



COLLOQUIUM SEMINAR SERIES

DYNAMIC MODELLING OF HORIZONTAL GENE TRANSFER IN MICROBIAL POPULATIONS



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Microbial communities are involved in a wide range of processes in health, agriculture, manufacturing, water treatment, and environmental remediation. Manipulation of those communities can result in improvements in activity. However, the complexity of microbial interactions makes it difficult to predict the effects of intervention. Dynamic modelling of community activity provides a tool for making such predictions, and thus can allow for model-based design of modified or constructed communities. We consider the delivery by horizontal gene transfer of engineered genetic elements to bacterial populations in an idealized laboratory setting. We first discuss an ODE-based model of this process, calibrated and validated against time-series measurements of population distribution by flow cytometry. We then consider the construction and validation of spatiotemporal models (PDE and agent-based) supported by time-lapse microscopy.

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featuring

Professor Brian Ingalls

Wednesday, September 13, 2023 | 3:30pm

Location: CCT2150