


HKIAS Distinguished Lecture Series

About Tresca's Memoirs on the Fluidity of Solids (1864-1871) The Birth and the History of the Mathematical Theory of Plasticity



Professor Jean Salençon
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HKIAS Senior Fellow

Date: 19 February 2025 (Wednesday)
Time: 4:00pm-5:00pm
Venue: HKIAS, LG/F, Academic Exchange Building
City University of Hong Kong

Abstract One-hundred-and-fifty years ago, Henri-Édouard Tresca submitted a series of Memoirs to the French Academy of sciences, which were devoted to describing the extensive series of experiments he had carried out on various materials, and where he had identified a phenomenon that he termed the “fluidity” of metals when they were subjected to very high pressures. In addition to a detailed description of his experiments, Tresca proposed a mechanical theory for the observed phenomena, which addressed both the stress state and the flow of the material. These were the initial appearances of the concepts that are now known as the yield criterion and the plastic flow rule. After a precise description of Tresca’s work completed by Saint-Venant’s contribution, the Lecture will highlight how the mathematical theory of plasticity in its canonical form has been progressively elaborated as a model for material behaviour within the small perturbation framework, through the landmark inputs by illustrious scholars, from Maxwell and Beltrami unto Moreau and Brezis. It is hoped that this retrospective might aid in the development of new models that can be implemented with AI.

Biography Professor Jean Salençon, an Honorary Professor at École Polytechnique and École nationale des ponts et chaussées in France, is a distinguished figure in the field of Continuum Mechanics. He also held the positions of Chair Professor-at-Large and Visiting Distinguished Professor at the City University of Hong Kong (CityU) from 2011 to 2016. He is currently a Senior Fellow of the Hong Kong Institute for Advanced Study at CityU.

During his illustrious career, he served as the President of the French Academy of Sciences in 2009 and 2010 and presided over the Institut de France in 2009. Professor Salençon is a Member (Emeritus) of the French Academy of Technologies and Academia Europaea, and holds foreign memberships in the Istituto Lombardo (Milan) and the Academia das Ciências de Lisboa (Portugal). He is also an Honorary Member of the Hungarian Academy of Sciences and a Corresponding Member of the Académie des sciences et lettres de Montpellier (France).

With a vast body of work that includes over 190 publications, 12 books, textbooks, and 8 multimedia software, Professor Jean Salençon is a renowned global leader in the field of Continuum Mechanics, contributing significantly to both theory and its practical applications.

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ALL ARE WELCOME!



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