Second Laureate
Fundamental Research

- Research Work Title: **The Ultimate Limits of Miniaturization**
- Researcher: **Prof. Paul Weiss**
- Country: **USA**
- Field: **Nanotechnology**
- Scientific Affiliation: **California NanoSystems Institute, University of California**

Abstract:

We explore the ultimate limits of miniaturization – the smallest switches and motors in the world. While our inspiration comes from Nature, using rigid synthetic molecules, so that we can go from quantum mechanics to mechanical engineering, in experiment, theory, and simulation. Using molecular design, tailored syntheses, intermolecular interactions, and selective chemistry to direct molecules into desired positions to create nanostructures, to connect functional molecules to the outside world, and to serve as test structures for measuring single or bundled molecules. We have developed the ability to place individual molecules into controlled environments and microscopes that simultaneously image structure, function, and spectra with submolecular resolution, tens and hundreds of thousands of times on the functional molecules and assemblies. In this way, we selectively and objectively test hypothesized mechanisms, enabling and disabling function and control using predictive and testable means.

Biography:

Prof. Paul S. Weiss received his S.B. and S.M. degrees in chemistry from MIT and his Ph.D. in chemistry from the University of California at Berkeley. He was a post-doctoral member at Bell Laboratories and a Visiting Scientist at IBM Almaden Research Center. In 2009, he became Director of the California NanoSystems Institute, Professor of Chemistry and Biochemistry at UCLA, and Fred Kavli Chair in NanoSystems Sciences. Before coming to UCLA, he was a Distinguished Professor of Chemistry and Physics at the Pennsylvania State University. His work 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. He has published over 200 papers and patents, and has given over 400 invited and plenary lectures.