



Professor Katia Bertoldi

See: <https://www.seas.harvard.edu/directory/bertoldi>

Professor in Applied Mechanics
Harvard School of Engineering and Applied Sciences

Education:

Laurea Degree, 2002, Civil Engineering, University of Trento
International Masters, 2003, Structural Engineering, Chalmers University of Technology in Goteborg, Sweden
Ph.D., 2006, Mechanics of Materials and Structures, University of Trento in Italy

Research Interests:

Applied Mathematics & Computational Science: Modeling Physical/Biological Phenonema and Systems
Materials & Devices:
 Materials Science
 Solid Mechanics

Profile:

Katia Bertoldi's research involves the use of continuum mechanics and applied mathematics to model the mechanical behavior of novel materials at the small scale, such as nano-composites and biological composites. The aim of her group is to establish relationships between the internal structure of a material and its mechanical properties. The greater understanding of existing and potential discovery of new materials, especially those with improved and even 'tunable' properties, have direct use in many critical fields, including acoustics, optics, and

electronics. Her primary areas of interest include: continuum mechanics analyses of behavior of modern materials; buckling and instabilities; waves propagation; constitutive modeling of polymers; computational mechanics; fracture mechanics; applied mathematics; and the mechanical behavior of biological materials. Prior to her appointment at Harvard, Bertoldi was an Assistant Professor at the University of Twente in the Netherlands. She earned a Ph.D. in Mechanics of Materials and Structures from the University of Trento in Italy; an International Masters in Structural Engineering from Chalmers University of Technology in Goteborg, Sweden; and a Laurea Degree in Civil Engineering from University of Trento.

Honors:

Institute for Multiscale materials systems, University of California, Santa Barbara, Visiting Researcher Fellowship, February 2009

Award for outstanding presentation by younger scientists in Solid Mechanics, ICTAM 2008

Riken, The Japanese Center of Chemical and Physical Research, Tokyo, Japan, JISTEC-REES Fellowship, July-August 2003

Award for outstanding Thesis, University of Trento, Italy, 2006

Chalmers University of Technology (Goteborg, Sweden), Erasmus Grant, exchange student, August 1999–June 2000

Selected Publications:

S. Singamaneni, K. Bertoldi, S. Chang, J.H. Jang, S.L. Young, E.L. Thomas, M.C. Boyce, V.V. Tsukruk. “Bifurcated Mechanical Behavior of Deformed Periodic Porous Solids”. *Advanced Functional materials*, 19, 2009, 1426-1436.

J.H. Jang, C.Y. Koh, K. Bertoldi, M.C. Boyce, E.L. Thomas. “Combining Pattern Instability and Shape-Memory Hysteresis for Phononic Switching” *Nano Letters*, 9, 2009, 2113-2119

Katia Bertoldi, Mary C. Boyce “Wave Propagation and Instabilities in Monolithic and Periodically Structured Elastomeric Materials Undergoing Large Deformations” *Physical Review B*, 77, 2008, 184107

Katia Bertoldi, Mary C. Boyce, Stephanie Deschanel, Sharon M. Prange, Tom Mullin “Mechanics of deformation-triggered pattern transformations and superelastic behavior in periodic elastomeric structures” *Journal of the Mechanics and Physics of Solids*, 2008, 56, 2642-2668.

Tom Mullin, Stephanie Deschanel, Katia Bertoldi, Mary C. Boyce “Pattern Transformation Triggered by Deformation” *Physical Review Letters* 99, 2007, 084301