

# Sunayana Mitra

## CONTACT INFORMATION

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## EDUCATION

**University of Pittsburgh**, Pittsburgh, PA, USA Aug 2014 - Present  
Doctor of Philosophy, Chemistry. Physical Chemistry division.  
• Thesis Topic: *Revealing the ion-small molecule fundamental interactions using 2DIR spectroscopy.*  
**Indian Institute of Science Bangalore**, Bangalore, India Dec 2012 - Jan 2014  
Internship Projects in the Department of Physical Chemistry.  
**University of Rochester**, Rochester, NY, USA Aug 2011 - Sep 2012  
Rotation Projects in the Department of Biophysics & Biochemistry (BSCB Cluster). Completed 26 Credits.  
**University of Calcutta**, Kolkata, India  
Masters in Biochemistry, GPA = 4.79/6 Jul 2008 - Jul 2010.  
Bachelor in Biochemistry, GPA = 60.4% Graduated with first class Honors. Jul 2005 - Jul 2008.

## PUBLICATION

- Zhe Ren, Jordan Kelly, C. Prasad Gunathilaka, Thomas Brinzer, Samrat Dutta, Clinton A. Johnson, **Sunayana Mitra** and Sean Garrett-Roe; Ultrafast dynamics of ionic liquids in colloidal dispersion; Phys. Chem. Chem. Phys., 2017,19, 32526-32535.

## ACADEMIC EMPLOYMENT

- Research Assistant** Aug 2014 - Present
- PhD Advisor: Prof. Sean Garrett-Roe
  - Studying small molecule-ion fundamental interactions in solution using ultrafast two dimensional infrared spectroscopy and linear infrared spectroscopy.
  - Gathering experiences in optics alignment, optics setup building, computation chemistry, MATLAB data analysis, scientific methods, scientific communication and writing skills .
- Teaching As Research Project** Jan 2018 - Present
- Advisor: Prof. Eugene Wagner
  - Actively engaged in teaching freshmen undergraduates to distinguish between secondary and primary literature and how to read scientific primary literature. Received CIRTl certification and dB-SERC Mentor-Mentee award for conducting teaching as research project.
- Teaching Experience** Aug 2014 - Present
- Honors General Chemistry Course 720 (Primary TF). Jan 2019 - Apr 2019,
  - Physical Chemistry Course 1430 (TF). Teaching Fellow in the course. May 2019 - Jun 2019, Apr 2018 - Jun 2018
  - General Chemistry Course 120 (TA). Apr 2017 - Dec 2017
  - General Chemistry Course 970 (TA). Jan 2015 - Apr 2015
  - General Chemistry Course 110. Teaching Assistant (TA) in the course. Aug 2014 - Dec 2014
  - Instructed over 15 Lab sections, conducted recitation, delivered tutorials, designed quizzes, conducted feedback workshops and teaching as research materials, graded lab reports, graded exams and held student office hours.
  - Mentoring : Junior researchers in my research laboratory. Undergraduate Teaching assistants in Chem 0720 courses. Actively engaged in Pitt Teaching Center workshops mentoring other participants. Participated in *Center for the Integration of Research, Teaching and Learning (CIRTl) Learning Community*, providing feedback and mentoring attendants in Teaching As Research projects.

## COLLABORATION

### **Rutherford Appleton Laboratories Central Laser Facility (CLF) ULTRA facility.**

Research is partially supported by the Science and Technology Facilities Council (STFC). Harwell Campus, Didcot, UK. Feb 2017 - Present

- Project 2, 2019 : *Revisiting the 2D-IR measurement of the activation energy of a hydrogen bond.*
- Investigators: Dr. Paul Donaldson, Prof Sean Garrett-Roe, Prof. Steve Corcelli.
- Project 1, 2017: *Interplay Between Ultrafast Vibrational Spectroscopy & Nuclear Quantum Effects on the Proton Transfer Mechanism/Dynamics of Protic Ionic Liquids.*
- Collaborators: Dr. Paul Donaldson, Prof Sean Garrrtt-Roe, Prof. Tony Parker and Dr. Maria Izzo.

## TEACHING PROFESSIONAL DEVELOPMENT & OUTREACH

### **Discipline-Based Science Education Research center (dB-SERC).** May 2018 - Present

- Won dB-SERC Mentor-Mentee award to implement *Teaching As Research (TAR)* project on Honors General Chemistry Course Apr 2019.
- Implementing “Developing primary research literature reading comprehension skills in first year students” TAR project in *Honors General Chemistry Curriculum*.
- Actively developing TAR project to implement on Honors General Chemistry Class Fall 2019- Spring 2020. Creating assessments, student opinion surveys along with workshops for feedback to students.

### **Center for the Integration of Research, Teaching, and Learning (CIRTL).** Aug 2017 - Present

- Active member of CIRTL. Presented CIRTL TAR project at 25th Biennial Conference on Chemical Education (BCCE).
- Pitt-CIRTL Scholar Certification in STEM Teaching, University of Pittsburgh, 2019. Completed a teaching certification program to gain the knowledge and skills to be a scholarly teacher and develop the TAR project using experience through CIRTL Network.

1. Completed drafting a teaching portfolio.
2. Disseminated TAR project at BCCE 2018.
3. Mentored novice CIRTL participants on TAR project ideas and teaching techniques.

- Pitt-CIRTL Practitioner Certification STEM Teaching, University of Pittsburgh, 2019. Completed a teaching certification program to gain the knowledge and skills to be a scholarly teacher and use the Teaching-as-Research (TAR) process to improve teaching practices through reflective practice.

1. Completed a mentored Teaching-as-Research project. TAR Project Title: *Applying Primary Literature to Freshmen Laboratory*. Presented TAR project at Pitt CIRTL network 2018.
2. Completed one advanced course/seminar series to enhance professional development in STEM academia. Course Title: *Advancing Learning Through Evidence-Based STEM Teaching*. Mentored other Pitt-CIRTL participants on reflective practice and evidence-based instructional practice.

- Pitt-CIRTL Associate Certification in STEM Teaching, University of Pittsburgh, 2017. Completed a teaching certification program to gain the knowledge and skills to be an effective teacher and implement research-based best practices in different learning environments

1. Completed a learning community-based course that introduced evidence-based STEM teaching practices. Course Title: *An Introduction to Evidence-Based Undergraduate STEM Teaching*.
2. Participated in CIRTL Network professional development seminars: *Writing a Teaching Philosophy Statement Seminar* Thursday, Nov 30, 2017. Drafted a “Teaching Philosophy Statement”.

- Participated in numerous *Learning Community* meetings conducted by Pitt CIRTL.

### **Center for Teaching and Learning, University of Pittsburgh.** Jan 2018 - Present

- Received *Pedagogy Badge* in Spring 2019. Participated in workshops on Professional Development, Pedagogy and Diversity.
- Facilitated Teaching Assistant Orientation Aug, 2019. Led discussion between first year graduate students about teaching responsibilities and TA'ing at Pitt. Organised by the University of Pittsburgh Teaching center.

- Participated in *Mentoring Matters: How to Cultivate Productive Mentoring Relationships*. Workshop organised by Center for Doctoral and Postdoctoral Career Development, university of Pittsburgh, Sep 11, 2019.

**Pitt Phi Lambda Upsilon (PLU) Student Outreach Program.**

Sept 2019 - Present

- Actively working with high-school students. Teaching school students exciting scientific laboratory skills. This outreach program aims to motivate high school students in science.

## INTERNSHIP

**Junior Research Fellow in Indian Institute of Science Bangalore, Bangalore, India**

- Advisor: Prof. Siva Umapathy Dec 2012 - Jan 2014
- Project 1: *Amino acid sensitizer based 'nanosecond flash photolysis' study of Triplet-Triplet energy transfer to nucleobases.*
- Project 2: *Studying structural signature changes in nucleobases upon pH change, using Raman spectroscopy.*

**University of Rochester, Medical Center, Rochester, NY, USA**

Aug 2011 - Sep 2012

- Project 1: *Studying the unwinding of the Shine Dalgarno - Anti Shine Dalgarno sequence using FRET.* Advisor: Prof. Dmitri Ermolenko.
- Project 2: *Studying the Oligomerization of GPCR by FRET.* Advisor: Dr. Mark Dumont.
- Project 3: *Pinpoint whether the C terminus of the PLC $\beta$  3 is responsible for binding to the intercellular loop-3 of Human Muscarinic Receptor M3 (M3i3).* Advisor: Prof. Alan Smrka.
- Project 4: *To Study the Quantum Yields of Thymine dimers at different wavelengths, using TpT.* Advisor: Prof. David McCamant.
- Project 5: *Synthesis, characterization of cohort of nanoparticles to form a complex with si-RNA. Delivery of the Complex into hMSCs and direct their differentiation into OST and Chondrocytes.* Advisor: Prof. Danielle Benoit.

**Saha Institute of Nuclear Physics, Kolkata, WB, India**

Jun 2009 - Aug 2009

- Advisor: Prof. Udayaditya Sen
- Project: *Cloning, Expression and Purification Of Low Molecular Weight Protein Tyrosine Phosphatase [LMW-PTP-121] isolated from Vibrio cholerae0395.*

## CONFERENCES & WORKSHOPS

- "A method to develop undergraduate ability to interpret & analyze primary research", Oral Presentation in Disciplined-Based Science Education Research organization, Pittsburgh, University of Pittsburgh, Jun 8, 2020.
- "Mode mixing between the carboxylate symmetric stretch and CH bends cause the vibrational structures in EDTA, [Ca:EDTA]<sup>2-</sup>, [Mg:EDTA]<sup>2-</sup> spectrum." Accepted abstract in Gordon Conference 2020, RI. Conference was cancelled due to covid-19 situation.
- "Developing Primary Literature Comprehension Skills in Honors General Chemistry Students", Oral Presentation in ACS Conference 2020, virtual Sci-Meeting in Philadelphia, Mar 26, 2020.
- "Developing Primary Literature Comprehension Skills in Honors General Chemistry Students", Oral Presentation in Disciplined-Based Science Education Research organization, Pittsburgh, University of Pittsburgh, Feb 13, 2020.
- Attended *Pittsburgh Regional Faculty Symposium*, University of Pittsburgh, March 11, 2019.
- "Developing primary research literature reading comprehension skills in first year students", Oral Presentation at CIRTL, University of Pittsburgh, February 2019.
- "Applying Primary Literature to Freshmen Laboratory", Oral Presentation at 25th Biennial Conference on Chemical Education, University of Notre Dame, Jul 29 - Aug 2, 2018.
- Participated *POGIL-PCL Workshop*, University of Pittsburgh, May 8-10, 2019.
- "Kinetics of Proton Transfer in Protic Ionic Liquids", Poster Presentation at PQI 2018, Pittsburgh Quantum Institute, Pittsburgh, Apr 18-20, 2018.
- "Kinetics of Proton Transfer in Protic Ionic Liquids", Poster Presentation at Society of Women in Engineering: Women in STEM Conference, Pittsburgh, Feb 10, 2018.
- "Kinetics of Proton Transfer in Protic Ionic Liquids", Poster Presentation at Science 2017, Pittsburgh

Quantum Institute, Pittsburgh, Oct 18-20, 2017.

- Attended *Women in STEM Conference*, Organised by Society of Women in Engineering, Pittsburgh, Jan 28, 2017.
- Attended *2014 ACS, 45th Central Regional Meeting*, Organised by ACS CERM, Pittsburgh, Oct 29-Nov 1, 2014.
- “Flash Photolysis study of TTET from Tyrosine to Nucleobases.” Poster Presentation in DAE-BRNS NLS-22, Manipal University, Manipal, India, Jan 8 - 11, 2014.
- Attended *Quantum Simulations*. Organized by Centre for Quantum Information and Quantum Computation, IISc, Bangalore. Sept, 2013.
- Attended seminar on *New Frontiers in Haematology and Oncology*. Organized by NSC Bose Cancer Research Institute, Kolkata. 2009
- Attended workshop on *Autumn School for the Young Biochemist*, Kolkata, Nov 2007.
- Attended seminar on *Nutrition and Well Being* at Indian Science Congress Association. Kolkata, 2007.

#### AWARDS, ACHIEVEMENTS & EXTRA CURRICULARS

- Completed the “Pitt-CIRTL Scholar Level Certification (3rd and Final level)” Pittsburgh, Dec, 2019.
- Received the “2019 Safford Awards for Excellence as a Graduate Student Teacher”. Honored by the Department of Chemistry, University of Pittsburgh.
- Active member of the “Pitt PLU K-12 Outreach Program”. University of Pittsburgh, June, 2019. Worked on designing experiments and gave onsite school demonstrations.
- Active member of the “Women in Science and Engineering Graduate Student Organization (WISE GSO)”. University of Pittsburgh, Sept, 2019.
- Received the Mentor Mentee award for “Developing primary research literature reading comprehension skills in first year students” Teaching as Research Project from the Disciplined-Based Science Education Research organization, Pittsburgh, Apr, 2019.
- Completed “Pitt-CIRTL Practitioner Level Certification (2nd level)” Pittsburgh, Apr, 2019.
- Nominated for the “2019 Elizabeth Baranger Excellence in Teaching Award” University of Pittsburgh, Feb, 2019.
- Received “Pedagogy Badge” Center for Teaching and Learning, University of Pittsburgh, Pittsburgh, Feb, 2019.
- Completed the “Pitt-CIRTL Associate Level Certification (1st level)” Pittsburgh, Apr, 2018.
- Earned a fellowship for pursuing PhD in BioPhysics at University of Rochester.
- Awarded Sangeet Bivakar title in Vocal Music conducted by Bangiya Sangeet Parisad. (*First Division with Distinction*).
- Received a gold medal in cultural competition (Nazrulgeeti) held on March, 2009, University of Calcutta.
- Received a certificate for distinctive performance in Fourth National Science Olympiad, Calcutta, 2002.

REFERENCES: AVAILABLE UPON REQUEST.