Pierre Kawak

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Education

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

Selected Research Experience

Polymer Crystal Simulation with Douglas Tree — 2017 – present

- 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 Husseini — 2014 – 2017

- 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.

[2] Najla M. Salkho, Vinod Paul, Pierre Kawak, Rute F. Vitor, Ana M. Martins, Mohammad Al Sayah, and Ghaleb A. Husseini. "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.

[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 *Brigham Young University*	Thermodynamics Separations Engineering Process Dynamics & Control Heat & Mass Transfer	Winter 2021 Fall 2021 Fall 2018 Winter 2018
Volunteer Course Instructor; *University of the People*	College Algebra	Spring 2018
Graduate Instructor; *American University of Sharjah*	Principles of ChemE	2016 – 2017 (3x)
Graduate Teaching Assistant *American University of Sharjah*	Corrosion Lab ChemE Lab I Desalination (Grad.) Wastewater Treatment	2016 – 2017 (2x) 2015 – 2016 (2x) Spring 2015 Spring 2015
Undergraduate Teaching Assistant *American University of Sharjah*	Mass Transfer Kinetics Thermodynamics	2014 – 2015 (3x) Fall 2014 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 soceities (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 *PhD Advisor*

Ghaleb A. Husseini +971 (6) 515-2970 ghusseini@aus.edu
Professor of Chemical Engineering; American University of Sharjah *MS Advisor*

Thomas A. Knotts +1 (801) 422-9158 thomas.knotts@byu.edu
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