R Bharath Venkatesh

Phone: +1 267-815-4050 | Email: rbharathv.94@gmail.com | LinkedIn | Website

EDUCATION

University of Pennsylvania, Philadelphia, USA
Ph.D. Chemical and Biomolecular Engineering 2018 – 2022
Master of Science in Engineering, Chemical and Biomolecular Engineering 2016 – 2018

National Institute of Technology, Tiruchirappalli, India
Bachelor of Technology, Chemical Engineering 2012 – 2016

PROFESSIONAL TRAINING

Postdoctoral Researcher, Segalman Group, University of California, Santa Barbara 2022 – present
Designed a dielectric spectroscopic technique to probe reactivity of polymers under confinement *(Advisor: Rachel Segalman, Collaborators: Lynn Walker, Susannah Scott)*
Studied the electrochemical properties of novel zwitterion-based electrolytes for energy storage applications *(Collaborators: Raphaële Clément and Glenn Fredrickson)*

Graduate Researcher, Lee group, University of Pennsylvania 2018 – 2022
Thesis: Polymer dynamics in disordered nanoparticle packings – effect of confinement, interfaces, and humidity (*Advisor: Daeyeon Lee*)

Visiting Scholar, Sungkyunkwan University, South Korea Nov 2019 – Feb 2020
Designed catalytic nanoparticle packings with high stability for use in electrolyzers by conductive polymer infiltration *(with Pil Jin Yoo and Gi-Ra Yi)*

Master's Candidate Researcher, Lee group, University of Pennsylvania 2016 – 2018
Modelled solvent-driven polymer transport into nanopores using molecular dynamics simulations *(with Daeyeon Lee, Robert Riggleman, and Kathleen J Stebe)*

AWARDS AND HONORS

2024	Winner, Georgia Tech Polymer Postdoc Talk Competition
2024	Speaker, PMSE Future Faculty Symposium, ACS Fall National Meeting
2024	Speaker, Future of Rheology Seminar, organized by the Society of Rheology
2023 and 2024	UCSB Material Research Laboratory Heeger Fellowship Travel Award
2022	Speaker, Excellence in Graduate Polymer Research Symposium ACS Spring National Meeting
2021	Finalist, Langmuir Graduate Student Oral Presentation Award Competition ACS Colloid & Surface Science Symposium
2018	Masters Research Award – honorary commendation for master's research projects at the University of Pennsylvania
2016	ETS TOEFL Scholarship Award – given annually to 15 Indian students pursuing higher education abroad

PUBLICATIONS (Google Scholar)

11. Venkatesh RB, Bingaman J, Scott S, Walker LM, Segalman RA. Dielectric Spectroscopy as an *in-situ* Measure of Polymer Deconstruction in Nanometer Pores. *In preparation, manuscript shared upon request*
10. Kim BQ, Viacrs Z, Füredi M, Escobedo LF, Venkatesh RB, Guldin S, Patel AJ, Lee D. Amphiphilic Nanopores that Condense Undersaturated Water Vapor and Exude Droplets. *Submitted to Nature Communications*
9. Kim, B Q, Füredi M, Venkatesh RB, Guldin S, and Lee D. Water-Induced Separation of Polymers from High Nanoparticle-Content Nanocomposite Films. *Small,* 2302676 **2023**
8. Venkatesh RB, Lee D. Interfacial Friction Controls the Motion of Confined Polymers in the Pores of Nanoparticle Packings. *Macromolecules*, 55(19), 8659-8667 **2022**
7. Venkatesh RB, Lee D. Conflicting Effects of Extreme Nanoconfinement on the Translational and Segmental Motion of Entangled Polymers. *Macromolecules*, 55(11), 4492–4501 **2022**
6. Venkatesh RB, Manohar N, Qiang Y, Wang H, Tran HH, Kim BQ, Neuman A, Ren T, Fakhraai Z, Riggleman RA, Stebe KJ, Turner K, Lee D. Polymer-Infiltrated Nanoparticle Films Using Capillarity-Based Techniques: Toward Multifunctional Coatings and Membranes. *Annual Review of Chemical and Biomolecular Engineering*, 12, 411-437 **2021**
5. Venkatesh RB, Zhang T, Manohar N, Stebe KJ, Riggleman RA, Lee D. Effect of Polymer-Nanoparticle Interactions on Solvent-Driven Infiltration of Polymer (SIP) into Nanoparticle Packings: a Molecular Dynamics Study. *Molecular Systems Design & Engineering*, 5(3), 666–74 **2020**
4. Zhang XA, Jiang Y, Venkatesh RB, Raney JR, Stebe KJ, Yang S, Lee D. Scalable Manufacturing of Bending-Induced Surface Wrinkles. *ACS applied materials & interfaces*, 12(6), 7658-7664 **2020**
3. Donovan BF, Warzoha RJ, Venkatesh RB, Vu NT, Wallen J, Lee D. Elimination of Extreme Boundary Scattering *via* Polymer Thermal Bridging in Silica Nanoparticle Packings: Implications for Thermal Management. *ACS Applied Nano Materials*, 2(10), 6662-6669 **2019**
2. Tran HH, Venkatesh RB, Kim Y, Lee D, Riassetto D. Multifunctional Composite Films with Vertically Aligned Zno Nanowires by Leaching-Enabled Capillary Rise Infiltration. *Nanoscale*, 11(45), 22099–107 **2019**
1. Venkatesh RB, Han SH, Lee D. Patterning Polymer-Filled Nanoparticle Films *via* Leaching-Enabled Capillary Rise Infiltration (LeCaRI). *Nanoscale Horizons*, 4(4), 933–39 **2019**

PATENTS

Patterning Polymer-Filled Nanoparticle Films by Leaching-Enabled Capillary Rise Infiltration (LeCaRl)
United States Patent No. US 12,037,251 Approved July 16, 2024

GRANT WRITING EXPERIENCE

2024 Renewal application for DOE chemical upcycling award DE-SC0022294
(PIs: Susannah Scott and Rachel Segalman)
Rheology-enhanced chemo-catalytic upcycling of polyolefins (funded)

2023 NSLS-II Beamline General User Proposal #312199
(PI: Rachel Segalman)
Polymer dynamics and correlations in electrostatically mediated polymer blends under shear flow (not funded)

SELECTED CONFERENCE PRESENTATIONS

Invited Talks

1. Future of Rheology Seminar Apr **2024** – Nanoscale Rheology of Polymers in Porous Media – Extreme Confinements and Reactive Environments
2. UPR PREM Seminar Jan **2022** – How to Make Materials at Nanoscale? – Invited presentation to undergraduate researchers at the University of Puerto Rico Cayey

Contributed talks

1. Venkatesh RB, Bingaman J, Scott S, Walker LM, Segalman RA. Polymer Scission in Catalytic Nanopores: Role of Polymer Dynamics in Upcycling. AIChE Annual Meeting **2024**, San Diego, CA
2. Venkatesh RB, Bingaman J, Scott S, Walker LM, Segalman RA. Pore-level Catalytic Activity of Macromolecular Deconstruction via Broadband Dielectric Spectroscopy. ACS Fall **2024** Annual Meeting, Denver, CO (***in the PMSE Future Faculty Symposium session***)
3. Venkatesh RB, Bingaman J, Scott S, Walker LM, Segalman RA. Mapping Pore-Level Activity of Catalysts for Polymer Upcycling through Dielectric Spectroscopy. APS March Meeting **2024**, Minnesota, MN
4. Venkatesh RB, Lee D. Dynamics and Thermodynamics of Polymer in Nanoparticle Packings Under Varying Humidity Conditions. ACS Spring **2022** National Meeting, San Diego, CA (***in the Excellence in Graduate Polymer Research Symposium session***)
5. Venkatesh RB, Lee D. Leaching-Enabled Capillary Rise Infiltration (LeCaRI) and Lateral Diffusion of poly (dimethyl siloxane) in Nanoparticle Packings. APS March Meeting **2022**
6. Venkatesh RB, Lee D. Polymer Dynamics in Disordered Nanoparticle Packings. AIChE Annual Meeting **2021**, Boston, MA
7. Venkatesh RB, Lee D. Confined Polymer Mobility in Disordered Nanoporous Packings. ACS Colloid & Surface Science Symposium **2021** ***(in the Langmuir Graduate Student Oral Presentation Award session)***

TEACHING AND MENTORSHIP EXPERIENCE

- Teaching assistant: Material and Energy Balances of Chemical Processes, Heat and Mass Transport
- Designed a course on 'Surface sciences and capillarity' and presented lectures to the freshman students of Central High School, Philadelphia in 2021
- Mentor on Project SHORT guiding candidates from diverse backgrounds on their graduate school applications
- Undergraduate and visiting researcher mentees:
  University of Pennsylvania
  Shannon Zhang (currently Princeton graduate student),
  Stefani Míllan-Higuera (currently Johnson & Johnson research scientist)
  Charles Wong (currently senior at SUNY Stony Brook)
  Zimu Li (alumnus of Shanghai Jiao Tong University)
  University of California, Santa Barbara
  Jacob Castañeda (currently graduate student at UIUC)
  Anton Semerjediv (currently rising senior at UCSB)

OUTREACH AND PROFESSIONAL SERVICE

2022-present	**Reviewer**, ACS Energy Letters (by invite) Polymers, and Express Polymers Letters (volunteer)
2024	**Discussion Leader**, 'Polymers at Nanoscale' session Polymer Physics Gordon Research Seminar
2024	**Outreach volunteer**, 'Squishy Science Sunday', APS March Meeting Presented lab demos on non-Newtonian fluid flow for ages 5-12
2024	**Chair**, 'Experimental advances in polymer science' session APS March Meeting
2023	**Organizer**, Virtual Polymer Physics Symposium **Chair**, 'Dynamics and thermal transitions in polymers' session Two-day conference showcasing early career polymer science research
2022-present	**Admin-Moderator**, early career researchers in polymer physics slack Managing a 300-member slack group for young researchers
2022	**Panelist**, 'What to expect in graduate school' session ACS Spring National Meeting
2019-2022	**Member**, Dean's Doctoral Advisory Board Student representative advising the school administration on student welfare policies

PROFESSIONAL DEVELOPMENT

2023	**Attendee**, NIST NCNR Neutron Spectroscopy workshop NIST, Gaithersburg
2023	**Attendee**, TAMU-UDelaware Soft Matter Future Faculty Workshop Texas A&M University, College Station
2023	**Participant**, Promoting Postdoc Progress (P3) course at UCSB – a course designed to equip postdocs with skills for a successful career
2018-present	Professional society affiliations: American Physical Society (APS), American Chemical Society (ACS), American Institute of Chemical Engineers (AIChE), Society of Rheology (SoR)