

# GEST Seminar Series



**Date: 17.02.2014 | Room: Cassie 3.25 | Time: 13:00 - 14:00**

## **Earthquake resistance, failures and retrofit of masonry structures**

Dr Fulvio Parisi

*Department of Structures for Engineering and Architectur,  
University of Naples Federico II, Italy*



### **Abstract**

Masonry structures form a large part of the worldwide built heritage, including cultural heritage sites and modern urban centres. Many of these structures are located in earthquake-prone countries and need to be assessed and retrofitted in order to mitigate future losses.

This seminar will address some research advances in both earthquake resistance prediction and retrofit of masonry structures. Based on a back-analysis of structural failures observed after real high-intensity earthquakes and experimental tests, fundamentals of the seismic response analysis of masonry buildings are first provided. Dealing with performance-based seismic assessment, emphasis is given to structural modelling and nonlinear analysis procedures. The main sources of uncertainty affecting masonry structures are also identified to be included in seismic reliability analysis. Finally, recent experimental results of full-scale tests are presented to highlight: (1) the influence of construction features on the in-plane cyclic behaviour of masonry walls with openings; (2) the ability of new composite materials to increase strength and/or displacement capacity, allowing rapid repair interventions during earthquake clusters and sustainable retrofit of historic structures.