JAY HOON PARK, Ph.D.

Associate Professor, Department of Plastics Engineering
University of Massachusetts Lowell, Lowell, MA 01854

Faculty Appointment

09/2024-	Associate Professor, Department of Plastics Engineering University of Massachusetts Lowell, Lowell, MA
09/2018-08/2023	Assistant Professor, Department of Plastics Engineering University of Massachusetts Lowell, Lowell, MA

Professional Preparation

2017-2018	Postdoctoral Researcher, Polymers Branch U.S. Army Research Laboratory (ARL), Aberdeen Proving Grounds, MD Advisor: Joseph Lenhart
2014-2017	Postdoctoral Researcher, Chemical Engineering Massachusetts Institute of Technology (MIT), Cambridge, MA Advisor: Gregory C. Rutledge
2013	Ph.D., Chemical and Biomolecular Engineering Cornell University, Ithaca, NY *Dissertation: "Controlling the Placement of Inorganic Nanofillers Within Electrospun Nanofibers Using Flow and Self-assembly*" (Advisor: Yong L. Joo)
2009	M.S., Chemical and Biomol.1(r)-oJCBT12 0 2(i22009)-3000( )JETEMC/P /MCID 17Ɛ/w[2(d)7(

RESEARCH

Peer-Reviewed Publications

Peer-reviewed publications from research at UMass Lowell include **1 book chapter** (section **A**), **18 journal articles** (section **B-2**), with another **3 under review** (section **B-1**), and **2 conference papers** (section **C**). These papers and their impact are listed at https://scholar.google.com/citations?user=IS2huuIAAAAJ&hl=en

A. Book Chapter

[1] C. J. Hansen, A. M. Peterson, **J. H. Park. "**Chapter 23 - 3D Printing," in *Handbook of Thermoset Plastics*, 4th edition, ed. H. Dodiuk, Elsevier, pp. 1021-1043, **2022.**

B. Peer-Reviewed Journal Articles

B-1. UMass Lowell Manuscripts Under Review

*UMass Lowell students = underlined; (UG) = undergraduate student; * = corresponding author*

[1] J. Lee, N. Patil, **J. H. Park***, "Correlating Microstructural and Rheological Variations in Acrylonitrile-Butadiene-Styrene (ABS) with Interlayer Bond Formation in Material Extrusion Additive Manufacturing", *submitted*.

[2] N. Khadse, **J. H. Park*,** "Fabrication of Self-Coiling Bi-Component Electrospun Fibers with Periodic Radial Wrinkling", *under revision*.

[3] Y. Cho, S-H. Jeon, J. Y. Park, H. Kim, B-J. Shim, K. Nam, S. S. Köcher, H. Lee, H-K. Woo, **J. H. Park**, Y. Kim, J-S Kim, H. Lee, and I-S. Shin, "Discovery of a new solid coreactant for highly efficient and

[26] D. H. Cho, M. K. Kim, J. H. Hwang, **J. H. Park**, Y. L. Joo, and Y. J. Jeong “Facile Synthesis of Porous Silicon Nanofibers by Magnesium Reduction for Application in Lithium Ion Batteries”, *Nanoscale Research Letters*, **2015**, *10*, 424.

[27] **J. H. Park**, J. Yin, V. Kalra, Y. L. Joo, “Role of Nanoparticle Selectivity in the Symmetry Breaking of Cylindrically Confined Block Copolymers”, *Journal of Physical Chemistry C*, **2014**, *118*, 7653–7668.

[28] **J. H. Park**, Y. L. Joo, “Tailoring Nanorod Alignment in a Polymer Matrix by Elongational Flow under Confinement: Simulation, Experiments, and Surface Enhanced Raman Scattering Application”, *Soft Matter*, **2014**, *10*, 3494-3505.

[29] **J. H. Park**, Y. L. Joo, “Formation of Interconnected Morpholgies via Nanorod Inclusion in Confined Assembly of Symmetric Block Copolymers”, *Physical Chemistry Chemical Physics*, **2014**, *16*, 8865 - 8871.

[30] **J. H. Park**, V. Kalra, Y. L. Joo, “Controlling the Dispersion and Orientation of Nanorods in Polymer Melt under Shear: Coarse-Grained Molecular Dynamics Simulation Study”, *Journal of Chemical Physics*, **2014**, *140*, 124903.

[31] M. F. Aljishi, A Ruo, **J. H. Park**, B. Nasser, W. S. Kim, Y. L. Joo, “Effect of Flow Structure and Onset of Instability on Barium Sulfate Precipitation in Taylor-Couette Crystallizers”, *Journal of Crystal Growth*, **2013,** *373*, 20-31.

[32] **J. H. Park**, V. Kalra, Y. L. Joo, “Cylindrically Confined Assembly of Asymmetrical Block Copolymers with and without Nanoparticles: Simulation and Experiment”, *Soft Matter*, **2012**, *8*, 1845.

[33] D. H. Cho, Y. J. Cho, **J. H. Park**, M. Frey, C. K. Ober, Y. L. Joo, “Preparation and Characterization of Amphiphilic Triblock Copolymer Based Nanofibers for Antifouling Biomaterial”, *Biomacromolecules*, **2012**, *13*, 5, 1606.

[34] V. Kalra, J. H. Lee, **J. H. Park**, M. Marquez, Y. L. Joo, "Confined Assembly of Asymmetric Block Copolymer Nanofibers via Multi-axial Jet Electrospinning", *Small*, **2009**, *5*, 20, 2323-2332.

C. Conference Proceeding

[1] E. D. Wetzel, R. Dunn, L. J. Holmes, K. Hart, **J. Park**, and M. Ludkey, “Thermally Annealed, High Strength 3D Printed Thermoplastic Battery Bracket for M998,” In *Proceedings of the Ground Vehicle Systems Engineering and Technology Symposium (GVSETS), NDIA*, Noatems EngineA

Additive Manufacturing", *Annual AICHE Meeting*, Orlando, FL, **2023**

[5] J. Lee, **J. H. Park***, "Fundamental Study on Processing-

"High Strength, High Toughness Parts via Dual Material Fused Filament Fabrication" *ACS Spring Meeting*, San Diego, CA, **2022**

[22] B. Koker, R. Ruckdashel, H. Abajorga, N. Curcuru, R. Dunn, D. Kazmer, E. Wetzel, and **J. H. Park***, "High Strength, High Toughness Parts via Dual Material Fused Filament Fabrication" *Annual Society of Rheology Meeting*, Bangor, ME, **2021**

[23] B. Koker, R. Ruckdashel, H. Abajorga, N. Curcuru, R. Dunn, D. Kazmer, E. Wetzel, and **J. H. Park***, "High Strength, High Toughness Parts via Dual Material Fused Filament Fabrication" *Annual AICHE Meeting*, Boston, MA **2021**

[24] R. Ruckdashel, S. Wang, J. Vera-Sorroche, **J. H. Park*** "Multiscale rheological investigation of highly filled multi-layer filament for fused deposition modeling (FDM)" *ACS Spring Meeting*, Philadelphia, PA, **2020*** (virtual presentation submission due to COVID-19)

[25] Rebecca Ruckdashel and **J.H. Park*** "Dual-Layer Filament for Material Extrusion Additive Manufacturing" *Annual AICHE Meeting*, virtual meeting, **2020**

[26] Rebecca Ruckdashel, Shihang Wang, Javier Vera-Sorroche, **J. H. Park*** "Multiscale Rheological Investigation of Highly Filled Multi-Layer Filament for Fused Deposition Modeling (FDM)" *Annual AICHE Meeting*, Orlando, FL, **2019**.

[27] Rebecca Ruckdashel, Shihang Wang, Javier Vera-Sorroche, **J. H. Park*** "Multiscale Rheological Investigation of Highly Filled Multi-Layer Filament for Fused Deposition Modeling (FDM)" *Society of Rheology Meeting*, Raleigh, NC, **2019**

[28] Varun Venoor, **J. H. Park**, David Kazmer, Margaret Sobkowicz, Javier Vera-Sorroche, Jo Ann Ratto, Robina Hogan, Thomas Theyson, "Processing and Characterization Microcrystalline Cellulose Reinforced Amorphous Polyamide Composites**"** *NUMIFORM 2019*, Portsmouth, NH, **2019**.

Prior work

[29] **J. H. Park**. "Ultradrawn High Performance Polyethylene Fibers/Films: A Case for Griffith's Criterion" *Polymer Processing Society Americas Regional Meeting*, Boston, MA, **2018**.

[30] **J. H. Park** and G. C. Rutledge. "High Performance Electrospun Polyethylene Fibers by Gel-Electrospinning" *Annual AICHE Meeting*, San Francisco, CA, **2016**.

[31] **J. H. Park** and G. C Rutledge. "High-performance Electrospun Polyethylene Fibers by Gel-Electrospinning" *The Fiber Society Meeting*, Ithaca, NY, **2016**.

[32] **J. H. Park** and G. C Rutledge. "Development of High Performance Electrospun Materials and Their Composites" *Annual AICHE Meeting*, Salt Lake City, UT, **2015**.

[33] **J. H. Park** and Y. L. Joo. "Formation of Interconnected Morphologies of Symmetrical Block Copolymer/Nanorod Composites Under Cylindrical Confinement: A Coarse-Grained Molecular Dynamics Study" *Annual AICHE Meeting*, San Francisco, CA, **2013**.

[34] **J. H. Park** and Y. L. Joo. "Formation of Interconnected Morphologies of Symmetrical Block copolymer/Nanorod Composites under Cylindrical Confinement: A Coarse-Grained Molecular Dynamics Study", *Society of Rheology Meeting*, Montreal, Quebec, Canada, **2013**.

[35] **J. H. Park** and Y. L. Joo. "Tailoring Nanorod Alignment in a Polymer Matrix by Elongational Flow under Confinement: Simulation, Experiments, and Surface Enhanced Raman Scattering Application", *US-Korea Conference 2013 Meeting*, East Rutherford, NJ, **2013**.

[36] **J. H. Park** and Y. L. Joo. "Coaxial Nanofibers with Aligned Gold Nanorods near the Fiber Surface for Surface Enhanced Raman Spectroscopy", *Annual AICHE Meeting*, Pittsburgh, PA, **2012**.

[37] **J. H. Park**, V. Kalra, and Y. L. Joo. "The Effect of Elongational Flow on the Placement and Orientation of Nanorod in Polymer: Modeling and Experiments" *Annual APS Meeting*, Boston, MA, **2012**.

[38] **J. H. Park**, V. Kalra, and Y. L. Joo. "A Coarse-Grained Molecular Dynamics Study on the Effect of Nanoparticles on Cylindrical Confined Assembly of Symmetric and Asymmetric Block Copolymers"

Annual AICHE Meeting, Minneapolis, MN, **2011**.

[39] **J. H. Park**, V. Kalra, and Y. L. Joo. "The effect of flow and confinement on the placement of non-spherical nanofillers in polymer melts: simulation and experiment" *Society of Rheology Meeting*, Cleveland, OH, **2011**.

[40] **J. H. Park**, V. Kalra, J.H. Lee and Y. L. Joo "Confined Assembly of Block Copolymer/Nanoparticle Composites: Multi-Axial Electrospinning and Coarse-Grained Molecular Dynamics Simulation", *Annual AICHE Meeting*, Salt Lake City, UT, **2010**.

Invited Talks

UMass Lowell

[1] "Multi-layered Multifunctional Polymeric Materials for Advanced Manufacturing", Adhesion CoP Seminar Series, Dow Chemical, May. **2024**

[2] "Multi-layered Multifunctional Materials for Advanced Manufacturing via Ultrafine Fibers and 3d Printing", Global Scholar Seminar, Hanyang University, Seoul, Korea, Jan. **2024**

[3] "Harnessing Hierarchical Structure-Properties via Processing and Annealing in Ultrafine Fibers and 3d Printing", Solvay Seminar Series, Macromolecules Innovation Institute, Virginia Tech, Blacksburg, VA, Apr. **2023**

[4] "Engineering Polymer Physics and Processing for Advanced Materials", 237th ACS National Meeting, Salt Lake City, UT, March 27-31, **2023**

Grants

Total Approved/Completed Funding: $5.89 Million

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B) Co-PI Roles

Title	*Principal Investigators*	*Sponsoring Agency*	*Amount – UML only if subcontract*	*Effort*	*Duration*
FW10: Development of Synthetic Leather Alternatives	J. Reuther, **J.H. Park**	DoD DEVCOM-SC	$340,000	50%	Apr. 2024- Apr. 2025
D2-22 Improved Interlayer Adhesion in 3D Printed Parts	N. Orbey, **J.H. Park**, C. Meredith (Ga Tech)	NSF I/UCRC (SHAP3D)	$67,000	50%	Jan. 2023 – Jun 2024
D2-21 Improved Interlayer Adhesion in 3D Printed Parts	N. Orbey, **J.H. Park**, C. Meredith (Ga Tech)	NSF I/UCRC (SHAP3D)	$65,000	50%	Jan. 2022 – Jan. 2023
Soft Robotic Haptic Gloves as Intuitive Human-Machine Interfaces	Joey Mead, **J.H. Park**, C. Hansen, J. Zhang	SEMI/FlexTech	$250,000	33%	Nov. 2021 – Mar. 2023
NF PC5.2A Datacube for the Flexible Hybrid Electronics (FHE)	A. Amirkhizi, X. Lu, J. Mead, **J. H. Park**	NEXTFLEX	$100,000	25%	Jan. 2020 – May. 202

TEACHING

Lecture Courses

1) PLAS.3480 - *Heat Transfer (3 cr)* – required for juniors
2) PLAS.5250 - *Synthetic Fibers: Processing-Structure-Property (3 cr)* – a graduate elective first developed for fall 2018. In 2021 and 2022, PLAS.5250 was offered in HyFlex mode, in which one group of students is in the classroom and a second group of students is online at the same time.
3) PLAS.5500 - *Processing of Elastomers (3 cr)* – a graduate elective newly developed in 2021 and delivered asynchronously online.

Semester (COVID Status)	PLAS.3480 Students (Rating)	PLAS.5250 Students (Rating)	PLAS.5500 Students (Rating)
Fall 2018		7 (3.7/4.0)	
Spring 2019	48 (3.4/4.0)		
Fall 2019		12 (3.7/4.0)	
Spring 2020 (half virtual) Fall 2020 (virtual)	51 (N/A)		

- Sarah Ross (BS ’24)
- Olivia Widjaja (BS ’23) - **1 co-authored pub #[3]**, 1 refereed conference #[5]
- Nolan Buckley (BS’22) -1 refereed conference #[5]
- Breanne Eriksen (BS’22) -1 refereed conference #[5]
- Imran Sulaiman (BS’22) - 1 refereed conference #[5]
- Nicholas Curcuru (BS ’21) - **1 co-authored pub #[11]**, 3 refereed conferences #[13] [14] -autha2( )]TJ58844s[3

Fabrication Feedstock for Enhanced Diffusion"
Present position: Coalesenz Inc., MA

- Shnaidie Macajoux (Nov 2019 – May 2021): "*Study on Polyester based Fiber Extrusion and their Thermoresponsive Functionalities*"
  Present position: Proctor and Gamble, MA
- Taiyo Yamaguchi (Aug. 2020 – Dec. 2021): "

Fall Virtual Open House – Oct. 2020
Fall Open House – Sep. 21, 2019
Fall Open House – Oct. 14, 2018

- Department representation activity
  1st year Fall Semester Dean's List Award Celebration – Mar. 29, 2022
- Local Outreach
  Judge for Massachusetts Region IV Middle School Science Fair – Apr. 29, 2023
  Judge for Massachusetts Region IV Middle School Science Fair – Apr. 2019

Fabric Discover Center (110 Canal Street)

- Global Polymer and Textiles Summit tour – Apr. 20, 2023
  Tour of the Fabric Discovery Center to industrial and academic participants of the Global Polymer and Textiles Summit conference.
- Army Research Laboratory visit – Dec. 8, 2022
  Research and educational briefing of smart textiles and functional nonwovens to Army Research Laboratory personnel, accompanied by Chancellor Julie Chen.
- Lt. Governor STEM Week - Oct. 18, 2022