

# Morris Travers Lecture

on

**What can you learn from watching single molecules? From super-resolution imaging to nanoscale probes of 3D dynamics in cells**



Indian Institute of Science  
Bangalore



by

**Prof. W. E. Moerner**

Nobel Laureate in Chemistry, 2014

Stanford University, Department of Chemistry

Venue :

J. N. Tata Auditorium, IISc

at 4:00 PM, Thursday, 5th January, 2017

The Director will preside

## Abstract

Super-resolution microscopy has opened up a new frontier in which biological structures and behavior can be observed in fixed and live cells with resolutions down to 20-40 nm and below. Examples range from protein superstructures in bacteria to details of the shapes of amyloid fibrils and much more. Current methods development research addresses ways to extract more information from each single molecule such as 3D position and orientation, and ways to insure that the acquired data are both accurate and precise. Indeed, new labels are needed which provide more photons before photobleaching. At the same time, it is worth noting that in spite of all the current focus on super-resolution, even in the “conventional” low concentration, single-molecule tracking regime where the motions of individual biomolecules are recorded rather than the shapes of extended structures, much can still be learned about biological processes with quantitative measurements and analysis. Examples to be presented include studies of the primary cilium, motions of DNA loci in the yeast nucleus, and photodynamic of a single photosynthetic antenna trapped in solution.