



2D and 3D Pre-stressed Tensegrity DNA Structures

Tim Liedl, Donald E. Ingber, William M. Shih

Excursion to Architecture: Continuous compression



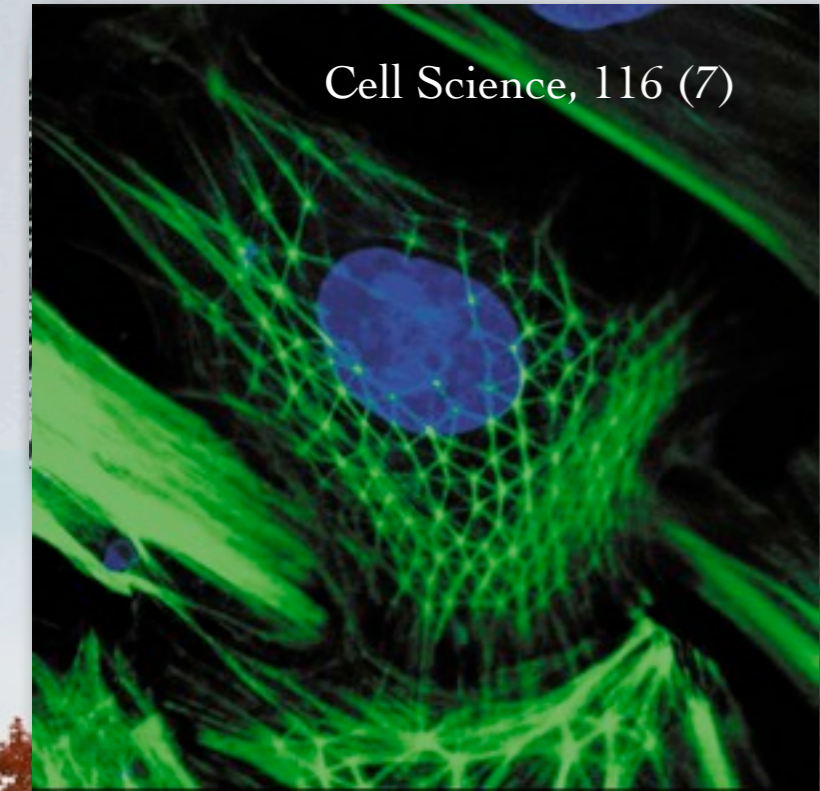
Mycenaean Arkadiko Bridge,
Peleponnese (~1300 BC)

Semperoper
built: 1848, 1878, 1985



Tensegrity - Tensional Integrity

Cell Science, 116 (7)



Geodesic Tensegrity Structures - Buckminster Fuller

Pre-stressed Tensegrity - Kenneth Snelson

Pre-stressed tensegrity design in architecture

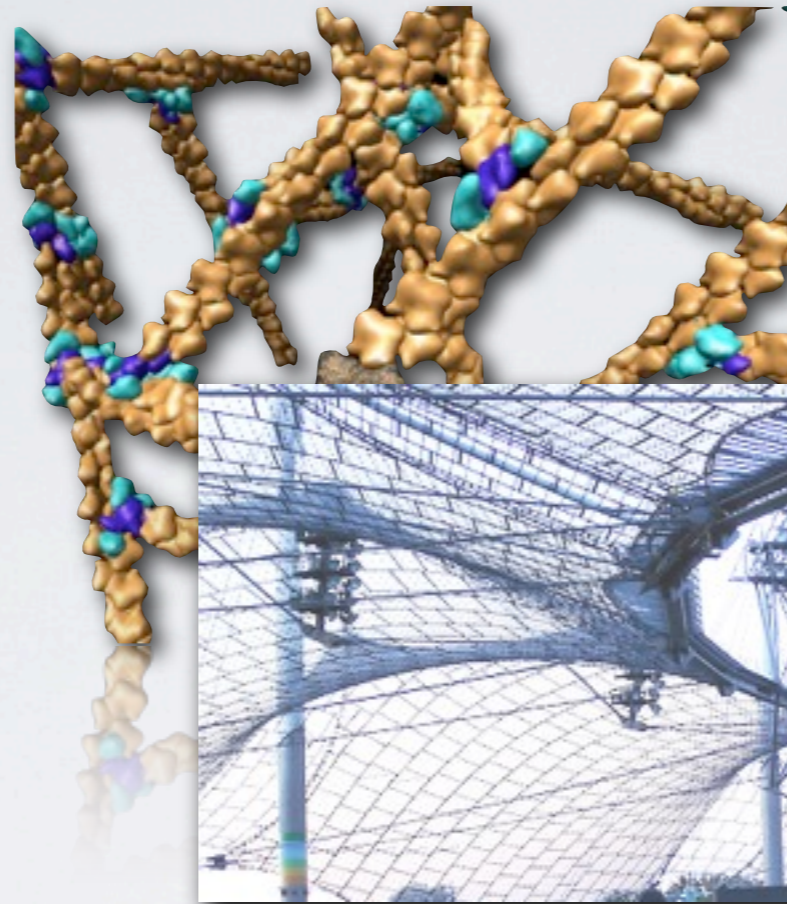
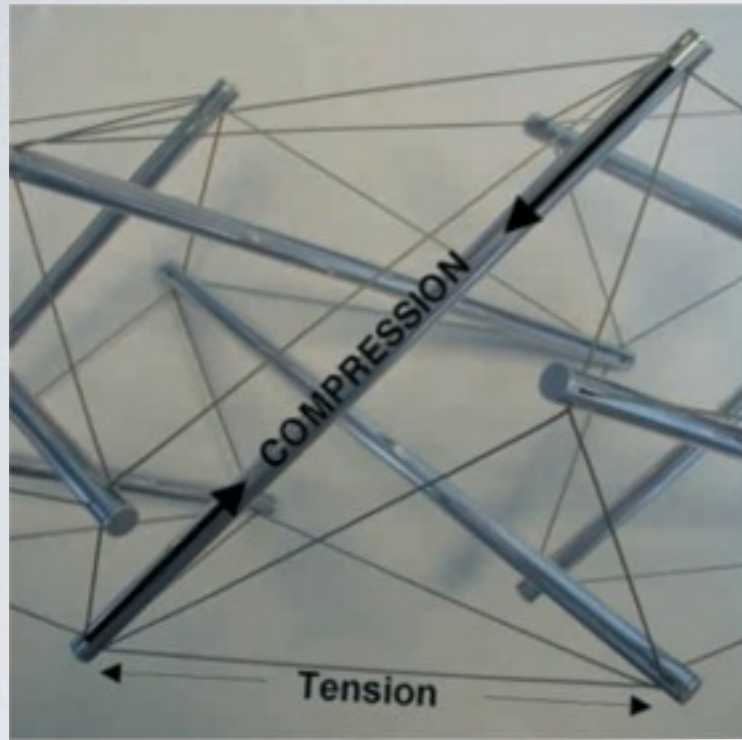


Zakim Bridge, Boston; Image: Rick Friedman

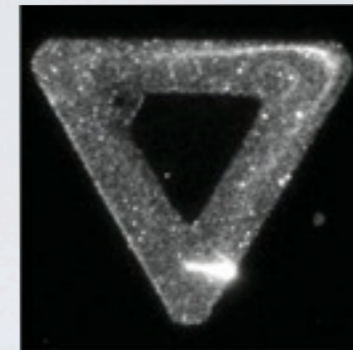


Olympiastadium, München; Otto, Behnisch

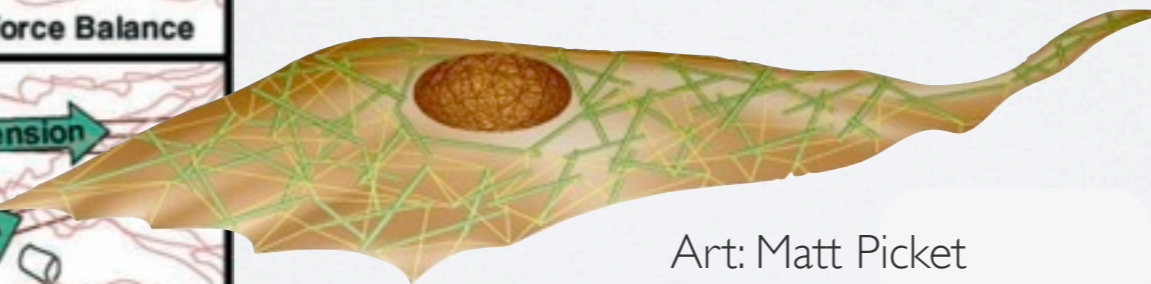
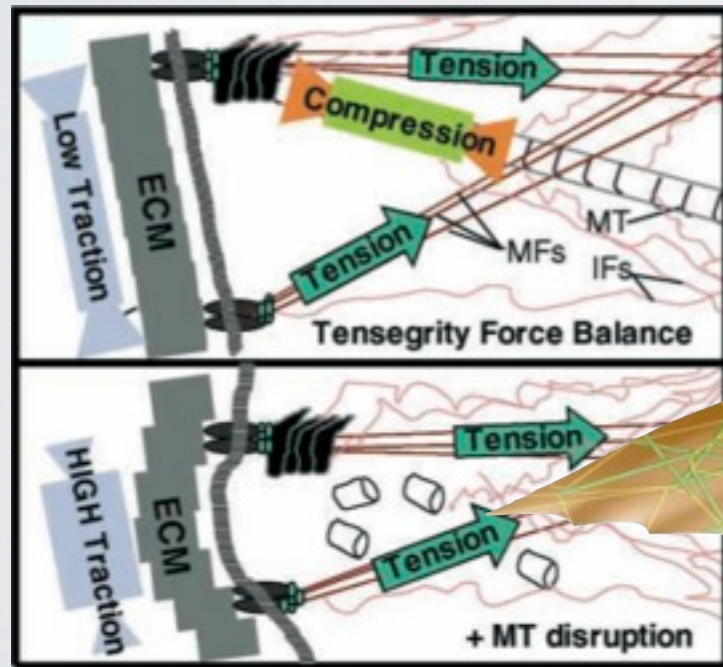
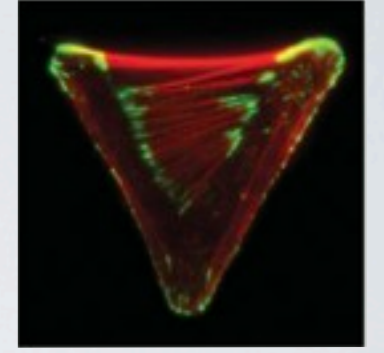
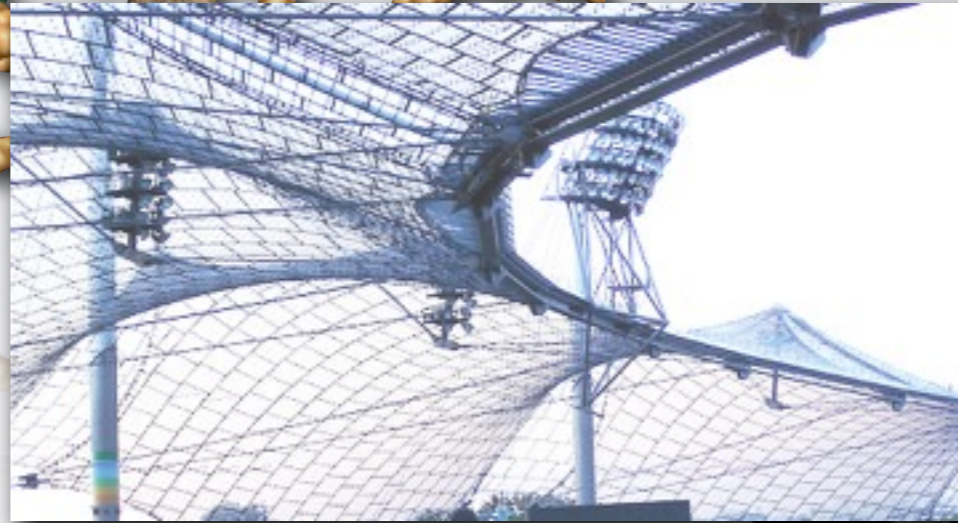
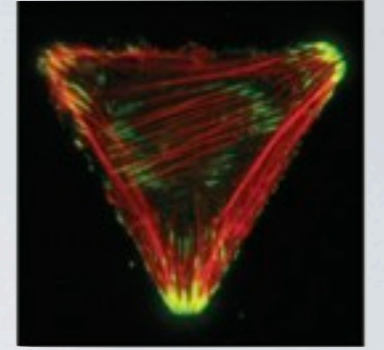
Pre-stressed tensegrity in nature



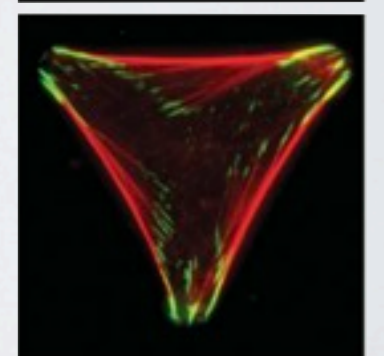
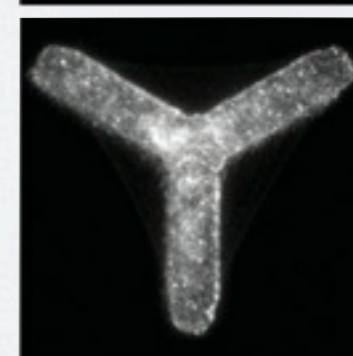
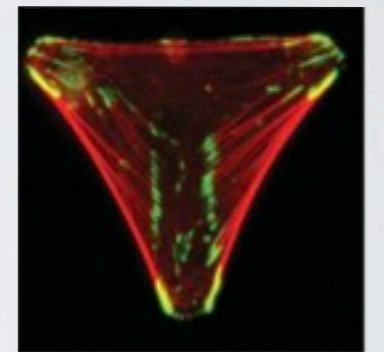
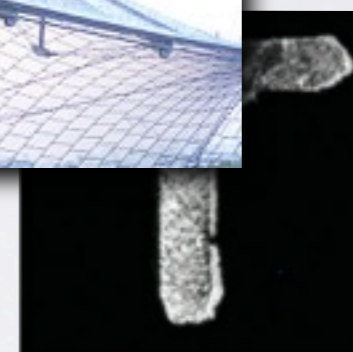
Fibronectin patterns



Vinculin: green
Actin: red



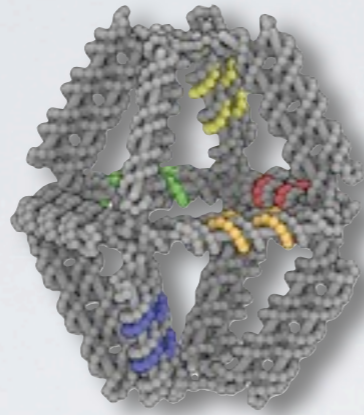
Art: Matt Picket



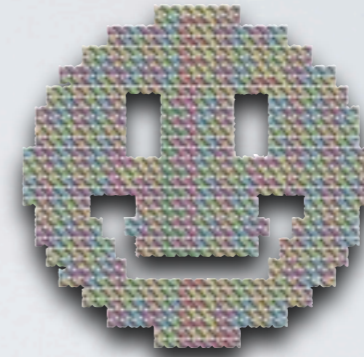
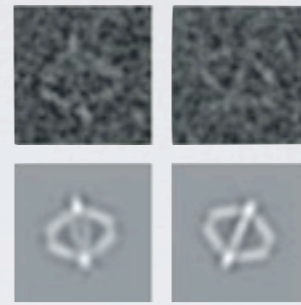
DNA Nanotechnology



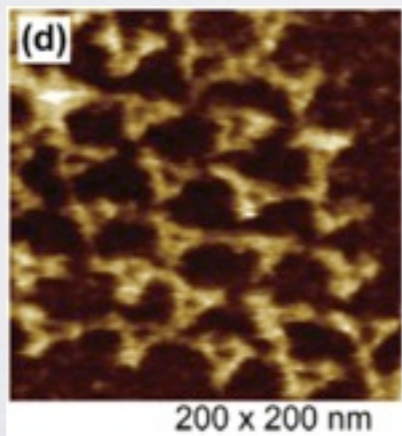
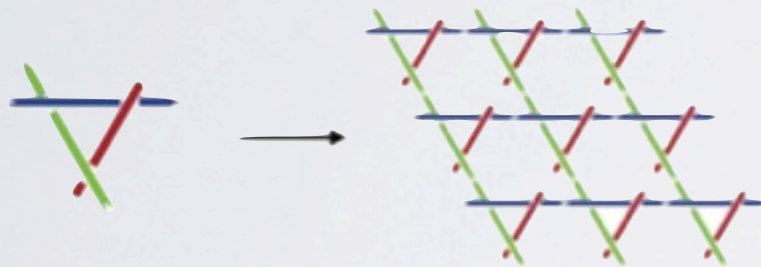
DNA cube
Ned Seeman (1991)



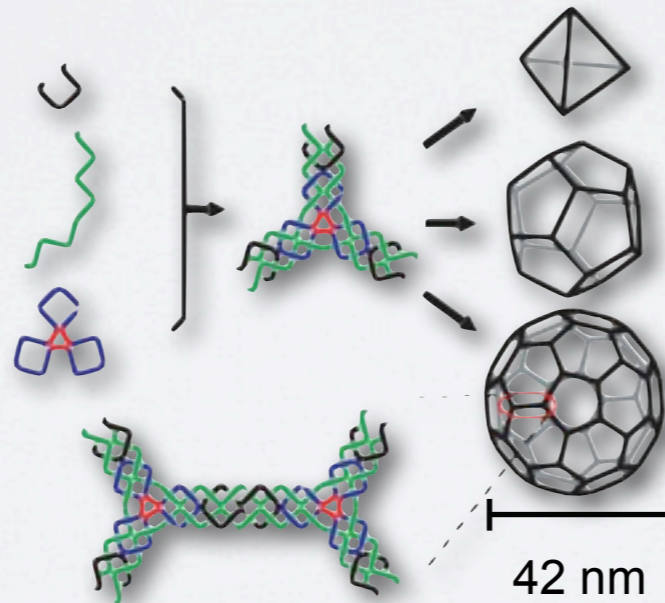
DNA octahedron
William Shih (2004)



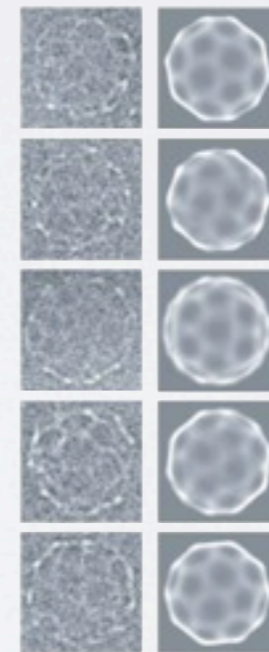
DNA 'Origami'
Paul Rothemund (2006)



Tensegrity Triangles
Chengde Mao (2004)



DNA Polyhedra
Chengde Mao (2008)



Pre-stressed
Structures ... ?

Future Directions



William Collins

www.kennethsnelson.net



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