



# BOSE COLLOQUIUM

**Friday, 14 February 2014**

**4.00 pm**

**Fermion**

**Speaker:**

**Prof. Amitabha Chattopadhyay**

*Ph.D. (Stony Brook), FNA, FNASc, FASc, FRSC, J.C. Bose Fellow, Outstanding Scientist (Director Level), Centre for Cellular & Molecular Biology, Hyderabad  
Professor & Dean, Biological Sciences, Academy of Scientific and Innovative Research*

**Title:**

**Current Excitements and Challenges in Membrane Biology**

**Abstract:**

Biological membranes are complex assemblies of lipids and proteins that allow cellular compartmentalization and act as the interface, through which cells communicate with each other and with the external milieu.<sup>1</sup> The biological membrane therefore constitutes the site of many important cellular functions involving transfer of information from outside to the interior of the cell. In physical terms, membranes can be treated as a complex oriented fluid which is a weakly coupled, non-covalent, and anisotropic assembly of molecules in two-dimensions (and can therefore be treated as soft matter). Membranes are

heterogeneous in the context of a wide range of spatiotemporal scales.<sup>2-4</sup> A unique aspect of such an assembly is its dynamics spanning a large range of time scales, which supports a wide variety of biological processes, necessary for cellular function. Monitoring membrane dynamics with all its complexities continues to be a challenge in contemporary membrane biophysics. A fundamental issue of biological relevance is how cell membrane dynamics could be related to cellular signaling. Another important emerging area is the role of cellular membranes in the entry of pathogens to host cells. I will provide a broad overview of these issues in this lecture with examples taken from literature as well as work from my laboratory.<sup>4-7</sup>

### References:

1. Mouritsen, O.G. (2005) *Life – As a Matter of Fat*, Springer.
  2. Jacobson, K., Mouritsen, O.G., and Anderson, R.G.W. (2007) *Nat. Cell Biol.* 9: 7-14.
  3. Marguet, D., Lenne, P.-F., Rigneault, H., and He, H.-T. (2006) *EMBO J.* 25: 3446-3457.
  4. Ganguly, S., and Chattopadhyay, A. (2010) *Biophys. J.* 99: 1397-1407.
  5. Pucadyil, T.J., Kalipatnapu, S., Harikumar, K.G., Rangaraj, N., Karnik, S.S., and Chattopadhyay, A. (2004) *Biochemistry* 43: 15852-15862.
  6. Ganguly, S., Pucadyil, T.J., and Chattopadhyay, A. (2008) *Biophys. J.* 95: 451-463.
  7. Pucadyil, T.J., and Chattopadhyay, A. (2007) *Trends Parasitol.* 23: 49-53.
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