

# CURVED TENSEGRITY

Principles and Applications

# CURVED FOOD TENSEGRITY





# Tent Futures

BY JIM GORANT



Tensegrity I with the storm flaps rolled up. The arch of intersecting triangles is held in place by tension.

comparable tents. And you don't even need an engineering degree to use it.

## Good Tension

Basically, tensegrity is a structure that's held together by tension.

▶ The word 'tensegrity' is an invention: a contraction of 'tensional integrity.' Tensegrity describes a structural-relationship principle in which structural shape is guaranteed by the finitely closed, comprehensive continuous, tensional behaviors of the system and not by the discontinuous and exclusively local compressional member behaviors. Tensegrity provides the ability to yield increasingly without ultimately breaking.

R. Buckminster Fuller  
Synergetics, 1975

That's easy for him to say. Of course, Fuller was the genius architect-philosopher who

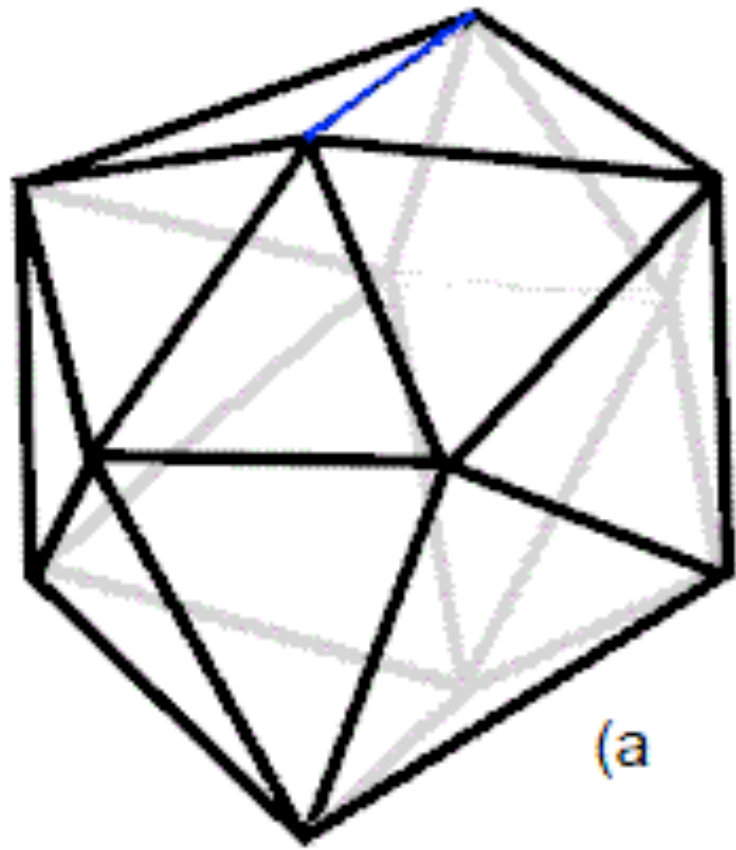
## CAMPING

of Spaceship Earth

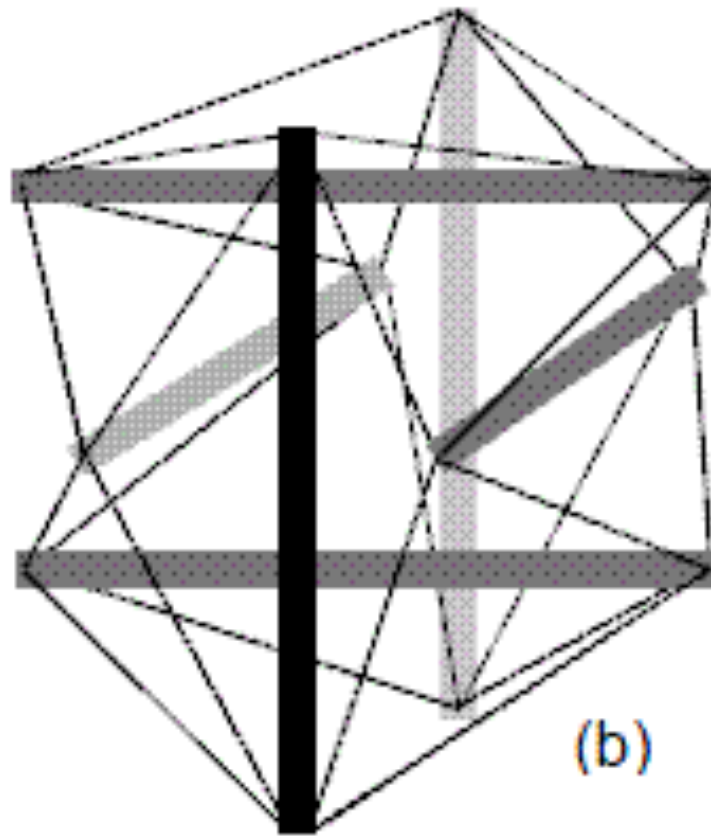
Most structures, like houses and skyscrapers, are built on principles of compression. The skeleton is a rigid lattice of beams, posts and girders connected by equally rigid fasteners. The building relies on the structure and the strength of the materials to resist forces such as weight, torque and lateral pressure. If those forces become too great, the house or office building will fail catastrophically. In other words, if a hurricane hits your house, it's either going to stand up to it or fall down. There's not much in between. A tension structure uses compression elements but ties them together with tension elements like cables or ropes. Fuller imagined



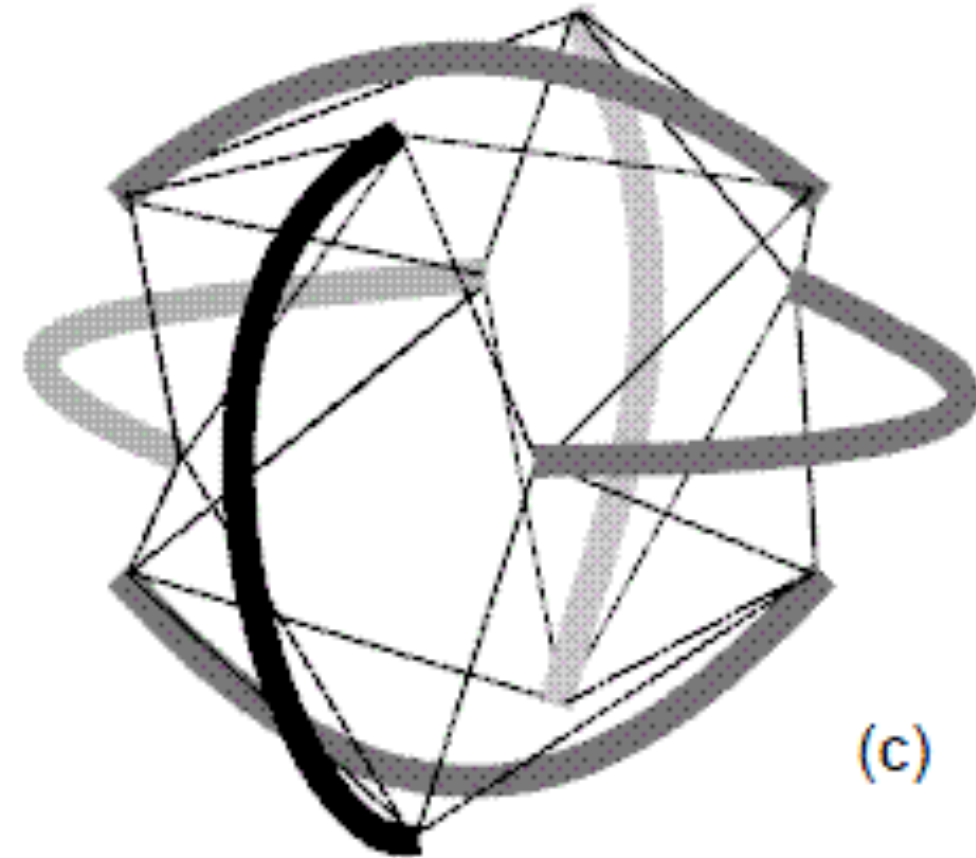
# FROM STRAIGHT TO CURVED



(a)



(b)

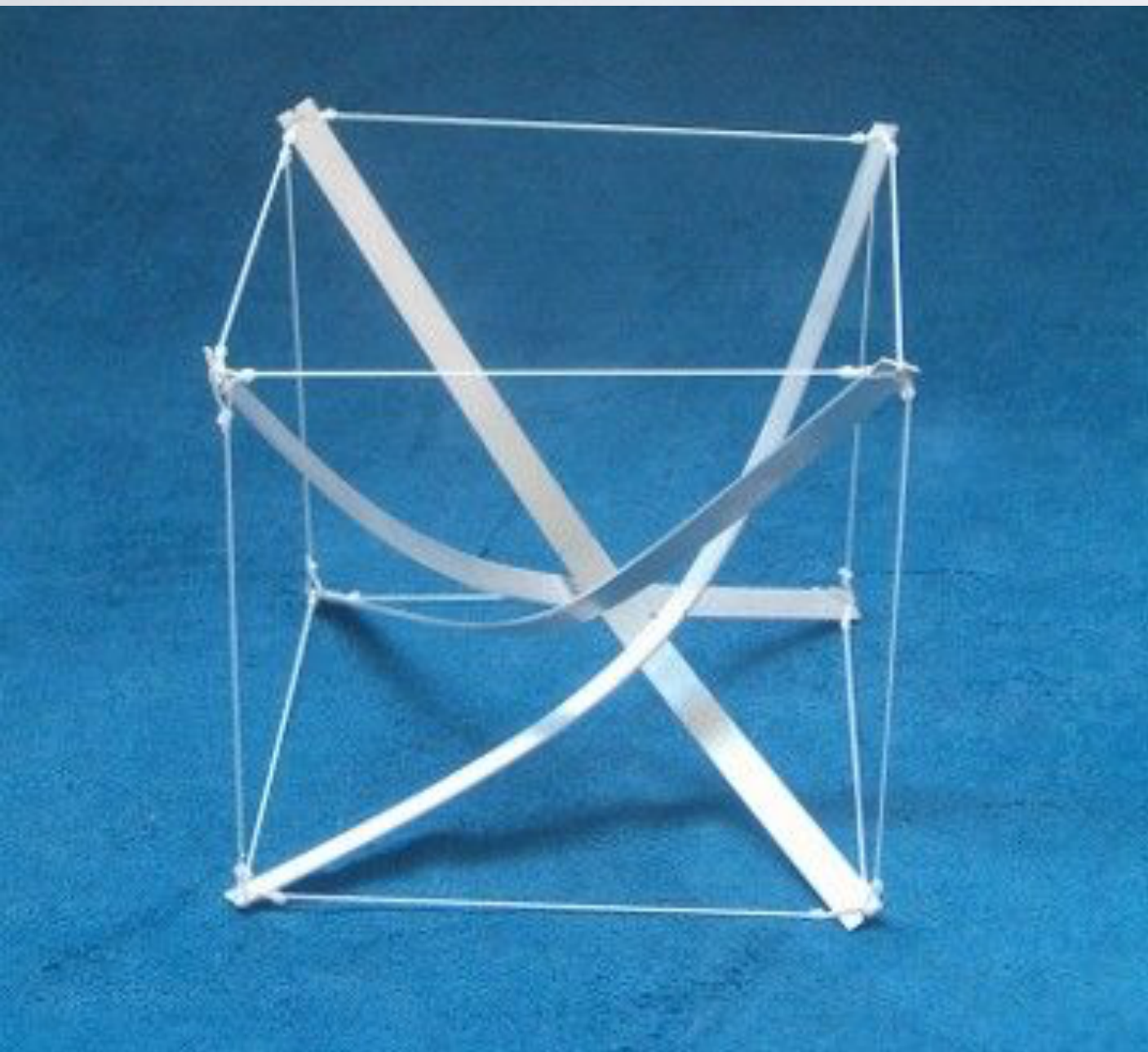


(c)

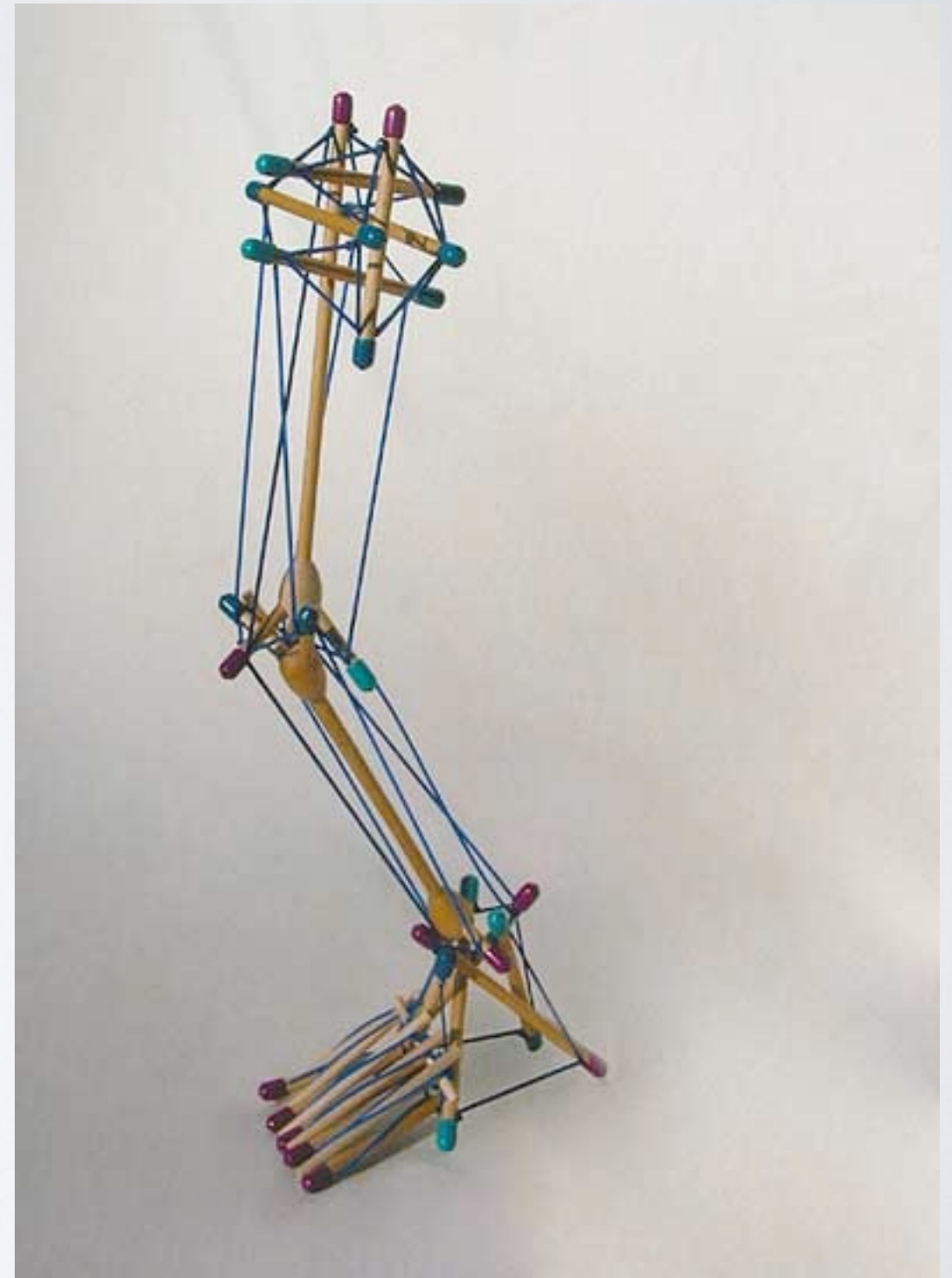
Converting an icosahedron into a tensegrity with straight internals then curved externals by Scarr



# FROM STRAIGHT TO CURVED

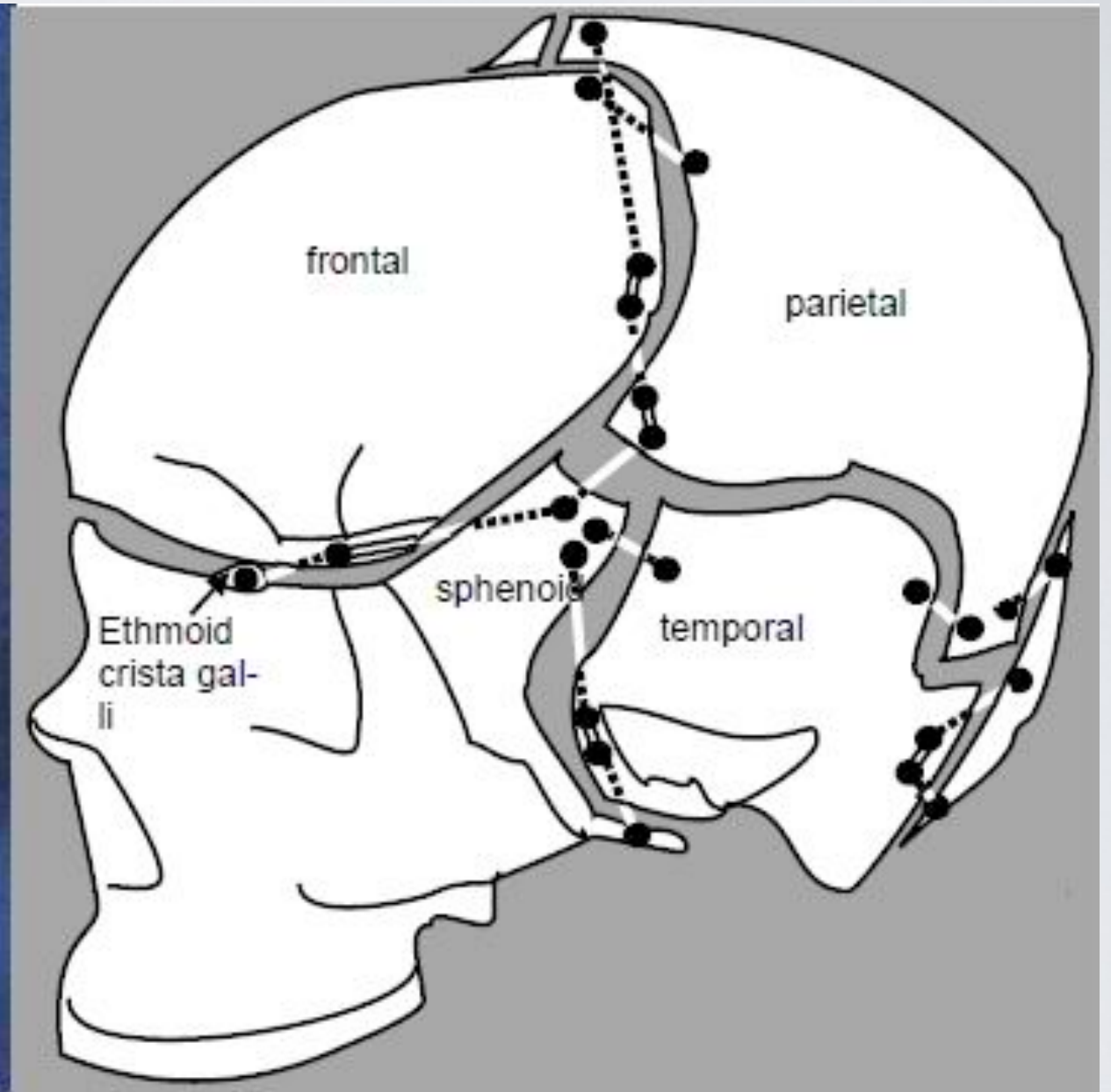


# TENSEGRITY EXAMPLES

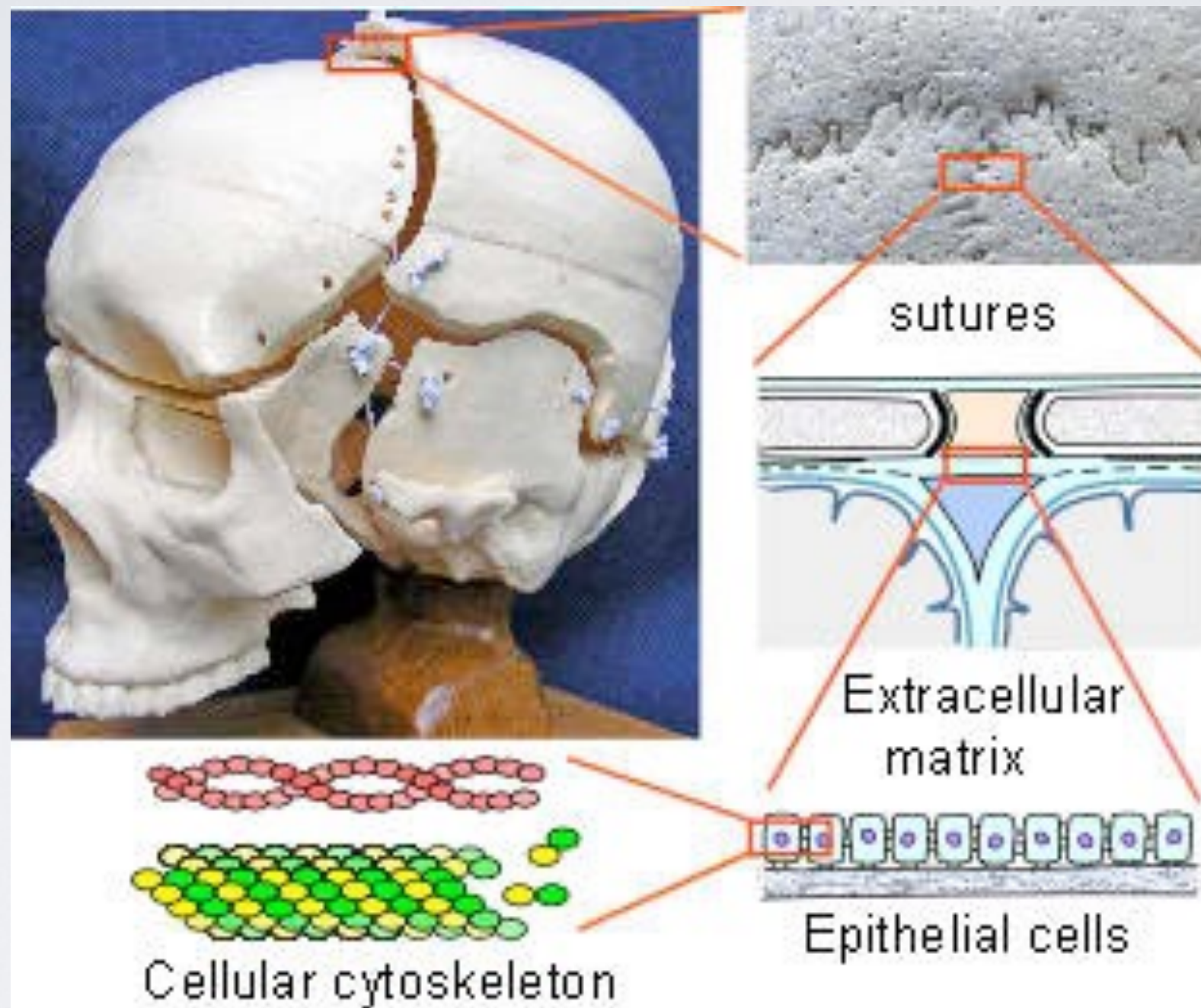




# THE CRANIUM

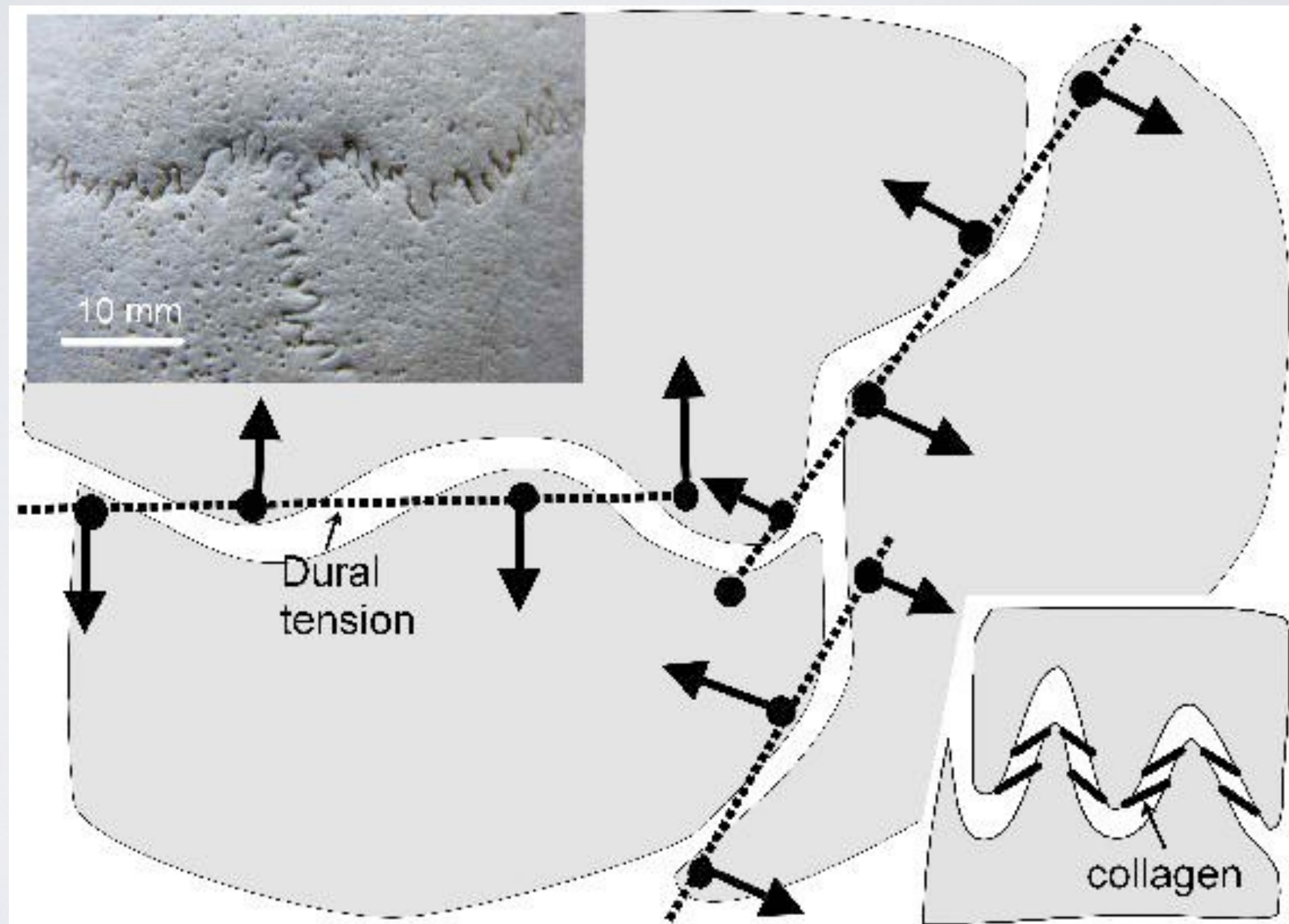


# SUTURAL MAKEUP

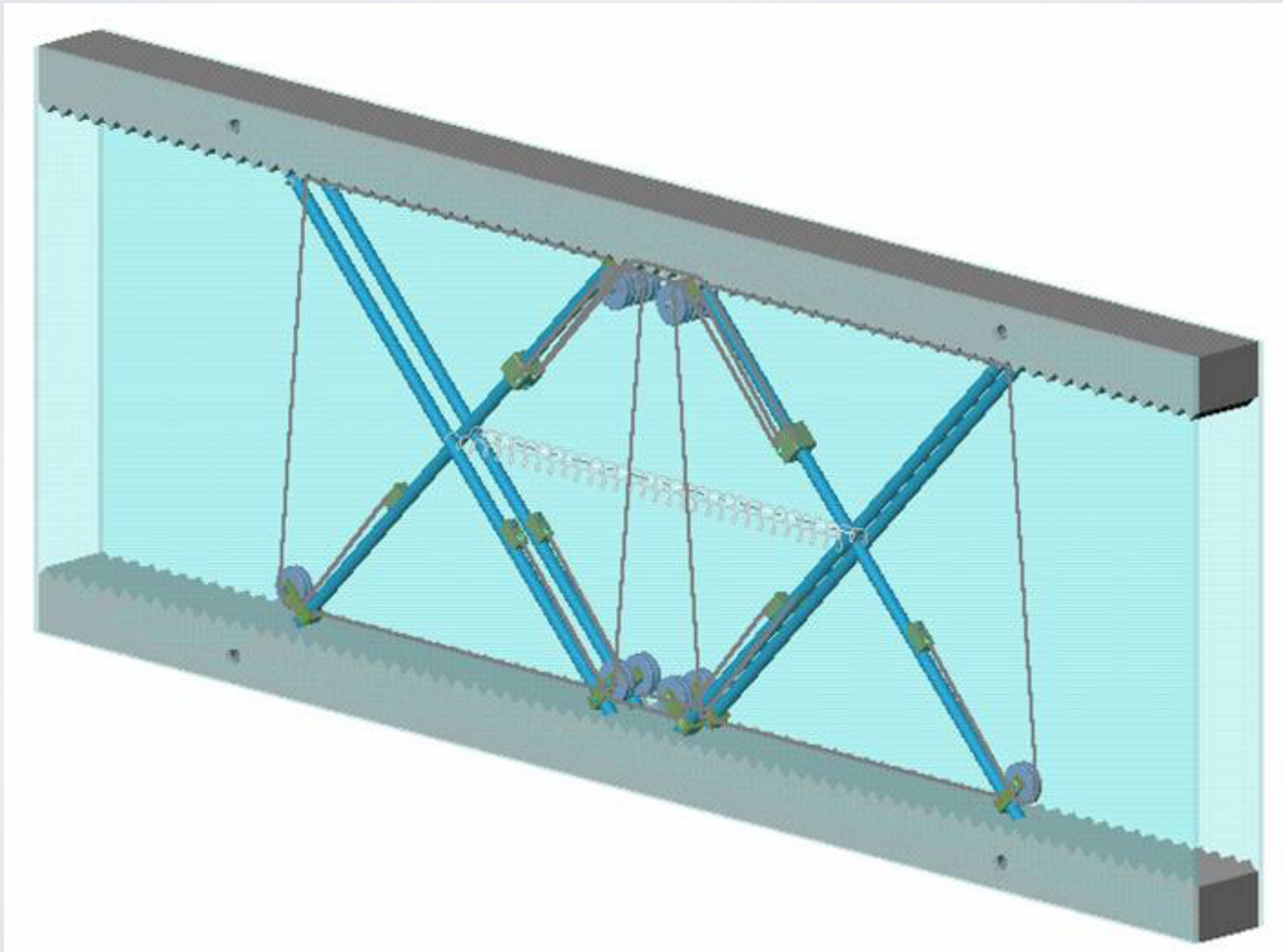




# THE SUTURES

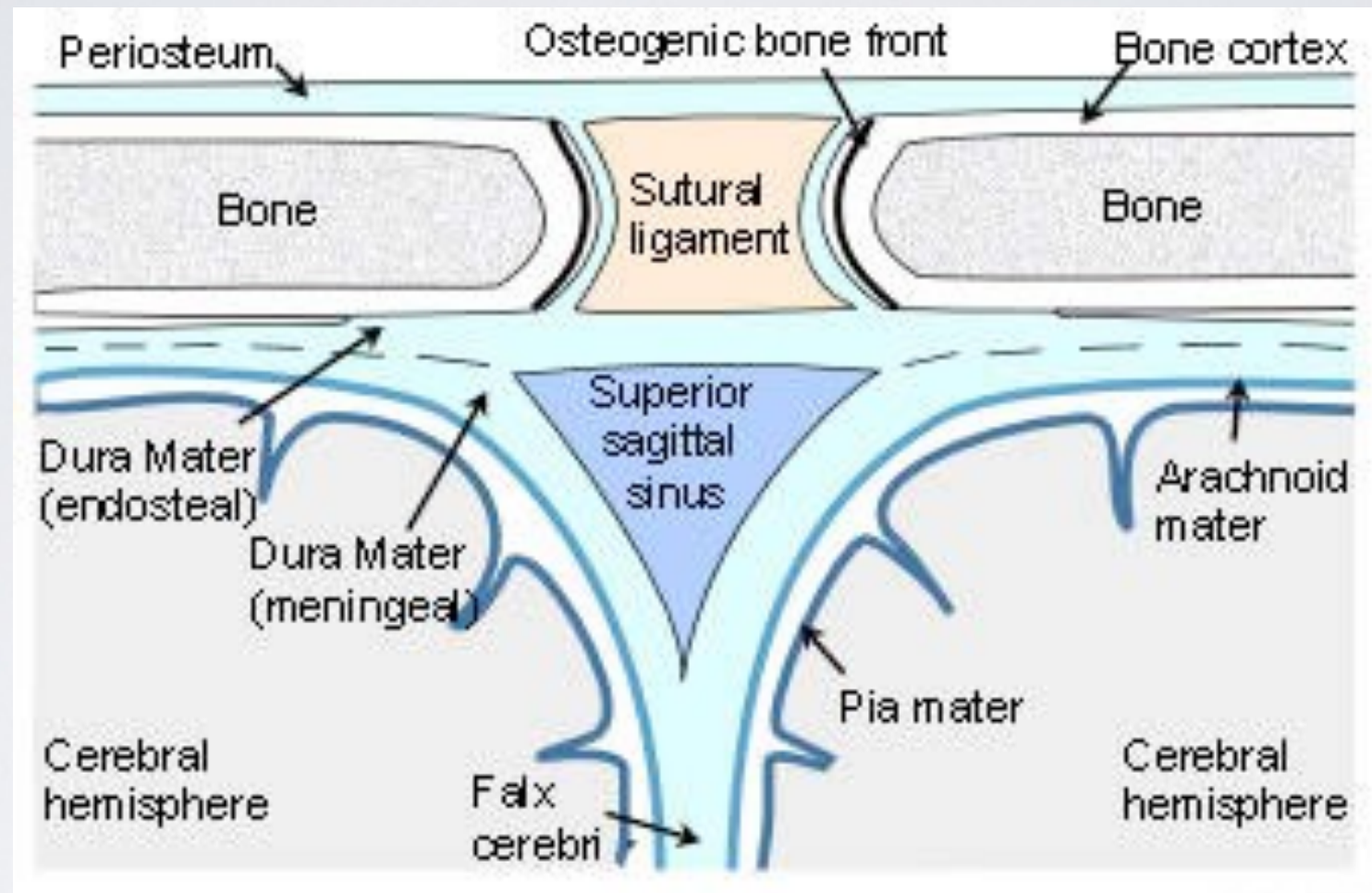


# THE SUTURES





# DURA



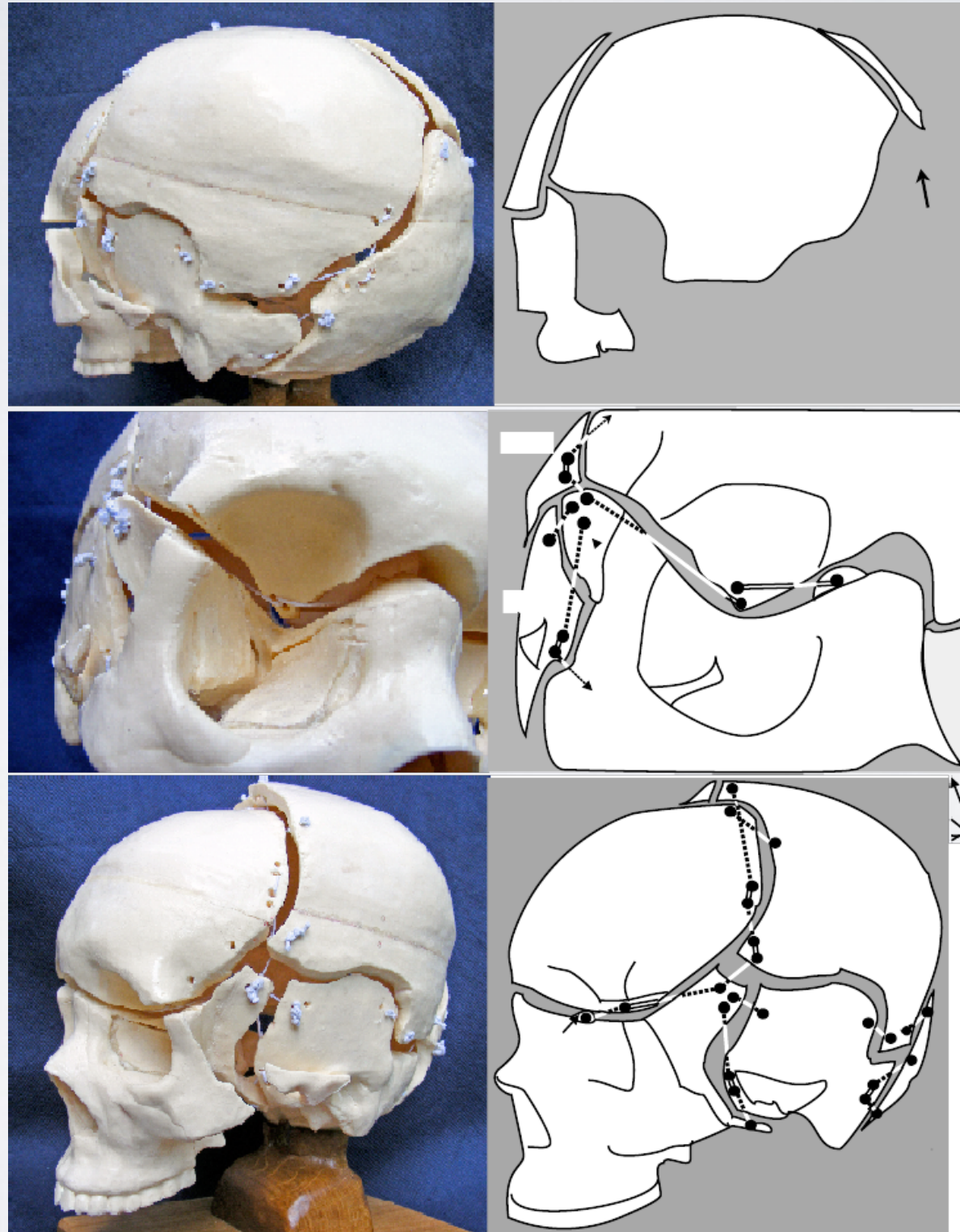
- The dural membrane also reduplicates into four sheets that penetrate the cranial cavity (falx cerebri and cerebellum and two halves of the tentorium cerebelli). Abnormalities in the cranial base may alter the tension pattern in these sheets and cause the sutural/dural mechanism to behave differently, leading to premature sutural fusion in babies (craniosynostosis) and malformation in head shape (plagiocephaly).

# DURA





# THE SKULL



# THE SKULL

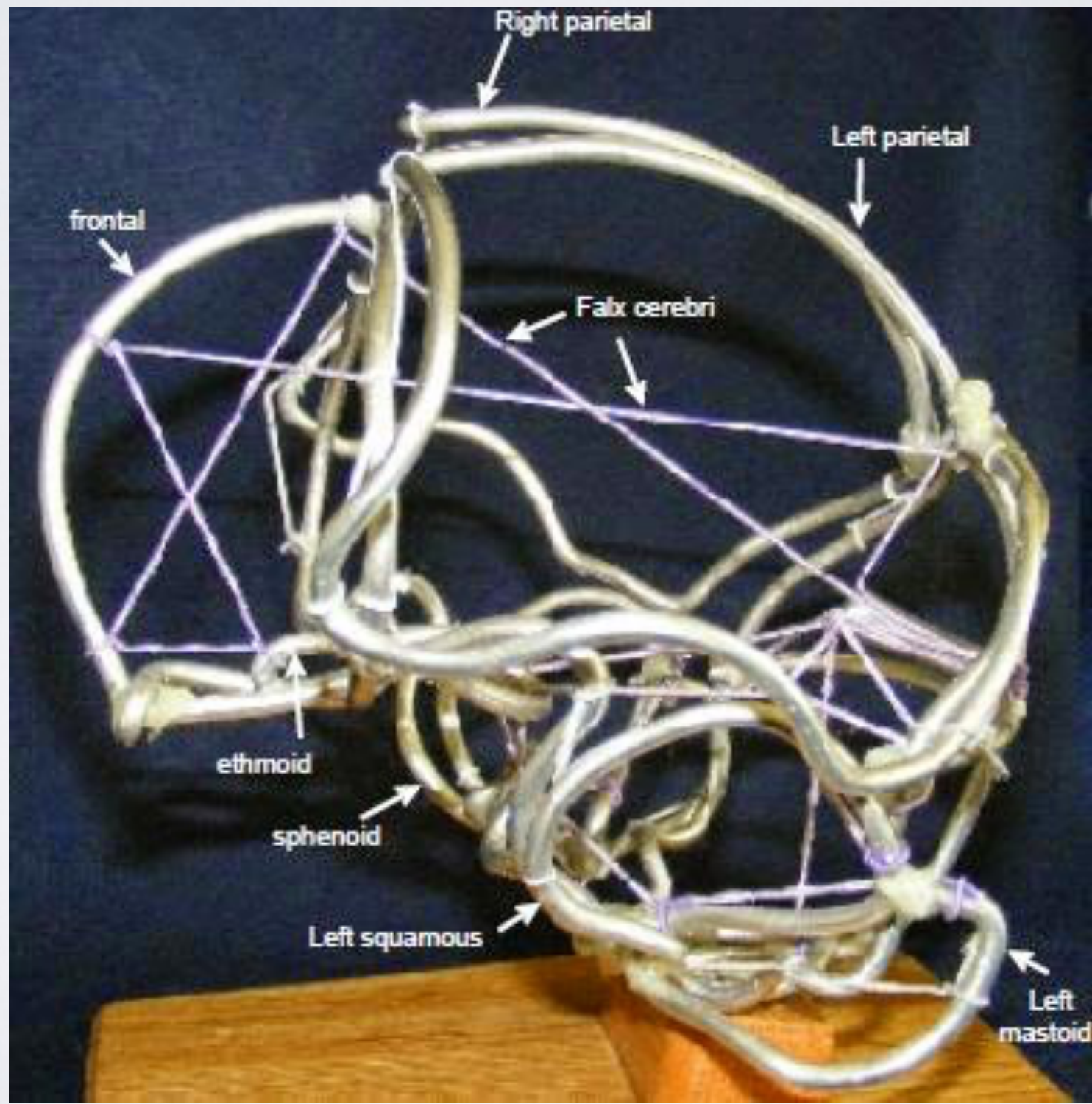


Tensional forces in the dura mater have the effect of *pushing* the bones apart, whilst at the same time integrating them into a single functional unit



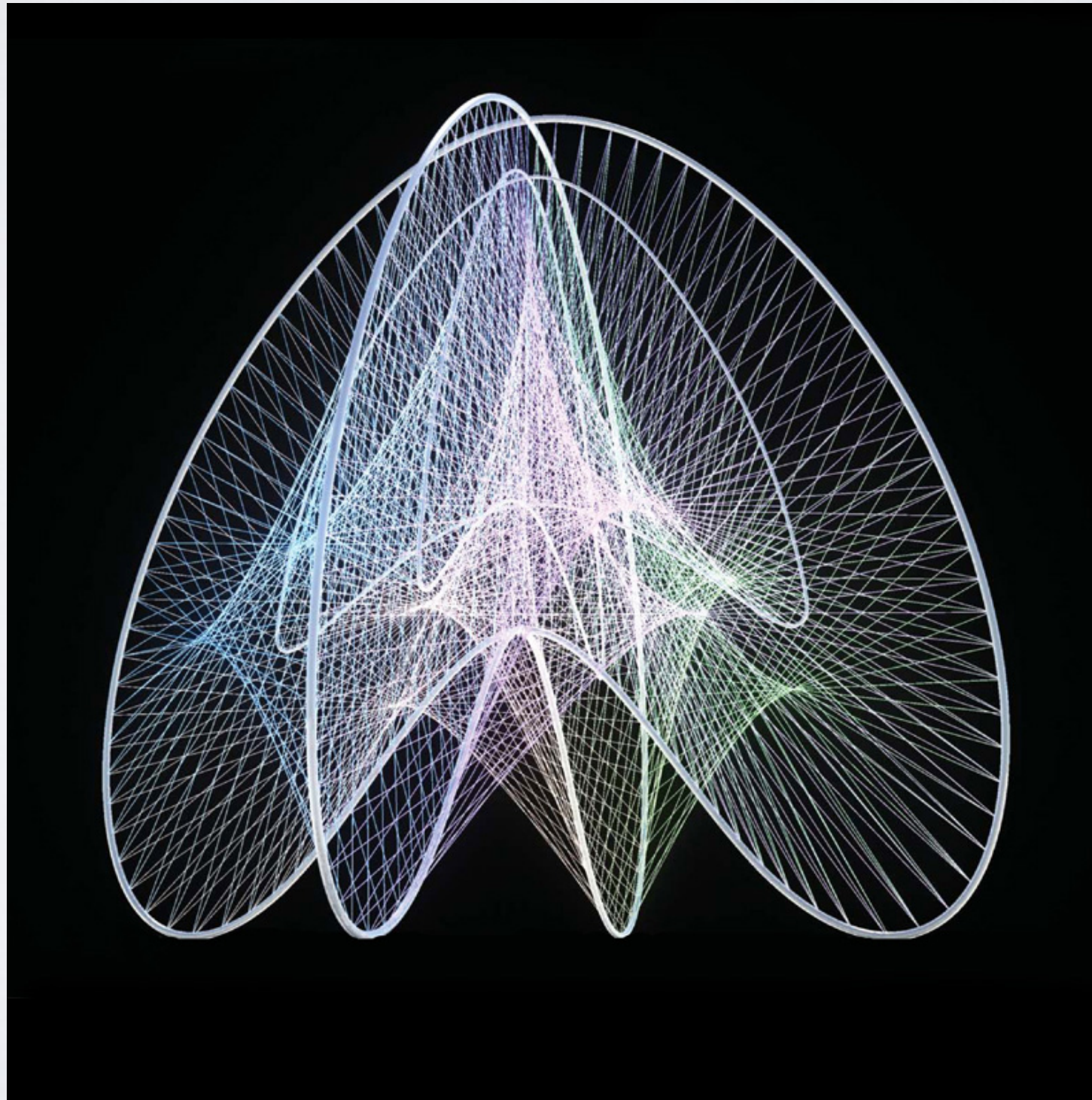


# THE SKULL



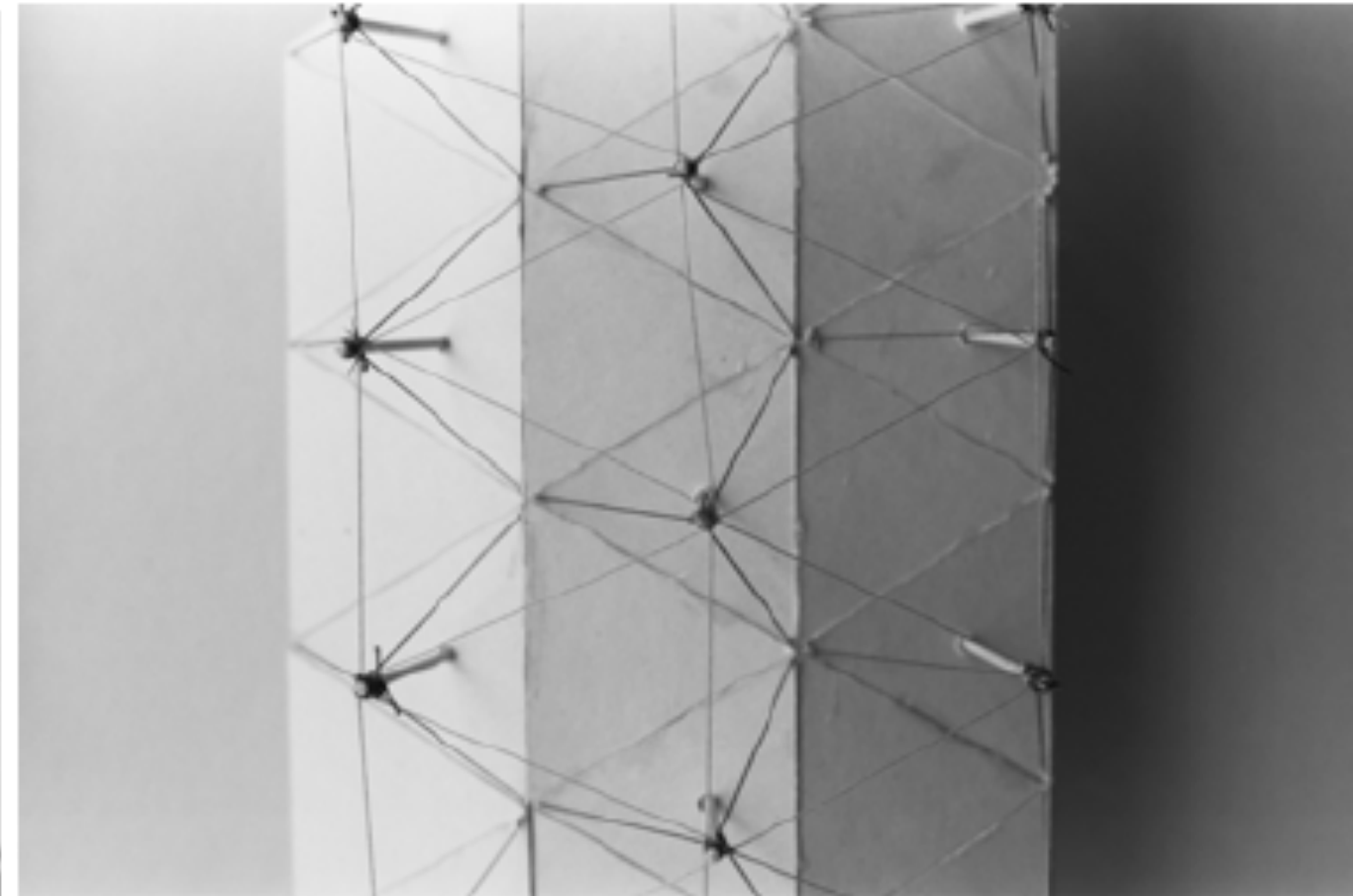
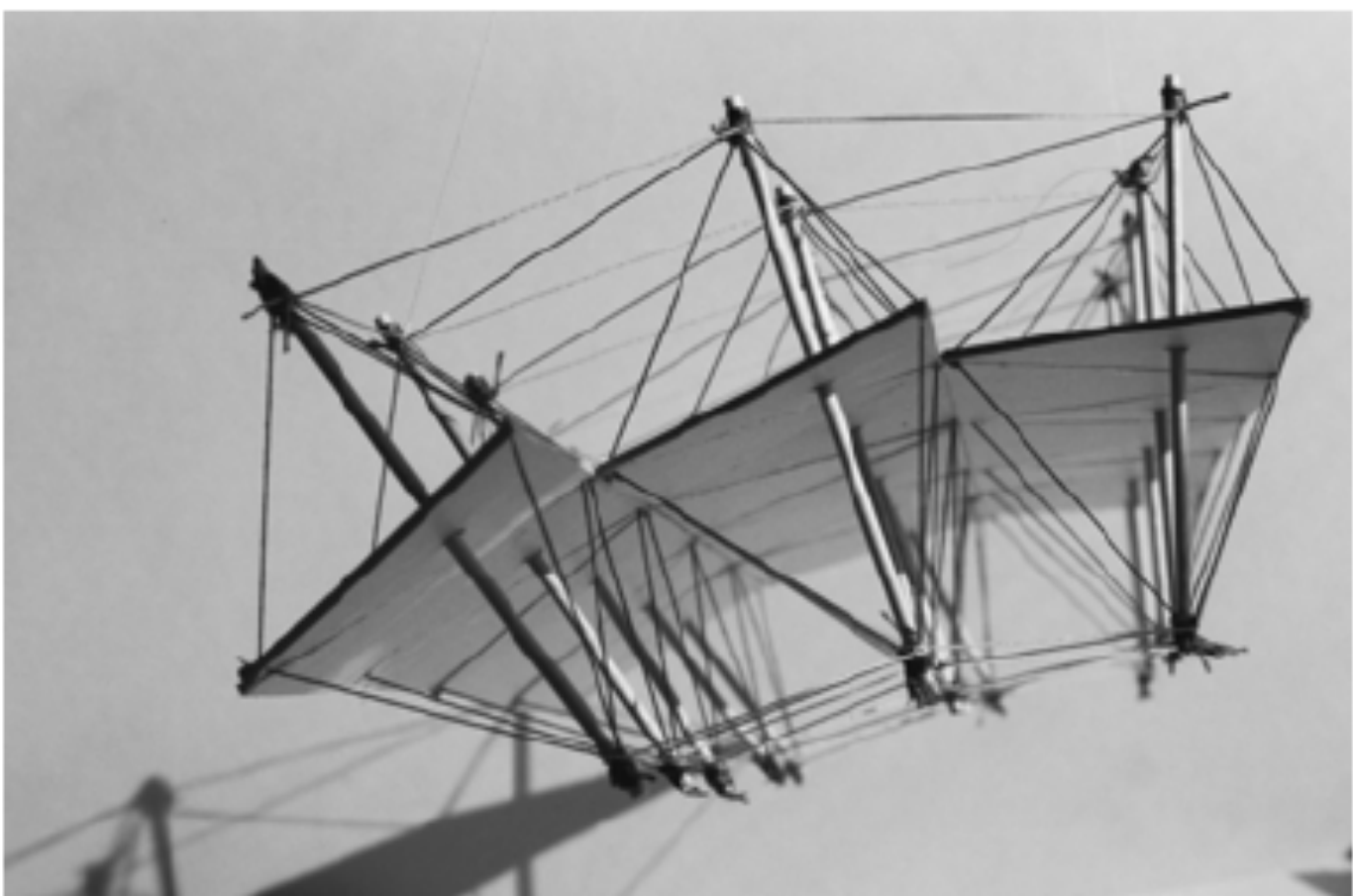


# THE SKULL





# THE SKULL

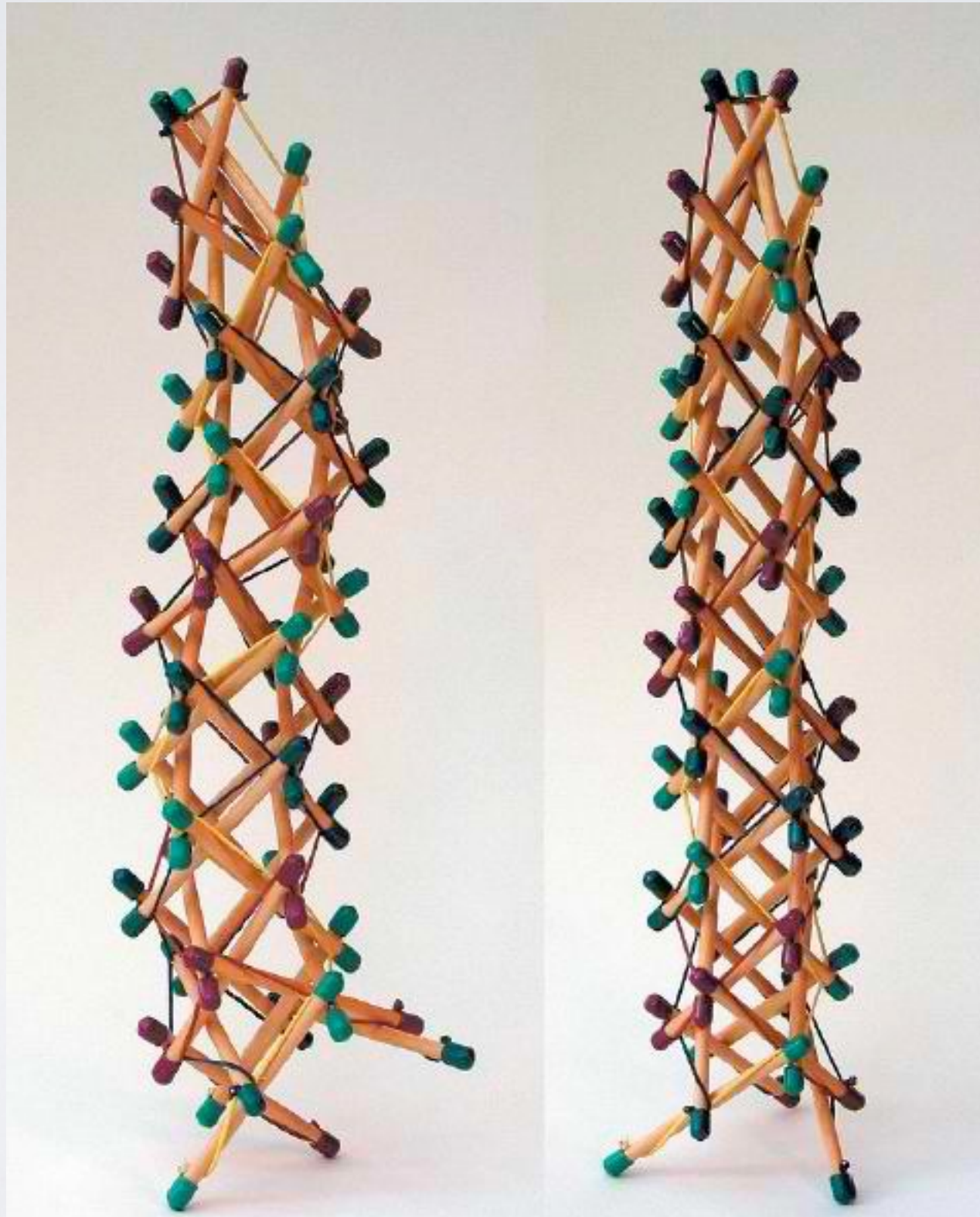


# THE SKULL

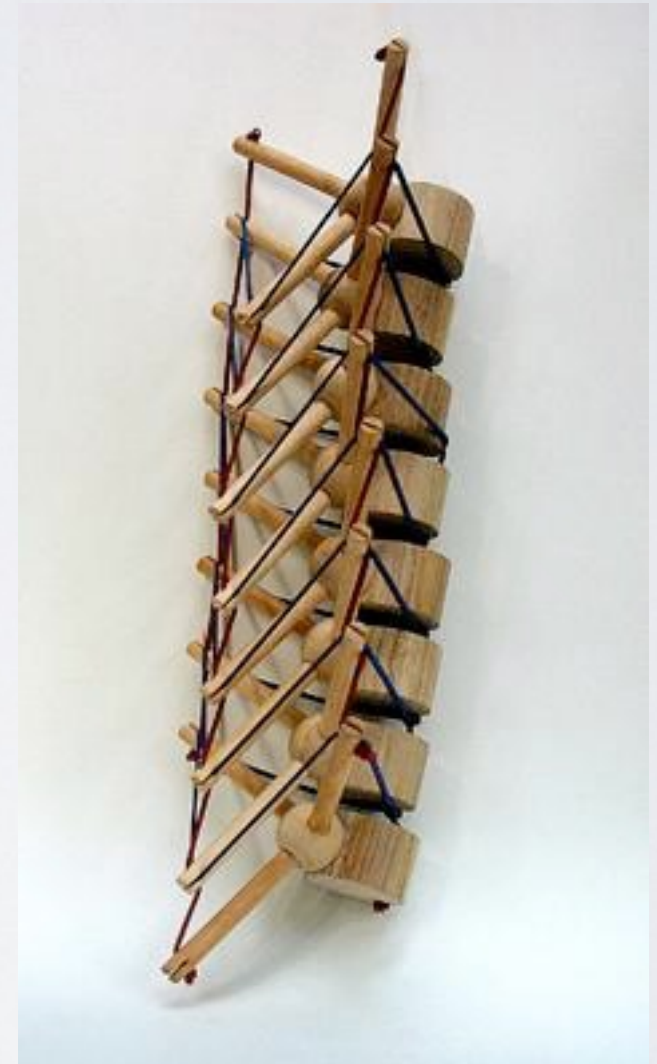
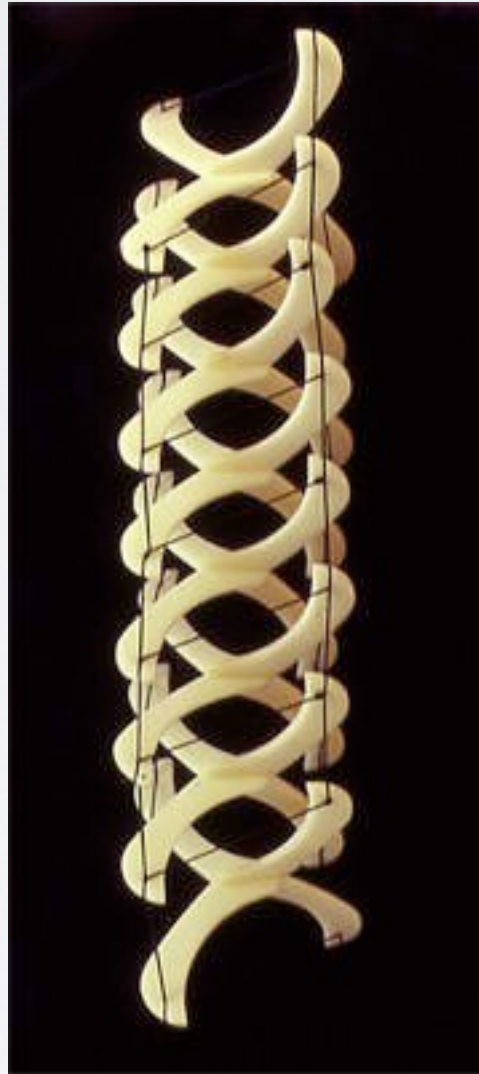




# THE SPINE



# MODELS BY TOM FLEMONS

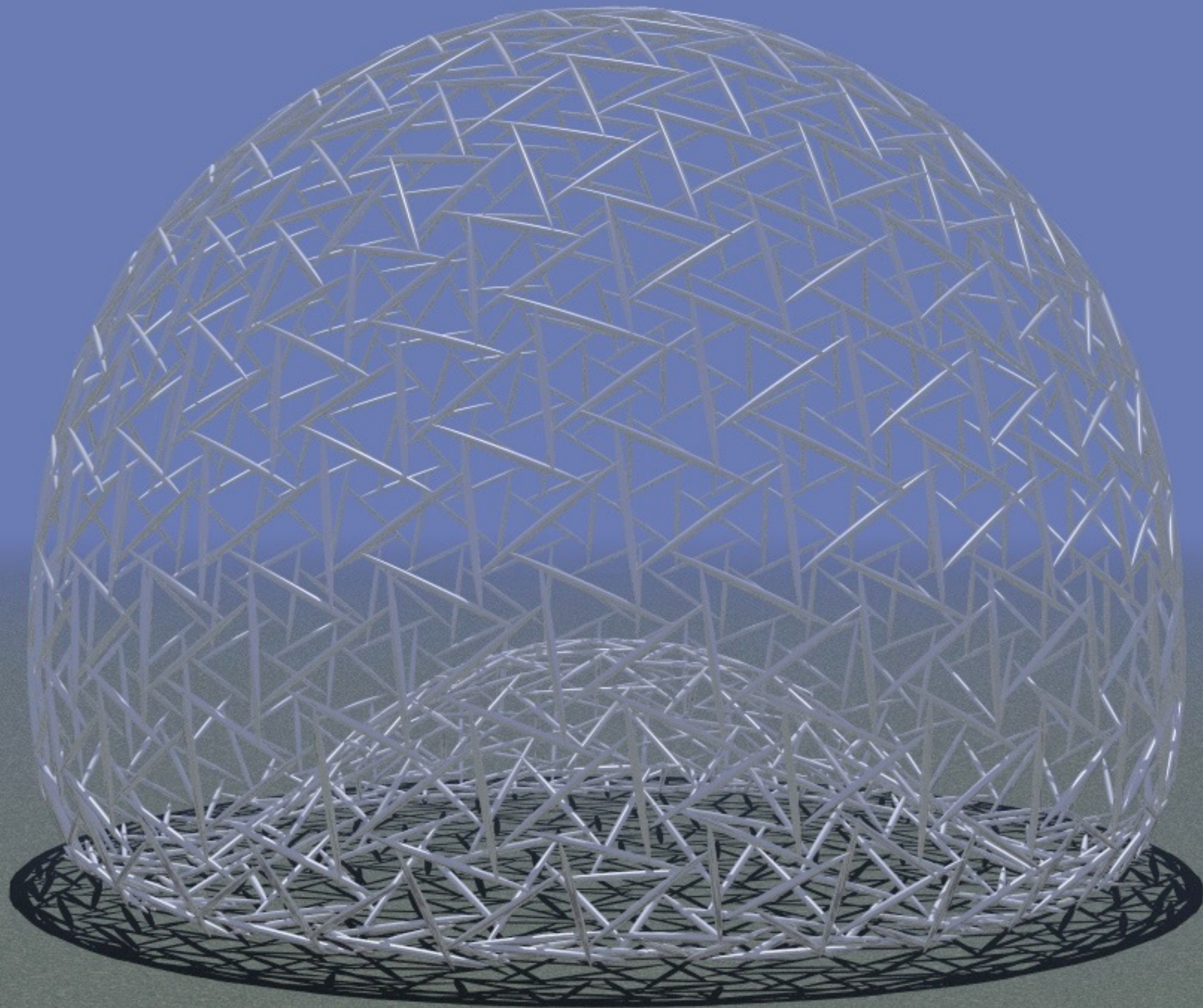




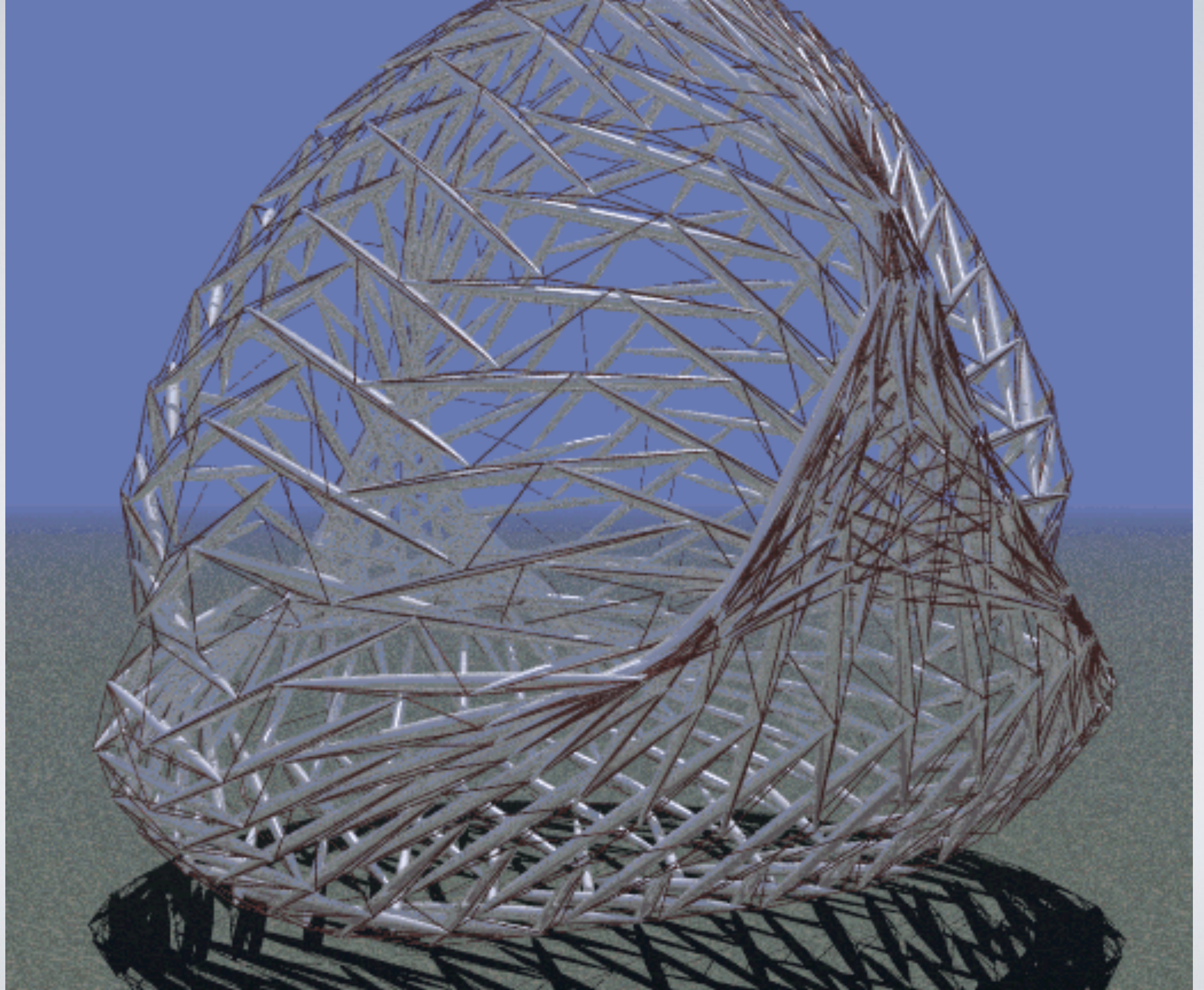
# THE SPINE

















# HEART



















