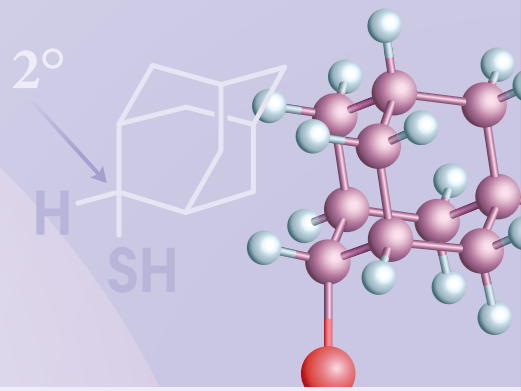
Institute for Advanced Study
Distinguished Lecture

Eyes of the 21st Century: Controlling the Placement and Environments of Molecules at All Scales



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29 Jan 2010 (Fri) **2:00 – 3:30 pm**
Cheung On Tak Lecture Theater (LT-E), HKUST

Abstract

As we learn to measure the precise structures, environments, and functions of molecules at the molecular scale, we are learning to direct molecules into desired positions to create nanostructures, to connect functional molecules to the outside world, and to serve as test structures for measurements of single or bundled molecules. Hierarchical patterning enables simultaneous control at many levels, all the way from the macroscale through the microscale, ultimately to the subnanometer scale. Interactions within and between molecules can be designed, directed, measured, understood, and exploited. We examine how these interactions influence the chemistry, dynamics, structure, electronic function and other properties. Such interactions can be used to advantage to form precise molecular assemblies, nanostructures, and patterns, and to control and to stabilize function. New tools are needed and are being developed both for patterning and for measurements to advance this approach further.

About the Speaker

Prof Paul Weiss received his PhD in chemistry from UC Berkeley in 1986. He embarked on an academic career in 1989 when he joined the Pennsylvania State University as an assistant professor, and was promoted to Distinguished Professor of Chemistry and Physics before joining UCLA in 2009. The work of his interdisciplinary research group focuses on the atomic-scale chemical, physical, optical, mechanical and electronic properties of surfaces and supramolecular assemblies. He and his students have developed new techniques to expand the applicability and chemical specificity of scanning probe microscopies. They have applied these and other tools to the study of catalysis, self- and directed assembly, physical models of biological systems, and molecular and nano-scale electronics. They work to advance nanofabrication down to ever smaller scales and greater chemical specificity in order to connect, to operate, and to test molecular devices.