com/chemical-physics-impact/editorial-board>)
 4. Member of Review Editor Board of *Frontiers* (Biophysics section), 2020 (<https://www.frontiersin.org/journals/all/sections/biophysics#editorial-board>)
 5. Invited Panel Member (Photonics – Optical Imaging and Biophotonics) for VAIBHAV Summit 2020, Govt. of India.
 6. Reviewer of Project Proposals of Science and Engineering Research Board (SERB), Department of Science and Technology, Government of India
 7. Reviewer of Ph.D. and M.Tech. theses from TIFR Mumbai, IISc Bangalore, IISER Pune, RRCAT, NCL Pune, Vidyasagar University, BITS Pilani, IIT Delhi, etc.
 8. Reviewer of Global Initiative of Academic Networks (GIAN) Courses
 9. Faculty In-Charge of Instruments (TRFS, Femtosecond Facility, Fluorescence Correlation Spectroscopy) in Advanced Instrumentation Research Facility (AIRF), JNU.
 10. Member of American Chemical Society (2014 – 2017)
 11. Life Member of Fluorescence Society, India (2013 – present)
 12. Life Member of Indian Photobiology Society (IPS) (2013 – present)
 13. Life Member of Indian Society for Radiation and Photochemical Sciences (ISRAPS) (2008 – present)
 14. Advisor of Ph.D. Students of Chemical Sciences at School of Physical Sciences, Jawaharlal Nehru University (2008 – 2019)
 15. Member of Academic Council and Court of Jawaharlal Nehru University (2011 – 2012)
 16. Member of Doctoral Committee (DC) and Research Advisory Committee (RAC) of Ph.D. Students from Various Schools and Centers of Jawaharlal Nehru University, Indian Institute of Technology Delhi and Delhi University (2010 – 2019)
 17. Member of Technical Committee of School of Physical Sciences, Jawaharlal Nehru University, New Delhi (2015 – present)
 18. Member of Technical Committee of Advanced Instrumentation Research Facility (AIRF), Jawaharlal Nehru University, New Delhi (2018 – 2020)

19. External Member of Technical Committee for “Femtosecond Pump-Probe Setup” in Indian Institute of Technology Delhi (IIT Delhi) (2020)
20. External Expert for Expression of Interest (EOI) Meeting and Technical Committee for Procuring “STED Microscope Facility under SATHI” in Indian Institute of Technology Delhi (IIT Delhi) (2020)
21. External Expert for Expression of Interest (EOI) Meeting for Procuring “Confocal Microscope” in the Institute of Genomics and Integrative Biology (IGIB), Delhi (2018)
22. External Member of Technical Committee for “Time-Resolved Confocal Microscope” in National Institute of Science Education and Research (NISER), Bhubaneswar (2018)
23. External Member of Technical Committee for “Confocal Microscope” in Regional Centre for Biotechnology (RCB), Faridabad (2016)
24. External Member of Technical Committee for “High Content Imaging System” in Institute of Genomics and Integrative Biology (IGIB), Delhi (2015)
25. External Member of Technical Committee for “Confocal and Calcium Imager” in Institute of Genomics and Integrative Biology (IGIB), Delhi (2014)
26. External Member of Technical Committee for “Super-Resolution Microscope (SR-SIM)” in Institute of Genomics and Integrative Biology (IGIB), Delhi (2013)
27. External Member of Technical Committee for “TIRF Microscope” in Institute of Genomics and Integrative Biology (IGIB), Delhi (2012)
28. External Member of Technical Committee for “Ultrafast Transient Absorption System” in National Physical Laboratory (NPL), New Delhi (2011)
29. Member, Selection Committee, Kishore Vigyanik Prosathan Yojana (KVPY) (2008)
30. Jury Member, INSPIRE Award for National Level Exhibition and Project Competition (NLEPC) (2012)
31. Member, Advisory Committee for Communication & Information Service (CIS), Jawaharlal Nehru University (2010 – 2011)
32. Convener, University Safety Committee for Chemical Waste Disposal in Jawaharlal Nehru University (2012 – 2013)
33. Member, Purchase Committees of School of Life Sciences, JNU (2012 – 2013), Special Centre for Molecular Medicine, JNU (2016 – 2017)

Symposium / Workshop / Conference Organization

- Co-Convener of “**National Workshop in Fluorescence and Raman Spectroscopy (FCS-2018)**” Organized by School of Physical Sciences, Jawaharlal Nehru University, Department of Chemistry, Indian Institute of Technology Delhi and Tata Institute of Fundamental Research Mumbai during November 12 – 17, 2018.

- Organizer of “**ACS & India: Partners in Progress**” Organized by School of Physical Sciences, Jawaharlal Nehru University and American Chemical Society (ACS) on October 30, 2018.
- Organizing Committee Member of **National Science Day 2018 “Science and Technology for Sustainable Future”** Organized by Department of Science and Technology (DST) and Jawaharlal Nehru University, New Delhi, India, on February 28, 2018
- Local Organizing Committee Member of “**Marie Curie Sesquicentennial Conference-2017 (MCSC-2017)**” Organized by Indian National Young Academy of Sciences (INYAS) in Jawaharlal Nehru University, New Delhi, India, during November 5 – 7, 2017
- Organizing Committee Member of **National Science Day 2017 “Science & Technology of Specially abled Persons”** Organized by Department of Science and Technology (DST) and Jawaharlal Nehru University, New Delhi, India, on February 28, 2017
- Organizing Committee Member of **National Science Day 2015** Organized by Department of Science and Technology (DST) and Jawaharlal Nehru University, New Delhi, India, on February 28, 2015
- Co-Convener of International Symposium on “**Advances in Spectroscopy and Ultrafast Dynamics**” held at Indian Association for the Cultivation of Science, Kolkata, India, during December 12 – 14, 2014
- Co-Convener of National Symposium on “**Foundations and Frontiers in Supramolecular Chemistry**” held in School of Physical Sciences, Jawaharlal Nehru University, New Delhi, India, during March 1 – 2, 2012
- Co-Organizer of National Fluorescence Workshop on “**Spectroscopy and Microscopy in Biology and Chemistry (FCS-2011)**” held in International Centre for Genetic Engineering and Biotechnology (ICGEB) and School of Physical Sciences, Jawaharlal Nehru University, New Delhi, India, during November 14 – 18, 2011
- Co-Organizer of National Symposium on “**Modern Trends in Chemistry: Molecules to Materials**” held in School of Physical Sciences, Jawaharlal Nehru University, New Delhi, India, during March 14 – 15, 2008