



**The Donald M. Burmister Lecture**  
 Department of Civil Engineering and Engineering Mechanics  
 Columbia University

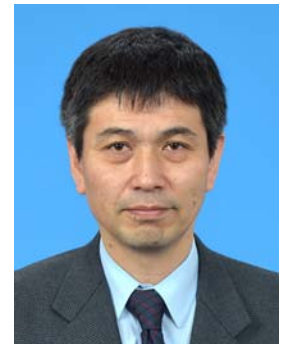
*Experimental Studies on Liquefaction and Re-Liquefaction Behavior of Saturated Sandy Soils*

**Professor Junichi Koseki**  
 The University of Tokyo

**April 14, 2021 (17:30-18:30 EDT)**

April 14, 2021				April 15, 2021			
Los Angeles	New York	London	Paris/Rome	Tel Aviv	New Delhi	Beijing	Tokyo/Seoul
14:30 -	17:30 -	22:30 -	23:30 -	0:30 -	3:00 -	5:30 -	6:30 -

**Zoom link:** <http://www.columbia.edu/cu/civileng/ling/burmister>



**ABSTRACT** During large earthquakes, liquefaction of saturated sandy soil deposits induced significant damage to both public infrastructures and private properties. In some case histories, it is reported that liquefaction occurred repeatedly at the same site. Despite the huge efforts made in the past, details of the liquefaction and re-liquefaction behavior of saturated sandy soils have not yet been fully understood. In order to provide new insight into this behavior, several types of experimental studies have been made by the lecturer and his colleagues, using triaxial test and hollow-cylindrical torsional shear test apparatuses in the laboratory as well as a 1-g shaking table. As a result, though overall densification occurred, the re-liquefaction resistance could either increase or decrease by the liquefaction history, where positive and negative impacts accumulate before and after passing the phase transformation line, respectively. The response during the current liquefaction stage was more predominantly affected by the immediate-past history, including smaller shaking levels, than by the current overall relative density. In case of the cyclic stacked-ring shear tests with initial static shear, significant effects of anisotropy that had been induced by the liquefaction history were also observed. The above observations were further extended to interpretation of the first liquefaction behavior, by assuming that the application of cyclic stress history would affect the subsequent response even during a single liquefaction event.

**About the Speaker** Junichi Koseki is a professor at the Department of Civil Engineering, The University of Tokyo, Japan. He worked as a researcher at the Public Works Research Institute of Ministry of Construction in Japan before joining the University of Tokyo in 1994. His areas of expertise include laboratory stress-strain testing of soils, deformation and strength properties of geomaterials, dynamic behavior and seismic design of earth structures, and soil liquefaction and its countermeasures. He delivered Mercer Lecture in 2010-2011 and Bishop Lecture in 2019. He served as Chair of TC101 on laboratory stress strain strength testing of geomaterials, organized by International Society for Soil Mechanics and Geotechnical Engineering, Vice president of the Japanese Geotechnical Society, and Council member of International Geosynthetic Society. He is currently Editor in chief of the journal 'Soils and Foundations'.



The late Prof. Donald M. Burmister (1895-1981) is one of the pioneers in the field of Soil Mechanics and Geotechnical Engineering. He established the Soils Laboratory at Columbia University in 1933. He was a faculty member for 34 years before retiring in 1963. During his tenure at Columbia University, he investigated earthworks and foundations for over 400 projects. Most notably among these were the Brookhaven National Laboratory, the Throgs Neck, Tappan Zee and Verrazano Narrows Bridges, the First New York World Fairs at Flushing Meadows, and the reconstruction of the White House in 1950. He has developed several soil testing methods and his soil classification system is still widely used. He also contributed to the first use of digital computer in conjunction with his theory of the layered pavement system.