

Robert Connelly (Princeton): *Tensegrities: Why things don't fall down*

In the late 1940's the young artist, Kenneth Snelson, created a simple, but very intriguing, structure of rigid rods suspended in midair by a system of strings. When he showed this to Buckminster Fuller, he called them tensegrities because of their "tensional integrity", and such things, large and small, have been called that ever since. The engineering literature has treated them on a case-by-case analysis, but in the 1970's there began a general mathematical study of tensegrities, creating a theory especially with regard to the understanding of the geometry. Tensegrity structures can be seen in such diverse subjects as packings of granular material, spider webs, cabled roofs, protein folding, robot arms, glass, and the structure of a living cell. The subject continues today with several successes, but many more open problems and connections to problems in distance geometry such as global rigidity.