COMPLEX SYSTEMS, COMPUTING, MATERIALS, AND MANUFACTURING FRONTIERS

Jeremy Palmer

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Publications

1. M. Warzecha, L. Verma, B. Johnston, J. C. Palmer, A. J. Florence, and P. G. Vekilov, Olanzapine Crystal Symmetry Originates in Preformed Centrosymmetric Solute Dimers, Nature Chemistry, 12, 914-920 (2020).

2. H. Dai, Y. Shen, T. Yang, C. Lee, D. Fu, A. Agarwal, T. Thanh Le, M. Tsapatsis, J. Palmer, B. M. Weckhuysen, P. J. Dauenhauer, X. Zou, and J. D. Rimer, Finned Zeolite Catalysts, Nature Materials, 19, 1074-1080 (2020).

3. R. Roberts, R. Poling-Skutvik, J. C. Palmer, and J. C. Conrad, Tracer Transport Probes Relaxation and Structure of Attractive and Repulsive Glassy Liquids, Journal of Physical Chemistry Letters, 9, 3008-3013 (2018)

4. R. Chen, R. Poling-Skutvik, A. Nikoubashman, M. P. Howard, J. C Conrad, and J. C Palmer, Macromolecules, Coupling of Nanoparticle Dynamics to Polymer Center-of-Mass Motion in Semidilute Polymer Solutions, Macromolecules, 51, 1865 – 1872, (2018)

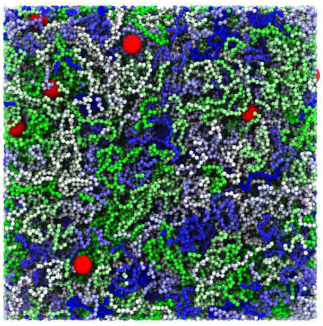
5. R. Chen, E. Lascaris, and J. C. Palmer. Liquid–Liquid Phase Transition in an Ionic Model of Silica. Journal of Chemical Physics, 146, 234503 (2017)

Dr. Palmer, a computational scientist, received his BS in biomedical engineering from John Hopkins University and his PhD in chemical engineering from North Carolina State University. Prior to joining the Cullen College of Engineering, Dr. Palmer worked as a postdoctoral fellow at Princeton University. He is a recipient of the Regional Blavatnik Award for Young Scientists (in Chemistry, 2014), the NSF CAREER Award (2018), the College Junior Faculty Research Award (2018), and the UH Award for Excellence in Research, Scholarship and Creative Activity (2020, Assistant Professor Level). Dr. Palmer's research interests include the application of statistical mechanics and molecular simulation to study supercooled liquids, phase transitions, porous materials, and complex transport phenomena.

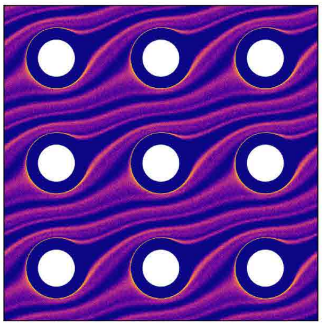
MODELING MOLECULAR SCALE TRANSPORT

One of the overarching themes in Dr. Palmer's research is characterizing complex transport processes. The advanced computer simulation techniques used by his group allow for these processes to be probed on short time scales and small length scales that are not easily accessible using the current experimental techniques. Insights from the simulations are used to inform experimental design of next-generation materials.

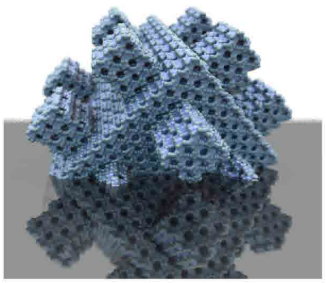
His recent research with experimental collaborator Dr. Jacinta Conrad (Professor, William A. Brookshire Department of Chemical and Biolmolecular Engineering) has elucidated mechanisms of nanoparticle transport through polymer suspensions that have implications in processing and formulation of high performance nanocomposites. They have also worked collaboratively to understand particle dispersion in porous materials for engineering improved stationary media for separations and sensing applications. In collaboration with experimentalist Dr. Jeffrey Rimer (Professor, William A. Brookshire Department of Chemical and Biolmolecular Engineering), his group has also used modeling to aid in the design of novel finned zeolite catalysts with transformative molecular transport properties that enhance catalytic performance.



Nanocomposites



Separations Media



Zeolite Catalysts