

Three Professors at UC San Diego Elected to National Academy of Sciences

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The National Academy of Sciences today elected three professors at the University of California, San Diego to membership in the National Academy of Sciences, one of the highest honors bestowed on U.S. scientists and engineers.

Herbert Levine, J. Andrew McCammon and David T. Sandwell were among the 72 new members and 18 foreign associates elected to the academy today "in recognition of their distinguished and continuing achievements in original research."

They join 89 current members of the UC San Diego faculty who previously had been named to membership in the academy, which was established by Congress in 1863 to serve as an official adviser to the federal government on matters of science and technology.

Herbert Levine, a professor of physics, has long been a leader in the theory of complex systems, particularly in the formation of patterns. His early work focused on the branching structures formed by growing crystals and led to the development of new analytical methods and computational strategies. Among his findings is the observation that particular ways of perturbing these systems can impose additional structure, turning disordered fractal patterns into regular branching patterns, like those of snowflakes.

Levine then applied this framework for understanding the physical processes that drive patterns to biological systems. One of the founders and co-director of UC San Diego's Center for Theoretical Biological Physics, which translates insights from physical science into a more quantitative understanding of biology and medicine, Levine and colleagues have been able to explain the patterns formed by colonies of micro-organisms such as bacteria and amoebae and have correlated these with cellular processes controlled by genes. The principles he has helped to uncover explain a wide range of phenomena from the aggregation of amoebae into a slug-like multicellular organism to the waves of calcium that convey information across a single cell.

Andrew McCammon, the Joseph E. Mayer Chair of Theoretical Chemistry, Howard Hughes Medical Institute investigator and distinguished professor of chemistry and biochemistry, and pharmacology, has invented theoretical methods for accurately predicting and interpreting how molecules interact with one another, methods that play a growing role in the design of new drugs and other materials.

In the 1980s, McCammon guided the establishment of a computer-aided drug discovery program for Agouron Pharmaceuticals and contributed to the development of the widely-prescribed HIV drug, Viracept. McCammon came to UC San Diego in 1995 where he studies rational drug design, molecular simulations, and questions in structural biology using advanced computing facilities, including visualization tools, networks of high-performance personal computers, and parallel supercomputers at the San Diego Supercomputer Center. His group's investigations of how an HIV enzyme flexes contributed to the discovery of the first in a new class of antiviral drugs named Isentress, which the FDA approved in 2007.

David Sandwell, a professor of geophysics in the Cecil H. and Ida M. Green Institute of Geophysics and Planetary Physics at Scripps Institution of Oceanography, studies geological structures of deep-ocean basins. His research focuses on mapping large-scale topographic features beneath the ocean using data collected by satellites orbiting earth and sonar on research vessels. He has led several seafloor mapping expeditions to remote areas of the South Pacific.

With colleagues, Sandwell developed the most detailed map to date of the global sea floor, providing scientists with the first uniform resolution view of 70 percent of the earth and opening up new areas of research in marine geology and geophysics. He uses these data to investigate the tectonics and geodynamics of the ocean basins. Sandwell was also involved in the Magellan mapping mission to understand the geodynamics of Venus. Much of his current research is focused on the measuring deformations of the earth's crust associated with earthquake processes.

The election was held this morning during the business session of the 148th annual meeting of the academy. Those elected today bring the total number of active members to 2,113.

The National Academy of Sciences is a private organization of scientists and engineers dedicated to the furtherance of science and its use for the general welfare. It was established in 1863 by a congressional act of incorporation signed by Abraham Lincoln that calls on the Academy to act as an official adviser to the federal government, upon request, in any matter of science or technology.

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