

Princeton University

HONORS FACULTY MEMBERS
RECEIVING EMERITUS STATUS



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

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IGNACIO RODRÍGUEZ-ITURBE



Ignacio Rodríguez-Iturbe, the James S. McDonnell Distinguished University Professor of Civil and Environmental Engineering and the Princeton Environmental Institute, and one of the pioneers in the field of hydrology, is transferring to emeritus status at the end of this academic year. Ignacio is known for developing rigorous mathematical theories for hydrologic processes and, more generally, geophysical and biological processes for which the water cycle plays a central role. He is also known for his service to Princeton and the environmental and geophysics communities around the world.

Ignacio was born in Caracas, Venezuela, and spent most of his youth in Maracaibo. He attended the University of Zulia in Venezuela, receiving an undergraduate degree in Civil Engineering in 1963. Afterwards, he attended the California Institute of Technology, receiving an M.S. in 1965, and Colorado State University, from which he received a Ph.D. in civil engineering in 1967. Ignacio returned to Venezuela after his graduate study in the United States to take a faculty position at the University of Zulia. He returned to the United States in 1971, taking an associate professor position at the Massachusetts Institute of Technology in the Department of Civil Engineering. He remained at MIT until 1975, when he became professor of engineering at the Simón Bolívar University in Caracas, a position he held until 1995. During this time, he also served as dean of research and dean of graduate studies at Simón Bolívar, professor at the International Institute of Advanced Studies in Caracas, and visiting professor and senior lecturer at MIT. Prior to joining Princeton in 1999, Ignacio held chairs at the University of Iowa and Texas A&M University.

Ignacio's early research centered on development of stochastic theories for hydrologic processes, often focusing on characterization of extremes. This work has provided a foundational set of results for examining fundamental problems in hydrology, as well as providing influential methods for solving engineering problems linked to drought and flood. Building on this line of research, Ignacio turned his attention to development of probability models of rainfall, producing

a collection of fundamental results and methods for examining one of the most challenging areas of the hydrologic cycle. Among the most influential areas of research during Ignacio's career has been his work on river networks and their control of hydrologic processes. His theory of the geomorphological unit hydrograph is among the most important contributions to the hydrologic sciences during the last 50 years. In addition to its direct connection to hydrologic processes, Ignacio's work on river networks has provided the starting point for examining a wide range of environmental problems related to species diversity and river conservation. For more than a decade, Ignacio has examined the interplay of vegetation and the water cycle. In this line of research, he has examined the mechanisms by which plants cope with water stress due to variability of the water cycle and, viewed from the hydrologic perspective, how vegetation alters the water cycle. The rapidly growing field of ecohydrology has evolved from Ignacio's work in this area.

Ignacio has authored a number of influential textbooks. His early work on stochastic theories of hydrologic processes provides the foundation for *Random Functions and Hydrology* (Dover Publications, 1994), which he coauthored with Rafael Bras. In 1997, he published the pathbreaking *Fractal River Basins: Chance and Self-Organization* (Cambridge University Press) with Andrea Rinaldo, synthesizing results on river networks, drainage basins, and hydrologic response. The pioneering book *Ecohydrology of Water-Controlled Ecosystems*, published with Amilcare Porporato by Cambridge University Press in 2004, is the foundational text for the field of ecohydrology.

Ignacio was elected to the National Academy of Engineering in 1988 and to the National Academy of Sciences in 2010. He has also been elected to the Pontifical Academy of Sciences and Latin American Academy of Sciences. Ignacio is a fellow of the American Geophysical Union, American Meteorological Society, and American Academy of Arts and Sciences. He has won numerous awards, most notably the Bowie Medal of the American Geophysical Union and the Stockholm Water Prize of the Stockholm International Water Institute. Among his other awards are the James B. Macelwane Medal for significant geosciences contributions by early career scientists, Hydrologic Sciences Award, Walter Langbein Lecture Award for lifetime contributions to hydrology, and Robert E. Horton Medal for outstanding contributions to hydrology, all from the American

Geophysical Union; the Robert E. Horton Lecturer in Hydrology award from the American Meteorological Society; the Walter Huber Civil Engineering Research Prize and Ven Te Chow Award for lifetime achievement from the American Society of Civil Engineers; and the Prince Sultan Bin Abdulaziz International Prize for Water.

Ignacio is an outstanding teacher, with a unique capability for conveying the excitement of scientific research. This was true for his undergraduate courses, like “The Fractal Beauty of Landscapes,” as well as his graduate courses in hydrology and ecohydrology. Ignacio’s service to Princeton has been extensive, ranging from his contributions to the Princeton Environmental Institute to his role in promoting diversity at Princeton. Ignacio has been a mentor to students, postdoctoral researchers, and faculty throughout the University, in both formal and informal settings. Perhaps most important were the informal settings. Whether the topic centered on the frontiers of science, the challenges of academic life, or the prominence of shortstops from Maracaibo, Ignacio was always available to engage and inspire his colleagues.