
Seminar

Self-organization in the realm of Chemical and Biological Physics

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Self-organization leading to the formation of order under far-from-equilibrium condition is a fundamental and ubiquitous process in natural systems. The occurrence of spatial order in the form of stationary and non-stationary patterns is pervasive in the context of chemical and biological physics. Underpinning of these phenomena is not only important but also is a matter of quest to control the spatiotemporal dynamics.

In the first part of the talk, I will discuss about the spatiotemporal dynamics of microbial biofilm, which is a multicellular community of bacterial cells adhered to each other and embedded in a matrix of self-produced extracellular polymeric substances. In such a dense environment mechanical interactions among the components become relevant. Following an individual-based modeling approach, I will decipher the role of *mechanical interactions*, governing the dynamics of a growing bacterial colony, which undergoes a spontaneous phase-separation in presence of self-produced extracellular polymeric substances.

In the second part, I will make a transition from *biological* to *chemical* context, where I will discuss about the formation of spiral wave and its dynamical response towards spatially homogeneous temporal periodic forcing using visible light in the *Chlorine dioxide-iodine-malonic acid* reaction-diffusion system.

Tuesday, Jul 14th 2015

2:00 PM (Tea/Coffee at 1:45 PM)

Seminar Hall, TCIS