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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Faculty Members Receiving Emeritus Status 2017

Jean-Herve Prévost

Jean H. Prévost, professor of civil and environmental engineering, and one of the pioneers in the field of computational geomechanics, is transferring to emeritus status at the end of the academic year after serving as an active member of Princeton's faculty for over thirty-five years.

Jean was born and raised in Morocco, and later moved to Paris where he attended École Spéciale des Travaux Publics, receiving an diplôme d'ingénieur in civil engineering in 1971. Afterwards he attended Stanford University, supported by a Fulbright fellowship and the French Foreign Ministry fellowship, where he obtained an M.S. and a Ph.D. in civil engineering in 1972 and 1974, respectively. After completing his Ph.D., he was awarded a research fellowship by the Norwegian Geotechnical Institute in Oslo, where he spent the following two years. He later returned to the United States as a research fellow and a lecturer at the California Institute of Technology, where he spent the next four years teaching courses related to soil mechanics and plasticity theory while expanding his research expertise to centrifuge testing for soil dynamics characterization. In 1978, he joined the faculty at Princeton University, where he established himself as a leader in the field of theoretical and computational geomechanics. From 1989–1994, Jean held the chair position for the department once known as civil engineering and operations research, which later morphed into the Department of Civil and Environmental Engineering.

Over the years, he has held several honorary appointments including visiting professor appointments at the ROSE School at the University of Pavia, École Polytechnique in Paris, École Polytechnique Federale de Lausanne, Stanford University, as well as the Institute for Mechanics and Materials at the University of California, San Diego.

With over thirty-five years of experience in the areas of computational solid mechanics, he has made several seminal contributions. His earlier work laid the foundations and shaped the field that would become known as computational geomechanics. His work on the rheology and plasticity of soils, on the localization of

deformation, and shear banding in geo-materials, as well as on non-linear transient phenomena in porous media, is still highly cited after thirty years since its appearance in the literature. More recently, he has worked in areas related to topology optimization (publishing work with over 500 citations); multi-physics problems (including thermo-elasticity, electro-magneto-solid interaction effects); delayed fracture in MEMS; cracks propagation in microstructures; and reservoir models for CO2 sequestration in deep saline aquifers. He is a pioneer of the extended finite element methods, a numerical method for modeling crack propagation, and is at the forefront of its development. It is safe to say that his work is equally deep as broad, and its quality will set the standard for excellence in the field of computational mechanics for many years to come.

Beyond his over 250 peer reviewed papers and several invited talks, including the prestigious Maurice A. Biot Lecture, some of his major past accomplishments include the establishment of the Centrifuge Soil Laboratory, a laboratory that set the trend for many research institutions around the world, and the Computational Laboratory, and the development of a powerful finite element software, Dynaflow, for the static and transient response of linear and nonlinear two- and three-dimensional systems. Dynaflow has been harnessed by practitioners and researchers, in academia and industry alike, to address some of the most challenging problems in earthquake engineering, energy resources engineering, and structural dynamics. His contributions have earned him several awards including the International Association for Computer Methods and Advances in Geomechanics (IACMAG) award for Significant Contribution in Constitutive Laws.

Jean's commitment to teaching initiated during his appointment as a lecturer at the California Institute of Technology and continued at Princeton, where he developed fundamental courses in solid mechanics, as well as numerical methods. "Introduction to Finite Element Methods" has been a core course for many students within the civil engineering department and beyond. His enthusiasm for teaching transpires when he proudly recalls discussions with alumni that assert that his core course on finite element methods has proven to be the most useful course taken during their studies. Beyond teaching, his mentorship helped forge some of the most prominent researchers in the field of computational mechanics, and many of his advisees have

carried on beyond Princeton to hold esteemed positions in academia and industry alike.

Although his presence in the class will be greatly missed, Jean plans to continue pursuing as a senior scholar his research interests in extended finite element methods and high-performance computing. His excellence and devotion to the academy will continue to be a source of inspiration for all of us.