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ACADEMIC APPOINTMENTS

The University of South Carolina, Columbia, SC

Associate Professor, Department of Chemical Engineering

2026-Present

Assistant Professor, Department of Chemical Engineering

2019- 2026

The University of Chicago, Chicago, IL

Postdoctoral Scholar, Institute for Molecular Engineering, de Pablo Lab

2014-2018

Research Area: Structure-Processing-Property Relationship in Liquid Crystals for Photonic Materials Design.

Resident Associate, Argonne National Laboratory

April 2014- 2017

Harvard University, Boston, MA

2012-2014

Postdoctoral Fellow, Laboratory for Molecular and Integrative Cellular Dynamics, Fredberg Lab

Research Area: Dynamics and Mechanics of Collective Cell Migration

EDUCATION

ETH Zürich, Zürich, Switzerland, Materials Science, Polymer Physics, **Ph.D.**

Feb 2012

Advisor: Prof. Hans Christian Öttinger

Research Area: Complex Flow Characterisations of Polymer Melts in a Cross-Slot Channel Using Birefringence, Particle Tracking and Rheological Modeling

Amirkabir University of Technology, Tehran, Polymer Engineering, **M.S.**

2005

Research Area: Mechanical Behavior Analysis of Polymer Thin Film

AWARDS

USC - Molinaroli College of Engineering and Computing Young Investigator Award

2025

National Science Foundation Early CAREER Award

2021

Swiss National Science Foundation Prospective Researchers Award

2012

Swiss National Science Foundation Advanced Postdoc. Mobility Award

2013

RESEARCH INTEREST

- Equilibrium and non-equilibrium self-assembly of colloidal and liquid crystalline materials for sustainable, functional materials design.
- Structural colors
- Designing structured materials via structure–processing–property relationships for energy and photonic applications, including structural batteries and mechanical metamaterials
- Polymer rheology and complex flow analysis
- Microfluidics and additive manufacturing (3D printing)
- Collective cell migration
- Data analysis

PUBLICATIONS (* corresponding author)

1. J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “Blue-Phase Liquid Crystal Disclination Networks: Free-Energy-Guided Lattice Architectures Linking Curvature to Mechanics”, Under Review, 2026.
2. J. Money, S.M. Tabatabaei, P.A.A.L.D. Pattuwearachchi, J. A. Martinez-Gonzalez, R. Foudazi, N. Taheri-Qazvini, ***M. Sadati**, “Programmable Anisotropy: From Mesophase Order to Functional Architectures”, *Journal of Chemical Reviews* (Invited, Impact Factor: 64.2), 126, 6101-6187 (2026) **[Featured on the Front Cover]**.
3. S. Norouzi, Y. R. Morales-Flores, T. Emersic, J. Money, O. E. Rodriguez-Lopez, A. Casale, J. A. Martinez-Gonzalez, ***M. Sadati**, “3D Polymer Shell Enables Reconfigurable Stabilized Blue Phase Soft Crystals”, *Advanced Functional Material*, 2424655 (2025) **[Featured on the Front Cover]**.
4. S. Norouzi, J. Money, S. Villada-Gil, J. A. Martinez-Gonzalez, ***M. Sadati**, “Curved Confinement Directs Anchoring-Mediated Structural Transitions in Highly Chiral Liquid Crystal Shells”, *Journal of Molecular Systems Design and Engineering* 10, 836 (2025) **[Featured on the Cover]**[Invited Research Article Contribution in Honor of Prof. Juan de Pablo’s 60th Birthday].
5. K. George, N. Taheri-Qazvini, P. ***M. Sadati**, “Processing Parameter-Performance Nexus in 3D Printing of Nanostructured Chiral Photonics”, *Small*, 2407658 (2025).
6. K. Glassey, G. Roman-Martinez, L. DeLatte, T. Burns, ***M. Sadati**, P. T. Coman, R. E. White, “Probing Sealed Ion- and Electron-Blocking Electrode Rigs for Ionic Conductivity in Hybrid Solid Polymer Electrolytes”, *The Journal of the Electrochemical Society*, 172, 020523 (2025).
7. T. C. Burns, L. DeLatte, G. Roman-Martinez, K. Glassey, P. Ziehl, **M. Sadati**, P. Coman, R. E. White, “Ultrasonic Spray Coating of Carbon Fibers for Composite Cathodes in Structural Batteries”, *Electrochem*, 6 (2), (2025).
8. S. Villada-Gil, **M. Sadati**, J. D. Ospina-Correa, D. A. Olaya-Muñoz, J. P. Hernández-Ortiz, J. A. Martínez-González, “Geometrical Impacts of Platonic Particles on Nematic Liquid Crystal Dynamics”, *Soft Matter*, 20, 8968 (2024) **[Featured on Cover]**.
9. M. Esmaili, E. Akbari, K. George, G. Rezvan, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing-Assisted Self-Assembly to Bio-Inspired Bouligand Nanostructures”, *Nano-Micro Letters*, 16, 54 (2024).
10. F. Gholamirad, **M. Sadati**, N. Taheri-Qazvini, “Microgel-Guided MXene Assembly for High-Performance, Low-Solid Content Conductive Inks”, *ACS Applied Materials & Interfaces*, 17, 4022 (2025).
11. G. Rezvan, M. Esmaili, **M. Sadati**, N. Taheri-Qazvini, “Size-dependent Viscoelasticity in Hybrid Colloidal Gels Based on Spherical Soft Nanoparticles and Two-dimensional Nanosilicates of Varying Size”, *Journal of Colloid and Interface Science*, 656, 577 (2024).
12. G. Rezvan, F. Gholamirad, M.K. Walden, Y. Wang, P. Zhao, **M. Sadati**, T.-C. He, Nader Taheri-Qazvini, “Hybrid Functional Membranes through Layer-by-Layer Assembly of Ti₃C₂T_x MXene and Gelatin-Stabilized Calcium Phosphate Nanospheres”, *Applied Materials Today*, 37, 102144 (2024).
13. R. Prakash, M. Esmaili, F. A. Gbadamosi, P. J. Pellechia, **M. Sadati**, L. S. Shimizu, “Supramolecular Gelation of Triphenylamine Bis-Urea Macrocycles in Toluene”, *Macromolecules*, 57, 1312 (2024).
14. C. Chen, V. Palacio-Betancur, S. Norouzi, P. F. Zubieta Rico, **M. Sadati**, S. J. Rowan, J. J. de Pablo, “LCPOM: Precise Reconstruction of Polarized Optical Microscopy Images of Liquid Crystals”, *Chem. Mater.* 36, 7, 3081 (2024).
15. N. Nikfargam, P.T. Coman, C. Free, P. Ziehl, ***M. Sadati**, R. White, “Advancing Ionic Conductivity in Solid Electrolytes: Insights from Polymerization-induced Phase Separation and Microstructural Optimization,” *J. Energy Storage*, 93, 112287 (2024).
16. J. Money, J. G. Munguia-Fernández, S. Norouzi, M. Esmaili, J. A. Martínez-González, ***M. Sadati**, “Photonic Features of Blue Phase Liquid Crystals Under Curved Confinement”, *Chemical Communications*, 59, 12231 (2023) **[Perspective Article (Invited)]**.
17. K. George, M. Esmaili, J. Wang, N. Taheri-Qazvini, A. Abbasbourrad, ***M. Sadati**, “3D Printing of Responsive Chiral Photonic Nanostructures”, *PNAS*, 120, e2220032120 (2023).

18. S. Ayoubian Markazi, M. Karimi, B. Yousefi, **M. Sadati**, H. Khoramshahi, S. Khoee, M. R. Karimi, "Experimental and Modeling Study on the Simultaneous Fouling Behavior of Micro/Nanoplastics and Bovine Serum Albumin in Ultrafiltration Membrane Separation", *Journal of Environmental Chemical Engineering*, 11, 109354 (2023).
19. M. Esmaili, S. Norouzi, K. George, G. Rezvan, N. Taheri-Qazvini, ***M. Sadati**, "3D Printing-Assisted Self-Assembly to Bio-Inspired Bouligand Nanostructures", *Small* 2206847 (2023) [**Featured on Cover**].
20. S. Norouzi, R. Zhang, J. G. Munguia-Fernández, L. de Pablo, Y. Zhou, N. Taheri-Qazvini, H. Shapiro, S. Morin, J. A. Martinez-Gonzalez, ***M. Sadati**, J. J. de Pablo, "Director Distortion and Phase Modulation in Deformable Nematic and Smectic Liquid Crystal Spheroids", *Langmuir*, 38, 15272-15281 (2022).
21. S. Norouzi, A. Tavera-Vazquez, J. Ramirez-de Arellano, D. Kim, T. Lopez-Leon, J. J. de Pablo, J. A. Martinez Gonzalez, ***M. Sadati**, "Elastic Instability of Cubic Blue Phase Nano Crystals in Curved Shells", *ACS Nano*, 16, 15894-15906 (2022).
22. M. Esmaili, K. George, G. Rezvan, N. Taheri Qazvini, R. Zhang, ***M. Sadati**, "Capillary Flow Characterization of Chiral Nematic Cellulose Nanocrystal Suspensions", *Langmuir*, (2022) [**Featured on Cover**].
23. S. Norouzi, J. A. Martinez Gonzalez, ***M. Sadati**, "Chiral Liquid Crystal Microdroplets for Sensing Phospholipid Amphiphiles", *Biosensors* 12, 313 (2022).
24. G. Rezvan, M. Esmaili, **M. Sadati**, N. Taheri-Qazvini, "Hybrid Colloidal Gels with Tunable Elasticity Formed by Charge-driven Assembly Between Spherical Soft Nanoparticles and Discotic Nanosilicates", *Journal of Colloid and Interface Science* 627, 40 (2022).
25. F. Gholamirad, J. Ge, **M. Sadati**, G. Wang, N. Taheri-Qazvini, "Tuning the Self-Assembled Morphology of Ti3C2Tx MXene-Based Hybrids for High-Performance Electromagnetic Interference Shielding", *ACS Applied Materials & Interfaces* 14, 49158 (2022).
26. **M. Sadati**, J. A. Martinez-Gonzalez, A. Cohen, S. Norouzi, O. Guzman, J. J. de Pablo, "Control of Monodomain Polymer Stabilized Cuboidal Nano Crystals of Chiral Nematics by Confinement", *ACS Nano*, 15, 15972-15981 (2021) [**Featured on Cover**].
27. **M. Sadati**, J. A. Martinez-Gonzalez, Y. Zhou, N. Taheri Qazvini, K. Kurtenbach, X. Li, R. Zhang, J. J. de Pablo, "Multiaxial Deformation of Confined Chiral Liquid Crystals", *Science Advances*, eaba6728 (2020).
28. C. Zhaoy, N. Taheri Qazvini, **M. Sadati**, Z. Zeng, S. Huang, A. L. De La Lastra, L. Zhang, Y. Feng, W. Liu, B. Huang, B. Zhang, Z. Dai, Y. Shen, X. Wang, W. Luo, B. Liu, Y. Lei, Z. Ye, L. Zhao, D. Cao, L. Yang, X. Chen, A. Athiviraham, M. J. Lee, J. M. Wolf, R. R. Reid, M. Tirrell, W. Huang, J. J. de Pablo, T.-C. He, "A pH-triggered, Self-assembled, and Bioprintable Hybrid Hydrogel Scaffold for Mesenchymal Stem Cell-based Bone Tissue Engineering", *ACS Applied Materials & Interfaces*, 11, 8749 (2019).
29. **M. Sadati**, Y. Zhou, D. Melchert, A. Guo, J. A. Martinez-Gonzalez, T. F. Robert, R. Zhang, J. J. de Pablo, "Spherical Nematic Shell with Prolate Ellipsoidal Core", *Soft Matter*, 13, 7465 (2017) [**Featured on Cover**].
30. **M. Sadati**, H. Ramezani, W. Bu, E. Sevgen, Z. Liang, C. Erol, M. Rahimi, N. Taheri Qazvini, B. Lin, N. L. Abbott, B. Roux, M. L. Schlossman, J. J. de Pablo, "Molecular Structure of Canonical Liquid Crystal Interfaces", *Journal of the American Chemical Society*, 139, 3841 (2017) [**Selected as a highlight**].
31. H. Ramezani, M. Sadati, M. Rahimi, B. Roux, J. J. de Pablo, "Understanding Atomic-Scale Behavior of Liquid Crystals at Aqueous Interfaces", *Journal of Chemical Theory and Computation*, 13, 237 (2017).
32. H. Ramezani, **M. Sadati**, R. Zhang, M. Rahimi, K. Kurtenbach, N. Abbott, B. Roux, J. J. de Pablo, "Water Flux-Induced Reorientation of Liquid Crystals", *ACS Central Science*, 3, 1345 (2017).
33. J. A. Martinez-Gonzalez, X. Li, **M. Sadati**, Y. Zhou, R. Zhang, P. F. Nealey, J. J. de Pablo, "Directed Self-assembly of Liquid Crystalline Blue-phases into Ideal Single-crystals", *Nature Communications*, 8, 15854 (2017).
34. Y. Zou, N. T. Qazvini, K. Zane, **M. Sadati**, Q. Wei, J. Liao, J. Fan, D. Song, J. Liu, C. Ma, X. Qu, L. Chen, X. Yu, Z. Zhang, C. Zhao, Z. Zeng, R. Zhang, S. Yan, T. Wu, X. Wu, Y. Shu, Y. Li, W. Zhang, R. R. Reid, M. J. Lee, J. M. Wolf, M. Tirrell, T.C. He, J. J de Pablo, Z. L. Deng, "Gelatin-Derived Graphene-Silicate Hybrid Materials are Biocompatible and Synergistically Promote BMP9-induced Osteogenic Differentiation of Mesenchymal Stem Cells (MSCs)," *ACS Applied Materials & Interfaces*, 9,15922 (2017).

35. X. Li, J. A. Martinez-Gonzalez, J. P. Hernandez-Ortiz, Y. Zhou, **M. Sadati**, R. Zhang, P. F. Nealey, J. J. de Pablo, “Mesoscale Martensitic Transformation in Single Crystals of Topological Defects”, *PNAS*, 114, 10013 (2017).
36. Y. Zhou, A. Guo, R. Zhang, J. C. Armas-Perez, J. A. Martinez-Gonzalez, **M. Sadati**, M. Rahimi, J. J. de Pablo, “Mesoscale Structure of Chiral Nematic Shells”, *Soft Matter*, 12, 8983 (2016) [Featured on Cover].
37. **M. Sadati**, A. Izmitli Apik, J. C. Armas-Perez, J. Martinez-Gonzalez, J. P. Hernandez-Ortiz, N. L. Abbott, J. J. de Pablo, “Liquid Crystal Enabled Early-Stage Detection of Beta Amyloid Formation on Lipid Monolayers”, *Advanced Functional Materials*, 25, 6050 (2015), [Featured on Cover].
38. **M. Sadati**, A. Nourhani, J. J. Fredberg, N. Taheri Qazvini, “Glass-like Dynamics of Cells and Cellular Collectives”, *WTREs: System Biology and Medicine*, 6, 137 (2014).
39. J. H. Kim, X. Serra-Picamal, D. T. Tambe, E. H. Zhou, C. Y. Park, **M. Sadati**, J. A. Park, R. Krishnan, B. Gweon, E. Millet, J. P. Butler, X. Trepap, J. J. Fredberg, “Propulsion and Navigation within the Advancing Monolayer Sheet”, *Nature Materials*, 12, 856 (2013), (Featured on Cover).
40. **M. Sadati**, N. Taheri Qazvini, R. Krishnan, C. Y. Park, J. J. Fredberg, “Collective Migration and Cell Jamming”, *Differentiation*, 86, 121 (2013).
41. **M. Sadati**, C. Luap, M. Kröger, B. Lüthi, H. C. Öttinger, “Application of Full Flow Field Reconstruction to a Viscoelastic Liquid in a 2D Cross-slot Channel”, *Journal of Non-Newtonian Fluid Mechanics*, 192, 10 (2013).
42. **M. Sadati**, C. Luap, M. Kröger, A.A. Gusev, H. C. Öttinger, “Smooth Full Field Reconstruction of Velocity and its Gradients from Noisy Scattered Velocimetry Data in a Cross-slot Flow”, *Journal of Rheology*, 55, 353 (2011).
43. **M. Sadati**, C. Luap, M. Kröger, H. C. Öttinger, “Hard vs. Soft Constraints in the Full Field Reconstruction of Incompressible Flow Kinematics from Noisy Scattered Velocimetry Data”, *Journal of Rheology*, 55, 1187 (2011).
44. M. Emami, **M. Sadati**, R. Mehtarani, F. Hormozi, A. Mirzaei, “Synthesis of Polypropylene/Poly(ethylene-copropylene) In-situ Blends Using 5th Generation of Ziegler-Natta Catalyst”, *Iranian Polymer Journal*, 16, 449 (2007).
45. **M. Sadati**, N. Mohammadi, N. Taheri Qazvini, N. Tahmasebi, S. Koopahi, “Evaluation of the Scratch Resistance of an Acrylic-Melamine Clear Coat Based on its Fracture Energy”, *Progress in Organic Coatings*, 53, 23 (2005).

PATENT APPLICATIONS

1. **M. Sadati**, J. Money, “Method of design and engineering three-dimensional disordered porous architectures” (2025).
2. **M. Sadati**, J. Money, J. A. Martinez-Gonzalez, “Design of Acoustic Metamaterials Based on Liquid Crystal Skyrmions”, US Patent App. 18/772,370.
3. **M. Sadati**, K. George, “Chiral Photonic Inks and Iridescent Products”, US Patent App. 17/866,137, 2023.
4. **M. Sadati**, S. Norouzi, J. A. Martinez-Gonzalez, N. Taheri-Qazvini, “Methods for Forming Auxetic, Zero, and Near-zero Poisson's Ratio Materials and Materials Formed Thereby,” US Patent App. 18/187,828, 2023.
5. J. J. de Pablo, N. Taheri Qazvini, **M. Sadati**, M. Tirrell, “Injectable Pastes Based on Oppositely Charged Polymer/Calcium Phosphate Hybrid Nanoparticles”, US Patent 12,318,475.
6. J. J. de Pablo, P. F. Nealey, X. Li, J. A. Martinez-Gonzalez, **M. Sadati**, R. Zhang, Y. Zhou, “Blue Phases on Patterned Surfaces”, U.S. Patent 10,969,642.
7. **M. Sadati**, B. Raissi, “Polymerization of Polypropylene in Bulk and Gas Phases”, Iranian Patent, 47974, 2008.

INVITED PRESENTATIONS AND SEMINARS

1. **M. Sadati**, “Leveraging Nanoscale Equilibrium and Non-Equilibrium Chiral Self-Assembly for Mechanical Metamaterials Design,” Air Force Research Laboratory, Materials and Manufacturing Directorate, Dayton, OH, May 2025.

2. **M. Sadati**, “Chiral Liquid Crystals Under Curved Confinement”, Department of Physics and Astronomy, University of South Carolina, July 2025.
3. **M. Sadati**, “Directed Non-equilibrium Chiral Self-assembly for Precise and Programmable Printing”, Notre Dame, Department of Chemical and Biomolecular Engineering (November 2024).
4. **M. Sadati**, “3D Printing-guided Chiral Self-assembly in Cellulose-based Constructs”, APS, Minneapolis (2024).
5. **M. Sadati**, “When Crystal Meets Curve”, AIChE Annual Meeting, Orlando, FL (2023).
6. **M. Sadati**, “3D Printing-guided Chiral Self-assembly in Cellulose-based Constructs”, Georgia Institute of Technology, Chemical and Biomolecular Engineering Department (October 2023).
7. **M. Sadati**, “Bio-inspired 3D Printing of Programmable Chiral Nanostructures”, University of South Florida, Department of Chemical, Biological and Materials Engineering (October 2023).
8. **M. Sadati**, “Chiral Liquid Crystals and the Color of Chirality”, AIChE Palmetto Section Meetings, University of South Carolina (2022).
9. **M. Sadati**, “3D Printing-guided Bouligand Nanostructure Self-assembly”, IMRC, Cancun, Mexico (2022).
8. **M. Sadati**, “Molecular Organization of Liquid Crystals at Free Interfaces: Synchrotron X-ray Reflectivity and Computational Simulations”, PacifiChem, Honolulu, Hawaii, December (2021).
9. **M. Sadati**, “Liquid Crystals and the Color of Chirality”, Department of Chemical and Biological Engineering, University of Alabama (2021).
10. **M. Sadati**, “Complex Flow, Liquid Crystals and Responsive Materials Design”, Purdue Davidson School of Chemical Engineering (February 2018).

CONFERENCE CONTRIBUTIONS

1. K. George, Nader Taheri-Qazvini, Peter Olmsted, ***M. Sadati**, “Bottom-Up Photonic Structuring through Flow-Directed 3D Printing of Liquid Crystalline Cellulose Inks”, APS, Denver 2026.
2. J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “Chiral Nematic Liquid Crystals as Generative Platforms for Disordered Architected Materials”, APS, Denver 2026.
3. J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “Exploring Nanoscale Architectural and Geometric Features in Chiral Nematic Liquid Crystal Disclination Networks”, AIChE, Boston 2025.
4. J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “Porous, Stochastic Materials Inspired By Disclination Networks of Chiral Nematic Liquid Crystals”, AIChE, Boston 2025.
5. S. Norouzi, Yazael R. Morales-Flores, J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “Polymer Shell Confinement for Reconfigurable Symmetry in Stabilized Blue Phase Liquid Crystals”, AIChE, Boston 2025.
6. K. George, ***M. Sadati**, “Shear-Induced Nanoscale Morphologies in 3D-Printed Structural Color”, Society of Rheology, Santa Fe (2025).
7. S. Norouzi, J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “Polymer-Stabilized Cuboidal Liquid Crystals with Reconfigurable Symmetry”, APS, Los Angeles, CA (2025).
8. Lauren Garret, ***M. Sadati**, “Polyurethane Foam Upcycling with Deconstructed Lignin”, USC Discover Day (2025).
9. S. Norouzi, Y. R. Morales-Flores, J. Money, O. E. Rodriguez-Lopez, J. A. Martinez-Gonzalez, ***M. Sadati**, “Curved Confinement-Induced Stabilized Blue Phase Liquid Crystals”, AIChE Meeting, San Diego (2024).
10. M. Esmaili, K. George, ***M. Sadati**, “3D Printing-Guided Chiral Nanostructures in Bio-Hybrid Nanocomposites”, AIChE Meeting, San Diego (2024).
11. M. Esmaili, K. George, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing-Directed Chiral Self-Assembly in Cellulose-Based Materials”, AIChE Meeting, San Diego (2024).

12. K. Glassy (REU Summer Student), P. Coman, ***M. Sadati**, “Engineering Solid Polymer Electrolytes for Structural Batteries with Enhanced Mechanical and Electrochemical Performances”, AIChE Meeting, San Diego (2024).
13. S. Norouzi, J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “From Curvature to Stability: Unraveling the Physics of Blue Phase Soft Crystals”, SC EPSCoR, Columbia, SC (2024).
14. J. Money, S. Norouzi, ***M. Sadati**, “Materials Design Guided by Defects in Liquid Crystals”, SC EPSCoR, Columbia, SC (2024).
15. S. Norouzi, J. Money, J. A. Martinez-Gonzalez, ***M. Sadati**, “Curvature-induced Instability in Crystallization of Chiral Liquid Crystals”, Materials Research Conference, Seattle, WA (2024).
16. J. Money, F. Emami, A. Gross, J. A. Martinez-Gonzalez, ***M. Sadati**, “Materials Design guided by Defects in Liquid Crystals”, Seattle, WA (2024).
17. M. Esmaili, K. George, N. Taheri-Qazvini, ***M. Sadati**, “Programming Bio-inspired Nanoscale Chiral Self-Assembly in 3D Printed Composites”, ISMC, Raleigh, NC (2024).
18. M. Esmaili, K. George, S. Norouzi, J. Money, ***M. Sadati**, “3D Printing of Programmable Chiral Nanostructures”, Additive Manufacturing Gordon Research Conference, Bryant University, RI (2024).
19. M. Esmaili, K. George, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing of Responsive Photonic Architectures”, IMRC, Cancun, Mexico (2023).
20. M. Esmaili, K. George, S. Norouzi, J. Money, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing of Programmable Self-assembly to Bouligand Nanostructures”, APS March meeting, Las Vegas, NV (2023).
21. M. Esmaili, S. Norouzi, ***M. Sadati**, “3D Printing of Bio-inspired Chiral Nanocomposites”, Liquid Crystal Gordon Research Conference, Manchester, NH, United States (2023).
22. S. Norouzi, J. A. Martinez-Gonzalez, ***M. Sadati**, “Blue Phase Liquid Crystal within Curved Cavities”, Liquid Crystal Gordon Research Conference, Manchester, NH, United States (2023).
23. C. Chen, V. Palacio-Betancur, S. Norouzi, **M. Sadati**, J. J de Pablo, “Simulating Liquid Crystals Birefringence Pattern in Droplets”, Liquid Crystal Gordon Research Conference, Manchester, NH, United States (2023).
24. M. Esmaili, K. George, N. Taheri-Qazvini, ***M. Sadati**, “Printing 3D Structures with Controlled Chiral Self-Assembly”, AIChE Annual Meeting, Orlando, FL (2023).
25. S. Norouzi, J. A. Martinez-Gonzalez, ***M. Sadati**, “Soft Crystals within Curved Confinement”, SC EPSCoR State Conference, Summerville (2023).
26. J. Money, S. Norouzi, ***M. Sadati**, “Leveraging Blue Phase Liquid Crystals for Architected Materials Design”, SC EPSCoR State Conference, Summerville (2023).
27. K. George, M. Esmaili, ***M. Sadati**, “Chiral Photonic Security Tokens Based on Polarized Structural Color for Physical Unclonable Functions”, SC EPSCoR State Conference, Summerville (2023).
28. K. George, M. Esmaili, N. Taheri-Qazvini, ***M. Sadati**, “Shear-Induced Optical Properties in Photonic Hydroxypropyl Cellulose Solids”, Discover USC, Columbia (2023).
29. S. Norouzi, J. A. Martinez-Gonzalez, ***M. Sadati**, “Cubic Blue Phase Crystals within Curved Boundaries”, SC EPSCoR, Columbia, South Carolina (2022).
30. K. George, M. Esmaili, N. Taheri-Qazvini, ***M. Sadati**, “Hydroxypropyl Cellulose-based Inks for Printing Solid Photonic Structures”, Society of Rheology, Chicago, IL, October (2022).
31. M. Esmaili, K. George, N. Taheri-Qazvini, ***M. Sadati**, “Flow-assisted Chiral Nematic Assembly in Cellulose Nanocrystals-based Inks”, Society of Rheology, Chicago, IL, October (2022).
32. M. Esmaili, K. George, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing of Chiral Inks within Jammed Microgels”, Society of Rheology, Chicago, IL, October (2022).
33. E. Akbari, M. Esmaili, ***M. Sadati**, “Flow Behavior of Chiral Nematic Liquid Crystals Using Orthogonal Superposition”, Society of Rheology, Main, Chicago, IL, October (2022).

34. S. Norouzi, A. Tavera-Vazquez, T. López León, J. J. de Pablo, J. A. Martinez-Gonzalez, ***M. Sadati**, “Blue Phase Liquid Crystal Core-Shells”, 28th International Liquid Crystal Conference, Lisbon, Portugal (2022), Virtual.
35. K. George, M. Esmaili, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing of Chiral Nanostructures”, 28th International Liquid Crystal Conference, Lisbon, Portugal (2022), Virtual.
36. S. Norouzi, J. A. Martinez-Gonzalez, ***M. Sadati**, “Polymer-Stabilized Blue Phases in Spherical Confinement”, Lisbon, Portugal (2022), Virtual.
37. M. Esmaili, K. George, S. Norouzi, J. Money, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing of Programmable Self-assembly to Chiral Nanostructures”, Gordon Research Conference, Ventura, CA (2022).
38. M. Esmaili, K. George, N. Nikfarjam, N. Taheri-Qazvini, ***M. Sadati**, “Organic-Inorganic Interactions in 3D Printed Bouligand Nanostructures”, AIChE Meeting, Phoenix, AZ (2022).
39. K. George, M. Esmaili, N. Taheri-Qazvini, ***M. Sadati**, “Phase Separation-Induced Structural Color in Hydroxypropyl Cellulose Solids”, AIChE Meeting, Phoenix, AZ (2022).
40. M. Esmaili, K. George, N. Nikfarjam, N. Taheri-Qazvini, ***M. Sadati**, “Relaxation Dynamics of Flow-Assisted Chiral Assembly”, AIChE Meeting, Phoenix, AZ (2022).
41. K. George, M. Esmaili, N. Taheri-Qazvini, ***M. Sadati**, “Shear-Induced Optical Properties in Photonic Hydroxypropyl Cellulose Solids”, AIChE Meeting, Phoenix, AZ (2022).
42. S. Norouzi, J. A. Martinez-Gonzalez, ***M. Sadati**, “Stimuli-Responsive Stabilized Blue Phase Liquid Crystals Microdroplets”, AIChE Meeting, Phoenix, AZ (2022).
43. S. Norouzi, A. Tavera-Vazquez, T. López León, J. J. de Pablo, J. A. Martinez-Gonzalez, ***M. Sadati**, “Crystallization of Soft Cuboidal Blue Phase Liquid Crystals in Shells”, AIChE Meeting, Phoenix, AZ (2022).
44. S. Norouzi, Rui Zhang, ***M. Sadati**, “Shear-Induced Instability of Blue Phase Liquid Crystals”, AIChE Meeting, Phoenix, AZ (2022).
45. G. Rezvan, M. Esmaili, **M. Sadati**, N. Taheri-Qazvini, “Stress Relaxation and Yielding Behavior of Gelatin Nanoparticles/2D Clay Hybrid Colloidal Gels”, AIChE Meeting, Phoenix, AZ (2022).
46. **M. Sadati**, H. Ramezani-Dakhel, W. Bu, E. Sevgen, C. Erol, N. Taheri Qazvini, Z. Liang, M. Rahimi, B. Lin, N. L. Abbott, B. Roux, M. Schlossman, J. J. de Pablo, “Molecular Organization of Liquid Crystals at Free Interfaces: Synchrotron X-ray Reflectivity and Computational Simulations”, PacificChem, Honolulu, Hawaii, December (2021) (*Invited*).
47. S. Norouzi, M. Esmaili, K. George, R. Zhang, J. A. Martinez-Gonzalez, N. Taheri-Qazvini, ***M. Sadati**, “Flow Behavior of Chiral Liquid Crystals”, Society of Rhology, Bangor, Main, October (2021).
48. S. Norouzi, J. A. Martinez-Gonzalez, ***M. Sadati**, “Tunable Photonic Soft Crystals Based on Stabilized Blue Phase Liquid Crystal”, AIChE Annual Meeting, Boston, November (2021).
49. M. Esmaili, K. George, N. Taheri-Qazvini, ***M. Sadati**, “3D Printing of Chiral Liquid Crystal Elastomers Using Cellulose Nanocrystals”, AIChE Annual Meeting, Boston, November (2021).
50. M. Esmaili, N. Taheri Qazvini, ***M. Sadati**, “The Effect of Sonication on the Self-Assembly of Cellulose Nanocrystals (CNC) in Suspensions and Dried Films”, Annual Meeting of AIChE, Virtual, November (2020).
51. S. Norouzi, ***M. Sadati**, “The Effect of Flow on Frustrated Polymer-stabilized Blue Phase Liquid Crystals”, Annual Meeting of AIChE, Virtual, November 2020.
52. **M. Sadati**, A. Cohen, J. A. Martinez-Gonzalez, S. Norouzi, J. J. de Pablo, “Stabilizing Blue Phase Liquid Crystal Under Spherical Confinement”, Annual Meeting of AIChE, Virtual, November (2020).
53. **M. Sadati**, J. A. Martinez-Gonzalez, Y. Zhou, K. Kurtenbach, V. Palacio Betancur, J. P. Hernandez-Ortiz, and J. J. de Pablo, “Strain-induced Topological Defects and Configurational Transitions in Liquid Crystals”, Annual Meeting of American Physical Society, Los Angeles, March (2018).

54. A. Cohen, **M. Sadati**, X. Li, H. Ramezani-Dakhel, Y. Zhou, J. P. Hernandez-Ortiz and J. J. de Pablo, "Polymer-Stabilized Blue Phase Liquid Crystal Droplets", Annual Meeting of American Physical Society, Los Angeles, March (2018).
55. **M. Sadati**, J. A. Martinez-Gonzalez, K. Kurtenbach, L. X. de Pablo, H. Shapiro, S. Morin, Y. Zhou, and J. J. de Pablo, "Strain-induced Topological Defects and Configurational Transitions in Liquid Crystals", Annual Meeting of AIChE, Minnesota, October 2017.
56. H. Ramezani, M. Sadati, R. Zhang, M. Rahimi, J.J. de Pablo, "Transient Reorientation of Liquid Crystals Induced By Water Transport", Annual Meeting of AIChE, Minnesota, October 2017.
57. **M. Sadati**, H. Ramezani-Dakhel, W. Bu, E. Sevgen, C. Erol, N. Taheri Qazvini, Z. Liang, M. Rahimi, B. Lin, N. L. Abbott, B. Roux, M. Schlossman and J. J. de Pablo, "Synchrotron X-ray Reflectivity and Computational Simulations of Structural Organization of the Binary Mixture 5CB/8CB Liquid Crystals at Liquid Crystal-Air Interface", Annual Meeting of AIChE, San Francisco, November 2016.
58. **M. Sadati**, H. Ramezani-Dakhel, W. Bu, E. Sevgen, Z. Liang, C. Erol, N. Taheri Qazvini, M. Rahimi, B. Lin, N. L. Abbott, B. Roux, M. Schlossman, J. J. de Pablo, "Structural Organization of Liquid Crystals at Liquid Crystal-Air Interface: Synchrotron X-ray Reflectivity and Computational Simulations", International Liquid Crystal Conference, Kent, August (2016).
59. J. J. de Pablo, **M. Sadati**, J. C. Armas-Perez, V. Soni and W. Irvine, "Topological Defects and Self-assembly of Cuboidal Colloidal Particles with Sharp Edges in Nematic Liquid Crystal", Annual Meeting of American Physical Society, Baltimore, March (2016).
60. D. Melchert, **M. Sadati**, Y. Zhou, J. J. de Pablo, "Colloidal Particles Embedded in Liquid Crystal Droplets", Annual Meeting of American Physical Society, Baltimore, March (2016).
61. **M. Sadati**, A. Izmitli Apik, N. L. Abbott, J. J. de Pablo, "Liquid Crystal Based Sensor to Detect Beta-sheet Formation of Peptides", Annual Meeting of American Physical Society, San Antonio, March (2015).
62. **M. Sadati**, C. Y. Park, N. Taheri Qazvini, D. T. Tamb, J. J. Fredberg, "Monolayers in Collision", American Thoracic Society International Conference, Philadelphia (2013).
63. **M. Sadati**, C. Luap, M. Kröger, H. C. Öttinger, "Signature of the Presence of Long Chain Branches on the Flow Kinematics and Stress Field in a Cross-slot Channel", 8th Liquid Matter Conference, Wien, Austria (2011).
64. **M. Sadati**, C. Luap, M. Kröger, H. C. Öttinger, "A Lubricated Cross-slot Channel with 2D Complex Flow Kinematics as an Optical Rheometer for Polymer Melts", The Society of Rheology 83rd Annual Meeting Cleveland (2011).
65. **M. Sadati**, C. Luap, M. Kröger, H. C. Öttinger, "Flow of a Long Chain Branched Polymer Melt in a Cross-slot Channel", Swiss Soft Days, Zürich, Switzerland (2011).
66. **M. Sadati**, C. Luap, M. Kröger, A. A. Gusev, H. C. Öttinger, "Reconstruction of Smooth Velocity and Velocity Gradient Fields from Velocity Data Obtained in a Complex Flow Situation", 6th Annual European Rheology Conference, Göteborg, Sweden (2010).
67. **M. Sadati**, A. Landolt, T. Rösger, T. Schweizer, "Demonstrating Two-dimensionality of the Polymer Flow in a Lubricated Cross-slot Rheometer Using Flow-Induced Birefringence and PIV", 5th Annual European Rheology Conference, Cardiff, UK (2009).
68. M. Emami, **M. Sadati**, R. Mehtarani, F. Hormozi, "Synthesis of Polypropylene High Impact Copolymer Using 5th Generation Ziegler-Natta Catalyst", 8th Iranian Seminar on Polymer Science and Technology, Tehran, Iran (2007).
69. **M. Sadati**, N. Taheri Qazvini, M. Ebrahimi, "Estimation of Molecular Characteristics of Isotactic Polypropylene from Linear Viscoelastic Measurements", 7th Iranian Seminar on Polymer Science and Technology, Tehran, Iran (2005).
70. **M. Sadati**, M. Emami, R. Mehtarani, F. Hormozi, "Synthesis of High Melt Flow Polypropylene Using 5th Generation Ziegler-Natta Catalyst", 7th Iranian Seminar on Polymer Science and Technology, Tehran, Iran (2005).

TEACHING EXPERIENCE

University of South Carolina

Fluid Mechanics, ECHE320 (undergrad) (Spring 2023, Fall 2023, 2024, 2025). Advanced Fluid Analysis ECHE720 (graduate) (Fall 2019, 2020, 2021, 2022, 2023, 2024, Fall 2025). Polymer Processing, ECHE 577 (graduate/undergrad) (Spring 2021, 2022)

ETH Zurich

Polymer Physics (TA: Fall 2009, Fall 2010), Finite Elements in Solids and Structures (TA: Spring 2009, Spring 2011), Instructed Laboratory Course in Rheology and Viscoelastic Properties of Polymer Melts (Fall 2007, Spring 2008, Spring 2009, Fall 2009), Instructed Laboratory Course in Simulation of Polymer Behavior in Step Shear Flow Using Doi-Edwards Reptation Model (Fall 2010).

THESES SUPERVISED

1- Sepideh Norouzi, “Blue Phase Liquid Crystals Under Curved Topological Confinements”, Ph.D. Thesis, October 2023. **Sepideh received the AIChE travel award and the Department of Chemical Engineering’s Outstanding Graduate Award.**

2- Mohsen Esmaeili, “Guiding 3D Chiral Self-assembly at Nano/Micro Length Scales via 3D Printing”, Ph.D. Thesis, January 2024. **Mohsen received the Department of Chemical Engineering’s Outstanding Research Award.**

3- Kyle George, “Shear-Induced Nanoscale Morphologies in 3D Printed Liquid Crystal Polymers for Programmable Structural Color”, Ph.D. Thesis, October 2024. **Kyle received the Department of Chemical Engineering’s Best Presentation Award as well as the Koerner Family Fellowship Award.**

RESEARCH EXPERIENCE (prior to U of SC)

The University of Chicago and Argonne National Laboratory

April 2014-Dec. 2018

Postdoctoral Researcher with Prof. Juan J. de Pablo

- Studied dynamics of linear and branched DNA molecules in microfluidic channels.
- Explored the molecular organization of LCs at LC–air interface and under the influence of ions at LC–water interfaces using synchrotron X-ray reflectivity.
- Developed a LC-based sensor to detect early-stage aggregation of polypeptides involved in neurodegenerative diseases such as Alzheimer’s.
- Stabilized blue phase liquid crystals using polymers.

Harvard University

May 2012-Mar 2014

Postdoctoral Researcher with Prof. Jeffrey Fredberg

- Developed an assay to study physical forces and rheology of cellular collectives in contraction channels.
- Designed and built a device to apply intercellular shear deformation on a cellular collective and evaluated the response of the living cell.

ETH Zürich, Materials Department, Institute for Polymers

Oct 2007- Feb 2012

Graduate Student with Prof. Hans Christian Öttinger

- Modified the lubricated optical rheometer to improve flow stability for the study of two-dimensional complex flows of polyethylene melts.
- Verified the two-dimensionality of the flow using particle image velocimetry.
- Performed point-wise and field-wise flow-induced birefringence and particle tracking techniques, respectively, to collect stress and velocity fields and analyze the data.
- Established a regularization technique based on high-order finite element approximation to reconstruct

accurate full-field kinematics from noisy experimental data.

- Examined the performance of the eXtended Pom-Pom model for LDPE and HDPE using numerical simulations and implementing the regularized experimental flow kinematics in two-dimensional complex flows.

PROFESSIONAL INDUSTRY EXPERIENCE

Petrochemical Research and Technology Company (Research Scientist)

2005-2007

Research Area: Structure-property-processing Relationships of polyolefins

- **Director** of Industry-academia monthly meetings on the structure-property-processing relationship of polyolefin (2005-2007).

ACADEMIC SERVICE & SYNERGISTIC ACTIVITIES

- **Service:** Session Chair at **AIChE** Annual Meeting 2021, 2022, 2023, 2024, 2025, and **APS** 2026; Contributor to NSF report on “Frontiers in Polymer Science and Engineering”, Arlington, Virginia (2016), and served on “Materials Laboratories of the Future Soft Materials workshop” organized by NSF in 2022, hosted by UChicago.
- **Review activities:** Panelist/ad hoc reviewer for USDA, DOE, NSF, UofSC ASPIRE, UofSC SPARC; Reviewer for >20 journals, including Science Advances, PNAS, ACS Nano, Advanced Materials, Advanced Functional Materials, Small, Langmuir, Soft Matter, Scientific Reports, Journal of Colloids and Interfaces, Advanced Optical Materials, ChemComm, Nanoscale Advances, Crystal Growth and Design.
- **Mentoring and Research Recognitions:** Mentored (7) Ph.D. students since 2019, one (1) visiting scientist, and nineteen (19) undergraduate students (including (7) REU students), as well as eight (8) high school students. Three Ph.D students graduated with distinguished recognitions, including the AIChE Travel Award, the Koerner Family Fellowship Award, the Department of Chemical Engineering’s Outstanding Graduate Award, the Outstanding Research Award, and the Best Presentation Award. Their research has been published in high-impact peer-reviewed journals such as *Advanced Functional Materials*, *ACS NANO* (2), *PNAS*, *Small* (2), *Nano-Macro Letters*, *ChemComm*, and *Langmuir* (2).
- In response to an editor’s invitation, we have submitted a comprehensive review to *Chemical Reviews* (Impact Factor 55.8) on liquid-crystal-based assembly, the core focus of our group’s research, highlighting the recognition of our research by the materials science community. The work has been accepted for publication.
- All three graduates successfully secured industry research positions before their final defense, joining organizations like E-ink, Poly-med, and the Air Force Research Laboratory as senior scientists and materials design engineers.
- Prior to joining U of SC, I supervised two (2) graduates, six (6) undergraduates, and five (5) high school students since 2013 at Harvard and the University of Chicago.
- **Outreach:** Summer program for research interns (SPRI) administered by South Carolina Governor’s School for Science and Mathematics (GSSM), 2021, 2022, 2023, 2024, and 2025. One day “Soft and Vivid” workshop for 16-20 K12 students (Summer 2023 and 2024), as part of the Partners for Minorities in Engineering and Computer Science (PMECS) Program.

PROFESSIONAL TRAINING (Selected)

- Polymer characterization training course, Basell, Germany (2006).
- 7th European School on Rheology, Leuven, Belgium (2008).
- Liquid crystal workshop, Kent, Ohio (2016).
- School on Liquid Surface X-ray Scattering, Argonne National Laboratory (2016).
- Selected for UChicago i-Corps program for “Injectable Paste for Bone Regeneration”.