

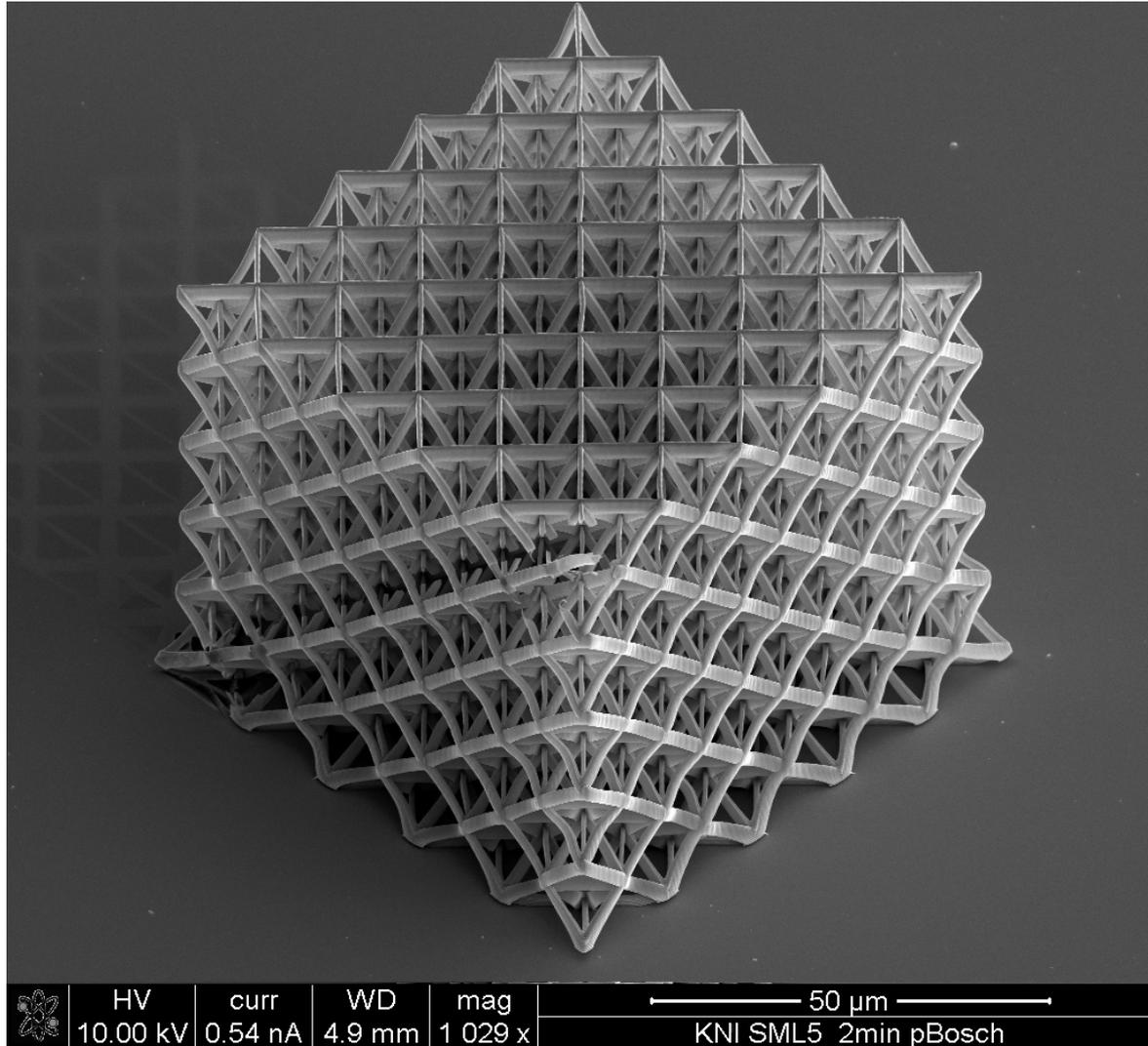
Characterization of Thin Films for Nano-Architected Structures

Michael Hoefft

Mentor: Andrew Gross

PI: Dr. Katia Bertoldi

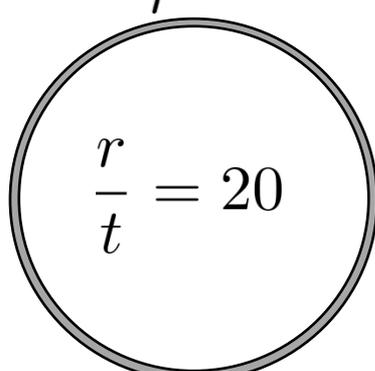
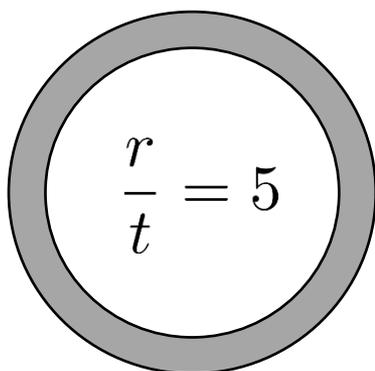
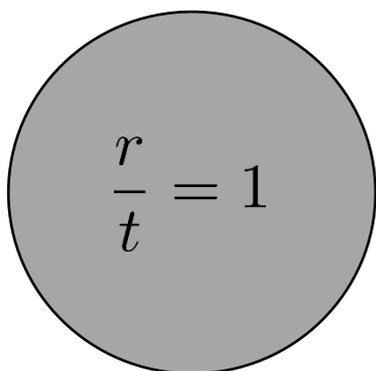
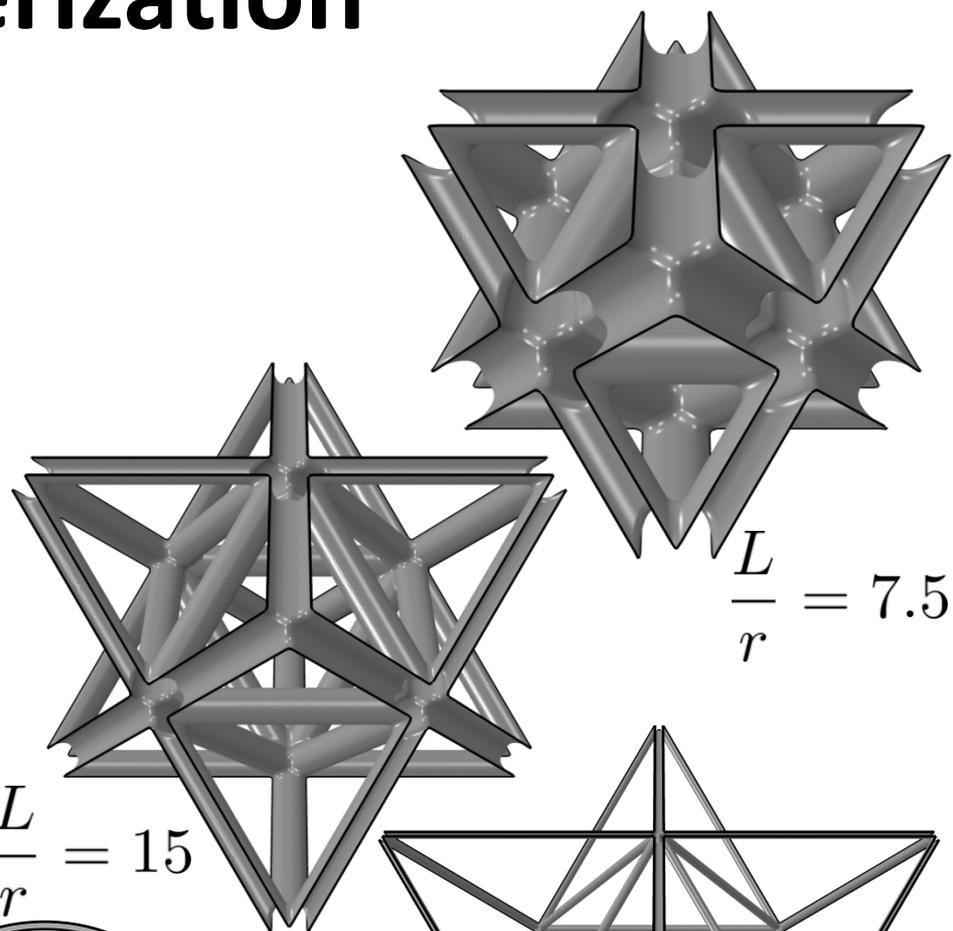
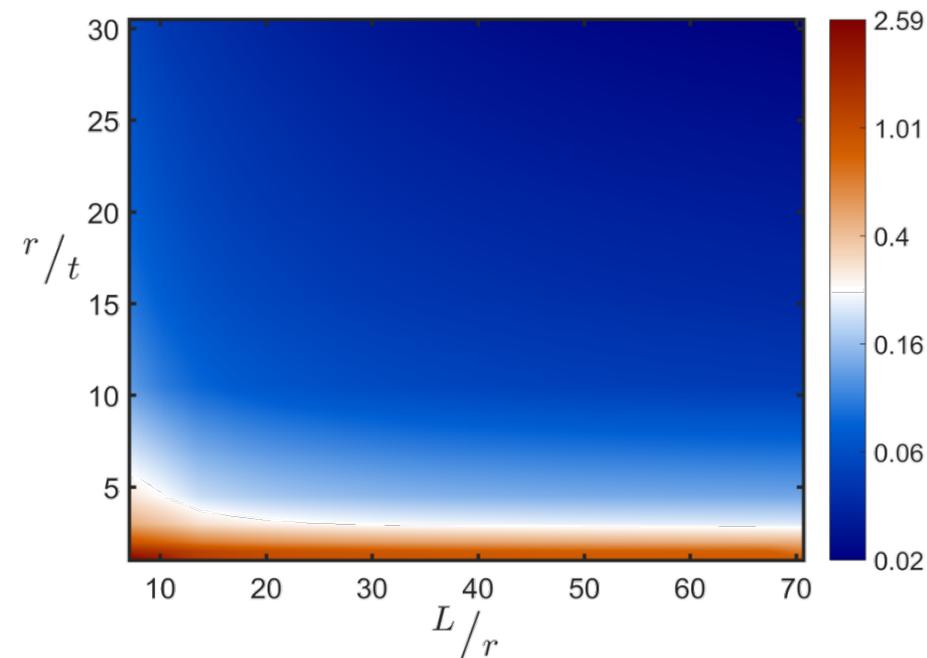
Octet Structure



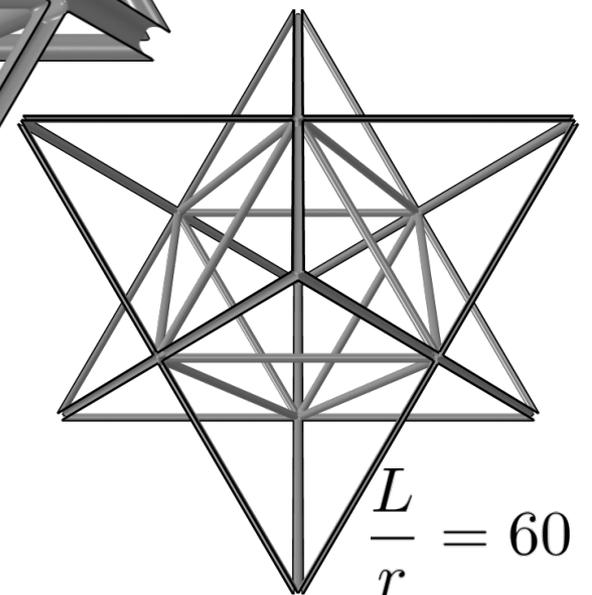
(<http://www.jrgreer.caltech.edu/home.php>)

Geometric parameterization

Strength

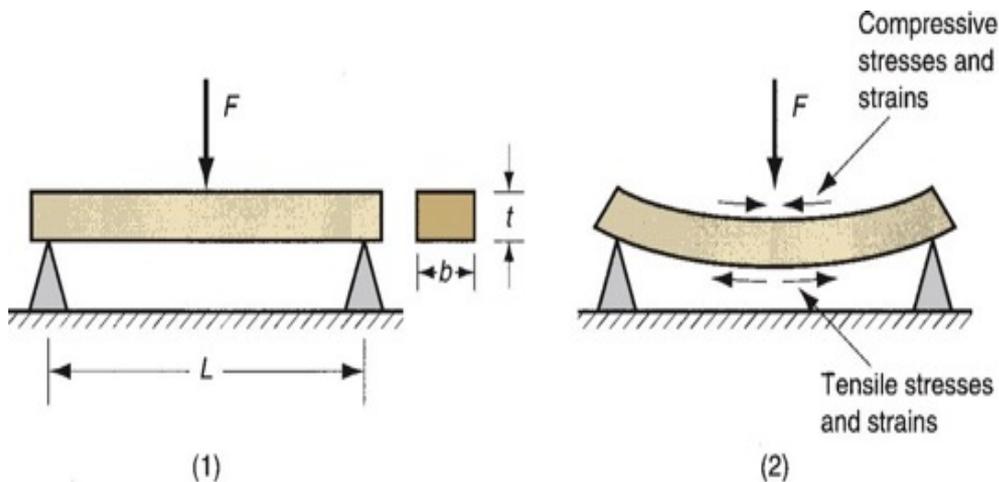


Cross sectional proportions



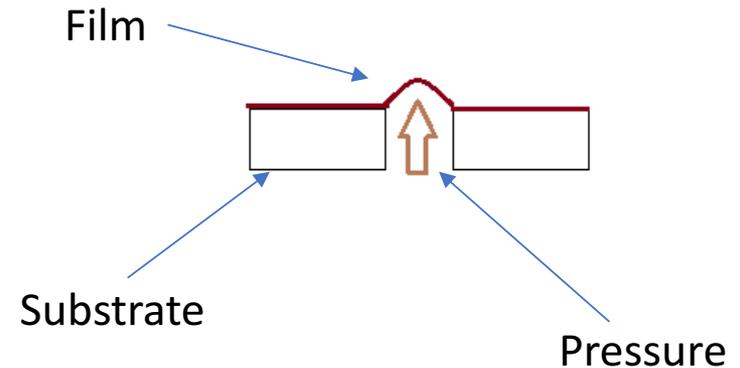
Traditional Material Strength Testing

Bending Test

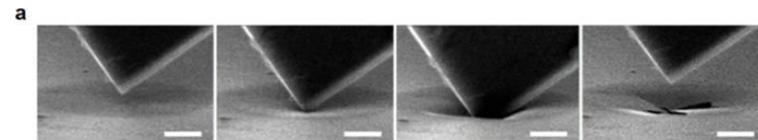


(Groover, 2016 Pg. 65)

Blister Testing

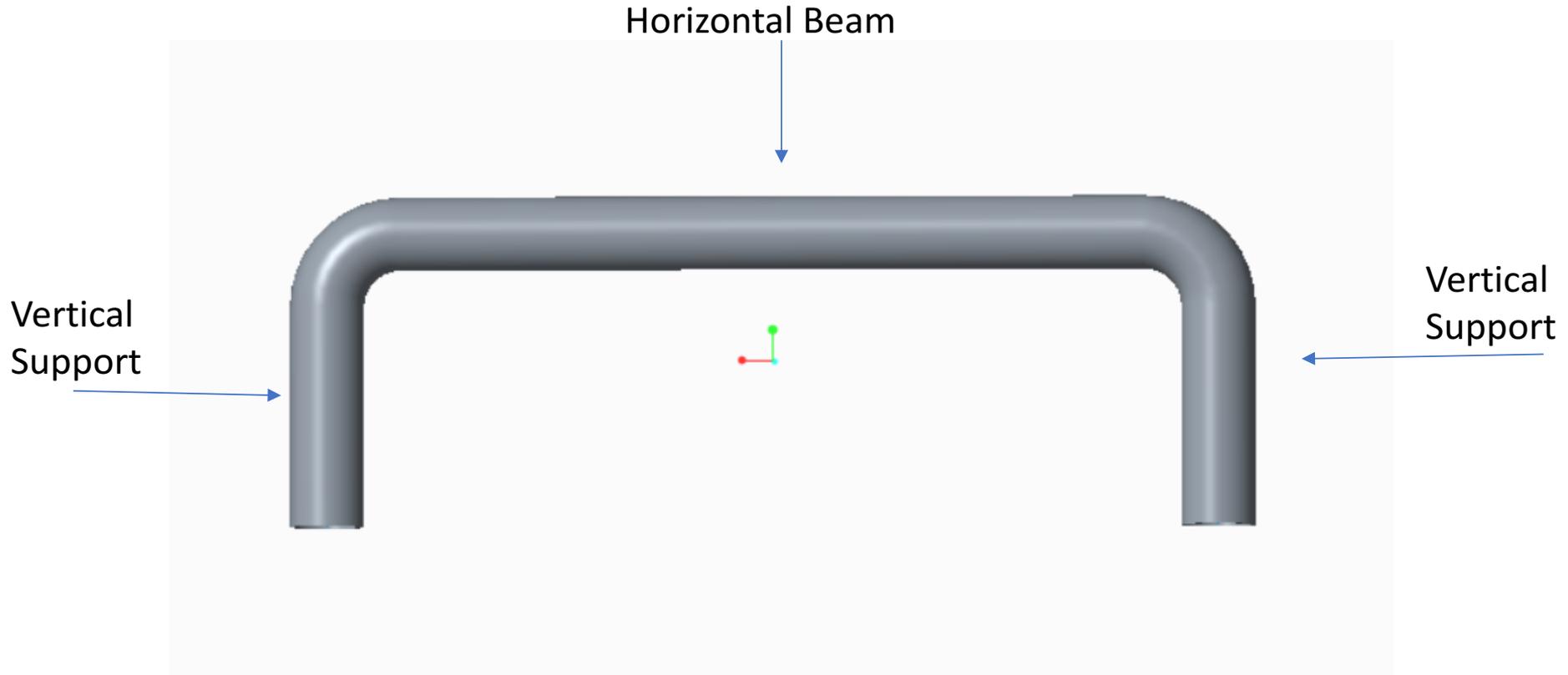


Hole-Nanoindentation



(Kang, Kim, Jeon, 2017)

Microscale Beam Bending Test

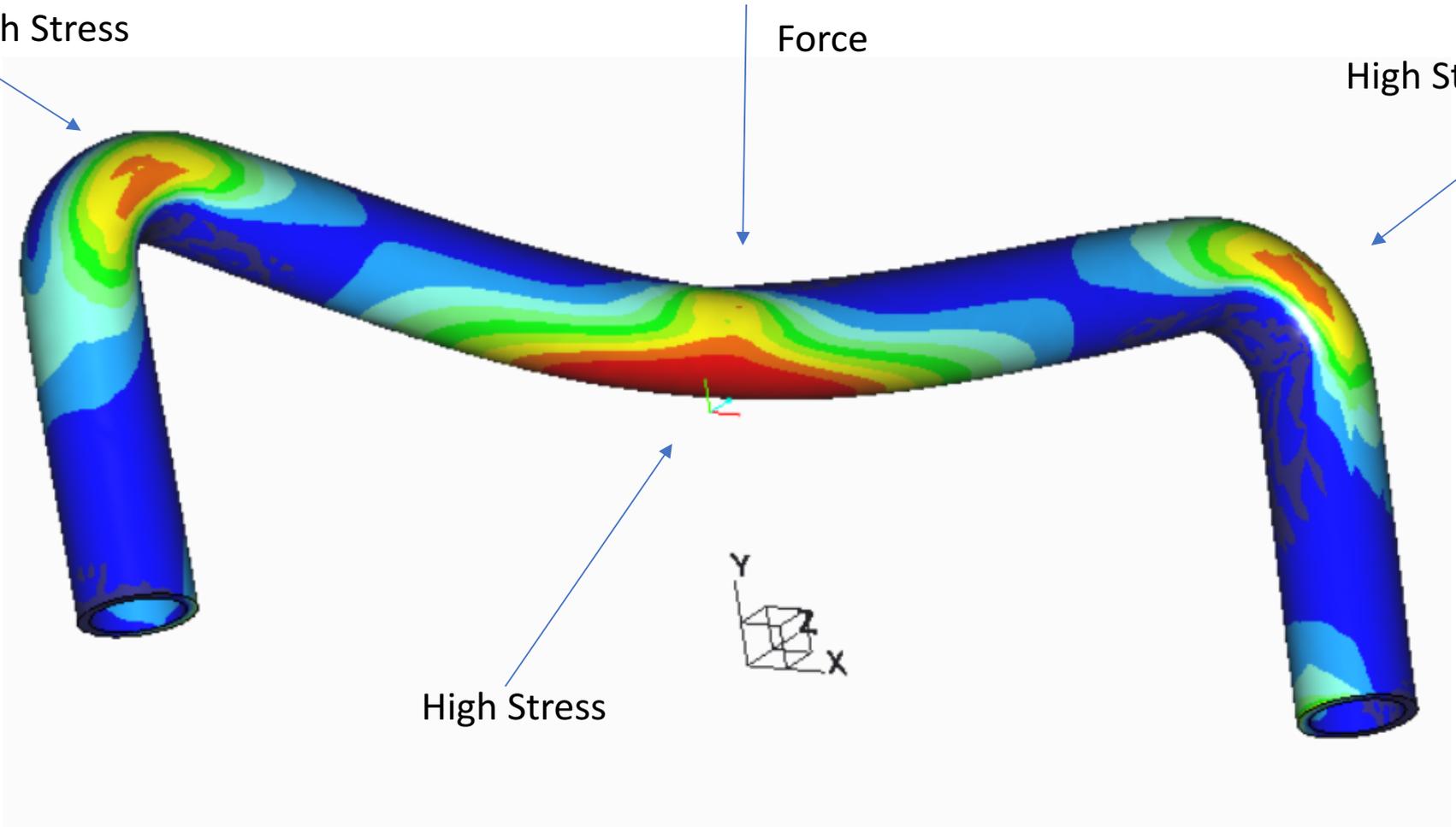


Finite Element Analysis

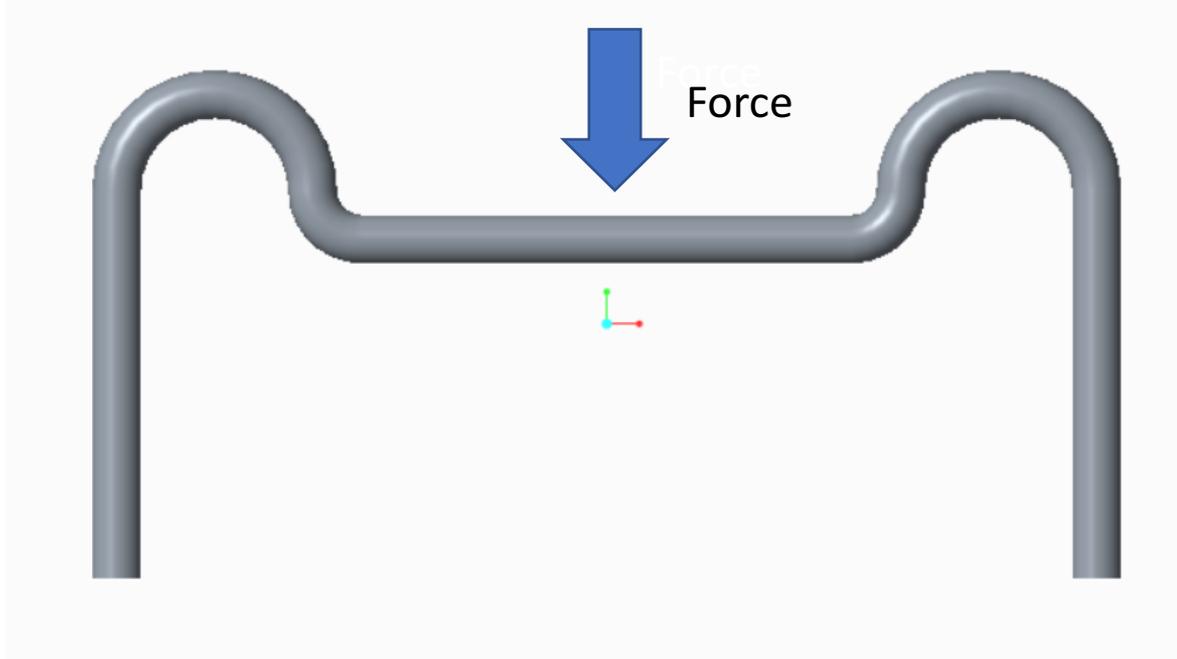
High Stress

Force

High Stress

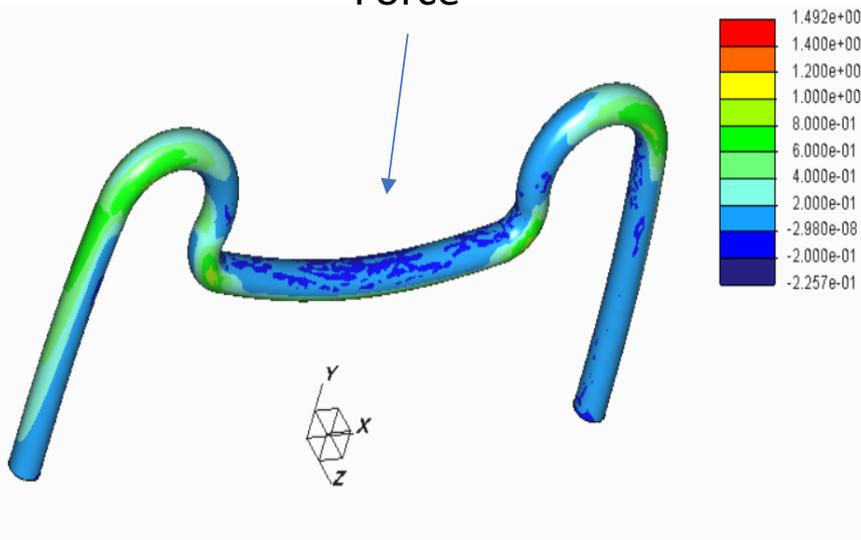


High Stress



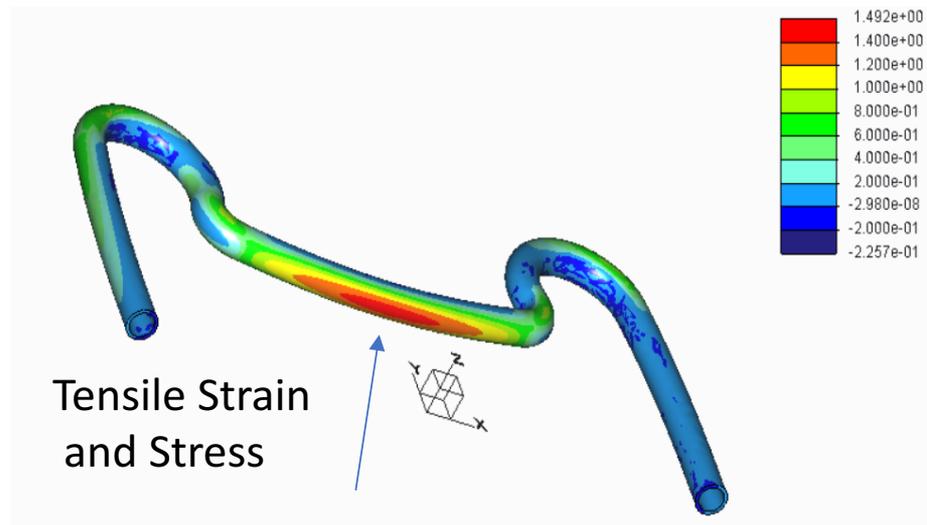
Top View

Force MPa

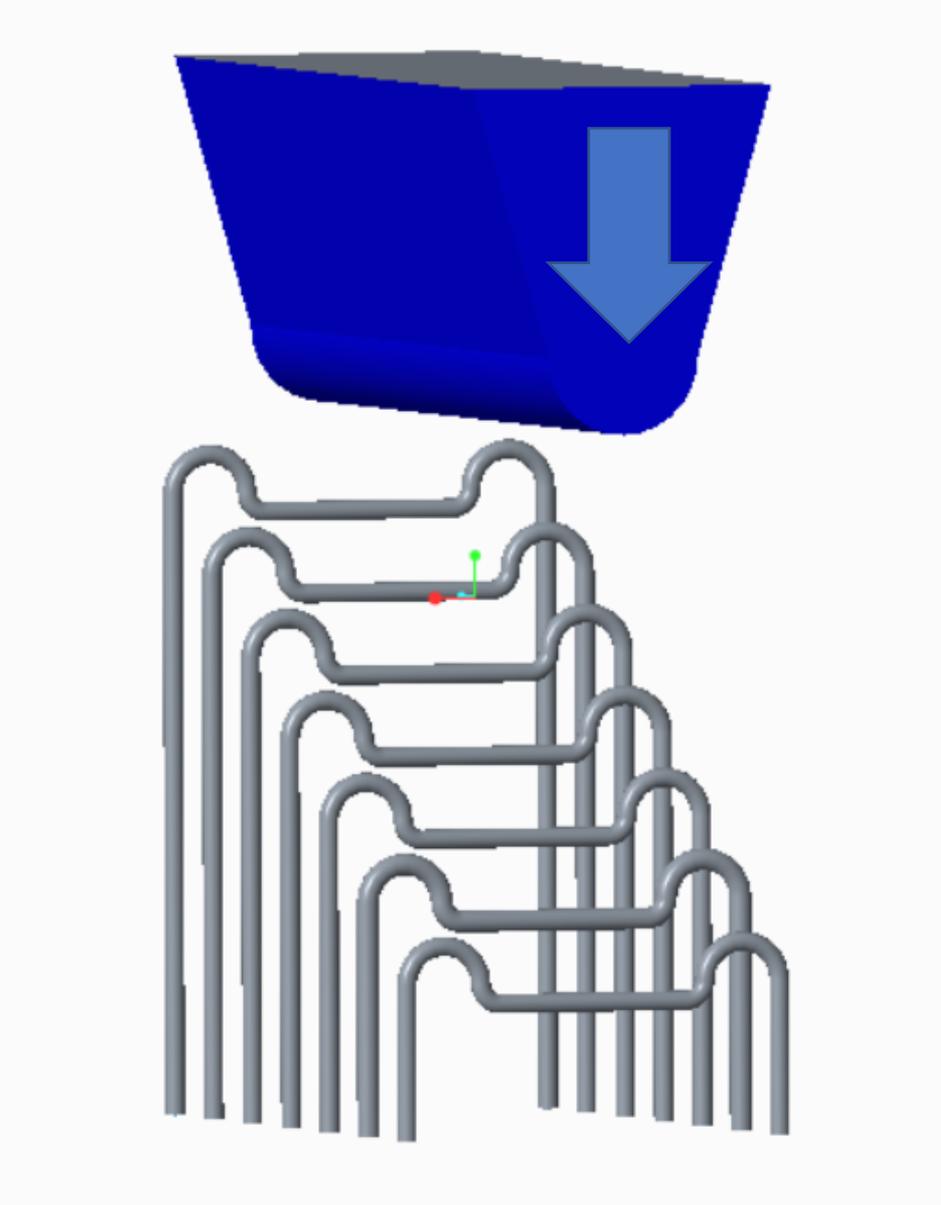


Bottom View

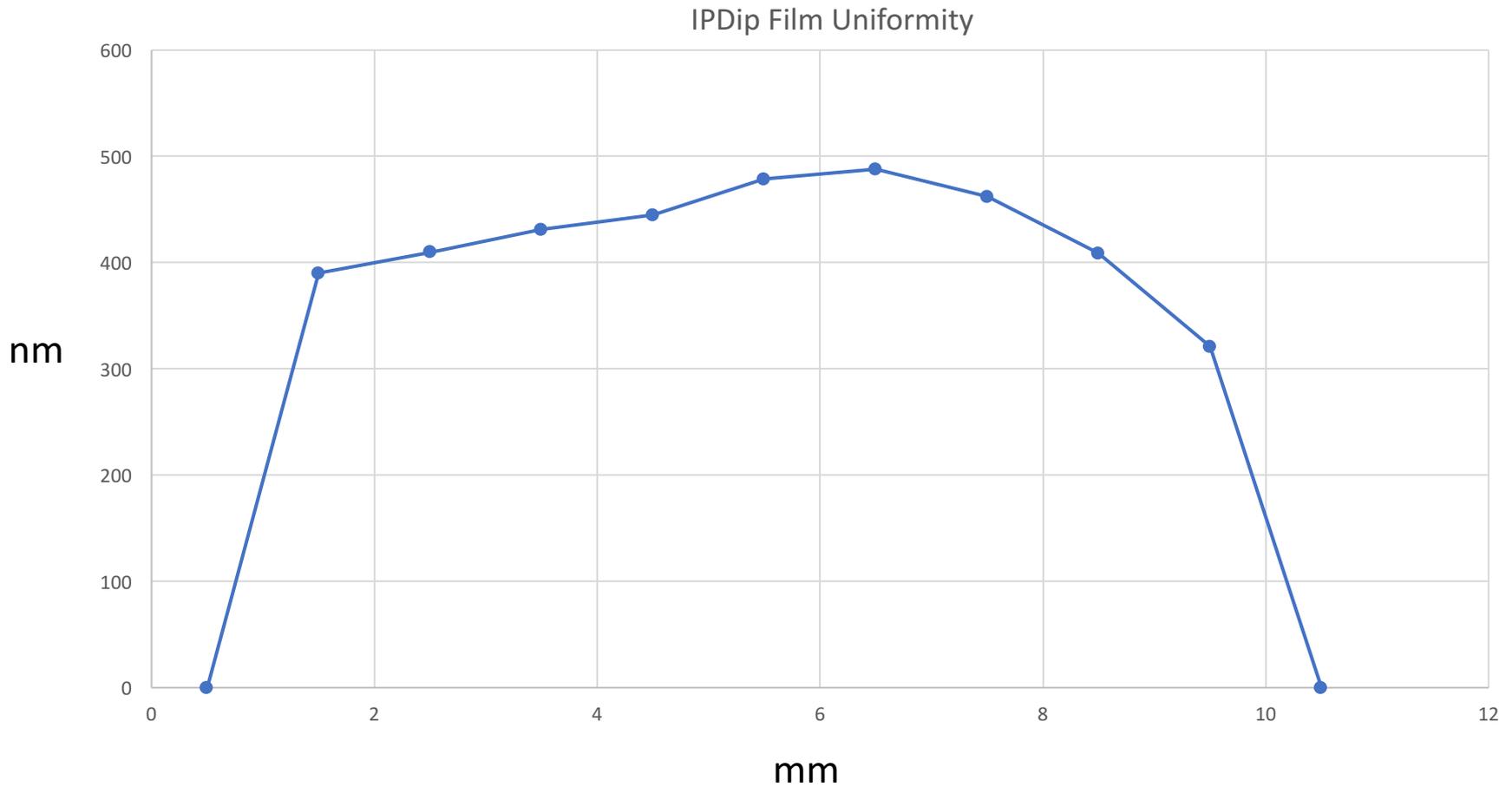
MPa



Multiple specimens with same film thickness tested with one iteration.



The Challenge



Thank You



Center for
Nanoscale
Systems

Harvard University

Andrew Gross
Dr. Katia Bertoldi
The Bertoldi Group
REU Staff



National
Nanotechnology
Coordinated
Infrastructure



Questions?