

RYAN POLING-SKUTVIK

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RESEARCH EXPERIENCE

2020 – Now Assistant Professor, University of Rhode Island, Kingston RI

Department of Chemical Engineering

2018 – 2020 Postdoctoral Researcher, University of Pennsylvania, Philadelphia, PA

Department of Chemical and Biomolecular Engineering with Chinedum Osuji

- Development of novel materials with controllable hierarchical dynamics
- Rheology of jammed fluids such as thermoresponsive emulsions and gels of semiflexible fibers

2013 – 2018 Graduate Research Assistant, University of Houston, Houston, TX

Department of Chemical and Biomolecular Engineering with Jacinta C. Conrad and Ramanan Krishnamoorti

- Developed model systems to investigate dynamics of nanoparticles in complex, polymeric fluids
- Performed neutron and x-ray scattering experiments to isolate dynamics of particles and polymers in complex fluids

EDUCATION

2013 – 2018 Ph.D. Chemical Engineering

University of Houston, Department of Chemical and Biomolecular Engineering

Houston, TX

Advisors: Jacinta C. Conrad and Ramanan Krishnamoorti

Thesis: "Transport of nanoparticles through complex polymeric fluids"

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)

- 2020 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.
18. 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*
- 2019 17. 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*
16. 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*
15. 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.
14. 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 13. 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.
12. 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.
11. 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.
10. 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.

9. 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.
8. **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 7. **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.
 - *Featured as NSE-SNS highlight for DOE triennial review*
6. 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.
5. 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; Designated HOT article*
- 2016 4. **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 3. 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.
2. **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 1. 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

- 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 at Organization of Chemical Engineering Graduate Students Symposium, University of Houston
Poster Award for Graduate Student Research, Society of Rheology
Cullen Travel Grant to Present at Society of Rheology, University of Houston
- 2015 Poster Award at Organization of Chemical Engineering Graduate Students Symposium, University of Houston
Travel Grant to Conduct Experiments at University of Bergen, Norway, NorTex Petroleum Cluster
- 2013 Full Tuition Scholarship (4 years 2009-2013), The Cooper Union for the Advancement of Science and Art

PRESENTATIONS AND POSTERS

- 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
 - 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
 - *Finalist presentation in the Excellence in Graduate Polymer Research award session*
 Presentation: Tunable assembly of gold nanorods in polymer solutions to generate controlled nanostructured materials
- ACS Colloids *Penn. State University,*
Presentation: Tunable assembly of gold nanorods in semidilute polymer solutions State College, PA

	American Physical Society March Meeting	Los Angeles, CA
	Presentation: Softly confined relaxations of grafted polymers	
	○ <i>Finalist presentation in Frank J. Padden award session</i>	
	Argonne National Lab APS/CNM Annual User Meeting	Argonne National Lab,
	Presentation: Polymer-induced structural changes in suspensions of gold nanorods	Argonne, IL
	○ <i>Invited student talk in plenary session</i>	
	○ <i>Travel award</i>	
2017	Organization of Chemical Engineering Graduate Students Symposium	University of Houston,
	Poster: Polymer-induced structural changes in suspensions of gold nanorods	Houston, TX
	○ <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	
	○ <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	University of Houston,
	Presentation: Structure and dynamics of nanoparticles dispersed in polymer solutions	Houston, TX
	ACS Colloids	Harvard University,
	Presentation: Dynamics of interacting particles in semidilute polymer solutions	Boston, MA
	Texas Soft Matter	University of Texas –
	Presentation: Dynamics of polymer-grafted nanoparticles using complementary scattering methods	Dallas, Dallas, TX
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	University of Houston,
	Poster: Transport of nanoparticles through structured materials	Houston, TX
	Organization of Chemical Engineering Graduate Students Symposium	University of Houston,
	Poster: Particle and polymer dynamics in semidilute solutions	Houston, TX
	○ <i>Poster award</i>	
	Texas Soft Matter	Rice University,
	Presentation: Dynamics of nanoparticles in polymer solutions	Houston, TX
2014	Texas Soft Matter	University of Texas,
	Poster: Effect of particle size on the dynamics of nanoparticles in semidilute polyelectrolyte solutions	Austin, TX
	Organization of Chemical Engineering Graduate Students Symposium	University of Houston,
	Poster: Size-dependent coupling between particles and polymers in semidilute polyelectrolyte solutions	Houston, TX