

# Chemical Engineering Colloquium

March 25, 2026

Goddard Hall, Room 227

12:00 PM – 1:00 PM

## **Life in a Tight Spot: Watching Bacterial Life in Complex Spaces**

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Bacteria in nature inhabit complex environments like mucus, biofilm matrices, and soils. However, lab studies typically focus on cells in simple liquid media or at flat interfaces. How do the material properties of these complex environments shape bacterial behavior? In this talk, I will describe my group's work addressing this question using tools from soft matter, 3D imaging, and biophysical modeling. We have developed the ability to (i) directly visualize bacteria from the scale of a single cell to that of an entire multi-cellular collective, (ii) 3D-print precisely structured collectives, and (iii) model their large-scale motion and growth in complex environments akin to natural soils and sediments. I will describe how, using this approach, we have discovered several ways in which material interactions fundamentally alter bacterial motility and growth—with implications for microbial ecology, engineered living materials, and other active matter systems.



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