

# TENSEGRITY

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## Tensegrity Defined

“Tensegrity” was coined in the mid 20<sup>th</sup> century by the inventor, designer, futurist, systems theorist Richard Buckminster Fuller. Fuller used the term to refer to a technological system of design based on tensile components arranged to form stable structures.

Tensegrity is a property of a skeletal structures, manmade and natural, having continuous tension members, such as cables, and discontinuous compression members, such as struts, that perform efficiently in producing the integrity of a form.

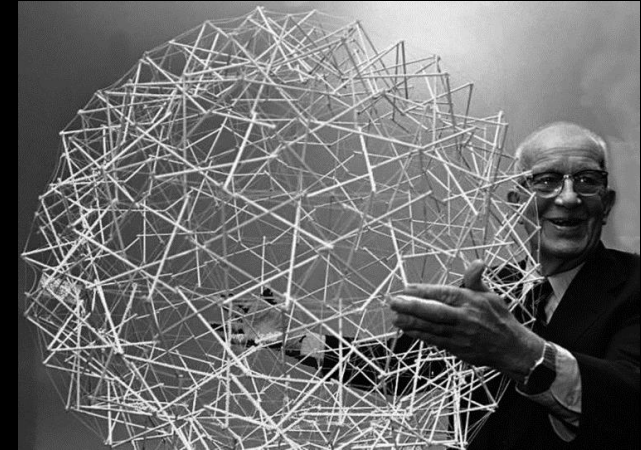
The term tensegrity is a portmanteau of *tension* and *structural integrity*, or tensional integrity. The most well-known of Fuller’s structural inventions is the geodesic dome.

Sculptor Kenneth Snelson, a contemporary of Fuller, derived the technique to produce sculptural works that seem to defy gravity, a characteristic he called floating compression. Perhaps his most famous work is the Needle Tower at the Hirshhorn Museum and Sculpture Garden in Washington, D.C.

Since the inventions of Fuller and Snelson, tensegral structures have been identified in the works of artists and engineers who preceded them and discovered in nearly every niche of nature – from the quantum to the cosmic – including atoms, planets, cells, molecules and enzymes.

The tensegral nature of our muscles, bones, fascia, ligaments and tendons is the reason we can walk upright and why we can wave our arms without snapping our spines.

“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.” -R. Buckminster Fuller



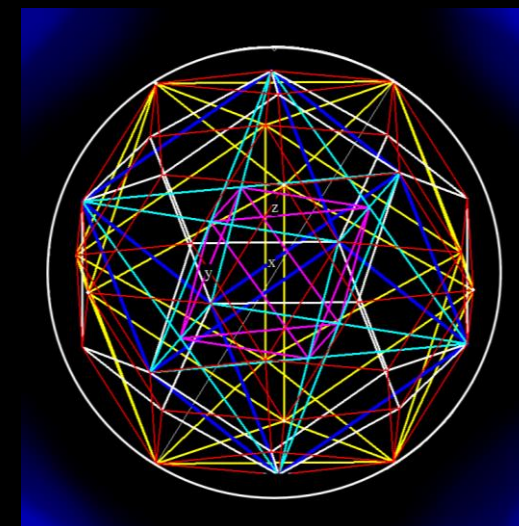
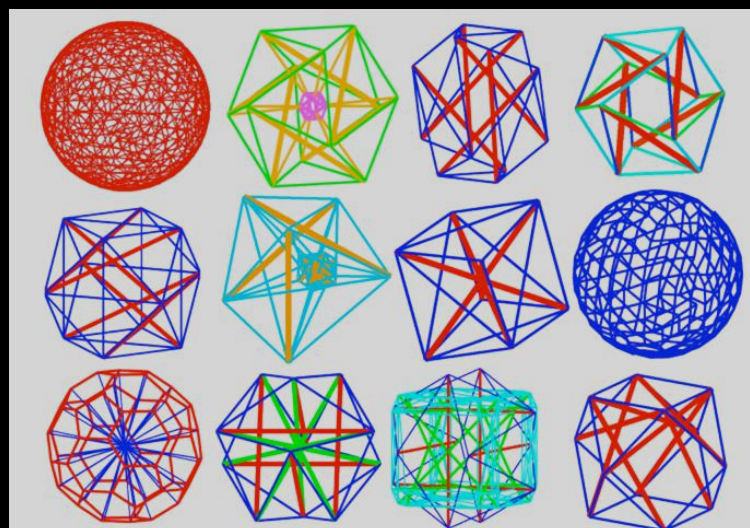
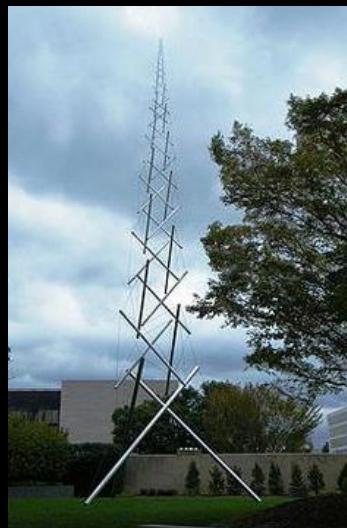
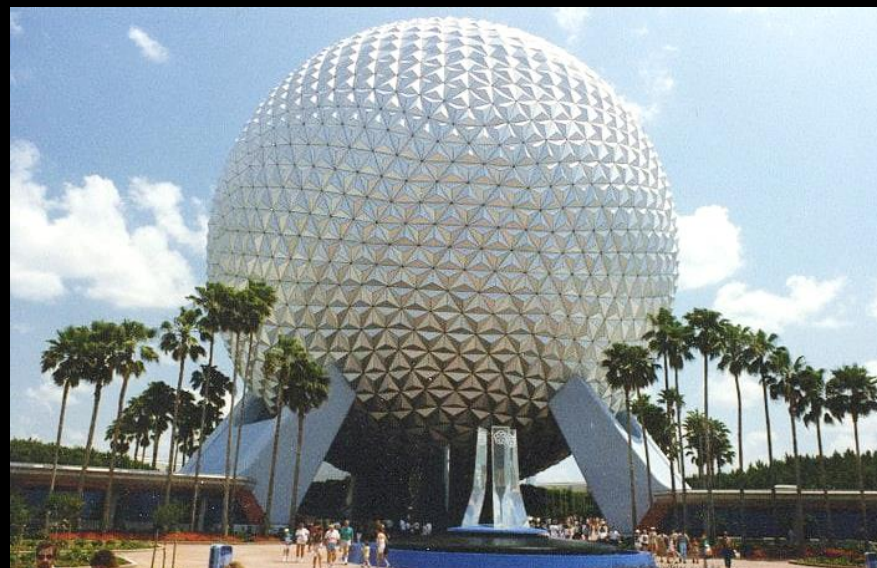
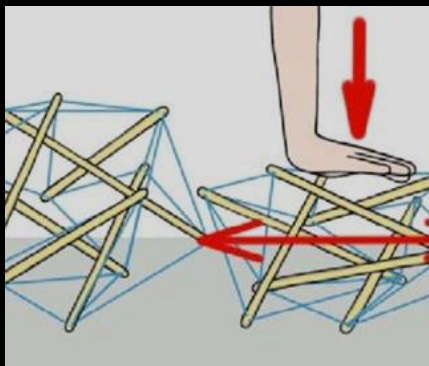
R. Buckminster Fuller



Kenneth Snelson

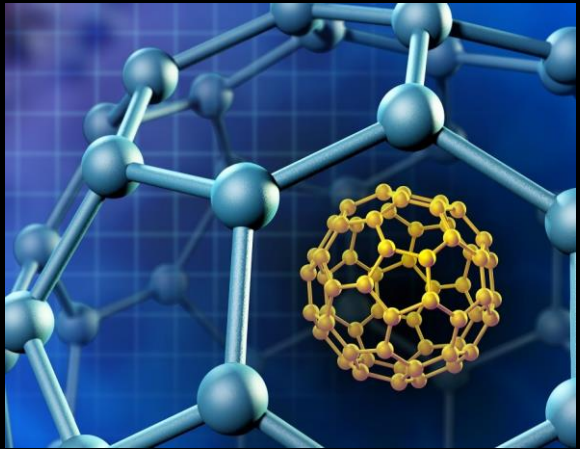
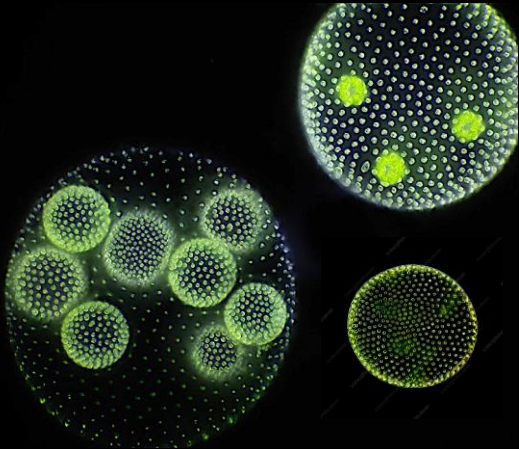
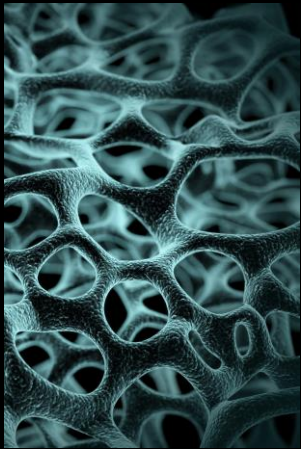
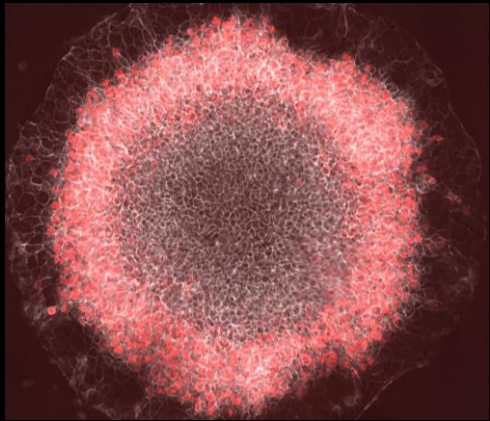
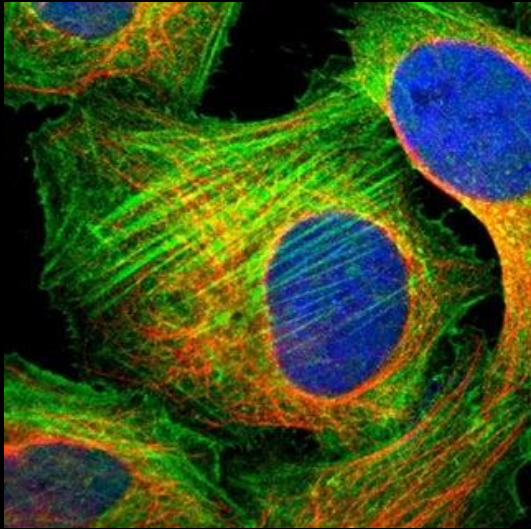
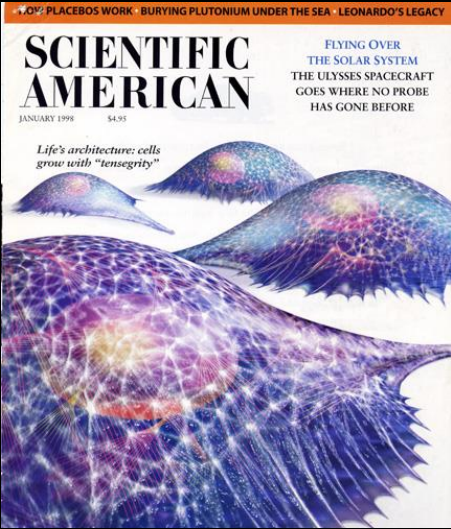


# Tensegrity in Art and Engineering



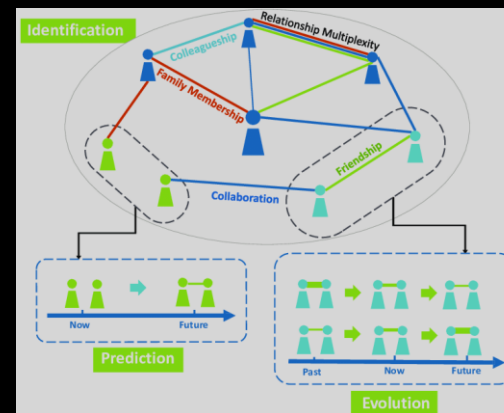
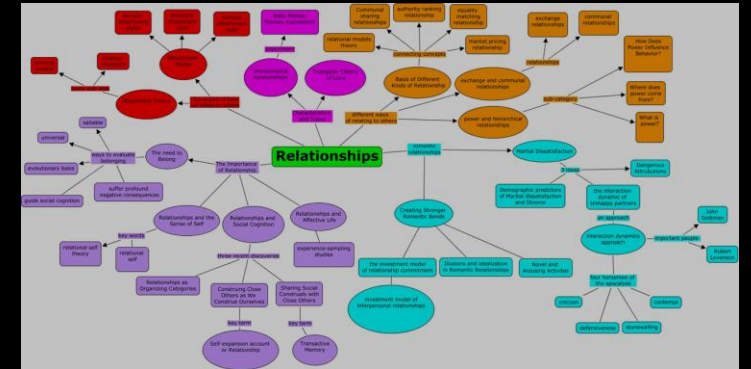


# Tensegrity in Nature





# Tensegrity in Relationships



# Tensegrity as a Systems Metaphor

From a spherical point of view, tensegrity exists in every system.

Used metaphorically, tensegrity refers to the omnidirectional push/pull dynamics at work in all interactions, from the delicate give and take of human relationships to the war dance of office politics to the complex negotiations of world leaders in a crisis.

Every element (node) in the sphere (system) exists in dynamic relationship to every other. Nodes push and pull. They send and receive. They communicate.

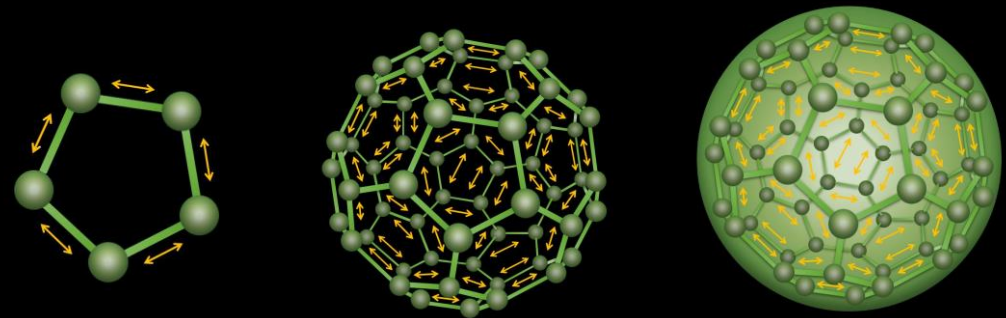
Tensegrity is the characteristic that allows spheres to continually respond and adjust to the conditions of the environment.

Tensegrity between nodes varies based on the relationship and the strength of the connections.

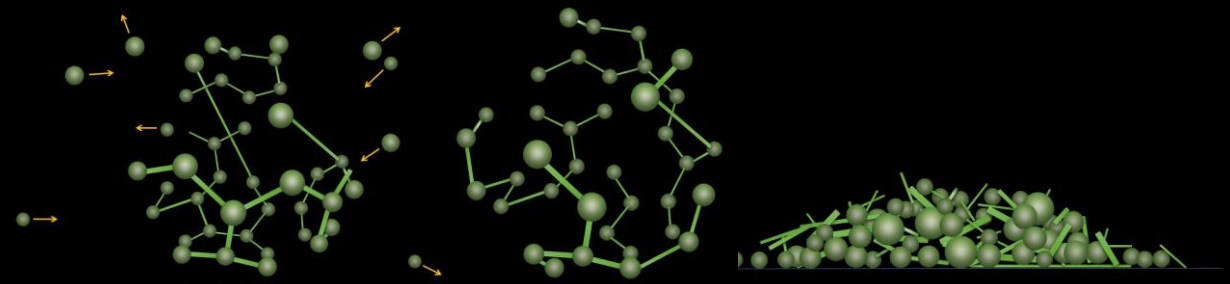
The tensegral connection between a father and son, for example, is typically more robust than the connection between a father and grocer.

The tensegral connection between a company and the CEO is much stronger and more influential in shaping the system than the relationship between the company and a mailroom clerk.

"Nature has spheres – the earth, the moon, and the atoms – all islands of compression possessing great integrity, held together by an invisible web of tension." -R. Buckminster Fuller



The degree to which a system can handle internal and external forces (change) depends on the dynamic interplay of tension and compression between elements (nodes). A well-rounded system is by nature more efficient and effective.



When connections are tenuous and tensegrity is weak, spheres (systems) lose the capacity to flex under pressure. They fail to adapt effectively to changing conditions. The dynamics are essentially the same for individuals, groups and organizations.



## Tensegrity Agents

In every healthy system, whether a family, community or company, one or more individuals will by choice, instinct or assignment make it their business to bring the right people together and make sure that information and ideas flow where they are needed.

In spherical terms, those who make it their responsibility to see that a system maintains reliable connections and that energy is flowing freely are *tensegrity agents*, or as some prefer to be called, *tensegrity artists*.

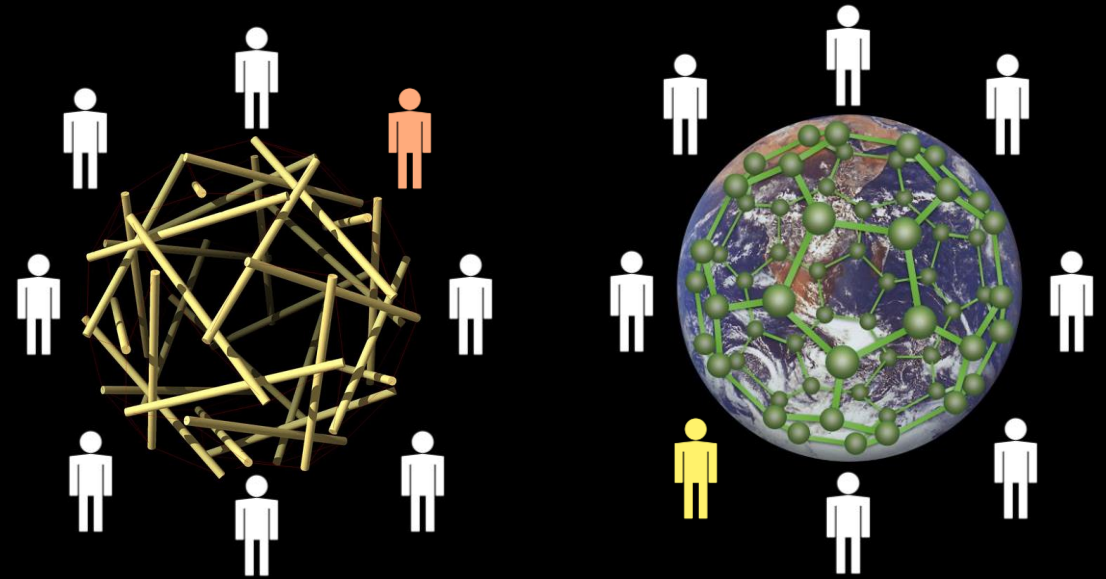
Tensegrity agents watch over the push and pull, back and forth, give and take energies that influence the shape of the system. Consciously or subconsciously, they work to keep connections alive and vital.

In personal relationships, for example, there is often one individual who makes the greater effort to stay connected and to initiate relationship-building activities.

In nuclear and extended families there is invariably someone who strives to keep family members aware and in touch with one another.

Tensegrity agents understand that strong, tensegral connections are necessary to maintain spherical integrity. They understand that it takes effort to keep the spheres of relationships well-rounded.

“How wonderful it is that nobody need wait a single moment before starting to improve the world.” -Anne Frank



Often, an authority figure acts as the tensegrity agent in a system. In other cases, tensegrity agents have little or no formal or recognized authority.



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