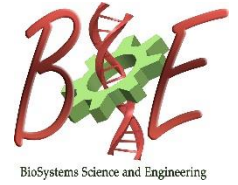




Indian Institute of Science
Centre for BioSystems Science and Engineering



SEMINAR

at 4:00 pm on 5th February 2018 (Monday)

MRDG Seminar Hall

Morphogenetic Patterns: Biochemical Signalling, Mechanics and Geometry

Vijaykumar Krishnamurthy
International Centre for Theoretical Sciences

Morphogenesis-- the emergence of the three-dimensional shape and functional form in developing embryos, involves a strong interplay between active mechanochemical forces and biochemical signalling. Mechanical forces in cells and tissues arise from the adenosine-triphosphate (ATP) consuming activity of molecular motors in the cellular cytoskeleton. In this talk, we will discuss the generic physical principles of the establishment of active mechanochemical patterns in the actomyosin cytoskeleton. This self-organization of the cytoskeleton can couple to signalling proteins that are involved in various morphogenetic processes, like the establishment of cell polarity and the emergence of body axes in developing embryos. We will end with a discussion of our ongoing work on studying active patterns on curved deformable surfaces, and speculate on how the geometry of the underlying domain can select the emergent mechanochemical patterns.

Dr. Vijay Kumar Krishnamurthy is currently an Assistant Professor at the International Centre of Theoretical Sciences, bangalore. He pursued his masters and doctoral studies in physics at IISc. He was a Post-doctoral scholar at Yale University, New Haven and at Max-Planck-Institute for the Physics of Complex Systems, Max Planck Institute of Molecular Cell Biology and Genetics and BIOTEC, Technische Universität Dresden, Dresden, Germany. His current research interests are Mechanobiology, Physics of the Actomyosin Cytoskeleton, Active Mechanical Processes in Developmental Biology, Mechanochemical Pattern formation, Soft Condensed Matter Physics, Nonequilibrium Statistical Mechanics.

