

Physics Colloquium

Prof. Sarah Keller
(University of Washington)

“Phase Separation in Living Yeast Membranes”

Friday, November 12 2021

2:30pm—3:30pm

Virtual Only

Zoom link: <https://virginiatech.zoom.us/j/96084996911>

Equilibrium concepts like phase separation are rarely applied to living systems. However, since the 1960s, researchers have reported tantalizing hints that vacuole membranes in living yeast undergo phase separation at a particular point in the cell's growth cycle. Of course, proof of phase separation hinges on an observation of a reversible transition. Here, we provide that direct evidence. We then show that yeast actively tune the transition temperature to be close to the yeast's growth temperature, which implies that the membrane's proximity to the transition is important for the cell's function. Membrane phase separation is just as interesting when it is taken out of its cellular context, because it has the potential to reveal new physics. A persistent open question in the field is what physical mechanisms give rise to patterns of dots or stripes when membranes have excess area, whereas taut membranes separate into macroscopic phases. Here we show which aspects of current theories are supported by our data, and where opportunities lie for developing new models.