

# Special LASSP Seminar



**Friday  
March 1, 2019**

**416 Physical Sciences  
Building**

**1 P.M.**

**Martin Van Hecke**

Huygens-Kamerlingh Onnes Laboratory  
Universiteit Leiden

## **Mechanical Metamaterials as Machines**

The structural complexity of metamaterials is limitless, but in practice, most attention has focussed on periodic architectures, leading to relatively simple properties and functionalities. Here we discuss structurally complex metamaterials, which exhibit spatially textured and sequential behavior. First, we introduce a combinatorial approach that allows to design aperiodic, yet frustration-free, mechanical metamaterials, and discuss the physics of a textured 3D metamaterial, as well as a multi-shape origami-based metamaterial. Second, we show how to design and create metamaterials that translate a global uniform compression into a precise multistep pathway of reconfigurations. These innovations open new avenues towards mechanical metamaterials with unusual order and machine-like functionalities.

*Hosted by Itai Cohen*