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## The wisdom of the crowd: How bacterial collectives (re)shape themselves

*Wednesday 18 September 2024 15:30 (35 minutes)*

Bacteria are arguably the simplest form of life; and yet, as multi-cellular collectives, they perform complex functions critical to environment, food, health, and industry. What principles govern how complex behaviors emerge in bacterial collectives? And how can we harness them to control bacterial behavior? In this talk, I will describe my group's work addressing this question using tools from soft matter engineering, 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. I will describe how, using this approach, we are developing new ways to predict and control how bacterial collectives —and potentially other forms of “active matter” —spread large distances, adapt shape to resist perturbations, and self-regulate growth to access more space by processing chemical information in their local environments.

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