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Title of the Theme Lecture
Modelling liquefaction effects – From lateral spreading to soil-structure interaction

Abstract
Soil liquefaction induced by earthquakes can cause significant damage to adjacent structures and lead to considerable economic loss. The mechanism and effects of soil liquefaction have been studied extensively throughout the years. With the development of computational tools and advanced constitutive models which can capture complex soil behaviour under various loading and drainage conditions, numerical modelling has become popular for predicting liquefaction induced ground failure, deformations, and effects induced by this phenomenon. This is particularly true for Soil Structure Interaction (SSI) problems where the interaction between the liquefied soil and pile foundations is highly nonlinear and inherently complex in nature. In this paper, we examine important considerations that must be taken into account when numerically evaluating soil structure interaction effects due to liquefaction including the capabilities of the constitutive model, boundary conditions, solution strategies and soil-pile interface representation.

Bio
Prof. Arduino has taught geotechnical engineering at the University of Washington since 1997. His primary research interest are in computational geomechanics with emphasis in constitutive modeling of soils, finite element analysis, meshless techniques, soil structure interaction, and hazard analysis. Much of his current research is in the area of landslide and debris flow simulation, soil-structure interaction, and performance-based earthquake engineering. He has conducted research for the National Science Foundation, the Pacific Earthquake Engineering Research (PEER) Center, and the Washington State Department of Transportation (WSDOT). He is a member of the ASCE EM Inelasticity and ER Earth and Retaining Structures committees and served on the editorial board of the ASCE Journal of Geotechnical and Geo-environmental Engineering. Prof. Arduino is a member of GEER and was part of the reconnaissance teams after the 2010 Maule earthquake, 2011 Great Japan earthquake, and 2017 Morelos-Puebla Mexico earthquake. Arduino has also served as a consultant to private firms and government agencies in the U.S. and abroad.