

# Pierre Kawak

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## Education & Training

University of South Florida <i>Advisor: David S. Simmons</i>	Postdoctoral Scholarship	2022 – 2025
Brigham Young University (BYU) <i>Advisor: Douglas R. Tree</i> Dissertation: Simulation of Crystal Nucleation in a Polymer Melt	Ph.D. Chemical Engineering <i>Funded Assistantship; 3.81 GPA</i>	2017 – 2022
American University of Sharjah (AUS) <i>Advisor: Ghaleb A. Hussein</i> Dissertation: Ultrasound Triggered Release of Estrone-Targeted Liposomes	M.S. Chemical Engineering <i>Full Scholarship; 4.0 GPA</i>	2015 – 2017
American University of Sharjah (AUS) Minor Economics	B.S. Chemical Engineering <i>Partial Scholarship</i>	2010 – 2015

## Peer-Reviewed Publications

- [4] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. "Central role of filler-polymer interplay in nonlinear reinforcement of elastomeric nanocomposites". *Macromolecules* (2024). DOI: [10.1021/acs.macromol.4c00489](https://doi.org/10.1021/acs.macromol.4c00489).
- [3] **Pierre Kawak**, Christopher Akiki, and Douglas R. Tree. "Effect of local chain stiffness on oligomer crystallization from a melt". 8 (2024), p. 075606. DOI: [10.1103/PhysRevMaterials.8.075606](https://doi.org/10.1103/PhysRevMaterials.8.075606).
- [2] **Pierre Kawak**, Dakota S. Banks, and Douglas R. Tree. "Semiflexible oligomers crystallize via a cooperative phase transition". *Journal of Chemical Physics* 155 (2021), p. 214902. DOI: [10.1063/5.0067788](https://doi.org/10.1063/5.0067788).
- [1] Najla M. Salkho, Vinod Paul, **Pierre Kawak**, Rute F. Vitor, Ana M. Martins, Mohammad Al Sayah, and Ghaleb A. Hussein. "Ultrasonically controlled estrone-modified liposomes for estrogen-positive breast cancer therapy". *Artificial Cells, Nanomedicine, and Biotechnology* 46 (2018), pp. 462–472. DOI: [10.1080/21691401.2018.1459634](https://doi.org/10.1080/21691401.2018.1459634).

## Awards & Fellowships

### Research Grants & Fellowships

National Postdoctoral Association (NPA) <a href="#">IMPACT Fellowship</a>	2023 – 2024
One of 6 fellows selected out of 100 applicants nationwide for \$1,000 funding for an IMPACT project.	
National Science Foundation (NSF) CoPI Discover <a href="#">ACCESS</a> Compute Resource Grant	Nov. 2023
Awarded National Science Foundation funding for access to high performance computing resources.	
American Physical Society (APS) <a href="#">Career Mentor Fellowship</a>	2023
Received mentorship training, administered career talk at USF & judged young trainee submissions.	

### Relevant Program Acceptance & Participation

<a href="#">Torrey Pines Foundations of Leadership Development Program</a> Participant	2024 – 2025
<a href="#">NSF &amp; SACNAS Grant Writing &amp; Peer Review Workshop</a> Attendance	Aug. 2023
<a href="#">Future Faculty Workshop Diverse Leaders for the Future Workshop</a> Attendance	June 2023
<a href="#">Out in Science, Tech., Engineering, &amp; Maths Professional Development Summit</a> Participant	Mar. 2021

UCSD SDSC High Performance Computing Summer Institute Attendee

Jul. 2018

**Conference Awards**

Outstanding Poster Award at Gordon Research Conference on Polymer Physics

July 2024

USF Annual Postdoctoral Research Symposium [Best Poster Award](#) \$200

Mar. 2023

APS Forum on International Physics [Distinguished Student Award](#)

Fall 2022

**Excellence, Leadership & Service Awards**AUS [College of Engineering Hall of Fame Inductee](#)

2023

BYU Chemical Engineering Department Graduate Student of the Month

Sept. 2022

BYU University Accessibility Center Banquet Scholarship Award \$1,500

Fall 2021

BYU Graduate Student Society Professional Presentation Award \$500

Fall 2021

BYU Chemical Engineering Department Travel Award

Fall 2021

Delta Alpha Pi (DAPI) International Honor Society Inductee

2021

AUS Biomedical Engineering Symposium Best Overall Talk Award \$700

Fall 2016

AUS 3× Dean's List for Academic Excellence

2013 – 2014

**Research Mentorship Experience**

Tianna Virgo	Alyna Williams	Amanda Sharrer	Luiz Zepeda
USF Undergraduate	USF Undergraduate	USF Ph.D. Candidate	USF Ph.D. Candidate
Harshad Bhapkar	Peijing Yue	Makayla Branham	William F. Drayer
USF Ph.D. Candidate	USF Ph.D. Candidate	USF Ph.D. Candidate	USF Ph.D. Candidate
Bao Ma	Annelise Curtin	Austin Hartley	Dakota S. Banks
USF Ph.D. Candidate	USF M.S. Student	USF Undergraduate	BYU Undergraduate
Christopher Akiki	Beverly S. Delgado	Andrew S. Gibson	Paul Kawak
BYU Undergraduate	BYU Undergraduate	BYU Undergraduate	AUS Undergraduate

**Teaching Experience**

Graduate Teaching Assistant	Thermodynamics	Winter 2021
<i>Brigham Young University</i>	Separations Engineering	Fall 2021
	Heat & Mass Transfer	2018 – 2021 (3x)
	Process Dynamics & Control	Fall 2018
Volunteer Course Instructor; <i>University of the People</i>	College Algebra	Spring 2018
Graduate Instructor; <i>American University of Sharjah</i>	Principles of ChemE	2016 – 2017 (3x)
Graduate Teaching Assistant	Corrosion Lab	2016 – 2017 (2x)
<i>American University of Sharjah</i>	ChemE Lab I	2015 – 2016 (2x)
	Graduate Desalination	Spring 2015
	Wastewater Treatment	Spring 2015
Undergraduate Teaching Assistant	Mass Transfer	2014 – 2015 (3x)
<i>American University of Sharjah</i>	Kinetics	Fall 2014
	Thermodynamics	Spring 2014
Private Tutor	Maths, Engineering, Business, etc.	2008 – now

## Community & Service

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### Peer Review

American Chemical Society <a href="#">Macromolecules</a>	8× Reviews
American Chemical Society <a href="#">Journal of Chemical Information and Modeling</a>	2× Reviews
American Chemical Society <a href="#">Petroleum Research Fund (PRF)</a>	1× Review
Freiburg Institute for Advanced Studies <a href="#">Early Career Fellowship Programme</a>	1× Review
Wiley <a href="#">Journal of Polymer Science</a>	1× Review

### Professional Society & Conference Leadership

#### *American Physical Society (APS)*

Member of <a href="#">Committee on International Freedom of Scientists</a>	2025-2026
Member of Division of Polymer Physics (DPOLY) Membership Committee	2024-2025
Session Chair “Polymer Structure & Dynamics across Length & Timescales”	Mar 2024, 2025
Session Organizer “Polymer Structure & Dynamics across Length & Timescales”	Mar 2024, 2025
Organizer & Winner of Inaugural DPOLY T-Shirt Design Competition	Mar 2024
Ranked Undergraduate Talks & Posters as <a href="#">Career Mentoring Fellow</a>	2022 – 2023
Session Chair “ <a href="#">Polymers &amp; Composites for Energy Storage &amp; Conversion I</a> ”	Mar 2023

#### *Early Career Researchers in Polymer Physics*

Administrator of 550 member Slack channel for collaboration & networking	2022 – present
Organizer of 2023 <a href="#">Virtual Polymer Physics Symposium</a> with 150 Global Attendees	Aug 2023
Cofounder & Organizer of <a href="#">Self-Development Seminar</a> series	2022 – present

#### *Out in Science Technology Engineering & Mathematics (oSTEM), Inc.*

Table Representative at MAA MathFest 2023	Aug 2023
Annual Conference Volunteer & Organizer	Nov. 2022
Annual Conference Merchandise Team Organizer	Nov. 2022

### Departmental & Institutional Service

#### *University of South Florida (USF) Postdoctoral Scholar Association (PSA)*

Founded & Chaired PSA Executive Committee at USF serving 200 postdocs	2023 – present
Organized Inaugural ELEVATE Talk Series	2024 – 2025
Led Postdoc Highlight Interviews, Socials, & Orientations	2023 – present

#### *BYU Chemical Engineering Graduate Student Council (GSC)*

President & Cofounder	2018 – 2021
Organizer of Department Recruitment Poster Event	2019, 2020, 2021
Department BBQ Social Organizer	2018 – 2021
Department-Wide Survey Administrator on Graduate Student Financial Health	Fall 2021
Social Media Accounts Manager	Fall 2021

### Outreach, Inclusion & Public Engagement

#### *Out in Science Technology Engineering & Mathematics (oSTEM), Inc.*

Scholarship Coordinator (Lead review of > 200 applicants for 20 scholarships)	2022 – present
Mentorship Program Volunteer	2021 – present

#### *American Chemical Society (ACS)*

<a href="#">Science Coach</a> (Education Outreach Initiative)	2023 – 2024
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Lecture series facilitator for high school students at Bradenton Christian School	2023 – 2024
<i>American Physical Society (APS)</i>	
Physicists To-Go Public Engagement Program Participant	2022 – present
Josephine C. Locke Elementary School visiting scholar talk	2022
Member of <a href="#">National Mentoring Community</a>	2022 – present
<i>State Science &amp; Engineering Fair of Florida (SSEF Florida)</i>	
Volunteer SSEF Judge	2023, 2024
<i>American Society for Engineering Education (ASEE)</i>	
Member of ASEE LGBTQ+ Advocacy in STEM <a href="#">Virtual Community of Practice</a>	2022 – present
Facilitator of <a href="#">Trans Allyship Safe Zone Ally Training Workshop</a>	Mar. 2023
<i>University of South Florida (USF)</i>	
Highschoolers Programming & Scientific Computing Summer Workshop Facilitator	June 2023

## Selected Presentations

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- [23] **Pierre Kawak**. “Molecular Simulations for Greener Polymers: From Theory to Reality”. AIChE Annual Meeting. American Institute of Chemical Engineers. San Diego, CA, 2024.
  - [22] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. “Contrasting Reinforcement Mechanisms in Elastomeric Nanocomposites”. AIChE Annual Meeting. American Institute of Chemical Engineers. San Diego, CA, 2024.
  - [21] **Pierre Kawak**. “Filler-Filler Contacts Reinforce Filled Elastomers at High Strains”. GRC Polymer Physics. Gordon Research Conferences. South Hadley, MA, 2024.
  - [20] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. “Polymer-Filler Competition-Driven Reinforcement Beyond the Payne Effect in Elastomeric Nanocomposites”. APS March Meeting. American Physical Society. Minneapolis, MN, 2024.
  - [19] Harshad Bhapkar, **Pierre Kawak**, and David S. Simmons. “Exploring the Effects of Nanoparticle Loading, Dispersion and Structure on the Stress Response of Elastomeric Nanocomposites”. APS March Meeting. American Physical Society. Minneapolis, MN, 2024.
  - [18] **Pierre Kawak**, David S. Simmons, and Douglas R. Tree. “Rational Sustainable Polymer Materials Design Using Multiscale Simulation and Theory”. AIChE Annual Meeting. American Institute of Chemical Engineers. Orlando, FL, 2023.
  - [17] **Pierre Kawak**, Makayla Branham, William F. Drayer, and David S. Simmons. “Tuning Polymer Dynamics Via Sequence Control”. AIChE Annual Meeting. American Institute of Chemical Engineers. Orlando, FL, 2023.
  - [16] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. “Elucidating the Molecular Origins of Reinforcement in Filled Elastomers Via Spatial- and Species-Resolved Stresses from Molecular Dynamics Simulations”. AIChE Annual Meeting. American Institute of Chemical Engineers. Orlando, FL, 2023.
  - [15] Harshad Bhapkar, **Pierre Kawak**, and David S. Simmons. “Insights into the Dependence of Elastomeric Nanocomposite Mechanics on Nanoparticulate Properties”. AIChE Annual Meeting. American Institute of Chemical Engineers. Orlando, FL, 2023.
  - [14] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. “Dissecting the Payne Effect: How Filler-Polymer Competition Reinforces Elastomeric Nanocomposites”. IOP Polymer Physics Group Graduate Symposium. Institute of Physics. Virtual, 2023.
  - [13] **Pierre Kawak**. “Career Paths in Physics”. Physics Colloquia Series. University of South Florida Department of Physics. Tampa, FL, 2023.
  - [12] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. “Exploring Mechanisms of Enhanced Dissipation in Nanoparticle-filled Rubber Using Molecular Dynamics”. Annual Postdoctoral Research Symposium. University of South Florida. Tampa, FL, 2023.
  - [11] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. “Exploring mechanisms of enhanced dissipation in nanoparticle-filled rubber using molecular dynamics”. APS March Meeting. American Physical Society. Las Vegas, NV, 2023.
  - [10] Douglas R. Tree and **Pierre Kawak**. “Free Energy Analysis of Crystal Nucleation of Semiflexible Polymers”. APS March Meeting. American Physical Society. Las Vegas, NV, 2023.
  - [9] **Pierre Kawak**, Harshad Bhapkar, and David S. Simmons. “Spatially resolving energy dissipation in molecular dynamics of polymer nanocomposites”. APS March Meeting. American Physical Society. Las Vegas, NV, 2023.

- [8] **Pierre Kawak**, Dakota S. Banks, and Douglas R. Tree. “Acute Sensitivity of Polymer Crystallization Phase Behavior to Intermolecular Interactions”. AICHe Annual Meeting. American Institute of Chemical Engineers. Phoenix, AZ, 2022.
- [7] **Pierre Kawak**, Dakota S. Banks, and Douglas R. Tree. “Free Energy Analysis of Polymer Crystal Nucleation Indicates Cooperative Crystallization and Nematic Alignment”. APS March Meeting. American Physical Society. Chicago, IL, 2022.
- [6] **Pierre Kawak**, Dakota S. Banks, and Douglas R. Tree. “Free Energy Surfaces for Homogeneous Nucleation in a Polymer Melt”. AICHe Annual Meeting. American Institute of Chemical Engineers. Boston, MA, 2021.
- [5] **Pierre Kawak**, Dakota S. Banks, and Douglas R. Tree. “GPU-accelerated Wang-Landau Simulation of Polymer Crystallization”. APS March Meeting. American Physical Society. Virtual, 2021.
- [4] **Pierre Kawak**, Andrew S. Gibson, Logan S. Brown, Beverly Delgado, Douglas R. Tree, and Dakota S. Banks. “Investigating Primary Nucleation in Polymer Melts using GPU-Accelerated Wang-Landau Simulations”. AICHe Annual Meeting. American Institute of Chemical Engineers. Virtual, 2020.
- [3] **Pierre Kawak**, Andrew S. Gibson, Logan S. Brown, Beverly Delgado, and Douglas R. Tree. “Wang-Landau Simulation of the Free Energy Surface of Crystallization in a Polymer Melt”. APS March Meeting. American Physical Society. Virtual, 2020.
- [2] **Pierre Kawak**, Vinod Paul, Paul Kawak, Rita Kassermally, Fatme Lahib, Rute F. Vitor, Mohammad Al-Sayah, and Ghaleb A. Hussein. “Doxorubicin-Encapsulated, Estrone-Appended Liposomes Triggered by Ultrasound for the Treatment of Breast Cancer”. Graduate Students Research Conference. UAE Ministry of Education. Khalifa University, Abu Dhabi, UAE, 2017.
- [1] **Pierre Kawak**, Christian C. Momah, Mohamed A. Elkhodiry, Shaima R. Suwaidi, Dina Gadalla, Fatehia M. Banamah, Rute F. Vitor and Hesham G. Moussa, Ana M. Martins and Mohammad Al-Sayah, and Ghaleb A. Hussein. “A Peptide-Targeted Nanodelivery System Triggered by Ultrasound for Anticancer Therapy”. Life Sciences Grand Challenges Conference. Institute of Engineering and Electronics Engineering. Khalifa University, Abu Dhabi, UAE, 2016.

## References

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Assistant Professor of Chemical, Biological, & Materials Engineering; University of South Florida		<i>Mentor</i>

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