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Research Interests

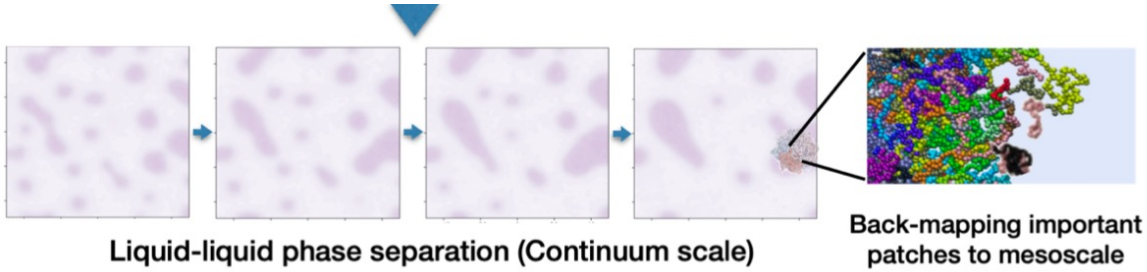
- Biomolecular condensates
- Single-molecule properties of intrinsically disordered proteins
- Macromolecular condensation, polyelectrolyte complex coacervates
- RNA folding and Protein Folding
- Biomolecular confinement, crowding, entanglement, and crystallization
- DNA functionalized carbon nanotubes
- Hydrophobic hydration and anomalous properties of water

Strengths or Unique Resources

- High Performance Computing Center (own a substantial number of CPU and GPU nodes and extensive data storage)
- Atomistic modeling of biomolecular solutions, Coarse-graining (mesoscale) of biopolymer mixtures
- Continuum modeling of biomolecular condensates, polymer phase transitions including liquid-liquid phase separation
- Molecular Dynamics and Monte Carlo Simulations
- Advanced sampling: parallel-tempering, metadynamics, umbrella sampling, On-the-fly probability enhanced sampling, Hamiltonian exchange, solute tempering
- Homology modeling and structure prediction (AlphaFold, Evolutionary Scale Model)
- Machine Learning Based nonlinear dimensionality reduction, classification, clustering, modeling and advanced sampling

Type of collaborator we seek

- In vitro or in vivo experimentation of transcriptional condensates
- Single-molecule experimentation of transcription factors and/or nuclear proteins and RNA



Publication List
goo.gl/n4cbZ0

Lab Website:
ghzresearch.com

LinkedIn: