SEMINAR

Mathematical models of basal cognition

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Venue: Online and Physics Seminar Room, Stellenbosch University

ABSTRACT

Building mathematical models of brains is difficult because of the sheer complexity of the problem. One potential approach is to start by identifying models of basal cognition, which give an abstract representation of a range of organisms without central nervous systems, including fungi, slime moulds, and bacteria. In this talk, I will first discuss the cognitive abilities of the true slime mould, *Physarum polycephalum*. Despite being an acellular organism, the true slime mould demonstrates habituation, finds shortest paths between food sources, and anticipates periodic events. I will then present a mathematical model for basal cognition that combines oscillatory and current-based reinforcement processes to mimic some of the cognitive abilities observed in slime moulds and other organisms demonstrating basal cognition.

BIOGRAPHY

Linnéa Gyllingberg recently received a PhD in applied mathematics from Uppsala University, within the Centre for Interdisciplinary Mathematics in Sweden. In September, she will start as a postdoctoral scholar at the Department of Mathematics at the University of California, Los Angeles (UCLA) in the USA, working with Prof Mason Porter. Her research focuses on developing and analysing mathematical models and methods for different biological applications. She uses dynamical systems, network models, and agent-based modelling, as well as statistical methods, to understand collective behaviour, decision making, and complex systems.

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