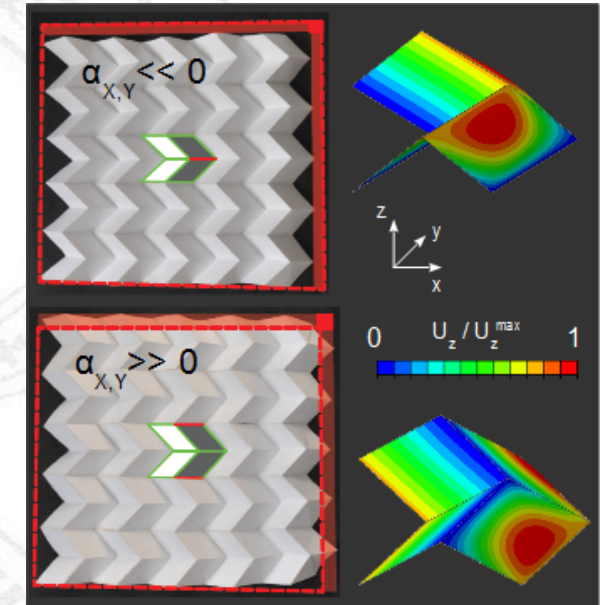
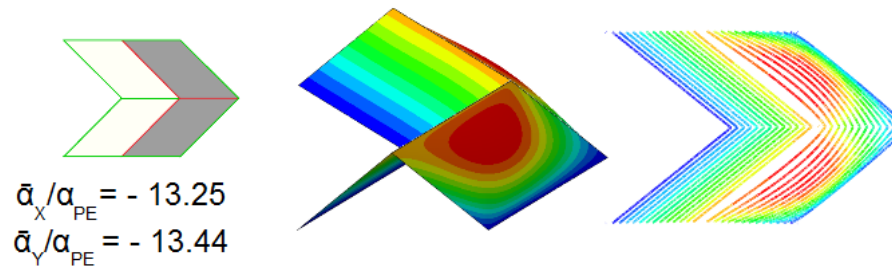


## Origami metamaterials for tunable thermal expansion

Applications in aerospace, optics, microelectronics, and many more, often require components with targeted area/volume changes in response to variations in temperature. We propose a new strategy, based on origami bilayers, to design metamaterials with tunable and extreme thermal expansion/contraction, opening new routes for the development of systems with engineered thermal properties. We combine experiments and simulations to demonstrate that by tuning the geometrical and mechanical parameters of the origami structure an extremely broad range of thermal expansion coefficients can be obtained, spanning both negative and positive values. Differently from all previously reported systems, the proposed structure is tunable in-situ and non-porous.



**Dr. Elisa Boatti**

John A. Paulson School of Engineering and Applied Sciences  
Harvard University

**June 7<sup>th</sup>, 11:30 am**  
**DICAr MS1 Meeting Room**  
Via Ferrata, 3 – Pavia