Title: Chromosome, entropy, and homeostasis

E. coli is arguably the best studied organism in biology. Yet, it has been a wonderful source of fundamental questions not only for biologists but also for physicists. In this talk, I will introduce two quantitative, complementary problems underlying cellular reproduction of E. coli. The first problem is about the “soft” nature of the E. coli chromosome for which entropy is an important driving force for its biological phenomena. In the second problem, I will explain how E. coli homeostatically control its cell size without apparent feedback.