Department of Physics
Condensed Matter Physics
Clarendon Laboratory, Parks Road, Oxford OX1 3PU

UNIVERSITY OF OXFORD

CONDENSED MATTER SEMINAR

Tuesday 10 November at 16.30

"From entropy to physiology: passive control in biology"

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U California San Diego

The pursuit of biological principles often involves searching for proteins with a dedicated function underlying the observed phenomena. While such approaches have been enormously successful in modern biology, some of the most fundamental cellular-scale processes can be better understood as a passive control based on physical properties or quantitative principles robust to molecular details. In this talk, I will describe how individual E. coli cells homeostatically control their cell cycle and cell size, a subject that is enjoying renewed interests from interdisciplinary researchers. I will introduce the quantitative phenomenology that we coined the adder and explain how it connects to the underlying mechanistic principles. These principles are general beyond E. coli and apply to both cell division and replication initiation. Passive regulation has multiple implications, from the evolution of primordial cells to the design of synthetic cells.

Host: Prof Achillefs Kapanidis

Zoom ID:

https://zoom.us/j/98388252366?pwd=U2hvVjdxVytOeFFjdDJLRmlBK2Fxdz09