INTERNATIONAL SOLVAY INSTITUTES BRUSSELS

22nd Solvay Public Lectures

Sunday 21 April 2024 - Flagey (Studio 4)

Prof. Stephanie Palmer

University of Chicago, USA

Stephanie Palmer is an Associate Professor in the Department of Organismal Biology and Anatomy and in the Department of Physics at the University of Chicago. She has a PhD in theoretical physics from Oxford University where she was a Rhodes Scholar, and works on questions at the interface of neuroscience and statistical physics. Her recent work explores the question of how the visual system processes incoming information to make fast and accurate predictions about the future positions of moving objects in the environment. She was named an Alfred P. Sloan Foundation Fellow and was granted a CAREER award from the NSF. Beginning in her undergraduate years at Michigan State University, Stephanie has been teaching chemistry, physics, math, and biology to a wide range of students. At the University of Chicago, she founded the Brains! Program, which brings local middle school students and science teachers from the South Side of Chicago to her lab to learn hands-on neuroscience. Stephanie is part of the leadership teams for two new major efforts in Chicago at the interface of biology, physics, and mathematics: The NSF Center for Living Systems at the University of Chicago and the NSF-Simons Institute for Theory and Mathematics in Biology.

Seeing what's coming

Abstract: Prediction is essential for interacting fluidly and accurately with our environment because of the delays inherent to all brain circuits. In order to interact appropriately within a changing environment, the brain must respond not only to the current state of its sensory inputs but must also make rapid predictions of the future. In this lecture, we'll explore how our visual system makes these predictions, starting as early as the retinal cells in the eye. We'll borrow techniques from statistical physics and information processing to assess how we get terrific, predictive vision from these imperfect component parts.