

RYAN POLING-SKUTVIK

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RESEARCH EXPERIENCE

- 2020–Now** **Assistant Professor**, University of Rhode Island, Kingston RI
Department of Chemical, Biomolecular, and Materials Engineering
Department of Physics
- 2018–2020** **Postdoctoral Researcher**, University of Pennsylvania, Philadelphia, PA
Department of Chemical and Biomolecular Engineering with Chinedum Osuji
- 2013–2018** **Graduate Research Assistant**, University of Houston, Houston, TX
Department of Chemical and Biomolecular Engineering with Jacinta C. Conrad and Ramanan Krishnamoorti

EDUCATION

- 2013–2018** **Ph.D. Chemical Engineering**
University of Houston Houston, TX
- 2009–2013** **B.E. Chemical Engineering**
The Cooper Union for the Advancement of Science and Art New York, NY

PEER-REVIEWED PUBLICATIONS

* denotes equal contribution, † denotes corresponding author, # indicates graduate student advisee, ‡ indicates undergraduate student advisee

Articles with URI Affiliation:

- 2024**
1. Kotkar, S. B.; Poling-Skutvik, R.; Howard, M. P.; Nikoubashman, A.; Conrad, J. C.†; Palmer, J. C. † Dynamics of nanoparticles in semiflexible ring polymer solutions. *J. Chem. Phys. B*. 2024. 128 (50) 12586-12596.
 - *Featured in the Journal of Physical Chemistry B Special Issue "Athanasios Z. Panagiotopoulos Festschrift"*
 2. Keane, D.#; Kolozsvary, T.; McDonald, B.‡; Poling-Skutvik, R.† Bottlebrush Midblocks Promote Colloidal Bridging of Telechelic Polymers. *ACS Macro Letters*. 2024. 13 (10), 1304-1310.
 3. Nikoumanesh, E.#; Jounaeh, C. J.‡; Poling-Skutvik, R.† Elucidating the Role of Physicochemical Interactions on Gel Rheology. *Soft Matter*. 2024. (20), 7094-7102.
 - *Featured in Soft Matter Emerging Investigators Series* ([link](#))
 - *Featured in the Colloidal interactions, dynamics and rheology themed collection* ([link](#))
 - *Featured on Front Cover* ([link](#))
 4. Kumar, R.‡; Slim, A. H.; Faraone, A.; Carrillo, J.-M. Y.; Poling-Skutvik, R.; Muthukumar, M.; Marciel, A. B.; Conrad, J. C.† Pivotal Roles of Triple Screening – Topological, Electrostatic, and Hydrodynamic – on Dynamics in Semi-Dilute Polyelectrolyte Solutions. *Macromolecules*. 2024. 57 (6), 2888-2896.
 5. Keane, D.#; Mellor, M.‡; Constantine, C.‡; Poling-Skutvik, R.† Nanoparticle transport in biomimetic polymer-linked emulsions. *AIChE J.* 2024. (70), e18307.
 - *Featured in CEP Magazine* ([link](#))
 - *Featured on AIChE J Cover* ([link](#))
- 2023**
6. Kotkar, S. B.; Howard, M. P.; Nikoubashman, A.; Conrad, J. C.†; Poling-Skutvik, R. †; Palmer, J. C. † Confined Dynamics in Spherical Polymer Brushes. *ACS Macro Lett.* 2023. (12), 1503-1509.
 7. Nikoumanesh, E. #; Poling-Skutvik, R.† The Effect of Thixotropy on the Yield Transition in Reversible, Colloidal Gels. *J. Chem. Phys.* 2023. 159, 044905.
 - *Featured in the Emerging Investigators Special Collection* ([link](#))
 8. Keane, D.#; Mellor, M.‡; Constantine, C.‡; Poling-Skutvik, R.† Bridging Heterogeneity Dictates the Microstructure and Yielding Response of Polymer-Linked Emulsions. *Langmuir*. 2023. 39 (22), 7852-7862.
- 2022**
9. Slim, A. H.; Shi, W. H.; Samghabadi, F. S.; Faraone, A.; Marciel, A. B.†; Poling-Skutvik, R.†; Conrad, J. C.† Electrostatic Repulsion Slows Relaxations of Polyelectrolytes in Semidilute Solutions. *ACS Macro Lett.* 2022. 11 (7), 854-860.
 10. Rereddy, S. K.; Cao, A. C.‡; Blackwell, B.; Poling-Skutvik, R.; Arratia, P. E.; Mirza, N. Rheology of Saliva in Health and Disease. *Biorheology*. 2022. 59 (1-2), 19-27.
 11. Keane, D. P.#; Mellor, M. D.‡; Poling-Skutvik, R.† Responsive Telechelic Block Copolymers for Enhancing the Elasticity of Nanoemulsions. *ACS Appl. Nano Mater.* 2022. 5 (5), 5934-5943.
 - *Featured in the ACS Applied Nano Materials Early Career Forum*

- 2021** 12. Gabinet, U.R.; Lee, C.; [Poling-Skutvik, R.](#); Keane, D.[#]; Kim, N. K.; Dong, R.; Vicars, Z.; Cai, Y.; Thosar, A. U.; Grun, A.; Thompson, S. M.; Patel, A. J.; Kagan, C. R.; Composto, R. J.; Osuji, C. O.[†] Nanocomposites of 2D-MoS₂ exfoliated in thermotropic liquid crystals. *ACS Mater. Lett.* 2021. 3 (6), 704–712.
13. Smith, M.; [Poling-Skutvik, R.](#); Slim, A. H.; Willson, R. C.[†]; Conrad, J. C.[†] Dynamics of Flexible Viruses in Polymer Solutions. *Macromolecules.* 2021. 54 (10), 4557–4563.
14. Zhang, Y.; Dong, R.; Gabinet, U. R.; [Poling-Skutvik, R.](#); Kim, N. K.; Lee, C.; Imran, O. Q.; Feng, X.; Osuji, C. O.[†] Rapid Fabrication by Lyotropic Self-Assembly of Thin Nanofiltration Membranes with Uniform 1 Nanometer Pores. *ACS Nano.* 2021. 15 (5), 8192–8203.
15. Chen, R.*; Kotkar, S. B.*; [Poling-Skutvik, R.](#); Howard, M. P.; Nikoubashman, A.; Conrad, J. C.[†]; Palmer, J. C.[†] Nanoparticle dynamics in semidilute polymer solutions: rings versus linear chains. *J. Rheol.*, 2021. 65 (4), 745–755.
16. Dhand, A. P.; [Poling-Skutvik, R.](#)[†]; Osuji, C. O.[†] Simple production of cellulose nanofibril microcapsules and the rheology of their suspensions. *Soft Matter.* 2021. 17 (17), 4517–4524.
- *Artwork featured on back cover* ([link](#))

Articles with Prior Affiliations:

- 2020** 17. [Poling-Skutvik, R.](#); McEvoy, E.; Shenoy, V.; Osuji, C. O.[†] Yielding and bifurcated aging in nanofibrillar networks. *Phys. Rev. Mat.* 2020, 4 (10), 102601.
18. Slim, A. H.; [Poling-Skutvik, R.](#); Conrad, J. C.[†] Local confinement controls diffusive nanoparticle dynamics in semidilute polyelectrolyte solutions. *Langmuir* 2020, 36 (31), 9153–9159.
19. [Poling-Skutvik, R.*](#); Di, X.*; Osuji, C. O.[†] Correlation of droplet elasticity and volume fraction effects on emulsion dynamics. *Soft Matter.* 2020, 16 (10), 2574-2580.
20. Liu, J.*; Gao, Y.*; Wang, H.; [Poling-Skutvik, R.](#); Osuji, C. O.; Yang, S.[†] Shaping and locomotion of soft robots using filament actuators made from liquid crystal elastomer-carbon nanotube composites. *Adv. Intell. Syst.* 2020, 1900163.
- *Featured in Advanced Science News* ([link](#))
 - *Artwork featured on back cover* ([link](#))
- 2019** 21. Roberts, R. C.; [Poling-Skutvik, R.](#); Conrad, J. C.[†]; Palmer, J. C.[†] Tracer transport in attractive and repulsive supercooled liquids and glasses. *J. Chem. Phys.* 2019, 19, 194501.
- *Featured as Editor's Pick*
22. [Poling-Skutvik, R.](#); Slim, A. H.; Narayanan, S.; Conrad, J. C.[†]; Krishnamoorti, R.[†] Soft interactions modify the diffusive dynamics of polymer-grafted nanoparticles in solutions of free polymer. *ACS Macro Lett.* 2019, 8, 917-922.
- *Artwork featured on cover* ([link](#))
23. [Poling-Skutvik, R.](#); Roberts, R. C.; Slim, A. H.; Narayanan, S.; Krishnamoorti, R.; Palmer, J. C.[†]; Conrad, J. C.[†] Structure dominates localization of tracers within aging nanoparticle glasses. *J. Phys. Chem. Lett.* 2019, 10, 1784-1789.
24. 13.Chen, R.; [Poling-Skutvik, R.](#); Howard, M. P.; Nikoubashman, A.; Egorov, S.; Conrad, J. C.; Palmer, J. C.[†] Influence of polymer flexibility on nanoparticle dynamics in semidilute solutions. *Soft Matter* 2019, 15 (6), 1260-1268.
- 2018** 25. Goel, V.; Pietrasik, J.; [Poling-Skutvik, R.](#); Jackson, A.; Matyjaszewski, K.; Krishnamoorti, R.[†] Structure of block copolymer grafted silica nanoparticles. *Polymer* 2018, 159, 138-145.
26. Mongcopa, K. I. S.*; [Poling-Skutvik, R.*](#); Ashkar, R.; Butler, P.; Krishnamoorti, R.[†] Conformational change and suppression of the Θ -temperature for solutions of polymer grafted nanoparticles. *Soft Matter* 2018, 14 (29), 6102–6108.
27. Roberts, R. C.; [Poling-Skutvik, R.](#); Palmer, J. C.[†]; Conrad, J. C.[†] Tracer transport probes relaxation and structure of attractive and repulsive glassy liquids. *J. Phys. Chem. Lett.* 2018, 9 (11), 3008-3013.
28. Conrad, J. C.[†]; [Poling-Skutvik, R.](#) Confined flow: consequences and implications for bacteria and biofilms. *Annu. Rev. Chem. Biomol. Eng.* 2018, 9 (1), 175-200.
29. Chen, R.*; [Poling-Skutvik, R.*](#); Nikoubashman, A.; Howard, M. P.; Conrad, J. C.; Palmer, J. C.[†] Coupling of nanoparticle dynamics to polymer center-of-mass motion in semidilute polymer solutions. *Macromolecules* 2018, 51 (5), 1865-1872.
30. [Poling-Skutvik, R.](#); Lee, J.; Narayanan, S.; Krishnamoorti, R.[†]; Conrad, J. C.[†] Tunable assembly of gold nanorods in polymer solutions to generate controlled nanostructured materials. *ACS Appl. Nano Mater.* 2018, 1 (2), 877–885.
- 2017** 31. [Poling-Skutvik, R.](#); Olafson, K. N.; Narayanan, S.; Stingaciu, L.; Faraone, A.; Conrad, J. C.[†]; Krishnamoorti, R.[†] Confined dynamics of grafted polymer chains in solutions of linear polymer. *Macromolecules* 2017, 50 (18), 7372–7379.
32. Safari, M. S.; [Poling-Skutvik, R.](#); Vekilov, P. G.[†]; Conrad, J. C.[†] Differential dynamic microscopy of bidisperse colloidal suspensions. *npj Microgravity* 2017, 3 (1), 21.

33. Kim, J.; Poling-Skutvik, R.; Trabuco, J. R. C.; Kourentzi, K.; Willson, R. C.†; Conrad, J. C.† Orientational binding modes of reporters in a viral-nanoparticle lateral flow assay. *Analyst* 2017, 142 (1), 55–64.
- *Artwork featured on January Cover* ([link](#))
 - *Designated HOT article*
- 2016 34. Poling-Skutvik, R.; Mongcopa, K. I. S.; Faraone, A.; Narayanan, S.; Conrad, J. C.†; Krishnamoorti, R.† Structure and dynamics of interacting nanoparticles in semidilute polymer solutions. *Macromolecules* 2016, 49 (17), 6568–6577.
- 2015 35. Safari, M. S.; Vorontsova, M. A.; Poling-Skutvik, R.; Vekilov, P. G.†; Conrad, J. C.† Differential dynamic microscopy of weakly scattering and polydisperse protein-rich clusters. *Phys. Rev. E* 2015, 92 (4), 42712.
36. Poling-Skutvik, R.; Krishnamoorti, R.†; Conrad, J. C.† Size-dependent dynamics of nanoparticles in unentangled polyelectrolyte solutions. *ACS Macro Lett.* 2015, 4 (10), 1169–1173.
- 2014 37. Babaye Khorasani, F.; Poling-Skutvik, R.; Krishnamoorti, R.†; Conrad, J. C.† Mobility of nanoparticles in semidilute polyelectrolyte solutions. *Macromolecules* 2014, 47 (15), 5328–5333.

AWARDS AND HONORS

- 2025 **Cottrell Scholar**, Research Corporation for Science Advancement
- 2024 **NSF CAREER Award**, National Science Foundation
- 2022 **Doctoral New Investigator Award**, American Chemical Society Petroleum Research Fund
- 2018 **Finalist in the Excellence in Graduate Research Symposium**, American Institute of Chemical Engineers
Finalist for the Frank J. Padden Jr. Award for Excellence in Polymer Physics Research, American Physical Society
APS Invited Student Talk at the APS/CNM Annual User Meeting, Argonne National Lab
Travel Award for APS/CNM Annual User Meeting, Argonne National Lab
Research highlighted for Department of Energy triennial review, Oak Ridge National Lab
- 2017 **Poster Award**, Organization of Chemical Engineering Graduate Students Symposium, University of Houston
Poster Award for Graduate Student Research, Society of Rheology
Cullen Travel Grant, University of Houston
- 2015 **Poster Award**, Organization of Chemical Engineering Graduate Students Symposium, University of Houston
Travel Grant, NorTex Petroleum Cluster
- 2013 **Full Tuition Scholarship**, The Cooper Union for the Advancement of Science and Art

RESEARCH SUPPORT

Current Support:

- 2020-2023 **University of Rhode Island**, Start-Up Funds, \$425,000, PI
- 2022-2024 **American Chemical Society Petroleum Research Fund**, Doctoral New Investigator, \$110,000, PI
 NCE–2025 (100% Effort)
Isolating the yield stress in tunable thixotropic emulsions
- 2023-2026 **Department of Transportation**, Pipeline Safety Research Competitive Academic Agreement Program (CAAP), \$1,000,000, Co-PI (PI: Srivastava, *Brown University*) (33 % Effort)
Selection and development of safer polymer and composite pipeline liners through microstructural and macroscopic study of materials and designs
- 2023-2028 **National Institutes of Health**, 1R25EB034489-01, \$1,142,105, Co-PI (PI: Meenach) (10% Effort)
ESTEEMED Scholars Program at the University of Rhode Island
- 2024-2026 **National Institutes of Health**, 3R25EB034489-02S1, \$203,170, Co-PI (PI: Meenach) (10% Effort)
Administrative Supplement for the URI ESTEEMED Training Program at the University of Rhode Island: Enhancement of Training Outcomes and Mentor Training
- 2024-2026 **NIUVT**, Comprehensive Grant, \$350,000, PI, (34% Effort)
Harvesting seafloor energy to support autonomous underwater devices
- 2024-2029 **National Science Foundation**, CBET- 2339052, CAREER, \$589,933, PI (100% Effort)
CAREER: Telechelic triblock copolymers as a platform to design functional colloidal gels
- 2024-2027 **National Science Foundation**, EEC-2348968, REU, \$472,193, Co-I (PI: Craver) (1% Effort)
REU-Site: URI Plastic Initiative at the University of Rhode Island
- 2024-2025 **Rhode Island Life Sciences Hub**, \$10,000, PI, (100% Effort)
Synthetic tissues for in vitro drug screening
- 2025-2028 **Research Corporation for Science Advancement**, Cottrell Scholar Award, \$120,000, PI (100% Effort)
Developing a Dynamic Taxonomy of Soft Matter for a New Era of Material Design

Completed Support:

- 2021-2022 Rhode Island Foundation**, Medical Research Funds, \$25,000, PI (100% Effort)
Development of a biomimetic tissue library for targeted drug delivery assays
- 2022-2023 RI-INBRE**, Pilot Project, \$40,000, PI (100% Effort)
Responsive hydrogels to enhance in vitro screening of theranostics
- 2023-2024 RI-INBRE**, Early Career Development, \$293,740, PI (100% Effort)
Hydrogels with improved biomimicry to screen in vitro transport of nanoparticle vectors
- 2023-2024 University of Rhode Island**, Proposal Development Grant, \$19,854, PI (100% Effort)
Self-oscillating nanoparticle assemblies: a novel class of active materials
- 2024 Rhode Island Water Resources Center**, United States Geological Survey, \$19,300, PI (100% Effort)
Nanoparticle-based sensors for real-time, continuous PFAS identification

INVITED/KEYNOTE PRESENTATIONS

- 2025 Tufts University Condensed Matter Seminar Series** *Dynamics-Centered Design of Soft Materials* **Tufts University, Medford, MA**
- 2025 Eckhardt Northeast Student Regional AIChE Conference** *TBD* **University of Rhode Island, Kingston, RI**
- University of California – Davis Chemical Engineering Seminar** *Functional Polymers for Dynamics-Driven Design of Soft Materials* **University of California – Davis, Davis, CA**
- American Physical Society March Meeting** *Controlling polymer conformations at particulate interfaces* **Anaheim, CA**
- University of Maine CBE Seminar** *TBD* **University of Maine, Orono, ME**
- University of New Hampshire Department of Chemistry Spring Seminar** *TBD* **University of New Hampshire, Durham, NH**
- Dow Rheology Center of Excellence Seminar** *Predictive control of yielding and nonlinear rheology in emulsions and suspensions using high-performance polymeric additives* **Virtual**
- 2024 Frontiers in Soft Matter and Macromolecular Networks Symposium** *Relating fracture and yielding motifs to dynamic recovery in colloidal gels* **University of San Diego, San Diego, CA**
- University of San Diego Department of Physics and Biophysics Seminar** *Programming yield stresses into biomimetic soft materials* **University of San Diego, San Diego, CA**
- University of Cincinnati Department of Chemical and Environmental Engineering Seminar** *Bottom-Up Design of Biomimetic Soft Matter* **University of Cincinnati, Cincinnati, OH**
- Society of Rheology Annual Meeting** *Optimizing polymer bridging in colloidal suspensions* **Austin, TX**
- University of Rhode Island Physics Colloquium** *Dynamics-Centered Design of Soft Materials* **University of Rhode Island, Kingston, RI**
- 2023 Brown Fluids Seminar** *The Yield Transition in Gels: Accounting for Structural Breakdown* **Brown University, Providence, RI**
- American Physical Society March Meeting** *The Yield Transition in Gels: Accounting for Structural Breakdown* **Las Vegas, NV**
- American Chemical Society Fall Meeting** *Evaluating kinetics of network restructuring in colloidal gels using serial creep divergence rheology* **San Francisco, CA**
- Bridgewater State University Department of Chemistry Seminar** *From nano to macro: designing soft matter systems that replicate biology* **Bridgewater State University, Bridgewater, MA**
- University of Rhode Island Amgen Chemical Engineering Seminar** *Incorporating Dynamics into Structure-Property Relationships for the Next Generation of Soft Matter* **University of Rhode Island, Kingston, RI**
- 2022 New England Complex Fluids** *Tuning the linear and non-linear rheology in suspensions of deformable particles* **Northeastern University, Boston, MA**
- 2021 SHUG/CNMS User Meeting** *Confined dynamics of grafted polymer chains and implications for transport* **Oak Ridge National Lab, Oak Ridge, TN (Virtual)**

APS/CNM User Meeting
Relating dynamics of soft materials across nano, micro and mesoscales

*Argonne National Lab,
Argonne, IL (Virtual)*

Brown Fluids Seminar
Heterogeneous soft materials: effects of local dynamics on transport and mechanics

*Brown University,
Providence, RI (Virtual)*

2020 University of Rhode Island Amgen Seminar Series
Relating structure and dynamics in complex soft materials

*University of Rhode Island,
Kingston, RI*

PRESENTATIONS AND POSTERS

- 2025 American Physical Society Global Summit** Anaheim, CA
Presentation: Fracture and yielding motifs in colloidal gels
- 2024 American Physical Society March Meeting** Minneapolis, MN
Presentation: Nanoparticle dynamics in fully synthetic biomimetic analogues
- ACS Colloids** *University of Washington, Seattle, WA*
Presentation: Fracture and yielding motifs in colloidal gels
- Polymer Physics Gordon Research Conference** Holyoke, MA
Poster: Enhancing the bridging density of triblock copolymers
- American Institute of Chemical Engineers Fall Meeting** San Diego, CA
Presentation: Optimizing polymer bridging in colloidal suspensions
- 2023 American Institute of Chemical Engineers Fall Meeting** Orlando, FL
Presentation: Polymer-linked emulsions as fully synthetic tissue mimics to evaluate nanoparticle transport
- ACS Colloids** *North Carolina State University, Raleigh, NC*
Presentation: Transport of nanoparticles in biomimetic polymer-linked emulsions
- 2022 Society of Rheology Annual Meeting** Chicago, IL
Presentation: Triblock copolymers as effective additives to control the linear and nonlinear rheology of emulsion suspensions
- American Institute of Chemical Engineers Fall Meeting** Phoenix, AZ
Presentation: Controlling the nonlinear rheology of emulsions using telechelic block copolymers
- Polymer Physics Gordon Research Conference** Holyoke, MA
Poster: Telechelic Triblock Copolymers as Efficient Rheological Modifiers
- ACS Colloids** *Colorado School of Mines, Golden, CO*
Presentation: Isolating the yield transition in thixotropic cellulose nanocrystal gels
- American Physical Society March Meeting** Chicago, IL
Presentation: Controlling emulsion elasticity by bridging telechelic triblock copolymers
- 2021 American Institute of Chemical Engineers Fall Meeting** Boston, MA
Presentation: Tuning the yield stress in suspensions of soft colloids
- Society of Rheology Annual Meeting** Bangor, ME
Presentation: Responsive yielding in colloidal suspensions
- ACS Colloids** Virtual
Presentation: Tunable yield stresses in suspensions of porous microcapsules *via* internal additives
- American Physical Society March Meeting** Virtual
Presentation: Isolating the yield stress in thixotropic fibrillar gels
- 2020 NANO Conference (Sustainable Nanotechnology Organization and Nanotechnology, Occupational and Environmental Health Committee)** Virtual
Poster: Mechanisms for enhanced transport of nanoparticles in complex fluids
- New England Complex Fluids** *Brandeis University, Waltham, MA (Virtual)*
Presentation: Measuring the yield stress of a thixotropic fluid
- American Physical Society March Meeting** Denver, CO (Virtual)
Presentation: Role of soft interactions in enhanced diffusivity of polymer-grafted nanoparticles in heterogeneous environments
Poster: Bifurcated yielding response of aging fibrillar networks

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| 2019 American Institute of Chemical Engineers Fall Meeting | Orlando, FL |
| Presentation: Rheology and yielding of fibrillar networks | |
| Society of Rheology Annual Meeting | Raleigh, NC |
| Presentation: Bifurcated yielding response of aging fibrillar networks | |
| Mid-Atlantic Soft Matter Symposium | <i>Johns Hopkins</i> |
| Presentation: Aging of cellulose nanofibril gels after yielding | <i>University, Baltimore, MD</i> |
| University of Pennsylvania Polymer Symposium | Philadelphia, PA |
| Presentation: Relaxations in complex fluids and implications for transport | |
| 2018 American Institute of Chemical Engineers Fall Meeting | Pittsburgh, PA |
| Presentation: Softly confined relaxations of grafted polymers | |
| <ul style="list-style-type: none"> ○ <i>Finalist presentation in the Excellence in Graduate Polymer Research award session</i> | |
| Presentation: Tunable assembly of gold nanorods in polymer solutions to generate controlled nanostructured materials | |
| ACS Colloids | <i>Penn. State University,</i> |
| Presentation: Tunable assembly of gold nanorods in semidilute polymer solutions | <i>State College, PA</i> |
| American Physical Society March Meeting | Los Angeles, CA |
| Presentation: Softly confined relaxations of grafted polymers | |
| <ul style="list-style-type: none"> ○ <i>Finalist presentation in Frank J. Padden award session</i> | |
| 2017 Organization of Chemical Engineering Graduate Students Symposium | <i>University of Houston,</i> |
| Poster: Polymer-induced structural changes in suspensions of gold nanorods | Houston, TX |
| <ul style="list-style-type: none"> ○ <i>Poster award</i> | |
| Society of Rheology Spring Meeting | Tampa, FL |
| Presentation: Dynamics of polymer-grafted nanoparticles in solutions of linear polymer: a combined neutron and x-ray scattering study | |
| Poster: Dynamics of concentrated suspensions of nanoparticles in semidilute polymer solutions | |
| <ul style="list-style-type: none"> ○ <i>Poster award for graduate student research and featured in UH News (link)</i> | |
| American Physical Society March Meeting | New Orleans, LA |
| Presentation: Confined relaxations of grafted polymer in solutions of linear polymer | |
| Presentation: Dynamics of interacting particles in semidilute polymer solutions | |
| 2016 Organization of Chemical Engineering Graduate Students Symposium | <i>University of Houston,</i> |
| Presentation: Structure and dynamics of nanoparticles dispersed in polymer solutions | Houston, TX |
| ACS Colloids | <i>Harvard University,</i> |
| Presentation: Dynamics of interacting particles in semidilute polymer solutions | Boston, MA |
| Texas Soft Matter | <i>University of Texas –</i> |
| Presentation: Dynamics of polymer-grafted nanoparticles using complementary scattering methods | <i>Dallas, Dallas, TX</i> |
| 2015 American Physical Society March Meeting | San Antonio, TX |
| Presentation: Length-scale dependent diffusivity in dilute and semidilute polyelectrolyte solutions | |
| Poster: Size-dependent effects on mobility of nanoparticles through dilute and semidilute polyelectrolyte solutions | |
| Graduate Research and Scholarships Projects Day | <i>University of Houston,</i> |
| Poster: Transport of nanoparticles through structured materials | Houston, TX |
| Organization of Chemical Engineering Graduate Students Symposium | <i>University of Houston,</i> |
| Poster: Particle and polymer dynamics in semidilute solutions | Houston, TX |
| <ul style="list-style-type: none"> ○ <i>Poster award</i> | |
| Texas Soft Matter | <i>Rice University,</i> |
| Presentation: Dynamics of nanoparticles in polymer solutions | Houston, TX |
| 2014 Texas Soft Matter | <i>University of Texas,</i> |
| Poster: Effect of particle size on the dynamics of nanoparticles in semidilute polyelectrolyte solutions | Austin, TX |
| Organization of Chemical Engineering Graduate Students Symposium | <i>University of Houston,</i> |
| Poster: Size-dependent coupling between particles and polymers in semidilute polyelectrolyte solutions | Houston, TX |

TEACHING

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| EGR 310 | Entering Research: Skills and Approaches for Success | 3 cr. | Spring 2025 |
| CHE 503 | Dynamics of Chemical Engineering Applications | 3 cr. | Fall 2023, Fall 2024 |
| CHE 449 | Transfer Operations III | 3 cr. | Fall 2020 – Fall 2022 |
| CHE/BME 466 | Biomaterials | 3 cr. | Spring 2021 – Spring 2025 |
| CHE 491/492 | Special Projects (Undergraduate research) | 3 cr. | Spring 2021 – Current |
| CHE 491/492 | ChemE Car Competition | 3 cr. | Fall 2021 – Spring 2023 |
| CHE 491/492 | URI ESTEEMED | 1 cr. | Fall 2023 |
| CHE 699 | PhD Dissertation | 6 cr. | Fall 2020 –Current |
| EGR 106 | Foundations of Engineering II | 3 cr. | Spring 2022 |

MENTORING

Current Graduate Student Advisees (Major Advisor)

- PhD Candidate** **Elnaz Nikoumanesh**, Chemical Engineering
Expected Graduation: 08/2026
Thesis: Isolating the Yield Transition in Thixotropic Complex Fluids
- PhD Candidate** **Mohammadjavad Hajirezaei**, Chemical Engineering
Expected Graduation: 12/2028
Thesis: Development of Safer Polymer and Composite Liners for Pipeline Rehabilitation
- PhD Candidate** **Masoud Abdi**, Chemical Engineering (co-advised with Dr. Irene Andreu)
Expected Graduation: 08/2029
Thesis: Polymer-grafted Nanoparticles for Next-Generation Photometric Sensing
- PhD Candidate** **Sabirul Khan Priyo**, Chemical Engineering
Expected Graduation: 12/2029
Thesis: Optimizing bridging density of telechelic polymers
- PhD Candidate** **Sepehr Yari**, Chemical Engineering (co-advised with Dr. Daniel Roxbury)
Expected Graduation: 12/2029
Thesis: Intracellular transport of carbon nanotubes as physical sensors of cell health
- MS Candidate** **Kylie Hartley**, Chemical Engineering (co-advised with Dr. Vinka Oyanedel-Craver)
Expected Graduation: 07/2025
Thesis: Design and Optimization of 3D Printed Polymer Anodes for Benthic Fuel Cells

Graduated Doctoral and Master's Students

1. **Daniel Keane**, *PhD Chemical Engineering, 2024*
Thesis: Telechelic Polymers as High-Performance Rheological Modifiers in Biomimetic Polymer-Linked Emulsions

Student Awards and Honors

- 2024** **Charles Jouaneh**, *Undergraduate*, Undergraduate Poster Award, RI-ACS Meeting
David Amirsadri, *Undergraduate*, 2nd Place Undergraduate Poster Award, AIChE Annual Meeting, Materials Engineering and Sciences Session
Colby Constantine, *Undergraduate*, 2nd Place Undergraduate Poster Award, AIChE Annual Meeting, Food, Pharmaceutical, and Biotechnology Session
Masoud Abdi, *PhD*, Student Travel Award, Sustainable Nanotechnology Organization
Elnaz Nikoumanesh, *PhD*, 1st Place Graduate Poster Award at URI CHE Research Symposium
Mohammadjavad Hajirezaei, *PhD*, 3rd Place Graduate Poster Award at URI CHE Research Symposium
Charles Jouaneh, *Undergraduate*, 2nd Place Undergraduate Poster Award at URI CHE Research Symposium
Colby Constantine, *Undergraduate*, 3rd Place Undergraduate Poster Award at URI CHE Research Symposium
Elnaz Nikoumanesh, *PhD*, APS DPOLY Short Course Travel Award
Daniel Keane, *PhD*, APS DPOLY Short Course Travel Award
Elnaz Nikoumanesh, *PhD*, APS DSOFY Future Investigator Travel Award
- 2023** **Matthew Mellor**, *Undergraduate*, Selected for the Future Leaders in Chemical Engineering Symposium, *North Carolina State University*
Elnaz Nikoumanesh, *PhD*, Invited Speaker for the Society of Rheology Future of Rheology Seminar Series
Daniel Keane, *PhD*, URI Chemical Engineering Symposium Poster Award
Elnaz Nikoumanesh, *PhD*, URI Chemical Engineering Graduate Student Travel Award
- 2022** **Elnaz Nikoumanesh**, *PhD*, Society of Rheology Student Travel Award

PhD and MS Thesis Committees:

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| 2023 – Now | Sophia Tiano , PhD Chemistry, “ <i>Using transient absorption spectroscopy to study the dynamics of heteroarene dye photooxidation</i> ” |
| 2023 – Now | Miyuru Madusanka , PhD Chemistry, “ <i>Probing Intermolecular Interactions of Deep Eutectic Solvents via Infrared Action Spectroscopy</i> ” |
| 2024 – Now | Rebecca Tobias , Brown University, PhD Chemistry, “ <i>Bioinspired Design of Synthetic Polymers: Hierarchical Self-Assembling Tissue-like Structures with Tunable Extreme Properties</i> ” |
| 2024 – Now | Juan Song , PhD Pharmaceutical Sciences, “ <i>Development and characterization of mucus-penetrating and adhesive nanoparticles for pulmonary delivery applications</i> ” |
| 2024 – Now | Sirri Neba Nforsoh , PhD Civil and Environmental Engineering, “ <i>Environmental Impacts of Recycling Plastics into Construction Materials</i> ” |
| 2024 – Now | Nicolý Welter , PhD Civil and Environmental Engineering, “ <i>TBD</i> ” |
| 2020 – 2023 | Weizhou Yue , PhD Pharmacy, “ <i>Development of Localized Drug Delivery Strategies for the Treatment of Cancers and Infectious Diseases</i> ” |
| 2022 – 2023 | Lisa Madungwe , MS Chemical Engineering, “ <i>Cytoplasmic Delivery of Single-Walled Carbon Nanotubes for Disease Detection and Therapy</i> ” |
| 2023 | Shivraj Kotkar , University of Houston, PhD, Chemical Engineering, “ <i>Understanding the Dynamics of Complex Nanoparticle and Polymer Solutions Using Molecular Simulations</i> ” |
| 2023 | Jesse Duroha , PhD Industrial Engineering (Chair), “ <i>Sustainable Ergonomics for Solar Installations</i> ” |
| 2023 | Pedro Mesquita , MS Mechanical Engineering (Chair), “ <i>Microfluidic Devices for Microplastics Separation and Identification</i> ” |
| 2023 | Zachary Shepard , PhD Civil & Environmental Engineering (Chair). “ <i>Nano/Bio Interactions for Synthetic and Natural Nanomaterials</i> ” |
| 2023 – 2024 | Sophia Boiani , MS Chemical Engineering, “ <i>Innovative Bioink Formulations for 3D Bioprinting of Tissue-Engineered Intervertebral Disc Implants</i> ” |
| 2024 | Nicholas Scholz , MS Mechanical Engineering (Chair), “ <i>Investigating the Thermal Multibody Effects in Spherical Inclusions of a Porous Matrix for Lithium-Ion Batteries</i> ” |

Current Undergraduate Student Advisees:

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| 2022 – Now | Colby Constantine , Chemical Engineering |
| 2023 – Now | David Amirsadri , Chemical Engineering |
| 2023 – Now | Abigail (Abby) Olson , Chemical Engineering |
| 2023 – Now | Aiden Ferreira , Mechanical Engineering |
| 2024 – Now | Liam Kennings , Biomedical Engineering |
| 2024 – Now | Gabriel Stradtman , Mechanical Engineering |
| 2025 – Now | Sam Toppa , Biomedical Engineering |
| 2025 – Now | Olivia (Liv) Kittrell , Biomedical Engineering |
| 2025 – Now | Brianna Marandola , Chemical Engineering |
| 2025 – Now | Lindsey Hui , Chemical Engineering |
| 2025 – Now | Daniele Russo , Chemical Engineering |

Previous Undergraduate Student Advisees:

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| 2020 – 2022 | Brittany Briere , Chemical Engineering |
| 2020 – 2022 | Enrique Hernandez Rodriguez , Chemical Engineering |
| 2021 – 2022 | Temitope Aina , Biomedical Engineering |
| 2021 – 2022 | Matthew Noyes , Chemical Engineering |
| 2021 – 2022 | Annie Brose , Chemical Engineering |
| 2021 – 2022 | Kaylee Coletti , Chemical Engineering |
| 2021 – 2024 | Matthew Mellor , Chemical Engineering |
| 2022 – 2024 | Charles Joseph Jouaneh , Chemical Engineering |
| 2023 – 2024 | Sean Cooper , Electrical Engineering |
| 2023 – 2024 | Kylie Hartley , Chemical Engineering and Cell and Molecular Biology |
| 2023 – 2024 | Maile Campbell , Electrical Engineering |
| 2023 | Jonatan Flores , Pharmaceutical Science |
| 2023 | Steven Rego , Community College of Rhode Island (INBRE SURF) |
| 2024 | Elias Newall-Vuillemot , Mechanical Engineering |
| 2024 | Anabella Willette , Community College of Rhode Island (INBRE SURF) |
| 2024 | Keisuke Minagi , Okayama University, Department of Chemistry, JIEP |

SERVICE

Committees at URI:

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| 2023 – Now | Graduate Committee, <i>Department of Chemical Engineering</i> |
| 2023 – 2024 | Assistant Professor Search Committee, <i>Departments of Chemical Engineering and Biomedical and Pharmaceutical Sciences</i> |
| 2023 | Scientific Research Grant Assistant Search Committee, <i>COE Research Office</i> |
| 2023 | Program Coordinator Search Committee, <i>URI ESTEEMED and MARC U*STAR</i> |
| 2020 – 2023 | Undergraduate Committee, <i>Department of Chemical Engineering</i> |
| 2022 | Teaching Professor Search Committee, <i>Department of Chemical Engineering</i> |
| 2021 – 2022 | Trans Inclusion Committee, <i>Gender, and Sexuality Center</i> Subcommittees: <i>Syllabus Development, Faculty and Staff Training</i> |

Service to Professional Organizations

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| 2023 – Now | Member, Education Committee, Society of Rheology |
| 2023 – 2025 | Membership Committee Chair, DSOFT, American Physical Society |
| 2022 – Now | Editorial Advisory Board Member, <i>iScience</i> |
| 2025 | Session Chair, Fluid Mechanics (Area 1J), American Institute of Chemical Engineering Annual Meeting |
| 2024 | Session Chair, Fluid Mechanics (Area 1J), American Institute of Chemical Engineering Annual Meeting |
| 2024 | Session Organizer and Chair, ACS Colloids Meeting, <i>Rheology and Complex Fluids</i> |
| 2023 | Panelist for Soft Matter: Dynamics, National Institute of Standards and Technology, Center for Neutron Research, Neutrons for the Future Workshop |
| 2023 | Discussion Leader, Argonne National Lab, Advanced Photon Source, X-Ray Photon Correlation Spectroscopy Workshop |
| 2023 | Chair and Organizer, 94 th New England Complex Fluids Symposium, University of Rhode Island |
| 2023 | Session Chair, DPOLY, American Physical Society March Meeting |
| 2023 | Session Organizer and Chair, ACS Colloids Meeting, <i>Emulsions, Foams, and Surfactants</i> |
| 2023 | Session Chair, Fluid Mechanics (Area 1J), American Institute of Chemical Engineering Annual Meeting |
| 2023 | Session Chair, Polymers (Area 8A), American Institute of Chemical Engineering Annual Meeting |
| 2022 | Session Chair, Fluid Mechanics (Area 1J), American Institute of Chemical Engineering Annual Meeting |
| 2022 | Session Chair, Polymers (Area 8A), American Institute of Chemical Engineering Annual Meeting |
| 2022 | Session Chair, DSOFT, American Physical Society March Meeting |
| 2021 | Session Chair, Fluid Mechanics (Area 1J), American Institute of Chemical Engineering Annual Meeting |
| 2021 | Conference Organizer, March Meeting at URI, New England Complex Fluids Workshop |

Proposal and Manuscript Review:

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| 2025 | NSF Panel Review |
| 2023 | American Chemical Society Petroleum Research Fund Reviewer |
| 2023 | NSF Panel Review |
| 2020 – Now | Peer-Reviewer <i>ACS Applied Materials and Interfaces, ACS Applied Nano Materials, ACS Applied Polymer Materials, ACS Macro Letters, AIChE Journal, Biomacromolecules, Cellulose, Electrophoresis, European Polymer Journal E, Frontiers in Physics, GIANT, Industrial & Engineering Chemistry Research, iScience, Journal of Rheology, Langmuir, Macromolecules, New Journal of Chemistry, Particle and Particle Systems Characterization, Physical Review Applied, Physical Review E, Physical Review Letters, Physics of Fluids, PRX Life, Rheologica Acta, Small, Soft Matter</i> |

Outreach:

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| 2024 – Now | LGBTQ+ in STEM , Coordinator Developed and led STEM nights introducing LGBTQ+ youth to science and engineering principles through hands-on experimentation with colloidal and polymeric gels |
| 2023 – Now | URI ESTEEMED , Scholarship Director Designed and conducted outreach efforts to incoming ESTEEMED cohort focusing on colloidal inks for biomimicry, design of non-Newtonian fluids to understand rheology, and ecological microscopy. |
| 2023 | Rhode Island Nano-Bio Engineering (RINBE) Academy Conducted nanoparticle assembly experiments with high school students from Narragansett High School |

PROFESSIONAL AFFILIATIONS

- Society of Rheology (SoR)
- American Institute of Chemical Engineers (AIChE)
- American Physical Society (APS)
- American Chemical Society (ACS)