



Department of Civil Engineering and Engineering Mechanics  
Columbia University

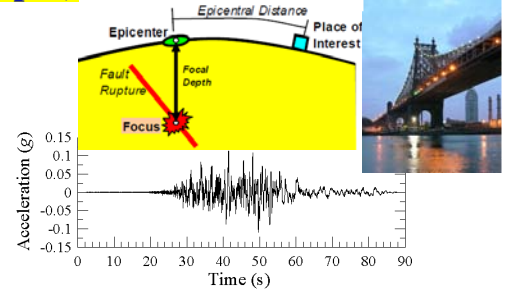
**Tuesday, April 17, 2012 (2:30-3:30 pm)**

**644 Mudd**



**Dr. Sissy Nikolaou, PE**

*Senior Associate, Mueser Rutledge Consulting Engineers*



## **EARTHQUAKE GROUND MOTIONS IN NEW YORK CITY:**

### **WHAT MAKES US DIFFERENT?**

#### **APPLICATION: SEISMIC RETROFIT OF LANDMARK BRIDGES**

The last couple of years were a reminder that our planet can produce disastrous seismic events that come as a surprise with our current state of understanding and exceed our scientific predictions. For example, the Great Tohoku-Okai M9 Earthquake and Tsunami in Japan had catastrophic irreversible consequences and the M5.8 Mineral, VA earthquake hit urban areas of the Eastern US that are generally not prepared for this type of hazard. A moderate earthquake in New York City could affect millions of people and potentially impact the world economy. The anticipated hazard places the region at high seismic risk because a significant portion of the infrastructure, including buildings, bridges, and public utilities, were not designed to accommodate seismic loading, as the regional practice of earthquake engineering has a relatively short history.

Dr. Nikolaou will present an overview of the regional characteristics of geology, seismicity, and the engineering approaches followed to address common seismic problems such as hazard assessment, soil response, and liquefaction potential evaluation in the Eastern US. Most of these approaches are based on developments and experiences from the Western US and other seismically active area and may not be applicable in our area. To illustrate the local issues, examples from actual retrofit projects of landmark bridges, such as the current studies for Queensboro Bridge, will be discussed.

**Biosketch:** Dr. Nikolaou is recognized as the leading authority for geo-seismic design in the tri-state area. At Mueser Rutledge Consulting Engineers, she established and leads a department focused on earthquake engineering services that include geophysical testing, site-specific seismic analyses, liquefaction hazard assessment, and soil-structure interaction modeling. Her recent projects include the Manhattanville Campus Expansion of Columbia University, Queensboro Bridge, Hillview Reservoir Cover, and Woodrow Wilson Bridge in Washington DC. She is a licensed Professional Engineer and a certified FEMA Search-Rescue Structural Specialist. She received a Diploma in Civil Engineering from National Technical University of Athens; her Master's/PhD are from SUNY-Buffalo.

Sissy has developed an enrichment program for the very young (school K-5) about the geology, earthquakes, and structures of New York that has been implemented in a Title-1 Public School, with participation from Columbia University students. She regularly participates in activities and delivers talks to support and promote the involvement of women in engineering. For her efforts, she was named an Outstanding Woman in the Building Industry by the Builders Council (2009). Sissy has been active in research and several committees, including chairing the seismic panel of the current revision of the NYC Building Code, and being a Director of ACEC NY (American Council of Engineering Companies). She has been placed among the 40-under-40 Outstanding Leaders in the Building and Construction Industry and has received the Prakash Award for Excellence in Geotechnical Earthquake Engineering.

<http://www.civil.columbia.edu>