

## Distinguished Lecture Series

# Modeling Microbial Diversity



11 May 2021 (Tuesday)

10:00-11:30 a.m. GMT+8 (Hong Kong Time)



Online via Zoom

(Meeting ID: 922 0299 3171)



## ABSTRACT

DNA sequencing has revealed hundreds to thousands of microbial species coexisting in all natural habitats, including inside human hosts. However, resource-competition models predict that the number of species in steady coexistence cannot exceed the number of resources - the so-called "paradox of the plankton". To address this puzzle, we model how trade-offs in metabolic abilities level-the playing field among competing microbes. The model spontaneously reproduces several notable features of natural ecosystems, including high diversity, keystone species, and population dynamics.

## Professor Ned Wingreen

Department of Molecular Biology  
Princeton University

Ned Wingreen is the Howard A. Prior Professor of the Life Sciences at Princeton University. He is a member of the Department of Molecular Biology and of the Lewis-Sigler Institute for Integrative Genomics. He is also associated faculty in the Department of Physics, and Associate Director of the Princeton Center for Theoretical Science. Ned received his Ph.D. in theoretical condensed matter physics from Cornell University in 1989. He did his postdoc in mesoscopic physics at MIT before moving, in 1991, to the NEC Research Institute in Princeton. At NEC, he continued to work in mesoscopic physics, but also started research in biophysics which grew into a general interest in problems at the interface of physics and biology. Ned joined Princeton University in 2004. Ned's current research includes intracellular phase separation as well as modeling intracellular networks in bacteria and other microorganisms, and studies of microbial communities. He is a fellow of the American Physical Society and the American Association for the Advancement of Science.