



Berlin
Mathematical
School

BMS Friday Colloquium

Friday 18 January 2019 at 14:15

Tea & Cookies starting at 13:00

BMS Loft, Urania, An der Urania 17, 10787 Berlin

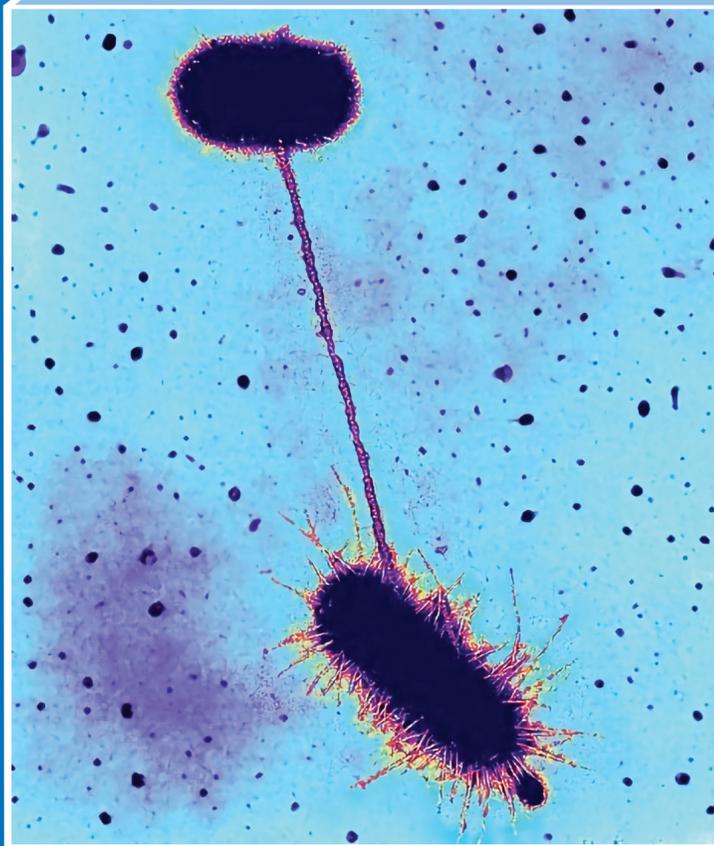
Sylvie Méléard

(CMAP, École Polytechnique)

Stochastic dynamics for adaptation and evolution of microorganisms

Understanding the adaptation and evolution of populations is a huge challenge, in particular for microorganisms, since it plays a main role in the evolution of virulence or in bacterial antibiotic resistance. In her talk, Méléard will propose a general eco-evolutionary stochastic model of population dynamics with clonal reproduction and mutations. Moreover, the individuals in this model compete for resources and exchange genes as in the transfer of plasmids in bacteria. Méléard will study different asymptotics of this general birth and death process depending on the respective demographic, ecological and transfer time-scales and on the population size. She will show that the horizontal transfer can have a major impact on the distribution of the successive mutational fixations, leading to dramatically different behaviors, ranging from expected evolution scenarios to evolutionary suicide. Simulations are given to illustrate these phenomena.

Sylvie Méléard is a French mathematician and professor at the École Polytechnique in Paris. She specializes in probability and stochastic processes, and plays a leading role in the field of mathematical biology and stochastic modeling. Méléard gained her PhD and did her habilitation at the University Paris 6 in 1984 and 1991, respectively. She has held positions at U Le Mans (1984-1989), Paris 6 (1989-1991) and U Paris-Ouest (1992-2006), and took up her current position in 2006. Her honours and awards include the Legion of Honour (2012) and "La Recherche" Award (2013). Méléard was an invited speaker at the 7ECM in Berlin (2016) and was recently elected as a Fellow of the European Academy of Sciences (2018).



© Benjamin Cummings