

# Vida Jamali

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## Academic Position

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### Georgia Institute of Technology

Aug 2022-present

School of Chemical and Biomolecular Engineering, *Assistant Professor and Spencer Faculty Fellow*  
Institute for Matter and Systems, *Affiliated Faculty*  
Institute for Data Engineering and Science, *Affiliated Faculty*  
Institute for BioEngineering and Biosciences, *Affiliated Faculty*  
Machine learning PhD Program, *Program Faculty*  
Bioengineering PhD Program, *Program Faculty*

### University of California, Berkeley

Dec 2017-Aug 2022

Department of Chemistry, Kavli Energy NanoScience Institute, Postdoctoral Researcher  
Advisor: **A. Paul Alivisatos and Kranthi Mandadapu**

## Education

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### Rice University, Houston, TX

2017

Ph.D. in Chemical and Biomolecular Engineering

Advisor: **Matteo Pasquali**

Thesis: Morphology of Carbon Nanotube Liquid Crystalline Solutions: Insights into Tactoids and Columnar Phase

Committee: Paul van der Schoot, S. Lisa Biswal, Fred C. MacKintosh

### Sharif University of Technology, Tehran, Iran

2011

B.Sc. in Chemical Engineering

## Honors and Awards

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Beckman Young Investigator Award Finalist (2025)

NSF CAREER Award (2024)

ACS Petroleum Research Fund, Doctoral New Investigator Award (2023)

Scialog Fellow, Automating Chemical Labs, Research Corporation for Science Advancement (2023)

AI for Chemical and Materials Discovery Initiative Lead, Georgia Tech (2023)

35 Voices of Chemistry of Materials (2023)

Rising Stars in Soft and Biological Matter, selected by the University of Chicago MRSEC (2021)

Berkeley Postdoctoral Association Professional Development Award (2021)

AIChE Women In Chemical Engineering Travel Award (2020)

Princeton University and University of Delaware Future Faculty in Soft Matter Workshop (2019)

American Chemical Society P2F Future Faculty Scholar (2019)

Society of Rheology Student Travel Award (2017)

Active and Smart Matter Conference Travel Award (2016)

Smalley-Curl Institute Travel Award (2016): Annual SCI Transdisciplinary Symposium

Society of Iranian-American Women for Education (SIAWE) Scholarship (2016)

ConocoPhillips Endowed Scholarship (2014)

Phi Lambda Upsilon Honor Society (2014)

NASA Space Health Innovation Challenge hackathon Finalist (2013): Awarded and organized by NASA

Ignite Silicon Valley Trek Travel Award (2013): Rice Alliance for Technology and Entrepreneurship

Best Teaching Assistant Award (2012): Department of Chemical and Biomolecular engineering

Screech Elevator Pitch Competition People's Choice Award (2012): Rice Center for Engineering Leadership

## Publications (\* denotes equal contribution, † denotes corresponding author)

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- Shabeeb, Z.\*, Saeedi, D.\*, Tsui, D.\*, **Jamali, V.**†, Aghazadeh, A.†, “cryoSENSE: Compressive Sensing Enables High-throughput Microscopy with Sparse and Generative Priors on the Protein Cryo-EM Image Manifold”. *arXiv:2511.12931* (2025).
  - Housley S., N.†, Bourque, A.R., Matyunina, L.V., Panicker, I.A., Schrader Echeverri, E., Izykowicz, M., Herrmann, O.A., Lee, S., Arboleda, J.C., **Jamali, V.**, McDonald, J.F., Dahlman, J. E., Finn, M.G., “Tumor Agnostic Drug Delivery with Dynamic Nanohydrogels”. *Nature Communications* (2025), *In print*.
  - Shabeeb, Z., Goyal, N., Attah Nantogmah, P., **Jamali, V.**†, “Learning the Diffusion of Nanoparticles in Liquid Phase TEM via a Physics-informed Generative AI”. *Nature Communications*, 16, 6298 (2025).
  - Shabeeb, Z., **Jamali, V.**†, “LEONARDO: A Physics-Informed Generative Model for Stochastic Nanoparticle Dynamics in Liquid-Phase TEM”. *Neural Information Processing Systems, AI for Science Workshop* (2025).
  - Wang\*, A., Xu\*, M., Goel, R., Shabeeb, Z., Panicker, I. A., **Jamali, V.**†, “SAM-EM: Real-Time Segmentation for Automated Liquid Phase Transmission Electron Microscopy”, *Neural Information Processing Systems, AI for Accelerated Materials Design Workshop* (2025).
  - Panicker I.A., Shabeeb, Z., Hargus, C., **Jamali, V.**†, “Modulating Nanoparticle-Surface Interactions at Liquid-Solid Interfaces via Ion Screening in Liquid-Phase TEM”. *ChemRxiv* (2025), *Under Review*.
  - Shabeeb, Z., Goyal, N., Attah Nantogmah, P. **Jamali, V.**†, “Learning the Physics of Liquid Phase TEM Nanoparticle Trajectories Using Physics-Informed Generative AI”. *Microscopy and Microanalysis* 30, S1, 1724 (2024).
  - Shabeeb, Z., Goyal, N., **Jamali, V.**†, “Determining Diffusion Characteristics of Nanoparticles in Liquid Phase TEM Using Deep Learning”. *Microscopy and Microanalysis* 30, S1, 2074 (2024).
  - **Jamali, V.**†, Alivisatos, A. P.†, “Studying Diffusion of Colloidal Nanoparticles in Solution Using Liquid Phase TEM and Machine Learning”. *Microscopy and Microanalysis* 28, 142 - 143 (2022).
  - Moreno-Hernandez, I. A.\*, Crook, M. F.\*, **Jamali, V.\***, Alivisatos, A. P., “Recent advances in the study of colloidal nanocrystals enabled by in situ liquid phase transmission electron microscopy”. *MRS Bulletin* 47, (2022).
  - Abbas, A., Vargo, E., **Jamali, V.**, Ercius, P., Pieters, P., Brinn, R., Ben-Moshe, A., Cho, M., Xu, T., Alivisatos, A. P. “Observation of an Orientational Glass in a Superlattice of Elliptically-Faceted CdSe Nanocrystals”. *ACS Nano* (2022).
  - **Jamali, V.**, Hargus, C., Ben Moshe A., Aghazadeh, A., Ha, H. D., Mandadapu, K. K., Alivisatos, A. P. “Deep Learning-assisted Liquid Cell Electron Microscopy Reveals the Nature of Anomalous Diffusion of Nanoparticles Near the Surface”. *Proceedings of National Academy of Sciences (PNAS)* 118 (10) (2021).
  - **Jamali, V.**, Mirri, F., Biggers, E. G., Pinnick, R.A., Liberman, L., Cohen, Y., Talmon, Y., MacKintosh F., van der Schoot, P., Pasquali, M. “Enhanced ordering in length-polydisperse carbon nanotube solutions at high concentrations as revealed by the small angle X-ray scattering”. *Soft Matter* 17, 5122-5130 (2021).  
*Featured on the front cover of Soft Matter, Issue 20.*
  - Cho, H., Moreno-Hernandez, I., **Jamali, V.**, Oh, M., Alivisatos, A. P. “In situ quantification of interactions between charged nanorods in a predefined potential energy landscape”. *Nano Letters* 21 (1), 628-633 (2021).
  - **Jamali, V.\***, Niroui, F.\*, Taylor, L. W., Dewey, O. S., Koscher, B. A., Pasquali, M., Alivisatos, A. P. “Perovskite-Carbon Nanotube Light Emitting Fibers”. *Nano Letters* 20 (5), 3178-3184 (2020).
  - Liberman, L., **Jamali, V.**, Pasquali, M., Talmon, Y. “The effect of carbon nanotube diameter and stiffness on their phase behavior in crowded solutions”. *Langmuir* 36 (1), 242-249 (2020).
  - Mirri, F.\*, Ashkar, R.\*, **Jamali, V.**, Liberman, L., Pinnick, R., Talmon, Y., van der Schoot, P., Butler, P., Pasquali, M. “Quantification of carbon nanotube liquid crystal morphology via neutron scattering”. *Macromolecules* 51 (17), 6892-6900 (2018).
  - Maillaud, L., Headrick, R. J., **Jamali, V.**, Maillaud, J., Tsentalovich, D., Neri, W., Bengio, E. A., Mirri, F., Kleinerman, O., Talmon, Y., Poulin, P., and Pasquali, M., “Flexible and conductive fibers made from highly concentrated aqueous dispersions of carbon nanotubes”. *Industrial and Engineering Chemistry Research* 57 (10), 3554-3560 (2018).

- Tran, T. Q., Headrick, R. J., Bengio, E. A., Myint, S. M., Khoshnevis, H., **Jamali, V.**, Duong, H. M., Pasquali, M. “Purification and dissolution of carbon nanotube fibers spun from floating catalyst method”. *ACS Materials and Interfaces* 9 (42), 37112-37119 (2017).
- **Jamali, V.**, Biggers, E., van der Schoot, P., Pasquali, M. “Line tension of twist-free carbon nanotube lyotropic liquid crystal microdroplets on solid surfaces”. *Langmuir* 33 (36), 9115-9121 (2017).
- Jiang, C., Peng, Z., de los Reyes, C., Young, C. C., Tsentelovich, D., **Jamali, V.**, Ajayan, P. M., Tour, J. M., Pasquali, M., and Marti A. A., “Increased solubility and fiber spinning of graphenide dispersions aided by crown-ethers”. *Chemical Communications* 53 (9), 1498-1501 (2016).
- **Jamali, V.\***, Behabtu, N.\*, Senyuk, B., Lee J. A. Smalyukh, I., van der Schoot, P., Pasquali, M. “Experimental realization of crossover in shape and director field of nematic tactoids”. *Physical Review E* 91 (4), 042507 (2015).

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## Manuscripts In Preparation

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- Requejo Roque, K., Cañari-Chumpitaz, C., **Jamali, V.**, Ruiz, R., Alivisatos, A. P., Bustamante, C. “Quantifying photochemical propulsion in light-powered Janus micromotors”. Submitted-Draft available upon request.

## Patents

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Alivisatos A.P., Niroui, F., Jamali, V., Pasquali M., “Light emitting fibers”, USSN 62/714,561  
 Alivisatos A.P., Jamali, V., “Processing method for fabricating perovskite-carbon nanotube fibers and devices”, USSN 62/958,394

## Selected Talks and Presentations

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AI-Driven Electron Microscopy for Visualizing Nanoscale Dynamics in Liquid (Invited) University of California, Santa Barbara, CA.	Dec 2025
AI for Anomalous Diffusion: From Classification to Generative Modeling of Stochastic Transport at the Nanoscale Potsdam University, Potsdam, Germany (Invited, Virtual).	Oct 2025
Liquid phase transmission electron microscopy for investigating multiscale dynamics of biomolecular systems 1st SouthEast Amyloid-CONDensate (SEACON) symposium, Ocean Springs, MS.	Aug 2025
AI-enabled single particle tracking in liquid-phase transmission electron microscopy ACS Colloid & Surface Science Symposium, Alberta, Canada.	Jun 2025
Imaging, Learning, and Engineering of Nanoscale Dynamics via Liquid Phase TEM (Invited) MRS Spring Meeting, Seattle, WA.	Apr 2025
Learning the Diffusion of Nanoparticles in Liquid Phase TEM Using Physics-Informed Generative AI AIChE Fall Meeting, San Diego, CA.	Oct 2024
Imaging, Learning, and Engineering of Nanoparticles' Dynamics using Liquid Phase Transmission Electron Microscopy Institute for Electronics and Nanotechnology, Georgia Tech, Atlanta, GA.	Mar 2024
Deep generative neural networks for learning the dynamics of nanoparticles in liquid phase electron microscopy APS March Meeting, Minneapolis, MN.	Mar 2024
Imaging, learning, and engineering of nanoparticles' dynamics using liquid phase TEM (Invited) Institute for Electronics and Nanotechnology, Georgia Tech, Atlanta, GA.	Mar 2024
Using deep learning to elucidate the dynamics of nanoparticles in liquid phase TEM (Invited) International Microscopy Congress IMC20, Busan, Korea.	Sep 2023

Deep Learning-Assisted Analysis of Anomalous Nanoparticle Surface Diffusion in Liquid Phase TEM (Invited) 2023 Institute for Materials Symposium on Materials Innovations, Atlanta, GA.	Mar 2023
Deep Learning-Assisted Analysis of Anomalous Nanoparticle Surface Diffusion in Liquid Phase TEM (Invited) CCMST, Machine Learning in Chemistry Seminar, GeorgiaTech, Atlanta, GA.	Mar 2023
Deep Learning-Assisted Analysis of Anomalous Nanoparticle Surface Diffusion in Liquid Phase TEM (Invited) LPTEM Gordon Research Conference, Ventura, CA.	Oct 2022
Studying diffusion of colloidal nanoparticles in solution using liquid phase TEM and machine learning (Invited) Microscopy and Microanalysis Conference, Portland, OR.	Aug 2022
Imaging, learning, and engineering of soft matter systems at the nanoscale (Invited) University of Southern California, Department of Chemical Engineering and Materials Science, Los Angeles, CA.	Mar 2022
Massachusetts Institute of Technology, Department of Chemical Engineering, Cambridge, MA.	Feb 2022
Brandeis University, MRSEC, Waltham, MA.	Feb 2022
University of Minnesota, Department of Chemical Engineering and Materials Science, Minneapolis, MN.	Feb 2022
University of Wisconsin-Madison, Department of Chemistry, Madison, WI.	Feb 2022
University of California, Los Angeles, Department of Chemistry and Biochemistry, Los Angeles, CA.	Feb 2022
Yale University, Department of Chemical and Environmental Engineering, New Haven, NH.	Feb 2022
Cornell University, Department of Chemistry and Chemical Biology, Ithaca, NY.	Jan 2022
Princeton University, Department of Chemical and Biological Engineering, Princeton, NJ.	Jan 2022
Georgia Institute of Technology, School of Chemical and Biomolecular Engineering, Atlanta, GA.	Jan 2022
University of California, Berkeley, Kavli Energy NanoScience Institute, Berkeley, CA.	Dec 2021
Deep Learning-Assisted Analysis of Anomalous Nanoparticle Surface Diffusion in Liquid Phase TEM AIChE Annual Meeting, Boston, MA.	Nov 2021
Imaging, learning, and engineering of complex soft matter systems at the nanoscale Rising Stars in Soft and Biological Matter Symposium, University of Chicago MRSEC (virtual).	Sep 2021
Deep learning-assisted analysis of anomalous nanoparticle surface diffusion in liquid phase TEM (invited) University of California Berkeley, Nano Seminar Series, Berkeley, CA.	Sep 2021
Imaging, learning, and engineering of complex soft matter systems at the nanoscale (Invited) Seagate Normandale AI/ML Distinguished Seminar Series, Bloomington, MN (virtual).	Jul 2021
Deep learning-assisted analysis of anomalous nanoparticle surface diffusion in liquid phase TEM ACS Colloid & Surface Science Symposium (virtual).	Jun 2021
Imaging, learning, and engineering of complex soft matter systems at the nanoscale Department of Chemical and Biomolecular Engineering, Johns Hopkins University, MD (virtual).	Feb 2021
Department of Chemical Engineering, Texas A&M University, TX (virtual).	Feb 2021
Department of Chemical and Biomolecular Engineering, University of Notre Dame, IN (virtual).	Jan 2021
Deep learning-assisted analysis of anomalous nanoparticle diffusion near the liquid cell surface reveals the effect of electron beam dose rate in TEM AIChE Annual Meeting, Boston, MA.	Nov 2021
Deep learning-assisted analysis of anomalous nanoparticle diffusion near the liquid cell surface reveals the effect of electron beam dose rate in TEM APS March Meeting (virtual).	Mar 2021
In-situ liquid phase electron microscopy for studying the dynamics of colloidal nanoparticles at the nanoscale AIChE Annual Meeting, San Francisco, CA (virtual, available online).	Nov 2020
From nanoscale building blocks to functional fibers AIChE Annual Meeting, Orlando, FL.	Nov 2019

From carbon nanotube liquid crystalline solutions to functional fibers (Invited) Department of Materials Science and Engineering, Cornell University, Ithaca, NY. Department of Physics, Physics of Living Systems, MIT, Cambridge, MA.	Feb 2019 Nov 2018
Colloidally synthesized nanomaterials as building blocks for functional fibers MRS Fall Meeting, Boston, MA.	Nov 2018
From carbon nanotube liquid crystalline solutions to functional fibers AIChE Annual Meeting, Pittsburgh, PA.	Oct 2018
Morphology of carbon nanotube liquid crystalline phases: insight into tactoids and columnar phase (Invited) APS March Meeting, Los Angeles, CA.	Mar 2018
A hexagonal columnar liquid crystal phase formation in dilute solutions of carbon nanotubes AIChE Annual Meeting, Minneapolis, MN.	Oct 2017
Phase behavior and morphology of carbon nanotube liquid crystal solutions 88th Society of Rheology Conference, Tampa, FL.	Feb 2017
Phase behavior and morphology of carbon nanotube liquid crystal solutions (Invited) Lewis-Sigler Integrative Genome Institute, Biophysics group, Princeton, NJ.	Feb 2017
Morphology of carbon nanotube liquid crystal solutions AIChE Annual Meeting, San Francisco, CA.	Nov 2016
Wetting behavior, shape, and morphology of sessile lyotropic liquid crystal microdroplets ACS Colloid & Surface Science Symposium, Harvard University, Cambridge, MA.	Jun 2016
Wetting behavior, shape, and morphology of sessile lyotropic liquid crystal microdroplets (Poster) Active and Smart Matter Conference, Syracuse University, Syracuse, NY.	Jun 2016
Experimental realization of crossover in shape and director field of nematic tactoids (Poster) Soft Condensed Matter Physics Gordon Research Conference, New London, NH	Aug 2015
Experimental realization of crossover in shape and director field of nematic tactoids ACS Colloid & Surface Science Symposium, Carnegie Mellon University, Pittsburgh, PA.	Jun 2015

## Graduate Research Trainees

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Zain Shabeeb, PhD Candidate, Georgia Institute of Technology CHBE	2022-present
Isabel Panicker, PhD Student, Georgia Institute of Technology CHBE	2023-present
Brian Chettle, PhD Student, Georgia Institute of Technology CHBE	2024-present
Yuling Zheng, PhD Student, Georgia Institute of Technology BioE	2025-present

## Undergraduate Research Trainees

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Diya Mahesh, Georgia Tech CHBE	2025-present
Riya Patel, Georgia Tech CHBE	2025-present
Anika Patel, Georgia Tech CS	2025-present
Siddarth Sreeram, Georgia Tech CE	2025-present
Madison Tat, Georgia Tech, CHBE, Presidential Undergraduate Research Awardee	2025-present
Alexander Wang, Georgia Tech CS	2025
Max Xu, Georgia Tech CS	2025
Lauren Caldwell, Georgia Tech CHBE	2024-present
Isabella Fianco, Georgia Tech CHBE	2024-2025

Cecilia Reed, Georgia Tech CHBE	2023-2025
Laurence Lines, Georgia Tech CHBE	2024-2025
Risha Goel, Georgia Tech CHBE, Presidential Undergraduate Research Awardee	2024-2025
Naisargi Goyal, Georgia Tech CHBE, Presidential Undergraduate Research Awardee	2022-2024
Gabriel Joaquim Sampaio De Almeida, Georgia Tech CHBE	2023
Arko Roy, Georgia Tech CHBE	2023
Tanner Yamada, University of California, Berkeley CBE	2018-2019
Evan Biggers, Rice University CHBE	2016-2017
Miranda Mittleman, Rice University, High School Summer Intern	Summer 2017
Samuel Quitzau, Rice University NSF-REU Program	2016-2017

## Teaching Experience

<i>Instructor:</i> AI in ChBE Experimentalists (Exp-AI) (CHBE 4803/6803)	Spring 2025
Georgia Institute of Technology	
<i>Instructor:</i> Fluid Mechanics (CHBE 3205)	Spring 2024, Fall 2024, Fall 2025
Georgia Institute of Technology	
<i>Instructor:</i> Transport Phenomena (CHBE 3200)	Fall 2022, Fall 2023
Georgia Institute of Technology	
<i>Dean's Teaching Assistant:</i> Thermodynamics I (CHBE 411)	Fall 2014
Rice University	
<i>Teaching Assistant:</i> Colloidal & Interfacial Phenomena (CHBE 560)	Spring 2014
Rice University	
<i>Teaching Assistant:</i> Transport Phenomena I (CHBE 401)	Fall 2012
Rice University	
<i>Teaching Assistant:</i> Chemical Engineering Lab II (CHBE 433)	Fall 2011
Rice University	

## Press

<b>Phys.org:</b> New AI Tool Deciphers Mysteries of Nanoparticle Motion in Liquid Environments (07/15/2025)
<b>Georgia Tech:</b> New AI Tool Deciphers Mysteries of Nanoparticle Motion in Liquid Environments (07/11/2025)
<b>Rice University:</b> Molecular jiggling has implications for carbon nanotube fibers (05/31/2021)
<b>Phys.org:</b> Molecular jiggling has implications for carbon nanotube fibers (05/31/2021)
<b>Phys.org:</b> Researchers advance characterization, purification of nanotube wires and films (10/16/2017)
<b>EurekaAlert:</b> Long nanotubes make strong fibers (10/16/2017)
<b>MaterialsToday:</b> Scientists explore ways to produce high-quality fibers from carbon nanotubes (11/10/2017)

## Service to Scientific Community

<b>Panelist</b> , NextProf Nexus Program, Preparing the next generation of scientific and technological leaders, AICHE GT chapter, Women in ChemE	2023
<b>Guest Editor</b> , Journal of Visualized Experiments	2022-present
<b>Peer Review</b> <i>Science, Science Advances, ACS Applied Electronic Materials, Journal of Rheology, ACS Nano, Nanoscale Soft Matter, Physical Chemistry Chemical Physics, PRX Life, PRE, Neurips AI4Mat, ICML AI4Mat</i>	
<b>Review Panel</b> , NSF CAREER, CBET, Bioimaging and Biophotonics Programs	
Facility Advisory Committee, Institute for Matter and Systems, Georgia Tech, Atlanta, GA	2024-present
Faculty Search Committee, School of ChBE, Georgia Tech	2025-present
Seminar Organization Committee, School of ChBE, Georgia Tech	2022-2025
Graduate Admission Committee, School of ChBE, Georgia Tech	2024-2025
Graduate Recruitment Committee, School of ChBE, Georgia Tech	2022-2024
Session Organizer and Chair, AICHE Fall meeting, Nanoscale Science and Engineering Forum	2024, 2025
Symposium Organizer, Southeast Soft Matter Day Symposium, Atlanta, GA	2024

Undergraduate Faculty Advisor, Sophomores, Georgia Tech CHBE	2023-present
BioE Day Thesis Competition Judge, Georgia Tech	2023
Workshop presenter, STEM GEM, Atlanta, GA	2023
Postdoc representative, Chemistry Graduate Life Committee, UC Berkeley, CA	2019-2020
Authorized superuser, Alivisatos lab small angle X-ray scattering facility	2018-2022
Session co-chair, AIChE Conference	2017
Recitation chair, CHBE graduate student association, Rice University	2013-2014
Workshop presenter, Sally Ride Science Festival for Girls, Houston, TX	2012 & 2013