## Ashley Z. Guo


Contact/Bio

Engineering C-164
Rutgers University-New Brunswick

Email: ashley.guo@rutgers.edu
Homepage: http://azguo.github.io

Born: Norfolk, VA USA
(US Citizen)


Appointments

**Rutgers, The State University of New Jersey**, New Brunswick NJ — Sept 2023–
Assistant Professor, Department of Chemical and Biochemical Engineering

**New York University**, New York NY — 2020–2023
Postdoctoral Associate, Center for Soft Matter Research, Advisor: Paul Chaikin

Education

**University of Chicago**, Chicago IL — 2014–2020
Ph.D., Molecular Engineering, Advisor: Juan de Pablo

**California Institute of Technology**, Pasadena CA — 2010–2014
B.S., Chemical Engineering (Materials track), Advisor: Julie Kornfield

Other Research

**Schlumberger**, Houston TX — Jun–Sep 2013
Chemical Engineering Intern, Pressure Pumping & Chemistry Group — Jun–Sep 2014

Fellowships, Leadership & Awards

**Faculty Excellence in Teaching and Advising Award**, Rutgers CBE — 2024
**Distinguished Young Scholar**, University of Washington Dept. of Chemical Engineering — 2022
**William Rainey Harper Dissertation Fellowship**, University of Chicago — 2018–2019
**Chicago Center for Teaching Fellow**, University of Chicago — 2018–2019
**Society of Women Engineers, Co-founder & Treasurer**, University of Chicago — 2017–2018
**Science Communication Fellow**, Museum of Science & Industry, Chicago IL — 2015–2017
**Arts, Culture, & Science Initiative Graduate Fellow**, University of Chicago — 2015–2016
**Howard Hughes Medical Institute Teaching Fellow**, Caltech — 2014
**American Institute of Chemical Engineers – Chapter President**, Caltech — 2012–2013
**Reed and Ruth Brantley Undergraduate Research Fellow**, Caltech — 2012

Publications

(* denotes equal contribution)


[10] Wilken, S.*, **Guo, A.Z.***, Levine, D., Chaikin, P.M., "Dynamical Approach to the Jamming Problem", Phys. Rev. Lett., 131, 238202 (2023). [doi:10.1103/PhysRevLett.131.238202]

[9] Fowler, W.C., Deng, C., Griffen, G.M., Teodoro, T., **Guo, A.Z.**, Zaiden, M., Gottlieb, M., de Pablo, J.J., Tirrell, M.V., "Harnessing Peptide Binding to Capture and Reclaim Phosphate", J. Am. Chem. Soc., 143, 4440-4450 (2021). [doi:10.1021/jacs.1c01241]

[8] Sevgen, E., **Guo, A.Z.**, Sidky, H., Whitmer, J., de Pablo, J., "Combined Force-Frequency Sampling for Simulation of Systems Having Rugged Free Energy Landscapes", J. Chem. Theory Comput., 16, 1448-1455 (2020).[doi:10.1021/acs.jctc.9b00883]

[7] Colón, Y.J., **Guo, A.Z.**, Antony, L.B., Hoffmann, K.Q., de Pablo, J.J., "Free Energy of Metal Organic Framework Self-Assembly", J. Chem. Phys., 150, 104502 (2019). [doi:10.1063/1.5063588]

[6] **Guo, A.Z.**, Lequieu, J., de Pablo J.J., "Extracting collective motions underlying nucleosome dynamics via the diffusion map", J. Chem. Phys., 150, 054902 (2019). [doi:10.1063/1.5063851]

[5] **Guo, A.Z.**, Fluitt, A.M., de Pablo, J.J., "Early-stage Human Islet Amyloid Polypeptide Aggregation: Mechanisms Behind Dimer Formation", J. Chem. Phys., 149, 025101 (2018). [doi:10.1063/1.5033458]

[4] **Guo, A.Z.***, Sevgen, E.*, Sidky, H., Whitmer, J.K., Hubbell, J.A., de Pablo, J.J., "Adaptive enhanced sampling by force-biasing using neural networks", J. Chem. Phys., 148, 134108 (2018). [doi:10.1063/1.5020733]

[3] Sidky, H., Colón, Y.J., Helfferich, J., Sikora, B.J., Bezik, C., Chu, W., Giberti, F., **Guo, A.Z.**, Jiang, X., Lequieu, J., Li, J., Moller, J., Quevillon, M.J., Rahimi, M., Ramezani-Dakhel, H., Rathee, V.S., Reid, D.R., Sevgen, E., Thapar, V., Webb, M.A., Whitmer, J.K., de Pablo, J.J., "SSAGES: Software Suite for Advanced General Ensemble Simulations", J. Chem. Phys., 148, 044104 (2018).

[doi:10.1063/1.5008853]
[2] Sadati, M., Zhou, Y., Melchert, D., **Guo, A.**, Martinez-Gonzalez, J.A., Roberts, T.F., Zhang, R., de Pablo, J.J., "Spherical nematic shell with prolate ellipsoidal core", Soft Matter, 13, 7465-7472 (2017). [doi:10.1039/C7SM01403A]
[1] Zhou, Y., **Guo, A.**, Zhang, R., Armas-Perez, J.C., Martinez-González, J.A., Rahimi, M., Sadati, M., de Pablo, J.J., "Mesoscale structure of chiral nematic shells", Soft Matter, 12, 8983-8989 (2016). [doi:10.1039/c6sm01284a]

## Invited Presentations

[11] A Data- and Information-driven Approach for Computational Soft Materials Design, 2025
*First Annual Rutgers Chemical Physics Symposium, Rutgers University–Newark*

[10] A Data- and Information-driven Approach for Computational Soft Materials Design, 2025
*ACS Middle Atlantic Regional Meeting (MARM), Seton Hall University*

[9] A Data- and Information-driven Approach for Computational Soft Materials Design, 2025
*University of Texas at San Antonio, Dept. of Physics and Astronomy Seminar*

[8] An Information-driven Approach to Quantifying and Controlling Emergent Order, 2023
*University of British Columbia Dept. of Chemical and Biological Engineering Seminar*

[7] An Information-driven Approach to Quantifying and Controlling Emergent Order, 2023
*Rensselaer Polytechnic Institute Dept. of Chemical and Biological Engineering Seminar*

[6] An Information-driven Approach to Quantifying and Controlling Emergent Order, 2023
*Rutgers University Department of Chemical and Biochemical Engineering Seminar*

[5] An Information-driven Approach to Quantifying and Controlling Emergent Order, 2023
*University of Washington Department of Chemical Engineering Seminar*

[4] An Information-driven Approach to Quantifying and Controlling Emergent Order, 2023
*UMass Amherst Department of Polymer Science and Engineering Seminar*

[3] An Information-driven Approach to Quantifying and Controlling Emergent Order, 2022
*Statistical Thermodynamics and Molecular Simulations Seminar Series, Virtual*

[2]] An Information-driven Approach to Quantifying and Controlling Emergent Order, 2022
*University of Washington Distinguished Young Scholars Seminar*

[1] Understanding Nucleosome Dynamics using Diffusion Maps, 2019
*D.E. Shaw Research, New York NY*

## Contributed Presentations

[21] An Information-Theoretic Approach for Probing Macromolecular Phase Separation Via Data Compression. *AIChE Annual Meeting, San Diego CA* (Oral) 2024

[20] A Data- and Information-Driven Approach for Computational Soft Materials Design. *FOMMS, Snowbird UT* (Poster) 2024

[19] Random Close Packing is least random in 3D, 2023
*APS March Meeting, Las Vegas NV* (Oral)

[18] An Information-Driven Approach to Quantifying and Controlling Emergent Order. *AIChE Annual Meeting, Phoenix AZ* (Oral) 2022

[17] An Information-Driven Approach for Controlling Emergent Order in Soft Materials. *AIChE Annual Meeting, Phoenix AZ* (Poster) 2022

[16] An Information-driven Approach to Quantifying and Controlling Emergent Order. *Univ. of Washington Distinguished Young Scholars Seminar* (Oral) 2022

[15] Higher Dimensional Biased Random Organization 2022
*APS March Meeting, Chicago IL* (Oral)

[14] Characterizing phase transitions in 2D Repulsive Random Organization 2021
*APS March Meeting, Virtual Talk* (Oral)

[13] Identifying Trimerization Mechanisms of Human Islet Amyloid Polypeptide through Molecular Simulation. *APS March Meeting, Boston MA.* (Oral) 2019

[12] Nonlinear Manifold Learning of Nucleosome Dynamics from Molecular Simulation 2018
*AIChE Annual Meeting, Pittsburgh PA.* (Oral)

[11] Human Islet Amyloid Polypeptide: Identifying Early-Stage Aggregation Mechanisms through Molecular Simulation. *EQUIFASE 2018, Córdoba, Argentina.* (Oral) 2018

[10] Understanding Nucleosome Dynamics using Diffusion Maps *Frontiers of Molecular Engineering, Chicago IL* (Poster, Best Poster Award) 2018

[9] Understanding Nucleosome Dynamics using Diffusion Maps *Mind Bytes Symposium, University of Chicago Research Computing Center* (Poster) 2018

[8] Human Islet Amyloid Polypeptide: Identifying Early-Stage Aggregation Mechanisms through Molecular Simulation. *Mind Bytes Symposium, University of Chicago* (Poster) 2018

[7] Extracting collective motions underlying nucleosome dynamics via nonlinear manifold learning. *APS March Meeting, Los Angeles CA.* (Oral) 2018

[6] Human Islet Amyloid Polypeptide: Identifying Early-Stage Aggregation Mechanisms through Molecular Simulation. *Biophysical Society, San Francisco CA.* (Poster) 2018

[5] Human Islet Amyloid Polypeptide: Identifying Early-Stage Aggregation Mechanisms through Molecular Simulation. *AIChE Annual Meeting, Minneapolis MN.* (Oral) 2017

[4] Amyloidogenic Proteins: Identifying Early-stage Aggregation Mechanisms. *Mind Bytes Symposium, University of Chicago* (Poster) 2017

[3] Early-Stage Aggregation of Human Islet Amyloid Polypeptide. *APS March Meeting, New Orleans LA.* (Oral) 2017

[2] Characterization of Self-associating and Complementary Polymers used to Control Fuel Misting. *Summer Undergraduate Research Fellowship Seminar, Caltech* (Oral) 2012

[1] Design of a Program for Shear Induced Polymer Crystallization Control. *Summer Undergraduate Research Fellowship Seminar, Caltech* (Oral) 2011

## Teaching

**Guest Lecturer**, 16:155:605 Teaching in the Engineering Curriculum, Rutgers-NB — Spring 2025

**Instructor**, 14:155:307 Computational Methods in ChE, Rutgers-NB — Spring 2024, Spring 2025

**Guest Lecturer**, 14:155:555 Advanced Materials in ChE, Rutgers-NB — Spring 2024

**Instructor**, 14:155:309 ChE Thermodynamics II, Rutgers-NB — Fall 2023

**Chicago Center for Teaching Fellow**, UChicago — 2018–2019

**Co-Instructor**, Enhanced Sampling for Molecular Simulations Tutorial — July 2017
Midwest Integrated Center for Computational Materials Summer School

**Teaching Assistant**, Collegiate Scholars Program — Summer 2016
Introduction to Engineering Laboratory, UChicago

**Teaching Assistant**, MENG 27300/32500: Polymer Physics & — Autumn 2015
Engineering, UChicago

**Dean's Tutor**, Ch 21b: Physical Chemistry, Caltech — 2014

**Teaching Assistant**, Ch 3x: Experimental Methods in Solar Energy — 2013, 2014
Conversion, Caltech (Supported by Howard Hughes Medical Institute in 2014)

## Service & Outreach

**Founding Instructor**, Rutgers Honors Engineering Experience — 2024–

**OXE Honor Society Faculty Advisor**, Rutgers-NB — 2023–

**CBE Graduate Student Organization Faculty Advisor**, Rutgers-NB — 2023–

**Junior Science Café Instructor**, Museum of Science and Industry, Chicago IL — June 2017

**Volunteer Instructor**, Girls in Engineering and Math, Fermilab — Feb 2016

**Education Programs and Outreach Volunteer**, Argonne National Laboratory — 2016

**Rutgers CBE Thesis Committees:**
Lingjun Lu (Androulakis), Shivam Parashar (Neimark), Jinwoong Nam (Celik),
Nicholas Corrente (Neimark), Haider Ejaz (Celik), Carlin Leung (Glasser)
Austin Seamann (Khare/Chundawat), Yiwei Shao (Dutt), Hongnan Hu (Tsilomelekis)

**External Thesis Committees:**
Aldo Vasquez (Ramirez-Hernandez, UT San Antonio Physics),

Atul Thakur (Remsing, Rutgers CCB), Carlos Marquez Ibarra (Mayer, UT San Antonio Physics)

Students Mentored

**Mansi Gokani** (PhD student at Rutgers-NB)
**Benjamin Borow** (PhD student at Rutgers-NB)
**Samiyah Siddiqui** (PhD student at Rutgers-NB)
**Kaelyn Chang** (MS student at Rutgers-NB)
**Brianna Fea** (UG student at Rutgers-NB, Aresty RA)
**Jean Chen** (UG student at Rutgers-NB, Aresty RA)
**Julietta Straviou** (UG student at Georgia Tech, visiting summer researcher)
**Chuting Deng** (PhD student at University of Chicago → Postdoc at Northwestern University)
**Gabriela Basel** (UG student at University of Chicago → PhD student at Stanford)
**Drew Melchert** (UG student at University of Chicago → PhD student at UCSB)