

Foresight Institute Announces Feynman Prize Winners

8 October 2009, By J. Storrs Hall

(PhysOrg.com) -- The Foresight Institute, a nanotechnology education and public policy think tank based in Palo Alto, has announced the winners of the prestigious 2009 Foresight Institute Feynman Prizes in Nanotechnology.

Established in 1993 in honor of Nobel Prize winner Richard Feynman, two \$5,000 prizes are awarded in two categories, theory and experiment, to recognize researchers whose recent work has most advanced the field toward the achievement of Feynman's vision for [nanotechnology](#): molecular manufacturing, the construction of atomically-precise products through the use of molecular machine systems.

The winner of the 2009 Feynman Prize for Experimental work is the team of Yoshiaki Sugimoto, Masayuki Abe (Osaka University), and Oscar Custance (National Institute for Materials Science, Japan), in recognition of their pioneering experimental demonstrations of mechanosynthesis, specifically the use of atomic resolution dynamic force microscopy — also known as non-contact [atomic force microscopy](#) (NC-AFM) — for vertical and lateral manipulation of single atoms on semiconductor surfaces. Their work, published in *Nature*, *Science*, and other prestigious scientific journals, has demonstrated a level of control over the ability to identify and position atoms on surfaces at room temperature which opens up new possibilities for the manufacture of atomically precise structures.

The winner of the 2009 Feynman Prize for Theory is Robert A. Freitas Jr. (IMM), in recognition of his pioneering theoretical work in mechanosynthesis in which he proposed specific molecular tools and analyzed them using ab initio quantum chemistry to validate their ability to build complex molecular structures. This Prize also recognizes his previous work in systems design of molecular machines, including replicating molecular manufacturing systems which should eventually be able to make

large atomically precise products economically and the design of medical nanodevices which should eventually revolutionize medicine.

“What once seemed like a distant vision when it was first outlined by Feynman in 1959 — a new manufacturing technology able to arrange the very atoms that are the fundamental building blocks of matter — has come a step closer to reality,” said J. Storrs Hall, President of Foresight Institute. “This is no small thing, for all manufactured products are made from atoms — and if we can better control how those atoms are arranged we can make fundamentally better products.

“Products that are remarkably light, strong, smart, green, and cheap. Molecular manufacturing will dwarf the Industrial Revolution.”

The Feynman Prizes will be awarded in person in January near the Palo Alto headquarters of Foresight Institute.

Provided by Foresight Institute

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