**Large-scale steel column tests and collapse simulations of steel moment resisting frames under seismic loading – Lessons learnt and future research directions**

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**Abstract:**

During the last decade, valuable experimental work was conducted to assess the seismic stability of steel columns under multi-axis cyclic loading. Corroborating finite element studies complemented the test observations and lead to a number of recommendations for improved seismic design and assessment of steel frame buildings with moment-resisting frame (MRF) lateral load-resistant systems. In parallel, system-level simulation studies with sophisticated deterioration models furthered our understanding regarding force redistributions within a steel MRF prior to global collapse in the aftermath of earthquakes. Some of the system-level findings have direct implications in seismic retrofit of steel MRFs designed in seismic regions. This talk provides a comprehensive overview of work done by the author in all the above-mentioned aspects. Moreover, a snapshot of ongoing research will be presented to address some of the presented challenges.

**Short Bio:**

Prof. Lignos’s research involves integrated computational modeling and large-scale experimentation for the fundamental understanding and simulating of structural collapse of steel structures. Prof. Lignos joined the École Polytechnique Fédérale de Lausanne (EPFL) in 2016 from McGill University, Canada, where he was a tenured Associated Professor in the Department of Civil Engineering and Applied Mechanics. Prior to that he was a post-doctoral researcher at Kyoto University (2010) and Stanford University (2009). He has degrees in Structural Engineering (Stanford University, M.S. 2004, Ph.D. 2008) and Civil Engineering (NTU, Athens, 5-year Diploma 2003). His awards include the 2019 Walter L. Huber Prize from American Society of Civil Engineers (ASCE) and the 2015 William Dawson Scholarship for Infrastructure Resilience, among others.