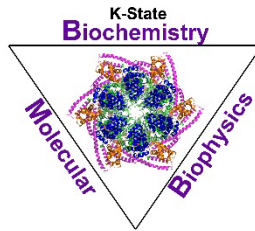


Ackert Hall, Room 120  
Wednesday, September 24, 2025  
4:00 P.M.



Coffee and Cookies  
Chalmers Hall, Room 168  
3:45 P.M.

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**Biochemistry**

&

**Molecular**

**Biophysics**

**Seminar**

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**Applied Soft Matter Physics: From Phase Separation to  
Chromatin and Beyond**

**Dr. Buddho Chakraborti**

Department of Physics  
Kansas State University

In this talk, I will present our modeling work that bridges soft matter physics and molecular biology. We have developed a quantitative framework to analyze multiscale phenomena in complex soft and biological systems. I will illustrate this approach with several applications: (1) liquid–liquid phase separation in biomolecular condensates, where elastic interactions stabilize microdroplet formation; (2) lamin-mediated chromatin organization in the cell nucleus; and (3) predicting the structural and mechanical properties of gram-positive bacterial cell walls. I will also highlight our recent theoretical work on polymer conformations under soft tubular confinement. Unlike rigid tubes, soft tubes deform in response to the polymer, with equilibrium arising from the balance between chain pressure and tube elasticity. I will conclude by discussing the broader implications of this research, including potential connections to the altered mechanics of metastatic cancer cells.