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Education:

1996-2000:	B. S. in Physics, Lanzhou University
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Professional Employment:

2012 – present:	Professor , Institute of Physics, Chinese Academy of Sciences
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Research interests:

Soft matter physics, statistical mechanics

Selected Publications:

1 . X. Yang, R. Liu, M. Yang, W.-H. Wang, and **K. Chen**, "Structures of Local Rearrangements in Soft Colloidal Glasses", *Physical Review Letters*, **116**, 238003 (2016)

2. Y. Zong, J. Liu, R. Liu, H. Guo, M. Yang, Z. Li, **K. Chen**, "An Optically Driven Bistable Janus Rotor with Patterned Metal Coatings", *ACS Nano* **9.11** : 10844-10851 (2015).

3. **K. Chen**, M. L. Manning, P. J. Yunker, W. G. Ellenbroek, Z. Zhang, Andrea J. Liu, and A. G. Yodh "Measurement of correlations between low-frequency vibrational modes and particle rearrangements in quasi-two-dimensional colloidal glasses", *Physical Review Letters*, 107, 108301 (2011)

4. **K. Chen**, Wouter G. Ellenbroek, Zexin Zhang, Daniel T. N. Chen, Peter J. Yunker, Silke Henkes, Carolina Brito, Olivier Dauchot, Wim van Saarloos, Andrea J. Liu, and A. G. Yodh, "Low-Frequency Vibrations of Soft Colloidal Glasses", *Physical Review Letters,* 105, 025501 (2010)

Search for structural orders in colloidal glasses

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Abstract: Glasses are often known as disordered solids whose structures exhibit no obvious long range periodicity. It has been long proposed however, that glasses may contain non-periodic amorphously ordered structures that are the physical origin of the unique dynamical, thermodynamical and mechanical properties of glasses. For decades, searching for signs of such structural orders has been pursued by both theoretical and experimental workers in the field. In this talk, I will briefly discuss our recent works in search for structural orders in colloidal glasses and supercooled liquids, using structural entropy and positional variances. In solid glasses, we find that local structural entropy S_2 is a good parameter to measure local structural order. Regions with higher S_2 are correlated with faster dynamics, softer phonon modes and higher propensity to rearrange under external loading, similar to defects in crystalline materials. We also measure the local positional variances of particles in disordered binary colloidal samples, ranging from dilute fluids to jammed glasses, and probe their spatial and temporal correlations to local dynamics during the glass transition. We observe the emergence of significant correlations between positional constraints and local dynamics within the Lindemann criterion, which coincides with the onset of glassy dynamics in supercooled liquids. Rigid domains in fluids are identified based on local constraints, and demonstrate a percolation transition near the glass transition, accompanied by the rise of dynamical heterogeneities.