



Date/Time : Wed, 29 July 2015 13:00-14:00
Venue : Meeting Room C016, Level/Floor C, Lab 1
Speaker: Prof. Thierry Mora, Département de Physique, École Normale Supérieure, France

Title: Learning the Collective Dynamics of Biological Systems, from Neurons to Flocks

Abstract:

Many biological phenomena are collective in nature, involving more than the sum of their parts. Recently, using the principle of maximum entropy, a formal analogy has been drawn between the collective behaviour of complex biological systems and problems of statistical mechanics, leading to new insights into a variety of biological systems. However, this approach has ignored the dynamical nature of interactions between biological units. I will show how the principle of maximum entropy can be extended to time series of the collective activity, and will illustrate the approach on data from neural populations in the retina obtained by multi-electrode recordings, and on the motion of bird flocks captured in the wild.