

# Pierre Kawak

Engineering Building, EB 312  
Brigham Young University, Provo, UT 84602  
(801) 762-7999 • [pskawak@gmail.com](mailto:pskawak@gmail.com) • [linktr.ee/pkawak](http://linktr.ee/pkawak)

## Education

Brigham Young University (BYU) <i>Full Scholarship</i> Dissertation: Simulation of Crystal Nucleation in a Polymer Melt	Ph.D, Chemical Engineering <i>Advisor: Douglas R. Tree</i>	2017 – Apr 2022
American University of Sharjah (AUS) <i>Full Scholarship; Only Graduate with 4.0 CGPA</i> Thesis: Ultrasound Triggered Release of Estrone- Targeted Liposomes	M.S. Chemical Engineering <i>Advisor: Ghaleb A. Hussein</i>	2015 – 2017
American University of Sharjah (AUS) <i>Partial Scholarship</i>	B.S. Chemical Engineering Minor Economics	2010 – 2015

## Selected Research Experience

Polymer Crystal Simulation with Douglas Tree	2017 – present
<ul style="list-style-type: none"><li>• Studied and simulated coarse-grained polymer models using molecular simulation methods</li><li>• Evaluated progress of and exposed trends in crystallization by employing varied order parameters</li><li>• Constructed accelerated, efficient and novel codes using C++, CUDA, Python, Bash, JSON, R, etc.</li><li>• Illustrated scientific results using VMD, Adobe Suite, etc.</li></ul>	
Ultrasound-sensitive smart drug delivery systems with Ghaleb Hussein	2014 – 2017
<ul style="list-style-type: none"><li>• Synthesized, validated and tested novel nanoparticle carrier for treatment of breast cancer cells</li><li>• Mastered lab methods including film hydration, centrifugation, extrusion, membrane filtration, etc.</li><li>• Analyzed release of nanoparticle carrier using NMR, DLS, ultrasound probe, spectrofluorometer, etc.</li><li>• Developed lab protocols that remain in contemporary use</li></ul>	

## Publications

- [4] Pierre Kawak and Douglas R. Tree. "Free energy trends in soft semiflexible polymers" (in preparation).
- [3] 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).
- [2] 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).
- [1] Pierre Kawak. "Ultrasound triggered release of estrone- targeted liposomes". *American University of Sharjah Theses & Dissertations: Masters Theses* (2017).

## Selected Presentations

- [5] Pierre Kawak et al. "Free Energy Analysis of Polymer Crystal Nucleation Indicates Cooperative Crystallization and Nematic Alignment". APS March Meeting. American Physical Society. Chicago, IL, 2022.
- [4] Pierre Kawak et al. "Free Energy Surfaces for Homogeneous Nucleation in a Polymer Melt". AIChE Annual Meeting. American Institute of Chemical Engineers. Boston, MA, 2021.
- [3] Pierre Kawak et al. "GPU-accelerated Wang-Landau Simulation of Polymer Crystallization". APS March Meeting. American Physical Society. Virtual, 2021.
- [2] Pierre Kawak et al. "Investigating Primary Nucleation in Polymer Melts using GPU-Accelerated Wang-Landau Simulations". AIChE Annual Meeting. American Institute of Chemical Engineers. Virtual, 2020.
- [1] Pierre Kawak et al. "Wang-Landau Simulation of the Free Energy Surface of Crystallization in a Polymer Melt". APS March Meeting. American Physical Society. Virtual, 2020.

## Teaching Experience

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

## Selected Miscellaneous Memberships and Academic Activities

<b>Recipient</b> of the BYU GSS Professional Presentation Award	Fall 2021
AUS Biomedical Engineering Symposium <b>Best Overall Talk Award</b>	Fall 2016
<b>Recipient</b> of three AUS dean's list awards for academic excellence	2010 – 2014
<b>Certified Reviewer</b> for American Chemical Society Journals (4 completed)	Fall 2021
<b>Member and Volunteer</b> of Out in Science, Technology, Engineering, and Mathematics (oSTEM), Inc.	2021 – present
<b>Cofounder and president</b> of BYU ChemE Graduate Student Council	2018 – present
<b>Cofounder</b> of three successful student clubs	2012 – 2018
Current <b>Member</b> of APS, AIChE and DAPi Honor Society	present
Past <b>Member</b> of various other scientific clubs and societies (IEEE, SPE, EMBS)	2012 – 2017
Attendance of the oSTEM Professional Development Summit	Fall 2021
Attendance of the UCSD SDSC High Performance Computing Summer Institute	Summer 2018
Two time <b>Volunteer</b> science fair judge at local schools	2021 – 2022

## References

Douglas R. Tree	+1 (801) 422-5162	<a href="mailto:tree.doug@byu.edu">tree.doug@byu.edu</a>
Assistant Professor of Chemical Engineering; Brigham Young University		<i>PhD Advisor</i>
Ghaleb A. Hussein	+971 (6) 515-2970	<a href="mailto:g Hussein@aus.edu">g Hussein@aus.edu</a>
Professor of Chemical Engineering; American University of Sharjah		<i>MS Advisor</i>
Thomas A. Knotts	+1 (801) 422-9158	<a href="mailto:thomas.knotts@byu.edu">thomas.knotts@byu.edu</a>
Professor of Chemical Engineering; Brigham Young University		<i>Dissertation Committee Member</i>
John D. Hedengren	+1 (801) 422-2590	<a href="mailto:john_hedengren@byu.edu">john_hedengren@byu.edu</a>
Associate Professor of Chemical Engineering; Brigham Young University		<i>Graduate Committee Head</i>
William G. Pitt	+1 (801) 422-2589	<a href="mailto:pitt@byu.edu">pitt@byu.edu</a>
Professor of Chemical Engineering; Brigham Young University		<i>Dissertation Committee Member</i>