

**The Department of  
Mechanical Engineering**

PRESENTS

**Chiara Daraio, Ph.D.**Professor of Mechanical Engineering and Applied Physics  
California Institute of TechnologyFriday, February 9, 2018  
WCH Room 205/206  
11:10-12:00PM***Meta-materials with locally addressable properties:  
from self-folding to autonomous propulsion*****Abstract:**

Mechanical metamaterials are materials with a tailored, architected structure, designed to achieve properties that depart from those found in natural or more “conventional” engineering materials. Initial realizations of these materials were periodic and derived their properties from an interplay of the constitutive material responses and the architected geometry. More recently, developments in the field of metamaterials focused on the effects of disorder, nonlinearities and tunability. This increasing complexity allows material designers to control more precisely local constitutive and structural properties, and harvest the richness of nonlinear phenomena. Current trends suggest a growing interest in the creation of metamaterials with programmable responses and metamaterials with autonomously adapting morphology. In this talk, I will highlight some of our recent work in the control of stored energy in structured materials, to create programmable, nonlinear metamaterials and their possible application to engineering problems.

**About the Speaker:**

Professor Daraio received her undergraduate degree in Mechanical Engineering from the Università Politecnica delle Marche, Italy (2001). She received her M.S. (2003) and Ph.D. degrees (2006) in Materials Science and Engineering from the University of California, San Diego. She joined the Aeronautics and Applied Physics departments of the California Institute of Technology (Caltech) in fall of 2006 and was promoted full professor in 2010. From January 2013 to August 2016, she joined the department of Mechanical and Process Engineering at ETH Zürich, with a chair in Mechanics and Materials. She returned at Caltech in August 2016, as a Professor of Mechanical Engineering and Applied Physics. She received a Presidential Early Career Award from President Obama (PECASE) in 2012, was elected as a Sloan Research Fellow in 2011 and received an ONR Young Investigator Award in 2010. She is also a winner of the NSF CAREER award (2009), of the Richard Von Mises Prize (2008) and received the Hetenyi Award from the Society for Experimental Mechanics (2015). She was selected by Popular Science magazine among the “Brilliant 10” (2010). She serves as a Board Editor for Science (AAAS) and as an Associate Editor for the journal Extreme Mechanics Letters. She published over 120 peer-reviewed papers, two book chapters and several patents. For a complete list of publication and research information: [www.daraio.catech.edu](http://www.daraio.catech.edu).