



Università  
di Genova

DICCA DIPARTIMENTO  
DI INGEGNERIA CIVILE, CHIMICA  
E AMBIENTALE

DICCA  
SEMINARS

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## “Slow dynamics and fluctuation-dissipation concepts for structural health monitoring”

ABSTRACT

The earthquake responses of existing structures are strongly dependent on their health and on the nature of the shaking. Nonlinear processes can be observed, by tracking the variations of the values of the elastic parameters that characterize their response (in particular, the resonance frequencies and the associated damping). Through new data collected in the structures (under weak and strong motion), these nonlinear processes can be physically interpreted in order to assess the health of the structures and to specify their behaviour and their safety under earthquakes. In particular, during this talk, two processes observed in structures will be discussed: (1) that of fluctuation-dissipation to account for the activation of heterogeneities (and fracture density) under weak motion (ambient vibration) through damping variation interpretation, and (2) that of slow dynamics to analyse the activation (opening/closing) and emergence of fractures (and damage) under seismic loading. The presentation will be illustrated with examples from laboratory data sets and instrumented buildings (Japan, Ecuador, France, US...) in reinforced concrete, masonry or steel frame.

**REINFORCED GREEN PASS NEEDED FOR THE ATTENDANCE OF THE SEMINAR**



Wednesday, February 9th  
9.30 am



Streaming on the Teams  
channel (CODE: wlp9vyt)



or using this link:  
<https://shorturl.at/jksH0>

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