

Pierre Kawak

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Education

Brigham Young University (BYU) <i>Funded Assistantship; 3.81 GPA</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 GPA</i> Dissertation: 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
<i>Skills & Tools:</i> GitHub, C++, CUDA, Python, Bash, JSON, R, VMD, Adobe Illustrator, Adobe Premiere <i>Expertise:</i> Free Energy Sim. (MC, MD), Morphology Analysis, Nucleation Theory, High Performance Comp.	
<ul style="list-style-type: none">• Developed and maintained 2 molecular simulators to study coarse-grained polymers• Evaluated progress of and exposed trends in crystallization by employing varied order parameters	
Ultrasound-sensitive smart drug delivery systems with Ghaleb Hussein	2014 – 2017
<i>Skills & Tools:</i> Assays, NMR, DLS, Spectrofluorometer, Centrifuge, Extruder, Membrane Filter, GC <i>Expertise:</i> Liposomes, Chemotherapy, Drug Delivery, Surface Mod., Breast Cancer, Ultrasound	
<ul style="list-style-type: none">• Synthesized, validated and tested novel nanoparticle carrier for treatment of breast cancer cells• 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 Separations Engineering Process Dynamics & Control Heat & Mass Transfer	Winter 2021 Fall 2021 Fall 2018 2018 – 2021 (3x)
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 ChemE Lab I Graduate Desalination Wastewater Treatment	2016 – 2017 (2x) 2015 – 2016 (2x) Spring 2015 Spring 2015
Undergraduate Teaching Assistant <i>American University of Sharjah</i>	Mass Transfer Kinetics Thermodynamics	2014 – 2015 (3x) Fall 2014 Spring 2014
Private Tutor	Maths, Engineering, Business, etc.	2008 – now

Selected Academic Activities

APS FIP Distinguished Student Travel Grant	APS 2022
BYU University Accessibility Center Banquet Scholarship for gifted disabled students	Fall 2021
BYU GSS Professional Presentation Award & BYU ChemE Department Travel Award	Fall 2021
AUS: Biomed. Eng. Symposium Best Talk Award ; 3x dean's list for academic excellence	2010 – 2016
Certified Reviewer for American Chemical Society Journals (4x assisted)	Fall 2021
Member & Volunteer of Out in Science, Tech., Engineering, & Maths. (oSTEM)	2021 – now
Cofounder & president of BYU ChemE Graduate Student Council	2018 – now
Cofounder of three successful student clubs	2012 – 2018
Regular Volunteer judge at local school and district science fairs	-
American Physical Society (APS) & American Institute of Chem. Eng. (AIChE) Member	2018 – now
Member & Volunteer of Delta Alpha Pi (DAPi) International Honor Society	2021 – now
Past Member of various other scientific clubs & 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	Summ 2018

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	ghusseini@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
Professor of Chemical Engineering; Brigham Young University		<i>Dissertation Committee Member</i>