

Pierre Kawak

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Education

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

Selected Research Experience

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

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.	2010 – present

Selected Miscellaneous Memberships and Academic Activities

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

References

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