# XIAOBING CHEN, Ph.D.

Assistant Professor

Department of Chemistry and Biochemistry, Augusta University

1120 15th Street, GE-3043, Augusta, GA 30912

xichen@augusta.edu

## EDUCATION AND ACADEMIC APPOINTMENTS

**Assistant Professor** *August 2025-Present*
Department of Chemistry and Biochemistry
Augusta University, Augusta, GA

**Postdoctoral fellow** *September 2021-June 2025*
Advisor: Prof. Carlos Baiz
Department of Chemistry
University of Texas at Austin, Austin, TX

**PhD** in Chemistry *August 2016-August 2021*
Advisor: Prof. Daniel Kuroda
Department of Chemistry
Louisiana State University, Baton Rouge, LA

**B.E.** in Chemical Engineering *September 2012-July 2016*
Advisor: Prof. Bing Yuan
Qingdao University of Science and Technology, Qingdao, China

## COURSES TAUGHT

**CHEM 1212 & 1212R: Principles of Chemistry II** *Fall 2025*
Introductory general chemistry course. Topics include solutions, acid-base, colligative properties, equilibrium, electrochemistry, kinetics, and descriptive chemistry.

## RESEARCH INTERESTS

**Postdoctoral Fellow** *September 2021*
Biophysical Chemistry Lab, Department of Chemistry, UT Austin *-June 2025*

- Investigated protein binding and lipid domain separation in plasma membranes.
- Developed PEG-protein conjugates as biologics with improved thermal stability and therapeutic effects.
- Researched tunable nanocrystal materials for thermo-optical applications.
- Explored the EF hand motifs in Lanmodulin protein for lanthanide ion separation.
- Built a novel BoxCARS 2D IR spectrometer with pulse-shaping to push the detection threshold for weak signals.
- Studied structure-function relation of actin filament networks upon morphological changes.



*Links are underlined by black lines.

**Graduate Student Researcher** *June 2019-December 2020*
Infrared Ultrafast Laser Lab, Department of Chemistry, LSU

- Established novel types of lithium ion electrolytes with improved safety and durability, addressing current safety concerns with conventional electrolytes.
- Developed Deep Eutectic Solvents (DES), a novel, non-ionic, and green solvent, for applications in catalysis, separation, and electrochemistry.
- Built a new approach to the frequency computation of highly coupled transitions using artificial neural networks.

## RESEARCH FUNDING

**Before Augusta University:**

**Protein Structure and Dynamics in Crowded and Heterogeneous Environments** *2025-2029*
National Institutes of Health: Awarded and processing
Principal investigator: Carlos Baiz
Amount: $1,980,000.00
Role: Developed the aims with Prof. Baiz and provided preliminary data.

**Understanding Highly Heterogeneous Biological Membranes** *2021-2024*
National Science Foundation: 2129209
Principal investigator: Carlos Baiz
Amount: $757,389.00
Role: Drafted the progress report and provided preliminary data.

## MENTORING EXPERIENCE

**Summer High School Research Academy**, UT Austin *Summer 2024*
Guided high school students to conduct IR spectroscopic experiments and analyze spectral data for co-solvent systems.

**Eman Alasadi**, Graduate Student, UT Austin *2022-2023*
(current: Ph.D Student, UT Austin)
Studied Lanthanide ion binding to EF-hand motifs and co-authored 1 publication.

**Reena Al-Mualem**, Graduate Student, UT Austin *2021-2023*
(current: Optical Engineer, PhaseTech)

Studied protein binding to lipid membranes and co-authored 3 publications.

## HONORS AND AWARDS

**Domino Professional Development Award**, UT Austin *June 2023*
This is a one-time travel fund for professional development.

**Kiran Allam International Award**, LSU *May 2021*
This award is for an international student who has excelled in teaching and research.

**Neil Kestner Physical Chemistry Award**, LSU *May 2021*

This award is for a graduate student with exceptional achievement in physical chemical research.

**Outstanding Graduate Award**, QUST *June 2016*
This award recognizes undergraduates' achievement in outstanding dissertation and defense.

**First-, Second-, and Third-class Scholarships**, QUST *April 2013 – June 2016*
These scholarships are one-time awards for students who have excelled in their classes. I was awarded First-, Second-, and Third-class scholarships once, twice, and three times, respectively, during my undergraduate studies.

## LEADERSHIP AND PROFESSIONAL DEVELOPMENT

**ACS P2F (Postdoc to Faculty) Workshop, Philadelphia, PA** *July 2024*
Developed skills for transitioning from a postdoctoral fellow to a faculty role at institutions of higher education.

**Academic Job Search Preparation Summer Series, UT Austin** *July 2024*
Organizer: Texas Career Engagement
Completed a series of workshops preparing graduate students and postdoctoral scholars for the academic job search.

***Entering Mentoring* Workshop, UT Austin** *April 2024*
Organizers: Prof. Stella Offner and Prof. Kelly Zamudio
Trained with mentoring principles and practices with the goal of accelerating the process of becoming effective research mentors.

***NSC Strategic Management*, McCombs School of Business, UT Austin** *Fall 2022*
Instructor: Stephen E. Courter
Completed a course on developing general management skills such as managing change strategically, implementing strategy, and addressing long-term health of an organization.

**10th International Conference on Coherent Multidimensional Spectroscopy (CMDS), Austin, TX** *June 2022*
Organizers: Prof. Carlos Baiz and Prof. Sean Roberts
As part of the organizing committee, I assisted attendees with navigation, led campus lab tours, and ensured the smooth progression of sessions.

## ACADEMIC SERVICE

**Membership**
American Chemical Society (ACS), Biophysical Society (BPS)

**Article Reviewer**
- J. Phys. Chem. Lett, J. Phys. Chem. B, Soft Matter, ACS Omega, PeerJ, Protein Science

## COMMUNITY SERVICE

**Volunteer,** Event ***"Chemists Celebrate Earth Week: The Curious Chemistry of Amazing Algae"*** *November 2019*
Organizer: Central Texas ACS

- Presented science demos with kids and families to promote the importance of chemistry in creating a sustainable world

**Assistant**, Event *"**Super Science Saturday**"* *November 2019*
Instructor: Prof. Daniel Kuroda, LSU
Participated in the science education event for students in kindergarten to 12th grade, parents, and anyone interested in seeing science in action

**Volunteer**, Program *"**Chemistry Graduate School Buddy Program**"* *October 2017-*
Organizer: Chemistry Graduate Student Council (CGSC), LSU *October 2019*

- Assisted incoming/new graduate students to facilitate their integration into community and life at Louisiana State University
- Contributed to building the connection between international and local students

## PUBLICATIONS

Citations 153 (updated 8/7/2025), h-index 8, Google Scholar Page

**Research Articles Submitted**

1. **Chen, X.**, Maia, R.N.A., Mulry, E., Eddy, M.T., Baiz, C.R., Solvent Reorganization in Stabilized Protein-Polymer Conjugates Visualized by 2D IR and NMR Spectroscopy. Submitted (2025)

**Peer-reviewed Research Articles**

2. **Chen, X.**, Li, B., Volek, T.S., Kang, J., Truskett, T.M., Milliron, D.J., Baiz, C.R., Roberts, S.T., Tracking Photothermal Heat Generation in ITO Nanocrystals and its Dissipation to their Surrounding Environment. Nano Letters 2025, 25(31), 11912-11920.
3. **Chen, X.**, Cardenas, A.E., Elber, R., Senning, E.N., Baiz, C.R., Cooperativity of PIP2 and PS Lipids Modulates PH Domain Binding. Biophysical Journal 2025, 124, 1146-1157.
4. **Chen, X.**, Al-Mualem, Z.A., Shafieenezhad, A., Senning, E.N., Baiz, C.R., Binding-induced lipid domains: Peptide-membrane interactions with PIP2 and PS. Biophysical Journal 2023, 123, 1-11.
5. **Chen, X.**, Roeters, S.J., Cavanna, F., Alvarado, J., Baiz, C.R., Crowding alters F-actin secondary structure and hydration. Communications Biology 2023, 6(1), 900.
6. **Chen, X.**, Al-Mualem, Z.A., Shirley, J.C., Xu,C., Baiz, C.R., BoxCARS 2D IR spectroscopy with pulse shaping. Optics Express 2023, 31, 2700-2709.
7. **Chen, X.**, Kuroda, D.G., Ionic Conduction Mechanism in High Concentration Lithium Ion Electrolytes. Chemical Communications 2023, 59, 1849-1852.
8. **Chen, X**., Kuroda, D.G., Molecular motions of acetonitrile molecules in the solvation shell of lithium ions. The Journal of Chemical Physics 2020, 153 (16), 164502.
9. **Chen, X**., Cui, Y., Gobeze, H., Kuroda, D.G., Assessing the Location of Ionic and Molecular Solutes in a Molecularly Heterogeneous and Nonionic Deep Eutectic Solvent. The Journal of Physical Chemistry B 2020, 124, 4762–4773.

10. **Chen, X**., Fulfer, K.D., Woodard, K.T., Kuroda, D.G., Structure and Dynamics of the Lithium-Ion Solvation Shell in Ureas. The journal of Physical Chemistry B 2019, 123 (46), 9889-9898.
11. Alasadi, E., Choi, W., **Chen, X.**, Cotruvo, J., Baiz, C.R., Lanmodulin's EF 2-3 Domain: Insights from Infrared Spectroscopy and Simulations. ACS Chemical Biology 2024, 19 (5), 1056-1065.
12. Zhang, X., **Chen, X**., Kuroda, D.G., Computing the Fluctuation Dynamics of Frequencies of Highly Coupled Vibrational Transitions Using Neural Networks. The Journal of Chemical Physics 2021, 154 (16), 164514.
13. Fulfer, K.D., Galle Kankanamge S.R., **Chen, X.**, Woodard, K.T., Kuroda, D.G., Elucidating the Mechanism Behind the Infrared Spectral Features and Dynamics Observed in the Carbonyl Stretch Region of Organic Carbonates Interacting with Lithium Ions. The Journal of Chemical Physics 2021, 154 (23), 234504.
14. Yuan, B., Xie, C., Yu, F., Yang, X., Yu, S., Zhang, J., **Chen, X**., A Novel Brönsted–Lewis Acidic Heteropoly Organic–Inorganic Salt: Preparation and Catalysis for Rosin Dimerization. SpringerPlus 2016, 5 (1), 460.

**Reviews and book chapters**

15. **Chen, X.**, Al-Mualem, Z.A., Baiz, C.R., Lipid Landscapes: Vibrational Spectroscopy for Decoding Membrane Complexity. Annual Review of Physical Chemistry 2024, 75, 283-305.

## PRESENTATIONS

**Invited Talks**

1. **Chen, X.**; Conrad, D.; Anslyn, E.; Baiz, C., *"Illuminating Nanomaterials: A Thermodynamic Study of Chloride Ion Release from photolysis"*, 2024 PREM-MRSEC Seminar, TXST, San Marcos, TX — *July 2024*
2. **Chen, X.**, *"The Great 2D IR Spectroscopy"*, 2023 Summer Seminar by Biophysical Society Student Chapter, UT Austin, TX — *July 2023*
3. **Chen, X.**; Lorenz-Ochoa, K.; Baiz, C., *"Study of cryoprotectants: Polymer in DMSO:water cosolvent environments"*, 2022 ACS Regional Meeting, Baton Rouge, LA — *November 2022*

**Oral Presentations**

4. **Chen, X.**; Al-Mualem, Z.; Shafieenezhad, A.; Senning, E.; Baiz, C., *"Binding-Induced Lipid Domains: Peptide-Membrane Interactions with PIP2 and PS"*, 2024 ACS Spring Meeting, New Orleans, LA — *March 2024*
5. **Chen, X.**; Al-Mualem, Z.; Shafieenezhad, A.; Senning, E.; Baiz, C., *"Binding-Induced Lipid Domains: Peptide-Membrane Interactions with PIP2 and PS"*, 2024 BPS Annual Meeting (platform co-chair), Philadelphia, PA — *February 2024*
6. **Chen, X.**; Baiz, C., *"Binding-Induced Lipid Domains & Aptamer-Based Biosensing"*, 2023 Wintergreen Meeting of Physical Chemists, Wintergreen, VA — *September 2023*
7. **Chen, X.**; Roeters, S.; Cavanna, F.; Alvarado, J.; Baiz, C., *"Crowding Alters F-Actin Secondary Structure and Hydration"*, 2023 11th Annual Texas Soft Matter Meeting, Houston, TX — *August 2023*

*March 2023*

8. **Chen, X.**; Roeters, S.; Cavanna, F.; Alvarado, J.; Baiz, C., *"Understanding Changes in Actin Network under Morphology Control"*, 2023 ACS Spring Meeting, Indianapolis, IN *August 2022*
9. **Chen, X.**; Lorenz-Ochoa, K.; Baiz, C., *"Study of Cryoprotectants: Polymer in DMSO:Water Cosolvent Environments"*, 2022 ACS Fall Meeting, Chicago, Illinois

**Poster Presentations** *February 2024*

10. Chen, X.; Conrad, D.; Anslyn, E.; Baiz, C., *"Illuminating Dynamic Nanomaterials: Exploring Chloride Release in Photolytic Molecules for Fueling Nanocrystal Gel Assemblies"*, 2024 MRSEC Annual Meeting, UT Austin, Austin, TX *November 2023*
11. Chen, X.; Roeters, S.; Cavanna, F.; Alvarado, J.; Baiz, C., *"Crowding Alters F-Actin Secondary Structure and Hydration"*, 2023 Build-a-Cell Workshop #11, Austin, TX *August 2022*
12. **Chen, X.**; Al-Mualem, Z.; Baiz, C., *"Probing Interactions with Phosphatidylinositol 4,5-Bisphosphate in Phospholipid Membranes"*, 2022 Vibrational Spectroscopy GRC, Smithfield, RI *June 2022*
13. **Chen, X.**; Al-Mualem, Z.; Baiz, C., *"Probing Interactions with Phosphatidylinositol 4,5-Bisphosphate in Phospholipid Membranes"*, 2022 CMDS conference, Austin, TX *June 2021*
14. **Chen, X.**; Cui, Y.; Gobeze, H.; Kuroda, D., *"Assessing the Location of Ionic and Molecular Solutes in a Molecularly Heterogeneous and Nonionic Deep Eutectic Solvent"*, 2021 TRVS conference, virtual *April 2021*
15. **Chen, X.**; Kuroda, D., *"Molecular Motions of Acetonitrile Molecules in the Solvation Shell of Lithium Ions"*, 2021 ACS Spring Meeting, virtual *November 2018*
16. **Chen, X.**; Woodard, K.; Fulfer, K.; Kuroda, D., *"Structure and Dynamics of a New Lithium Ion Electrolyte"*, 2018 ACS Regional Meeting, Little Rock, AR