

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 Heat & Mass Transfer Process Dynamics & Control	Winter 2021 Fall 2021 2018 – 2021 (3x) 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 <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

BYU University Accessibility Center Banquet Scholarship for gifted disabled students	Fall 2021
BYU GSS Prof. Presentation & BYU ChemE Dept Travel & APS FIP DS Awards	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 Socieity (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 & soceties (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 Assistant Professor of Chemical Engineering; Brigham Young University	+1 (801) 422-5162 tree.doug@byu.edu <i>PhD Advisor</i>
Ghaleb A. Hussein Professor of Chemical Engineering; American University of Sharjah	+971 (6) 515-2970 gousseini@aus.edu <i>MS Advisor</i>
Thomas A. Knotts Professor of Chemical Engineering; Brigham Young University	+1 (801) 422-9158 thomas.knotts@byu.edu <i>Dissertation Committee Member</i>
John D. Hedengren Associate Professor of Chemical Engineering; Brigham Young University	+1 (801) 422-2590 john_hedengren@byu.edu <i>Graduate Committee Head</i>
William G. Pitt Professor of Chemical Engineering; Brigham Young University	+1 (801) 422-2589 pitt@byu.edu <i>Dissertation Committee Member</i>