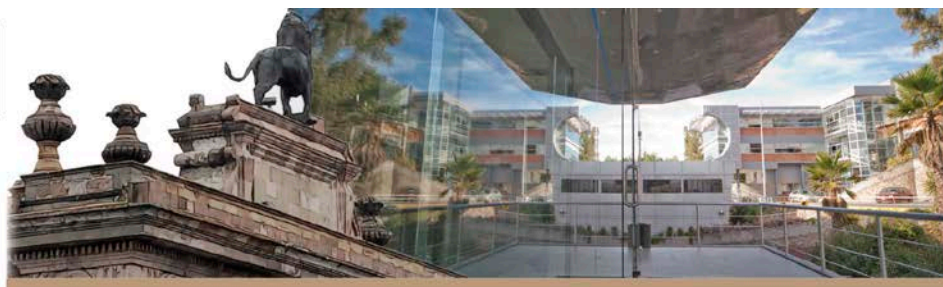


# MOPM

MEXICAN OPTICS AND  
PHOTONICS MEETING

September 9 -11, 2015  
Leon, Guanajuato Mexico



## Light Paves the Way to Single-Molecule Detection and Photocontrol, Foundations of Super-Resolution Microscopy

W. E. Moerner

*Departments of Chemistry, and by courtesy, of Applied Physics  
Stanford University, Stanford, CA USA 94305*

### ABSTRACT

More than 25 years ago, low temperature experiments aimed at establishing the ultimate limits to optical storage in solids led to the first optical detection and spectroscopy of a single molecule in the condensed phase. At this unexplored ultimate limit, many surprises occurred where single molecules showed both spontaneous changes (blinking) and light-driven control of emission, properties that were also observed in 1997 at room temperature with single green fluorescent protein variants. These observations form foundations for super-resolution microscopy beyond the diffraction limit based on control of the emission of single molecules. New structures and behaviors are now being observed in a variety of biological systems which were hidden before. Beyond super-resolution, tracking and trapping of single molecules continues to yield surprises about dynamics and behavior on the nanoscale.



**RIAO**

