ICTS Colloquium

Title : Active Matter and Nuclear Physics

Speaker : Gautam I Menon, The Institute of Mathematical Sciences, Chennai

Date : Monday, November 21, 2016

Time : 3:00 pm

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : In recent years our ability to model, quantitatively, a variety of bio-physical processes has increased greatly. These developments lie at the intersection of non-equilibrium statistical mechanics and soft matter physics and are rooted in methodologies now referred to as "active matter" approaches. I will describe a body of work from my group which uses such ideas to model the large-scale properties of chromosomes in the nuclei of living cells. Our work addresses several long-standing questions in the field, among them questions of why chromosomes are positioned non-randomly within nuclei, why chromosomes form individual "territories", what determines the shapes of chromosomes and an explanation for why chromosomes "reposition" when the DNA they contain is damaged. If time permits, I will also attempt to illustrate, through some additional examples, how the interaction of biology and physics at a quantitative level enriches both fields.