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.

Contents

Maitland Jones Jr.

Maitland Jones Jr. will retire after having taught organic chemistry at Princeton for more than 40 years. Born in New York in 1937, Mait began his chemistry career at the tender age of 13, working summers as a bottle washer in the laboratory of the man who was to inspire his lifelong passion for physical organic chemistry, Yale professor William von Eggers Doering. Mait went on to study chemistry and play tennis at Yale, completing his undergraduate work and his Ph.D. under the tutelage of Doering. After a postdoctoral year at Yale and a second postdoc at Wisconsin with Jerry Berson, Mait joined the chemistry faculty at Princeton in 1964, rising through the ranks to become the David B. Jones Professor of Chemistry.

For Mait, organic molecules present a fascinating challenge: the relationship between their structure and their reactivity. What happens when a molecule's reactivity is constrained by its novel geometry? How much distortion through bending, twisting, or crowding will a molecule or a reactive center tolerate before launching into new and unpredictable chemistry? How does the introduction of a heteroatom—or indeed, a framework based on non-carbon atoms—affect the properties of a reactive center? What is the impact of alignment or misalignment of molecular orbitals on these molecules and their reactivity? These seemingly esoteric questions require a creative and elegant approach to test the fundamental principles of organic structure-reactivity relationships. That inventiveness is the hallmark of the research that Mait directed at Princeton as he and his legion of collaborators investigated the reactions and spin states of carbenes, arynes, twisted π systems, and carborane chemistry.

Mait has an impressive research trail, commencing with his

naming the then-hypothetical molecule bullvalene (a seemingly trivial $C_{10}H_{10}$ structure with over 1.2 million possible isomers!) and the discovery of the oxy-Cope rearrangement before he came to Princeton. His research here focused on the synthesis of strained aromatic molecules, singlet and triplet carbene chemistry, explorations of chemistry on synthetic diamond surfaces, and proposals to use carboranes to deliver cancer drugs. On each of these projects, he worked with an array of colleagues at every level of experience, ranging from pre-college level to distinguished professors. His published oeuvre includes more than 200 papers, monographs and books, most of them with co-authors from among more than 60 undergraduates, 30 graduate students, and 34 postdoctoral and visiting fellows. They included those who were among the first Chinese and Russian scientists to be permitted to come to the United States after having been shut out during the Cold War. "Jones Alley," as the lab was known, was an incubator of scientific and cultural exchange at all levels.

As much as Mait's work is that of a research scientist, he embodies the quintessential Princeton faculty member: someone who teaches the very knowledge he creates. And it is his devotion to excellent teaching in the context of outstanding research that is the signal strength of Mait's career at Princeton. While he has taught other courses to rave reviews, it is ORGO—the introductory year-long undergraduate course taken by most of the aspiring scientists, engineers, and pre-meds to graduate from Princeton—that is his signature course, one that garners outstanding reviews for its teaching even as it is rated among the toughest courses at Princeton. There is not much that has developed to alter the basic canon of organic chemistry in the 40-plus years that Mait has been teaching, yet from his first efforts as a newly appointed instructor, he has never been satisfied with simply teaching the same excellent lectures, year in and year out. When it was clear that the perfect textbook was not to be found, he embarked on a 10-year project to write a

1,400-plus-page text now in its third edition and going strong. And in an effort to take the course subject that he treats as an art even further away from the "lecture-memorize-regurgitate facts" that is so common elsewhere, he has devoted more than 10 years to developing a new approach to teaching ORGO that is focused on small-group, problem-based learning. The course description said it all: "Our aim is to teach the best course in organic chemistry anywhere."

Mait has always been an early adapter of technology, whether it was the very first foray into electronic distance education in the late 1960s using the Victor Electrowriter Remote Blackboard (VERB) system or being among the beta-testers of a revolutionary desktop computer program to draw chemical structures in the early 1980s. And yet he understands the exquisite balance between the time and place for the complex versus the simple. In his classroom, however, nothing more than four pieces of colored chalk are needed to illuminate the most complicated chemical transformation or the complex three-dimensional nature of chemicals that are the building blocks of biological structures.

As he leaves behind his active duties at Princeton, his near-term plans are to continue teaching the subject he loves to some very fortunate students at New York University, to continue his avid appreciation for and promotion of live jazz performance, to play a little tennis, and to devote more time to his beloved family—wife Susan; children Mait, Hillary, and Stephanie; and seven beautiful grandchildren. An organic chemist is one whose scholarly focus is on the chemistry of a single element: carbon. Mait leaves a large carbon footprint at Princeton that has a welcome afterglow.