Thi D. Vo

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Assistant Professor | Chemical and Biomolecular Engineering
Whiting School of Engineering
Johns Hopkins University

Education and Training

University	Degree	Advisor	Graduation Year
Columbia University	MS, PhD Chemical Engineering	Sanat K. Kumar	October 2017
Rice University	BS, Chemical Engineering BS, Biochemistry and Cell Biology	Walter G. Chapman	May 2012

Professional Experience

University	Position	Duration
University of Michigan – Ann Arbor	Postdoctoral Research Fellow Advisor: Sharon C. Glotzer	October 2017 - June 2022

Mentoring and Teachings

Assistant Professor (Johns Hopkins University, July 2022 – present):

- *Transport Phenomena I*: Fall 2022
- *Kinetic Processes*: Spring 2023
- *Thermodynamics and Statistical Mechanics*: Fall 2023
- *Polymer Physics*: Spring 2024

Undergraduate and Graduate Student Mentoring:

- Kireeti Akkunuri: Chemical and Biomolecular Engineering, Johns Hopkins University, 2nd year PhD student
- Ranjitha R: Chemical and Biomolecular Engineering, Johns Hopkins University, 2nd year PhD student
- Emily Yao: Materials Science and Engineering, Johns Hopkins University, 4th year undergraduate student
- Jarret Ren: Chemical and Biomolecular Engineering, Johns Hopkins University, 3rd year undergraduate student
- Noah Medina: Chemical and Biomolecular Engineering, Johns Hopkins University, 2nd year undergraduate student
- Cole Jefferson: Chemical and Biomolecular Engineering, Johns Hopkins University, 2nd year undergraduate student
- Prasi Thapa: Chemical and Biomolecular Engineering, Johns Hopkins University, 2nd year undergraduate student
- Brandon Chang: Biomedical Engineering, Johns Hopkins University, 1st year undergraduate student

Current Funding and Support

Air Force Office of Scientific Research (AFOSR) Young Investigator Award – **Lead PI**: Thi Vo
"Synthetic-Biological LEGOs – Designing Versatile Nanoscale Synthons for Self-Assembly" June 2024 - May 2027

Ralph E. Powe Junior Faculty Enhancement Award – **Lead PI**: Thi Vo
"Supramolecular Engineering – First Principles Driven Sequence Design of Hybrid Polymers" June 2023 - May 2024

NSF - Macromolecular, Supramolecular, and Nanochemistry – **Co-PIs**: Thi Vo, Honggang Cui
"Entropically Constrained Self-Limiting Supramolecular Polymerization" July 2024 - June 2027

Awards and Honors

Air Force Office of Scientific Research (AFOSR) Young Investigator Award (2023)

Ralph E. Powe Junior Faculty Enhancement Award (2022)

Institute for Data Intensive Engineering and Science Faculty Fellow, JHU (2022 - present)

National Science Foundation Graduate Fellow (2014 - 2017)

Dwaine E. Rivers Scholarship (2010)

Rice University Class of 1930 Scholarship (2008 - 2012)

Publications

[* denotes corresponding author, # denotes equal contribution]

At Johns Hopkins University

Published/Accepted

1. Paul M. Kuhn[#], Gabriella C. Russo[#], Ashleigh J. Crawford, Aditya Venkatraman, Nanlan Yang, Bartholomew A. Starich, Zachary Schneiderman, Pei-Hsun Wu, Thi Vo*, Denis Wirtz*, Efrosini Kokkoli*. "Local, sustained and targeted co-delivery of MEK inhibitor and doxorubicin inhibits tumor progression in E-cadherin positive breast cancer." **Journal of Controlled Release**, 2024, 16.
2. Thi Vo*. "Theory and Simulation of Ligand Functionalized Nanoparticles - A Pedagogical Review." **Soft Matter**, 2024, 20. [Emerging Investigator Series]
3. Thi Vo*. "Patchy nanoparticles with surface complexity for directed self-assembly." **MRS Bulletin**, 2024, *49*.
4. Ahyoung Kim, Kireeti Akkunuri, Chang Qian, Lehan Yao, Kai Sun, Zi Chen, Thi Vo*, Qian Chen*. "Direct Imaging of "Patch-Clasping" and Relaxation in Robust and Flexible Nanoparticle Assemblies." **ACS Nano**, 2024, *18*.
5. Thi Vo*. "A general strategy for designing complex brush architecture using star-like polymeric grafts." **AIChE Journal**, 2023, *12*. [AIChE Early Career Series]
6. Xiangyu Chen, Thi Vo*, Paulette Clancy*. "A multiscale approach to uncover the self-assembly of ligand-covered palladium nanocubes." **Soft Matter**, 2023, *19*.
7. Sophia Y. Chan, Mayank Jhalaria, Yucheng Huang, Ruipeng Li, Brian C. Benicewicz, Christopher J. Durning, Thi Vo*, Sanat K. Kumar*. "Local structure of polymer-grafted nanoparticle melts." **ACS Nano**, 2022, *16*.

During Postdoc and Graduate Training

1. Emanuele Marino[#], Thi Vo[#], Daniel J. Rosen, Steven J. Neuhaus, Alice Sciortino, Harshit Baharti, Austin W. Keller, Cherie R. Kagan, Marco Cannas, Fabrizio Messina, Sharon C. Glotzer*, and Christoper B. Murray*. "Porous Magneto-Flourescent Superparticles by Rapid Emulsion Densification," **Chemistry of Materials**, 2024, *36*.
2. Wenjie Zhou, Yuanwei Li, Kwanghwi Je, Thi Vo, Haixin Liu, Benjamin E. Partridge, Ziyin Huang, Sharon C. Glotzer*, and Chad A. Mirkin*. "Space-Tiled Colloidal Crystals from DNA-Forced Shape-Complementary Polyhedra-Pairing Interactions," **Science**, 2024, *383*.
3. Sangmin Lee, Thi Vo, Sharon C. Glotzer*. "Entropy compartmentalization stabilizes open host-guest colloidal clathrates." **Nature Chemistry**, 2023, *15*. [cover article]
4. Prashant Kumar, Thi Vo, Minjeong Cha, Anastasia Visheratina, Ji-Young Kim, Wenqian Xu, Jonathan Schwartz, Alexander Simon, Daniel Katz, Emanuele Marino, Won Jin Choi, Si Chen, Christopher Murray, Robert Hovden, Sharon Glotzer*, Nicholas A. Kotov*. "Photonically active bowtie nanoassemblies with chirality continuum." **Nature**, 2023, *615*. [cover article]
5. Ahyoung Kim[#], Thi Vo[#], Hyosung An , Progna Banerjee , Lehan Yao , Shan Zhou , Chansong Kim , Delia Milliron, Sharon C. Glotzer*, Qian Chen*. "Symmetry-breaking in patch formation on triangular gold nanoparticles by asymmetric polymer grafting." **Nature Communications**, 2022, *13*.
6. Katherine C. Elbert[#], Thi Vo[#], Deborah Oh, Harshit Bharti, Sharon C. Glotzer*, and Christopher B. Murray*. "Evaporation-driven coassembly of hierarchical, multicomponent networks." **ACS Nano**, 2022, *16*.
7. Thi Vo and Sharon C. Glotzer*. "A theory of entropic bonding," **PNAS**, 2022, *119*.
8. Lanqin Tang[#], Thi Vo[#], Xiaoxing Fang, Drew Vecchio, Tao Ma, Jun Lu, Harrison Hou, Sharon C. Glotzer*, Nicholas A. Kotov*. "Self-assembly mechanism of complex corrugated particles," **JACS**, 2021, *143*. [cover article]
9. Katherine C. Elbert[#], William Zygmunt[#], Thi Vo[#], Corbin M. Vara, Daniel J. Rosen, Nadia M. Krook, Sharon C. Glotzer*, Christopher B. Murray*. "Anisotropic nanocrystal shape and ligand design for co-assembly," **Science Advances**, 2021, *7*.
10. Vyas Ramasubramani, Thi Vo, Joshua A. Anderson, Sharon C. Glotzer*. "A mean-field approach to simulating anisotropic particles," **Journal of Chemical Physics**, 2020, *153*.
11. Ye Tian, Julien Lhermitte, Lin Bai, Thi Vo, Huolin Xin, Ruipeng Li, Masafumi Fukuto, Kevin Yager, Sanat Kumar, Oleg Gang*. "Ordered three-dimensional nanomaterials using DNA-prescribed and valence-controlled material voxels," **Nature Materials**, 2020, *19*. [cover article]
12. Katherine C. Elbert[#], Thi Vo[#], Nadia M. Krook, William Zygmunt, Jungmi Park, Kevin G. Yager, Russell J. Composto, Sharon C. Glotzer*, Christopher B. Murray*. "Dendrimer ligand directed nanoplate assembly," **ACS Nano**, 2019, *13*.

13. Thi Vo, Sharon Glotzer*. "Principle of corresponding states for hard polyhedron fluids," **Molecular Physics**, 2019, *117*.
14. Fang Lu#, Thi Vo#, Yugang Zhang#, Alex Frenkel, Kevin G. Yager, Sanat Kumar*, Oleg Gang*. "Unusual packing of soft-shelled nanocubes," **Science Advances**, 2019, *5*.
15. Yugang Zhang, Suchetan Pal, Babji Srinivasan, Thi Vo, Sanat Kumar, Oleg Gang*. "Selective transformations between nanoparticle superlattices via the reprogramming of DNA-mediated interactions." **Nature Materials**, 2015, *14*.
16. Thi Vo, Venkat Venkatasubramanian, Sanat Kumar*, Babji Srinivasan, Suchetan Pal, Yugang Zhang, Oleg Gang. "Stoichiometric control of DNA-grafted colloid self-assembly." **PNAS**, 2015, *112*.
17. Babji Srinivasan, Thi Vo, Yugang Zhang, Oleg Gang, Sanat Kumar*, Venkat Venkatasubramanian*. "Designing DNA-grafted particles that self-assemble into desired crystalline structures using the genetic algorithm." **PNAS**, 2013, *110*.

Conference Presentations

Invited

1. Thi Vo. "Rational Design of Nanoparticle Surface Patterning for Directed Self-Assembly." *European Symposium on Applied Thermodynamics*, 2024.
2. Thi Vo. "Complex Nanoparticle Surface Patterning for Directed Self-Assembly." *ACS Fall*, 2024.
3. Thi Vo. "Stimuli-Responsive and Reconfigurable Materials Design." *International Conference on Complex Fluids and Soft Matter*, 2023.
4. Thi Vo. "Leveraging Shape as a Handle for Materials Design." *Statistical Thermodynamics and Molecular Simulations Seminar Series*, 2021.

Contributed

1. Thi Vo. "Computational Design of Patchy Particles with Complex Surface Patterning." *APS March Meeting*, 2024. **(Oral Presentation)**.
2. Thi Vo. "Rational Design of Complex Building Block for Directed Self-Assembly." *KITP - Structure Design and Emerging Phenomena in Nanoparticle Assemblies: What's Next?*, 2023. **(Poster Presentation)**.
3. Thi Vo, Lanqin Tang, Xiaoxing Fang, Drew Vecchio, Tao Ma, Jun Lu, Harrison Hou, Sharon C. Glotzer, Nicholas A. Kotov. "Symmetry-Breaking Patch Formation on Triangular Gold Nanoparticles." *APS - March Meeting*, 2023. **(Oral Presentation)**
4. Thi Vo, Ahyoung Kim, Hyosung An Progna Banerjee, Lehan Yao, Shan Zhou, Chansong Kim, Delia J. Milliron, Sharon C. Glotzer, Qian Chen1,. "Design and Assembly of Symmetry Breaking, Patchy Polymeric Grafts." *APS - March Meeting*, 2023. **(Poster Presentation)**
5. Thi Vo, Lanqin Tang, Xiaoxing Fang, Drew Vecchio, Tao Ma, Jun Lu, Harrison Hou, Sharon C. Glotzer, Nicholas A. Kotov. "Self-Assembly Mechanism of Hedgehog Particles." *APS - March Meeting*, 2022. **(Oral Presentation)**
6. Thi Vo, Katherine C. Elbert, Deborah Oh, Harshit Bharti, Sharon C. Glotzer, and Chrisotpher B. Murray. 'Evaporation Driven Assemblies of Hierarchical, Multi-Component Networks." *AIChE - Annual Meeting*, COMSEF Faculty Candidate Session, 2021. **(Oral Presentation)**
7. Thi Vo, Vyas Ramasubramani, Joshua A. Anderson, Sharon C. Glotzer. "Brownian Dynamics of Anisotropic Particles." *AIChE - Annual Meeting*, 2021. **(Oral Presentation)**
8. Thi Vo, Katherine C. Elbert, William Zygmunt, Corbin Vera, Daniel Rosen, Nadia Krook, Sharon C. Glotzer, and Christopher B. Murray. "Anisotropic Nanocrystal Shape and Ligand Design for Co-Assembly." *AIChE - Annual Meeting*, 2021. **(Oral Presentation)**
9. Thi Vo, Katherine C. Elbert, William Zygmunt, Corbin Vera, Daniel Rosen, Nadia Krook, Sharon C. Glotzer, and Christopher B. Murray. "Anisotropic Nanocrystal Shape and Ligand Design for Co-Assembly." *APS - March Meeting*, 2021. **(Oral Presentation)**
10. Thi Vo, Sharon C. Glotzer. "A Microscopic Theory of Entropic Bonding for Colloidal Crystal Prediction." *AIChE - Annual Meeting*, COMSEF Faculty Candidate Session, 2020. **(Oral Presentation)**
11. Thi Vo, Katherine C. Elbert, Nadia M. Krook, William E. Zygmunt, Jungmi Park, Kevin G. Yager, Russell J. Composto, Sharon C. Glotzer, and Christopher B. Murray. "Predictive Modeling of Dendrimer Directed Nanoparticle Self-Assembly." *APS - March Meeting,* 2020. **(Oral Presentation)**
12. Thi Vo and Sharon Glotzer. "A Universal Equation of State for Hard Polyhedra." *AIChE - Annual Meeting,* 2019. **(Oral Presentation)**

13. Thi Vo and Sharon Glotzer. "A Universal Equation of State for Hard Polyhedra." *Gordon Research Conference - Chemistry and Physics of Liquids,* 2019. **(Poster Presentation)**

14. Thi Vo and Sharon Glotzer. "A Universal Equation of State for Hard Polyhedra." *APS - March Meeting,* 2019. **(Oral Presentation)**

15. Thi Vo, Fang Lu, Yugang Zhang, Oleg Gang, Sanat Kumar. "Corona Driven Orientational Control of Grafted Nanoparticle Self-Assembly." *APS - March Meeting,* 2018. **(Oral Presentation)**

16. Thi Vo, Ye Tian, Oleg Gang, Sanat Kumar. "Predictive Modeling and Design of Corona Driven Self-Assembly." *APS - March Meeting,* 2017. **(Oral Presentation)**

17. Thi Vo, Sanat Kumar. "Predictive Modeling of the Assembly of DNA Grafted Non-Spherical Building Blocks ." *MRS - Fall Meeting,* 2016. **(Oral Presentation)**

18. Thi Vo, Fang Lu, Yugang Zhang, Oleg Gang, Sanat Kumar. "DNA Base Pairing Driven Self-Assembly of Non-Spherical Nanoparticles." *Foundations of Nanoscience Meeting,* 2016. **(Oral Presentation)**

19. Thi Vo, Fang Lu, Yugang Zhang, Oleg Gang, Sanat Kumar. "Anisotropic Packing of DNA-Mediated Colloidal Self-Assembly." *APS - March Meeting,* 2016. **(Oral Presentation)**

20. Thi Vo, Sanat Kumar. "Anisotropic Corona Driven Nanoparticle Self-Assembly." *Gordon Research Conference - Polymer Physics,* 2016. **(Poster)**

21. Thi Vo, Venkat Venkatasubramanian, Sanat Kumar, Babji Srinivasan, Suchetan Pal, Yugang Zhang, Oleg Gang. "Stoichiometric Control of DNA-Grafted Colloid Self-Assembly." *APS - March Meeting,* 2015. **(Oral Presentation)**

22. Thi Vo, Sanat Kumar, Oleg Gang. "Design of DNA-Grafted Building Blocks Self-Assembly." *Materials Genome Initiative - Principal Investigator Meeting,* 2015. **(Poster)**

23. Thi Vo, Sanat Kumar, Oleg Gang. "Modeling of DNA-Mediated Self-Assembly." *NYC Intercollegiate Chemistry and Chemical Engineering Conference,* 2014. **(Poster)**

24. Thi Vo, Babji Srinivasan, Sanat Kumar, Oleg Gang, Venkat Venkatasubramanian. "Quantitative Modeling of DNA Grafted Nanoparticle Self-Assembly." *AIChE - Annual Meeteing,* 2013. **(Oral Presentation)**

25. Thi Vo, Sanat Kumar, Oleg Gang. "Modeling and Inverse Design Of DNA-Grafted Nanoparticle Self-Assembly." *Materials Genome Initiative - Principal Investigator Meeting,* 2013. **(Poster)**

26. Thi Vo, Sanat Kumar. "Quantitative Modeling Of DNA Grafted Nanoparticle Self-Assembly." *Programmable Self-Assembly of Matter,* 2012. **(Poster)**