

Princeton University

Honors Faculty Members
Receiving Emeritus Status



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The biographical sketches were written by
colleagues in the departments of those honored.

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Faculty Members Receiving Emeritus Status

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Giacinto Scoles



Giacinto Scoles was born in Torino, Italy, on April 2, 1935, the son of a mechanical engineer who worked for the carmaker Fiat. With stops in Milan, Lake Orta, and Bergamo in the early years of the Second World War, Giacinto finished his first decade and the war years in a village near Vicenza northwest of Venice. After the war, and his mother's death, the family moved to Barcelona, Spain, where Giacinto attended the Italian High School of Barcelona. It was here that he initially encountered logic and philosophy, and the importance of good ideas and their defense was impressed upon him. He returned to Italy for his university education at the University of Genoa, where he began his studies of engineering. After the two-year basic course in engineering, he decided to study chemistry (against his father's advice) and carried out his M. Sc. thesis research in a physics department laboratory, graduating in February of 1959. This operation at the boundary between chemistry and physics, and his dedication to interdisciplinary work, has characterized Giacinto's scientific career.

Following a year of teaching in Genoa, Giacinto joined the laboratory of Professor J.J.M. Beenakker at the Kamerlingh-Onnes Laboratorium of the University of Leiden in the Netherlands. There his thesis work on the Senftleben effect became his first foray into the world of intermolecular forces, the understanding of which has benefited greatly from Giacinto's contributions over his entire career. Leiden was also the place where Giacinto met and married Giok-Lan Lim, his wife of 44 years. They met in the International Students Club in Leiden, where Giacinto spent time waiting for the late-night trams to stop running so he could carry out his experiments in a vibration-free environment. After receiving his Ph.D., he returned to Genoa as an assistant professor in the physics department. There he set up the first of four molecular beam scattering laboratories he was to build

during his career. At Genoa he carried out many breakthrough atomic scattering experiments, leading to detailed and precise understanding of the interactions between atoms. These experiments relied on the development of the bolometer detector, a device strongly linked with Giacinto's name, and led to the first observation of "rainbow scattering" between crossed atomic beams, the first measurements of orbiting resonances in scattering, and the first direct observation of quantum statistics effects in the collision cross section of helium atoms scattered by helium atoms.

Giacinto accepted a position as a professor of physics and chemistry at the University of Waterloo in Canada in 1970. There he established an active molecular beam laboratory, applying his considerable experimental skills to the high-resolution spectroscopy of cluster beams and structural studies of surfaces using helium diffraction. During those years, Giacinto and his collaborators introduced their widely used HFD model for intermolecular forces. It was in Waterloo as well that Giacinto and Giok-Lan became the proud parents of their daughter, Gigi. In 1987, Giacinto came to Princeton's chemistry department and was named the Donner Professor of Science. He expanded his work on cluster spectroscopy, pioneering the use of superfluid helium nanodroplets as a non-perturbing matrix for spectroscopic studies of molecules and clusters. During his very fruitful 20-year collaboration with Kevin Lehmann at Princeton, Giacinto used molecular beam technology in combination with Kevin's deep knowledge of spectroscopy to advance our understanding of intramolecular vibrational energy redistribution as well as the predissociation of van der Waals clusters, greatly increasing our knowledge of intermolecular forces and chemical reaction dynamics. Also at this time, Giacinto began his long-term affair with self-assembled monolayers of thiols on gold surfaces, using helium scattering and grazing incidence X-ray scattering to determine the structures of these important surface systems. He continues to work with these materials in real space, using scanning probe microscopy to characterize and nanofabricate these layers for use in DNA sensors

and proteomics studies using a technique (nanografting) introduced in 1997 by his former student Gang Yu Liu when she was an assistant professor at Wayne State University.

In parallel with his research activities, Giacinto has, throughout his career, shared his love for experimental science, as well as his organizational skills, with his students and colleagues. As anyone who has shared a meal at his home will attest, he continues to carry out classical scattering experiments on the billiard table with accuracy and enthusiasm. He organized and spearheaded the establishment of the experimental physics laboratory at the University of Trento in Italy, he was a cofounder of the Guelph-Waterloo Center for Graduate Work in Chemistry, and he played a leading role in the establishment of the Princeton Materials Institute upon his appointment at Princeton. Giacinto is also the editor of the famous multi-author, two-volume *Atomic and Molecular Beam Methods*, which is the indispensable handbook for practitioners of the art of molecular beams.

Giacinto has been widely honored for his scientific contributions. He is the holder of two honorary doctorates (one in physics and the other in science), is an elected Fellow of the Royal Society of the United Kingdom, and an elected foreign member of the Royal Academy of Arts and Sciences of the Netherlands. He is the recipient of the 2002 Peter Debye Award in Physical Chemistry of the American Chemical Society, the 2003 Earle K. Plyler Award in Molecular Spectroscopy of the American Physical Society (jointly with Kevin Lehmann), and in 2006 was awarded the prestigious Franklin Medal in Physics by the Franklin Institute. Although he becomes the Donner Professor of Science, Emeritus, at Princeton as of July 1, Giacinto continues to hold two appointments in his native Italy, as a professor of biophysics at SISSA, and as a scientific consultant at ELETTRA in Trieste. He also continues to work with a highly interdisciplinary group of enthusiastic students and postdoctoral fellows at Trieste, applying his fundamental approach to understanding problems at the boundary between physics and chemistry as well as to a new

realm of biological and even medical questions. We wish him great success in his continued pursuit of the forces that govern molecular interactions and the interdisciplinary approach to their understanding. We hope that he will continue to visit Princeton regularly, and keep the experimental pot stirred here as well.