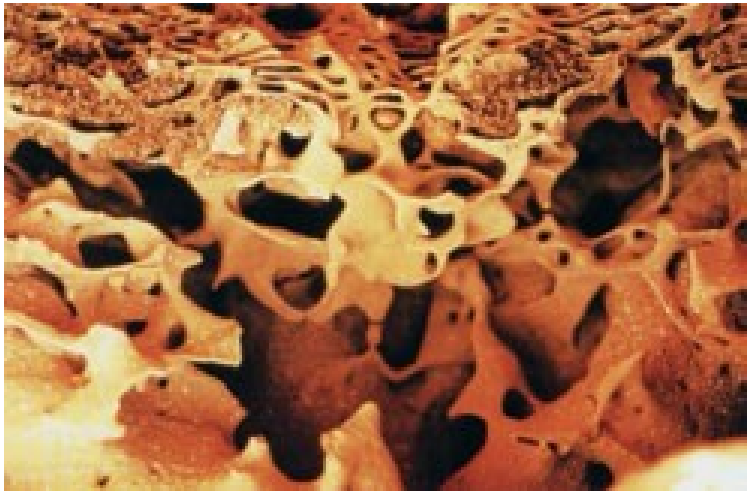
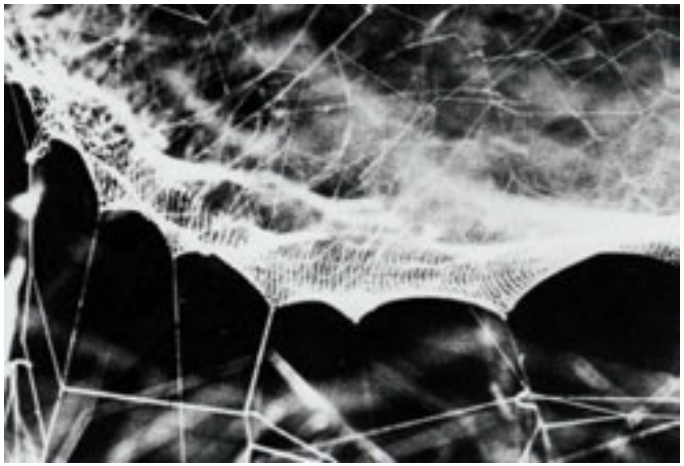
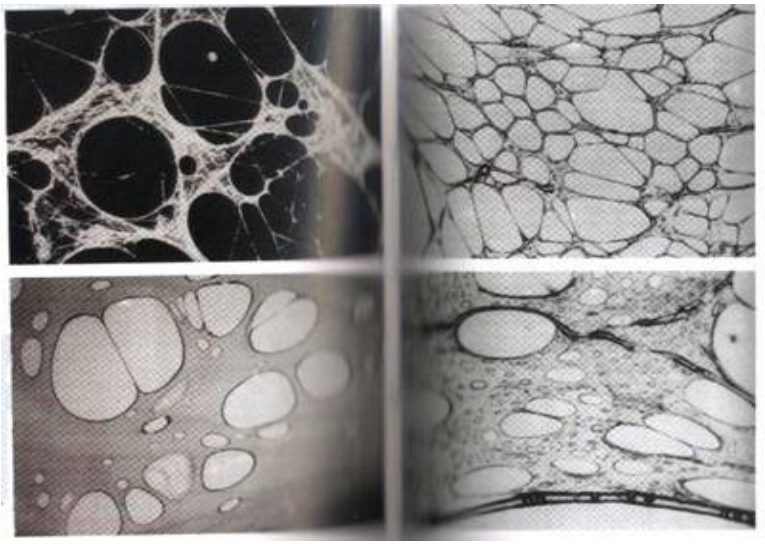
Φυσικές δομές οι οποίες μπορούν να αναχθούν σε γεωμετρικά μοτίβα και μαθηματικές επιφάνειες

- Ελάχιστες επιφάνειες
- Εξαγωνικές δομές / Voronoi
- Circle/Bubble packing

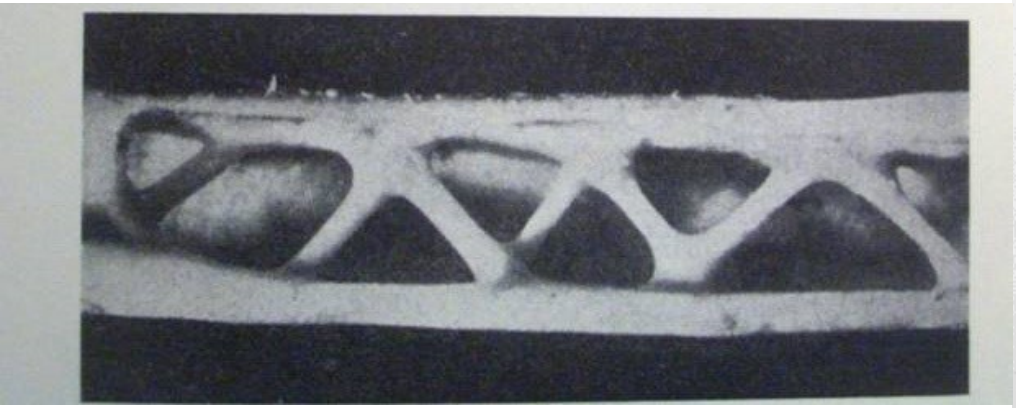
κλπ

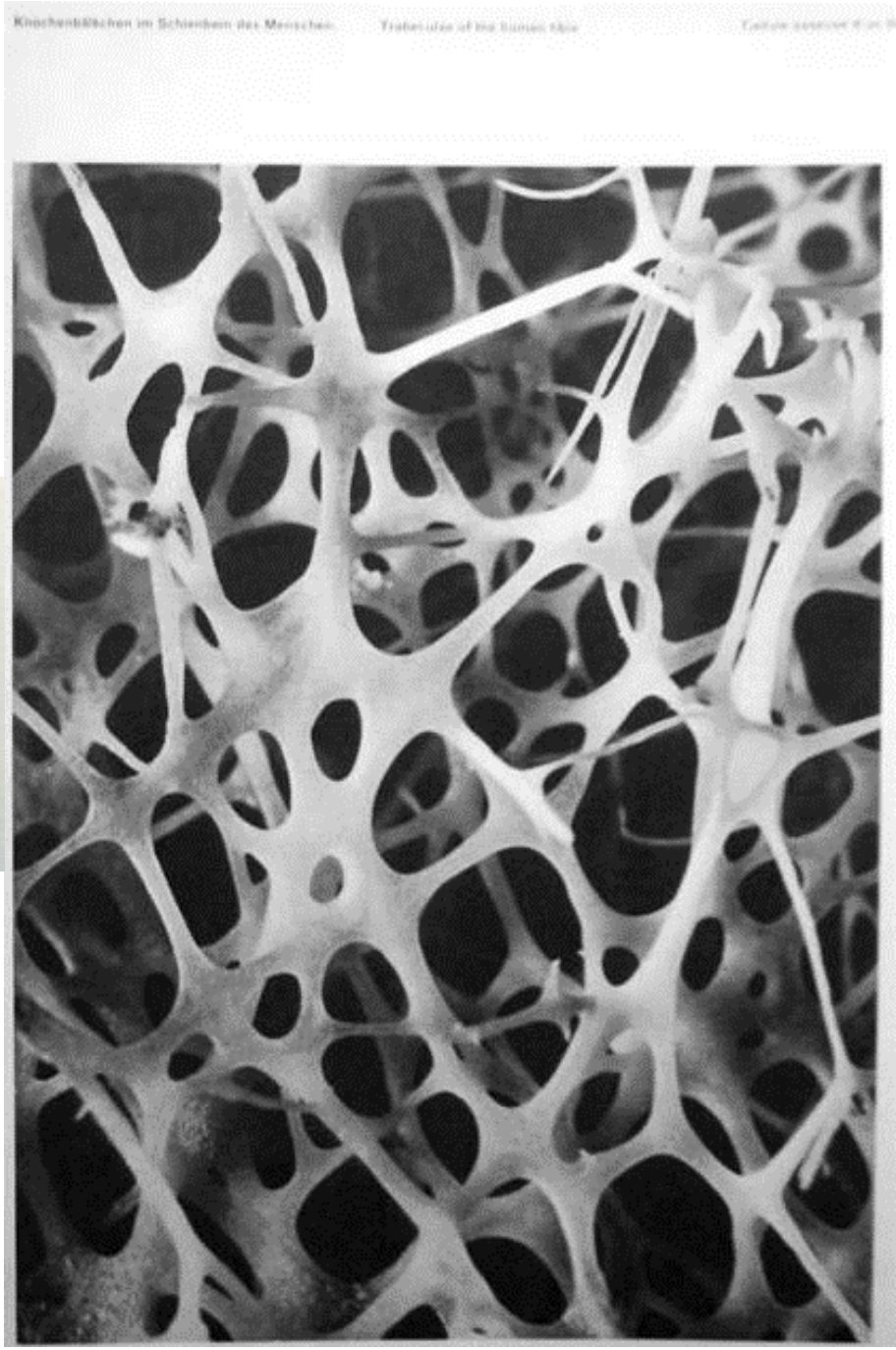


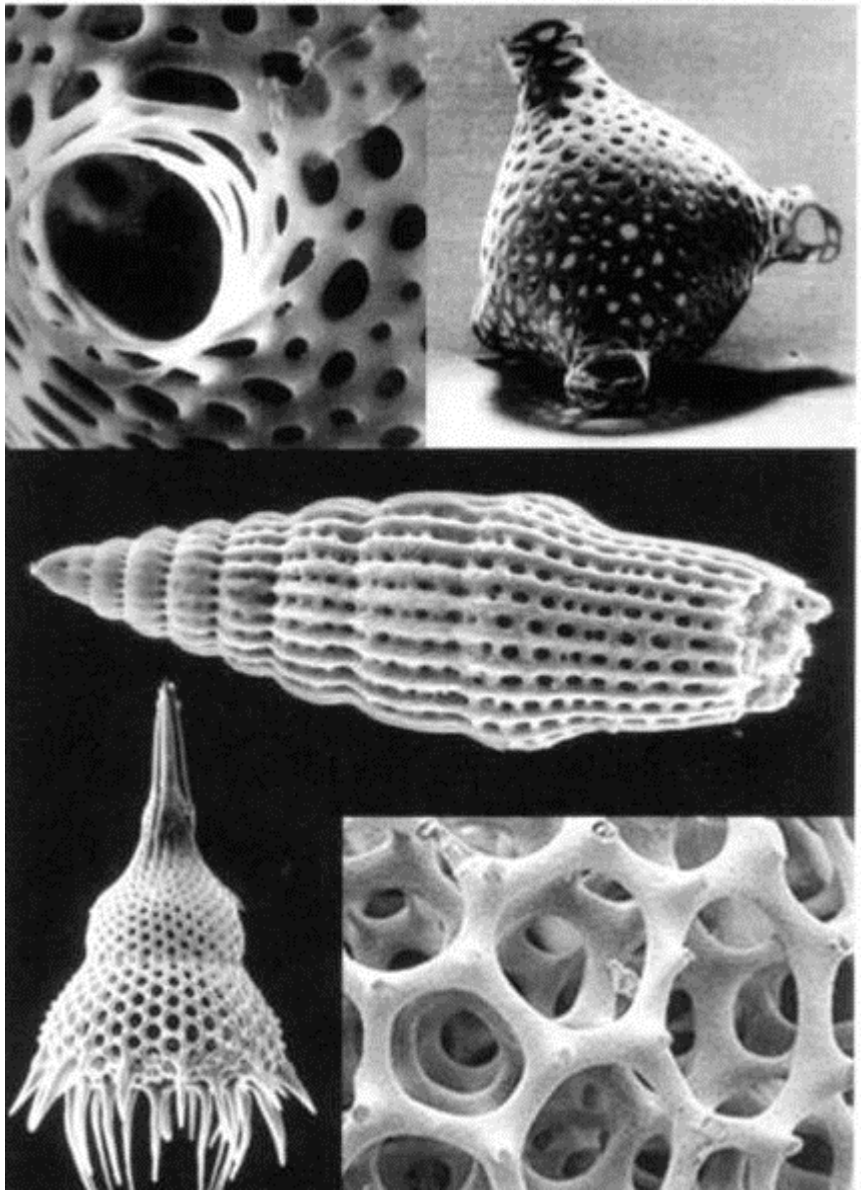




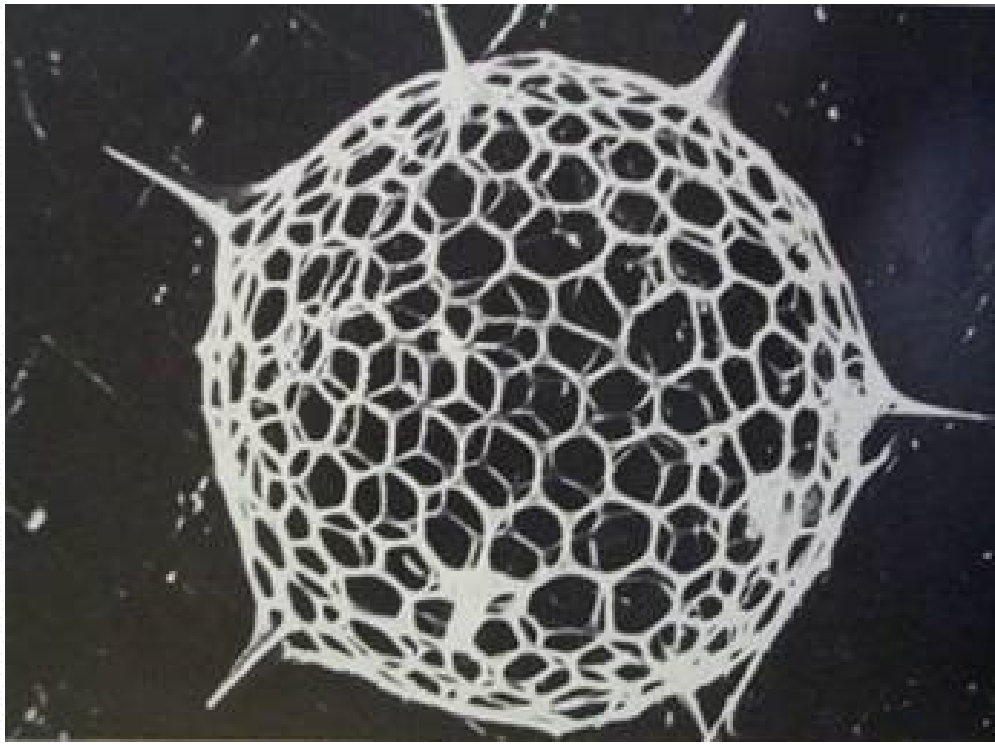
Εσωτερική δομή οστών

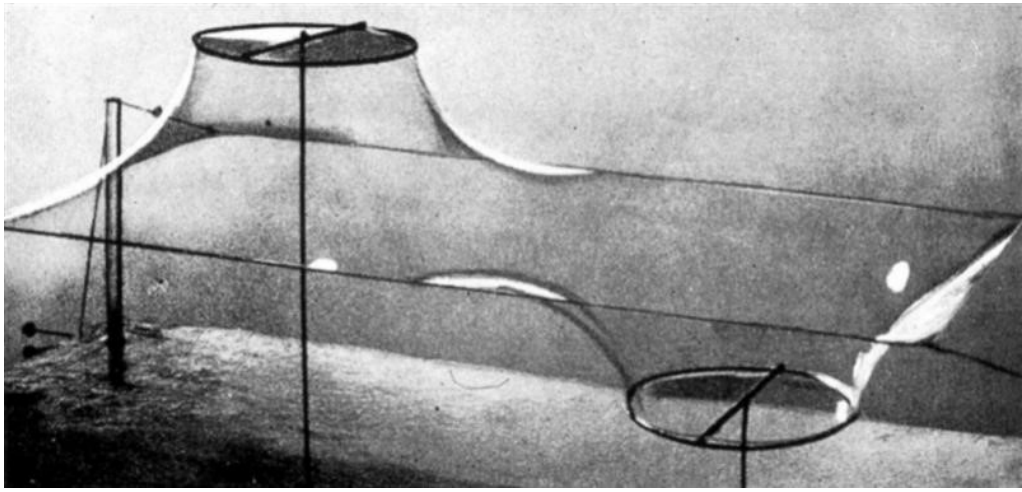




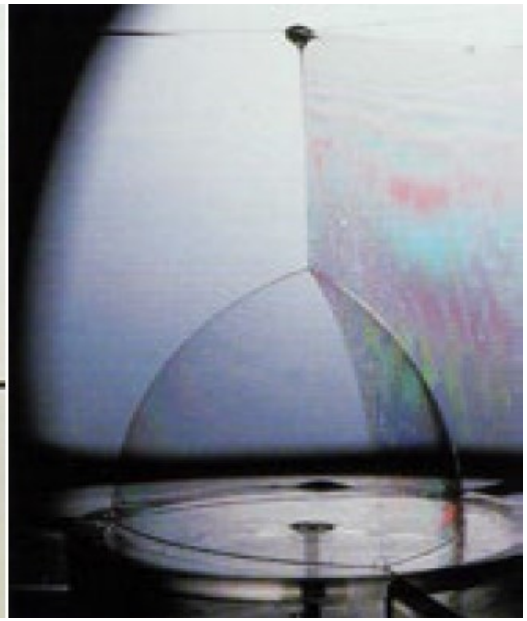


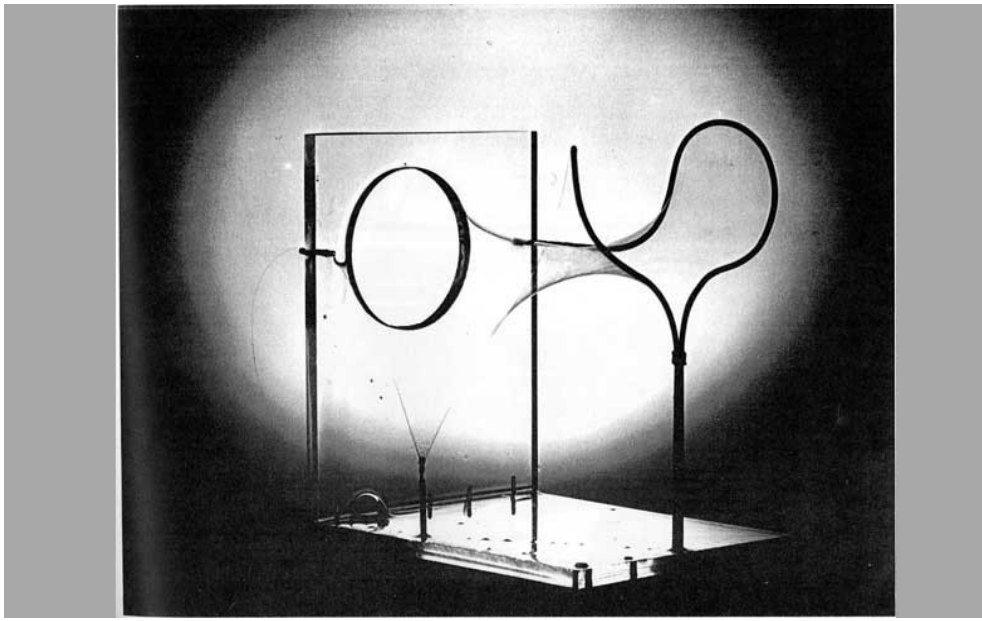
Σκελετοί Radiolarians

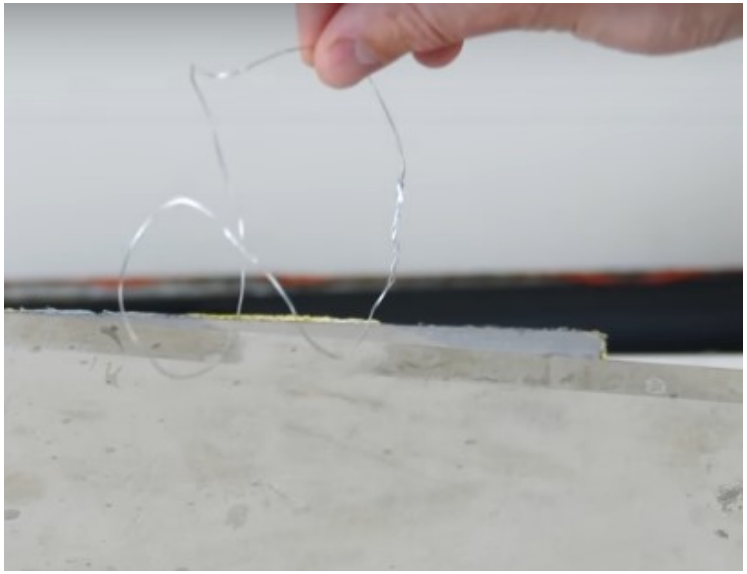


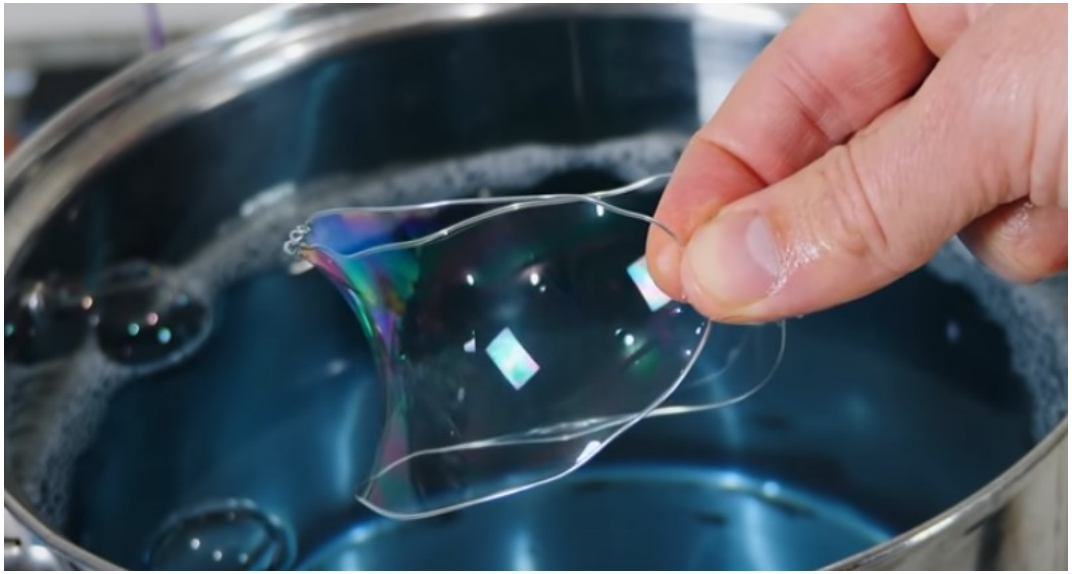


Υγρά φιλμ σαπουνιών για την εύρεση των ελαχίστων επιφανειών

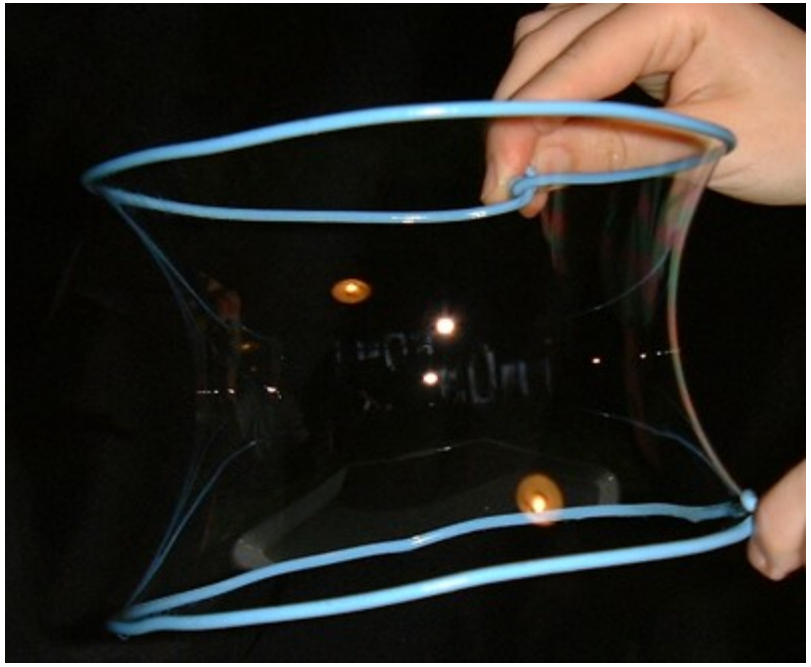


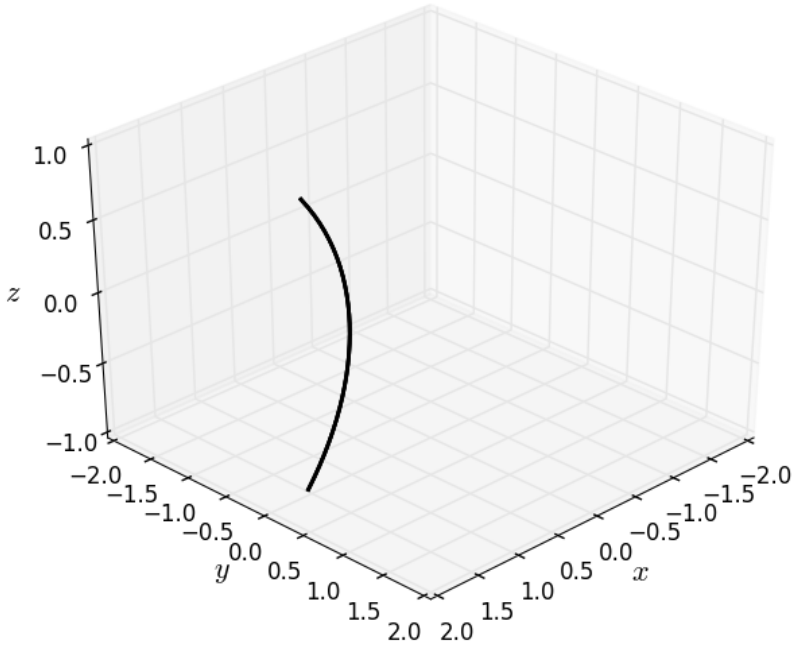




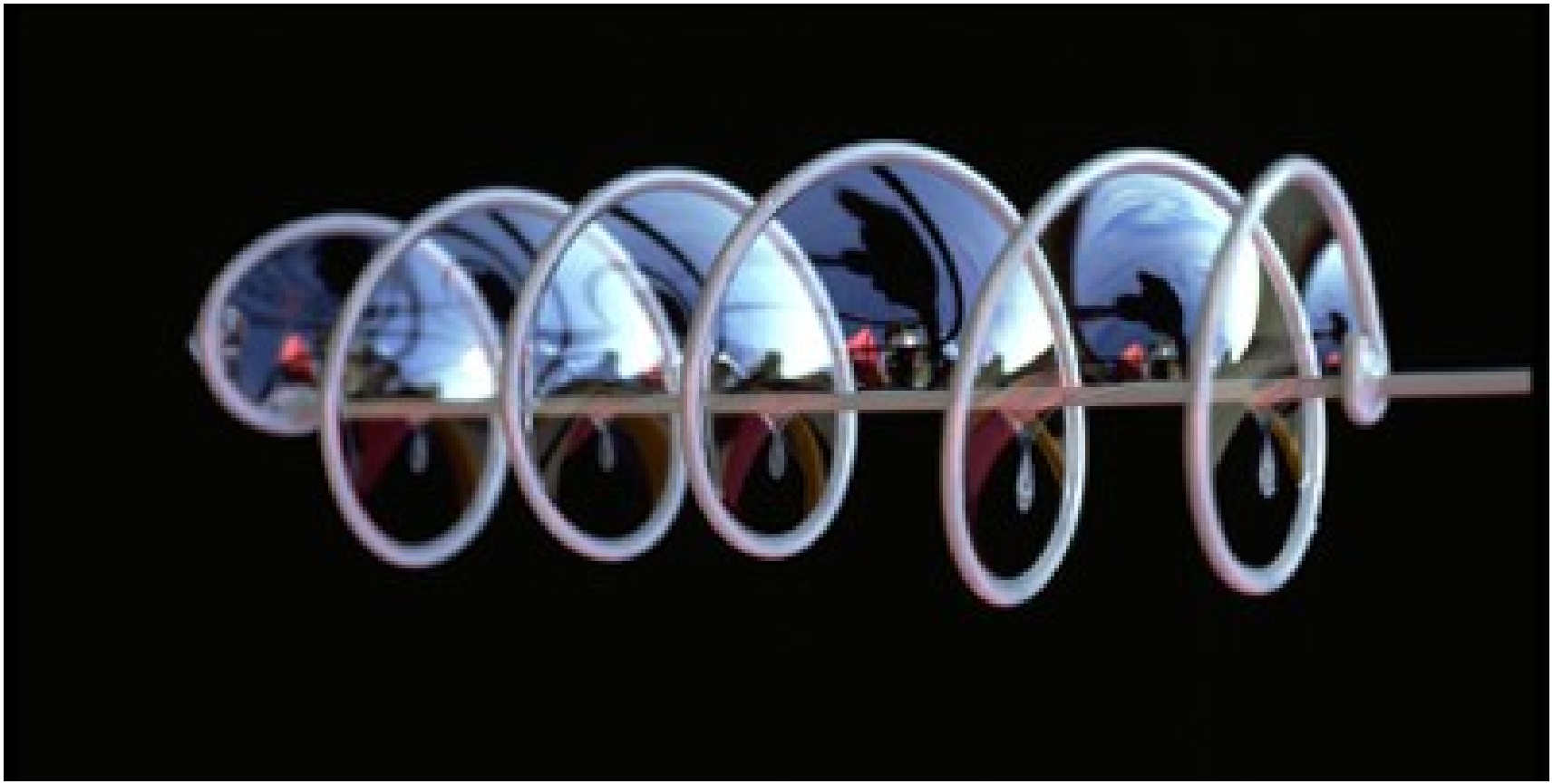


Σελοειδείς (υπερβ. παραβολ).

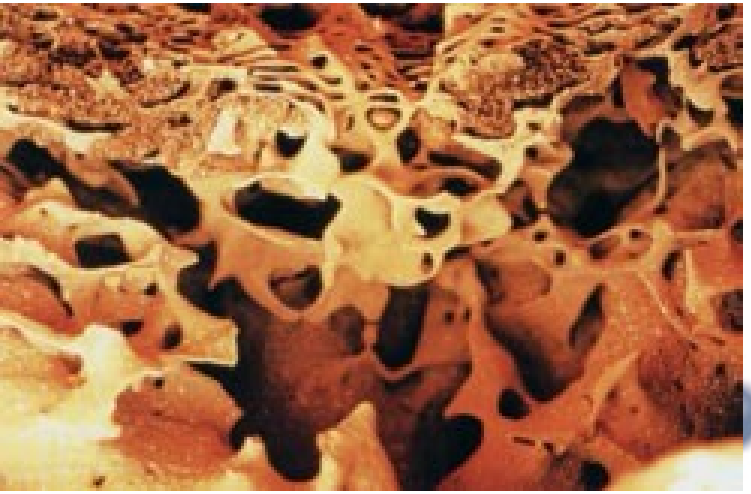


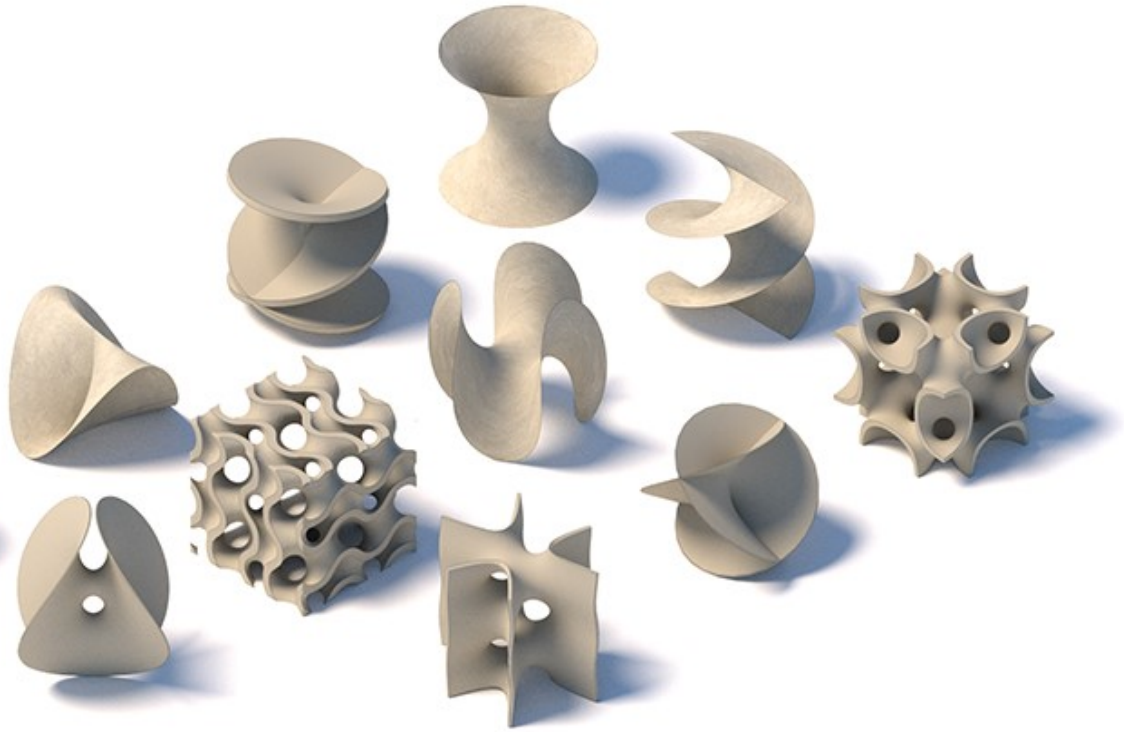


Catenoid



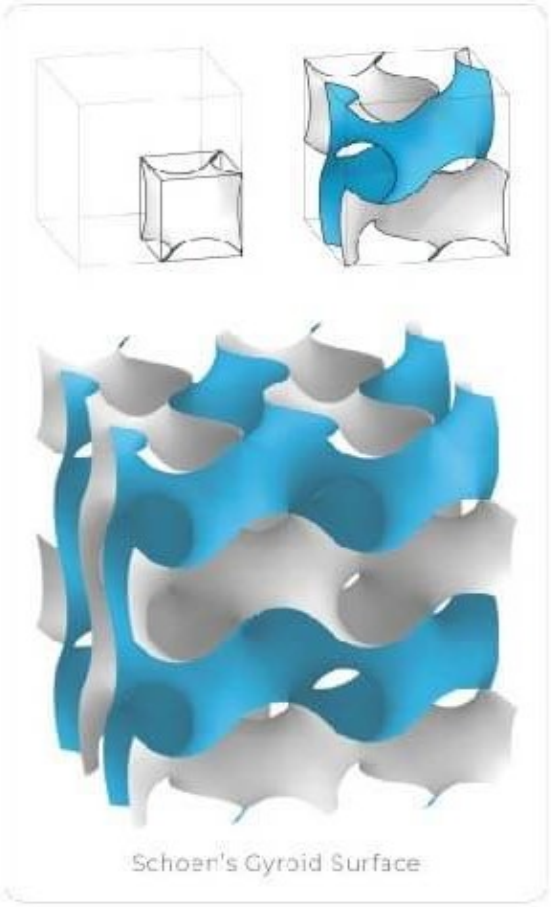
Helicoid



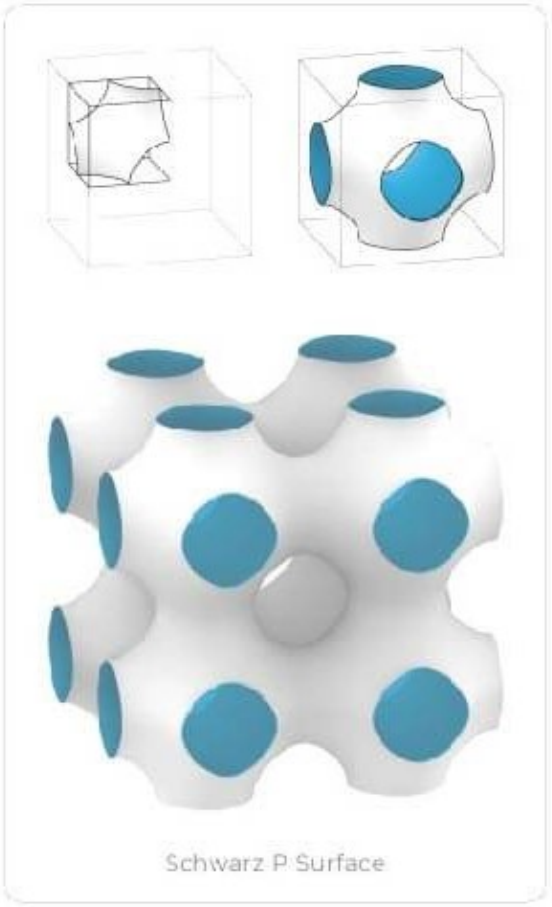


Τρία από τα πολλά είδη ελάχιστων επιφανειών
Google search→ Periodic minimal surfaces – sponge surfaces

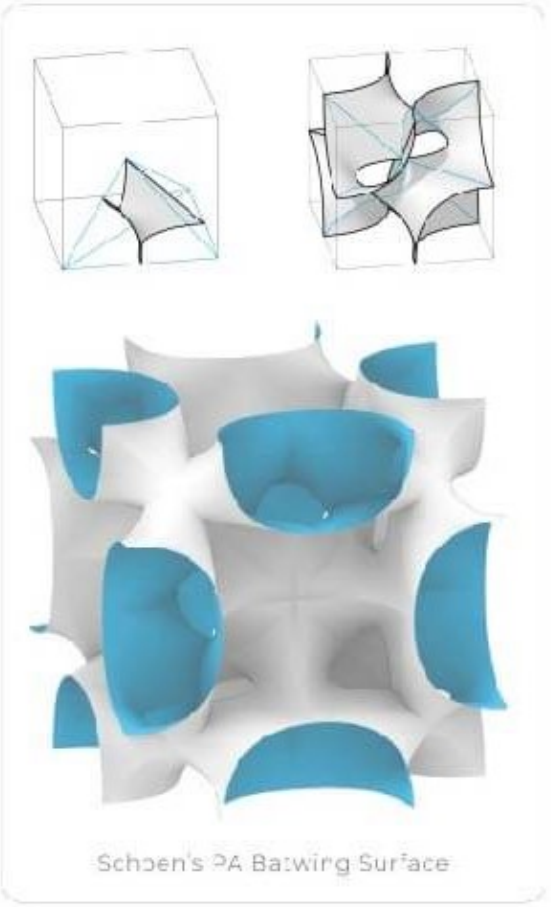
Gyroid Surface

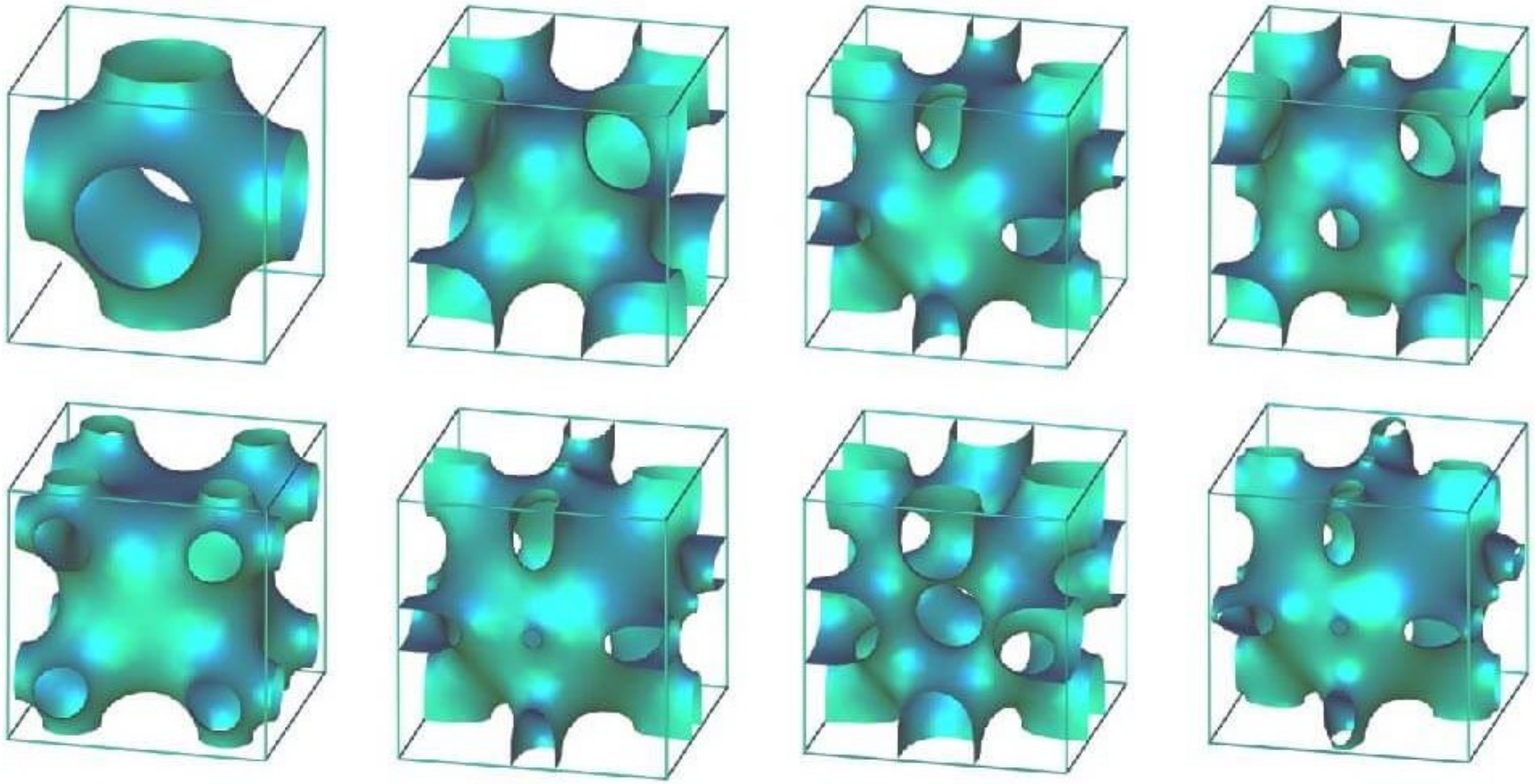


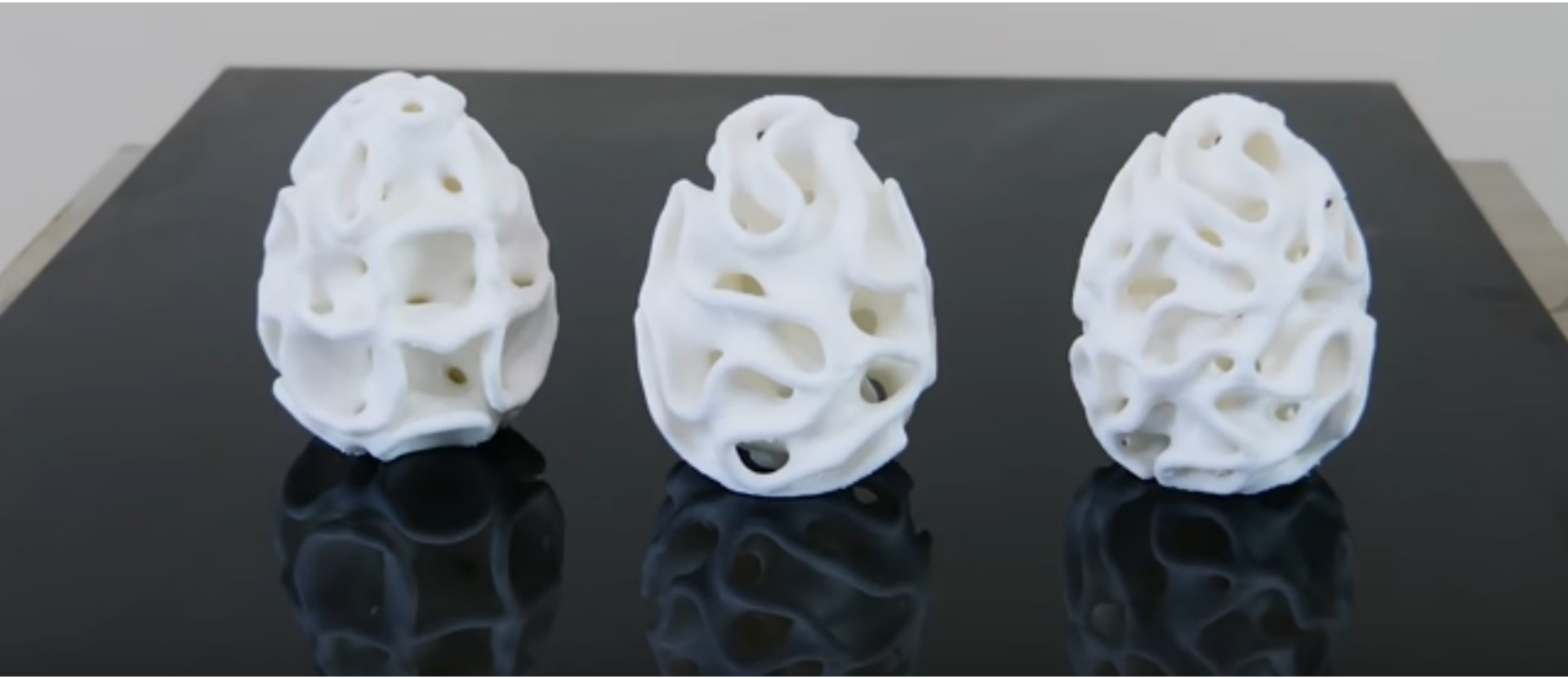
Schwarz P Surface



Shoen's PA Batwing Surface



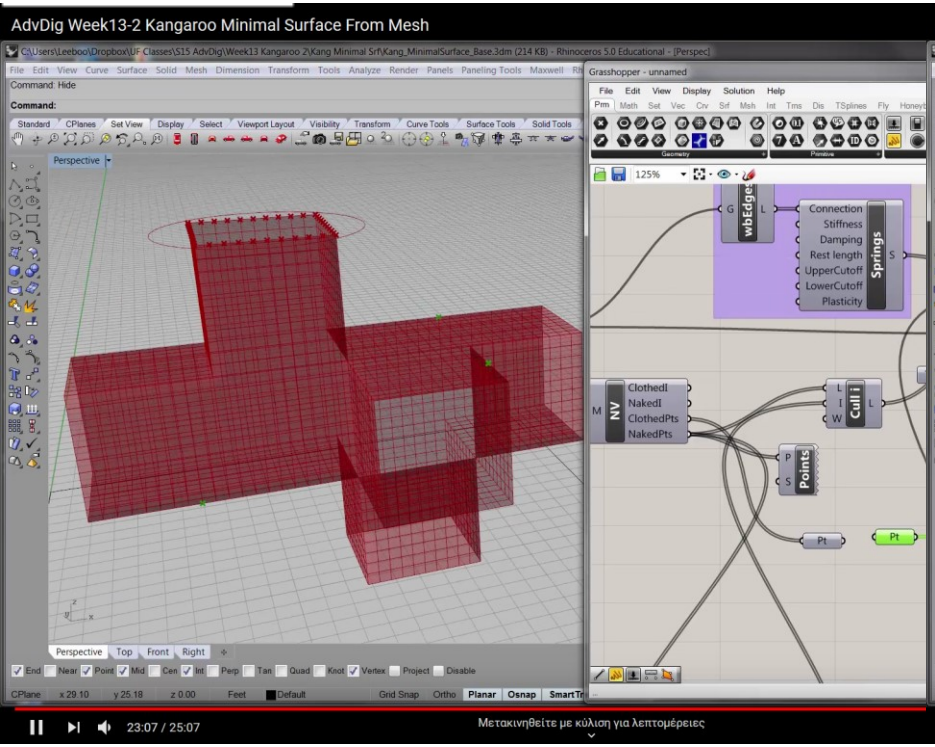


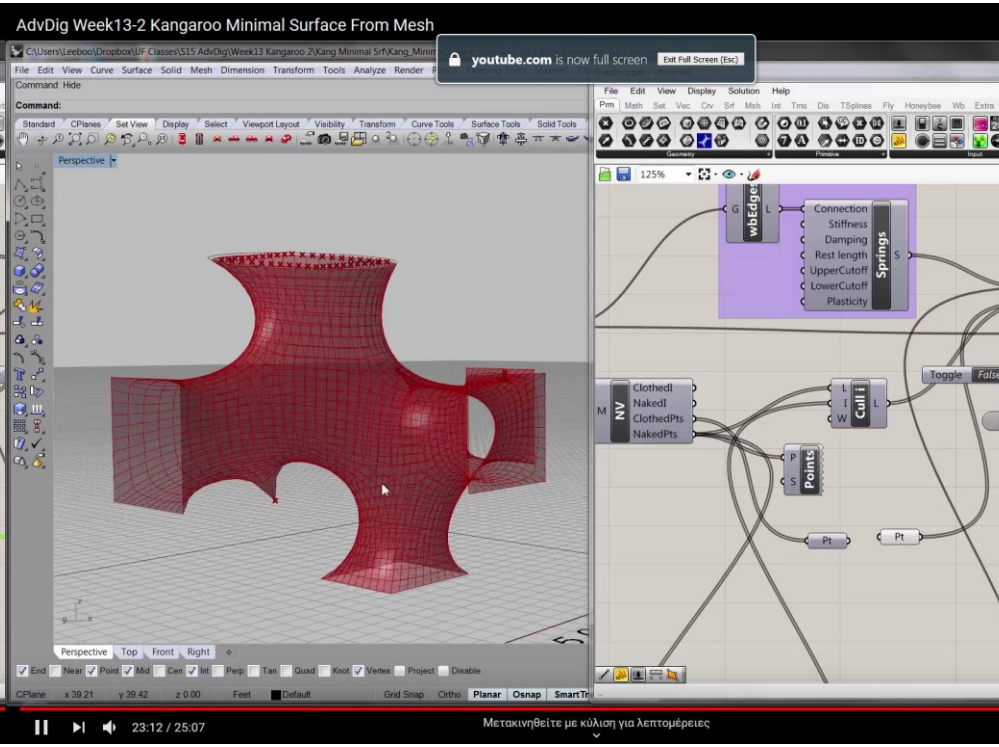


Harbin Opera House MAD Architects China
Hufton + Crow

Μέθοδοι μοντελοποίησης ελάχιστων επιφανειών μέσω Kangaroo plugin

Google search→ Minimal Surface From Mesh/mesh relaxation

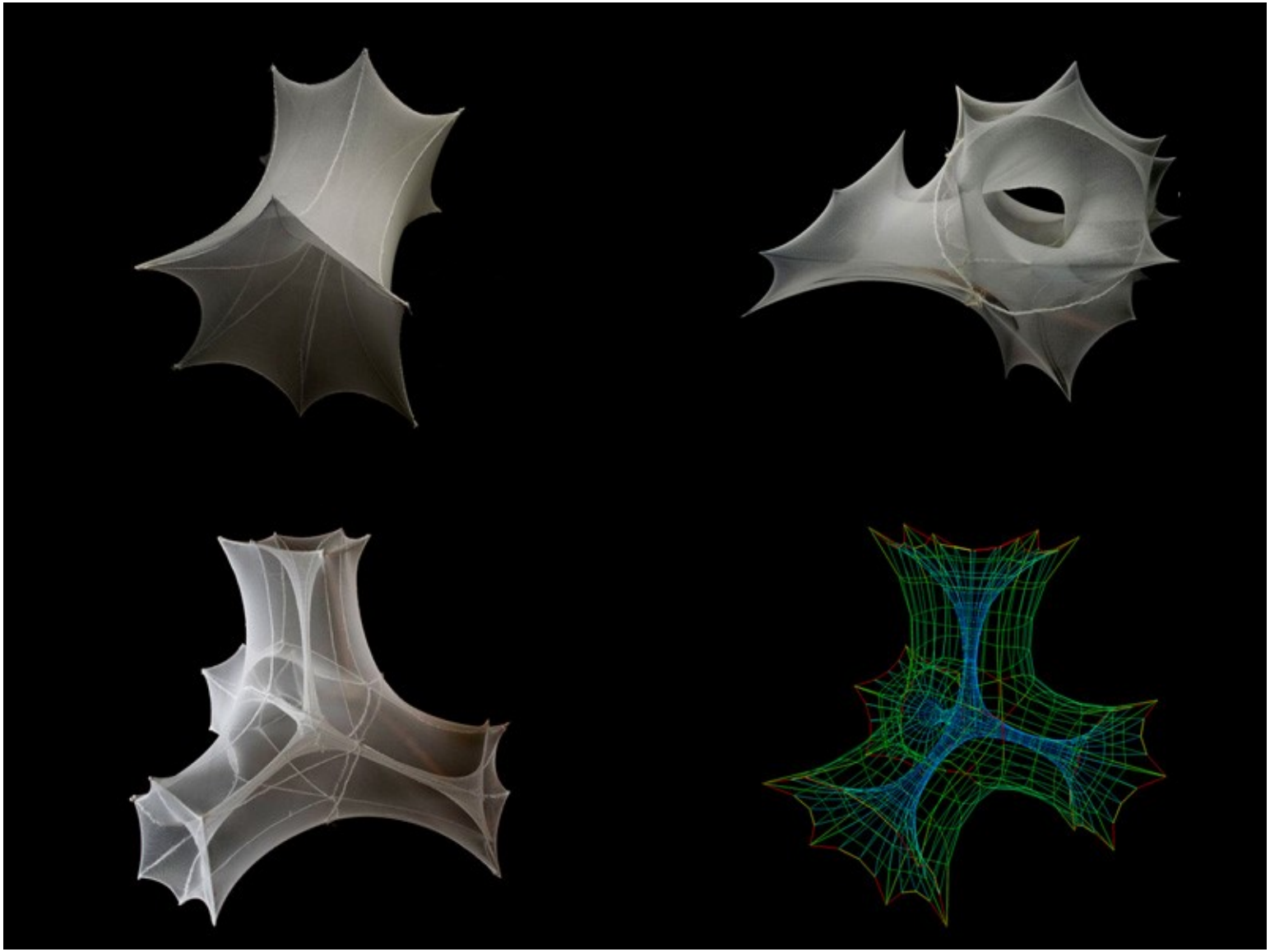




GREEN VOID, LAVA Sydney, Australia; Stuttgart, Germany

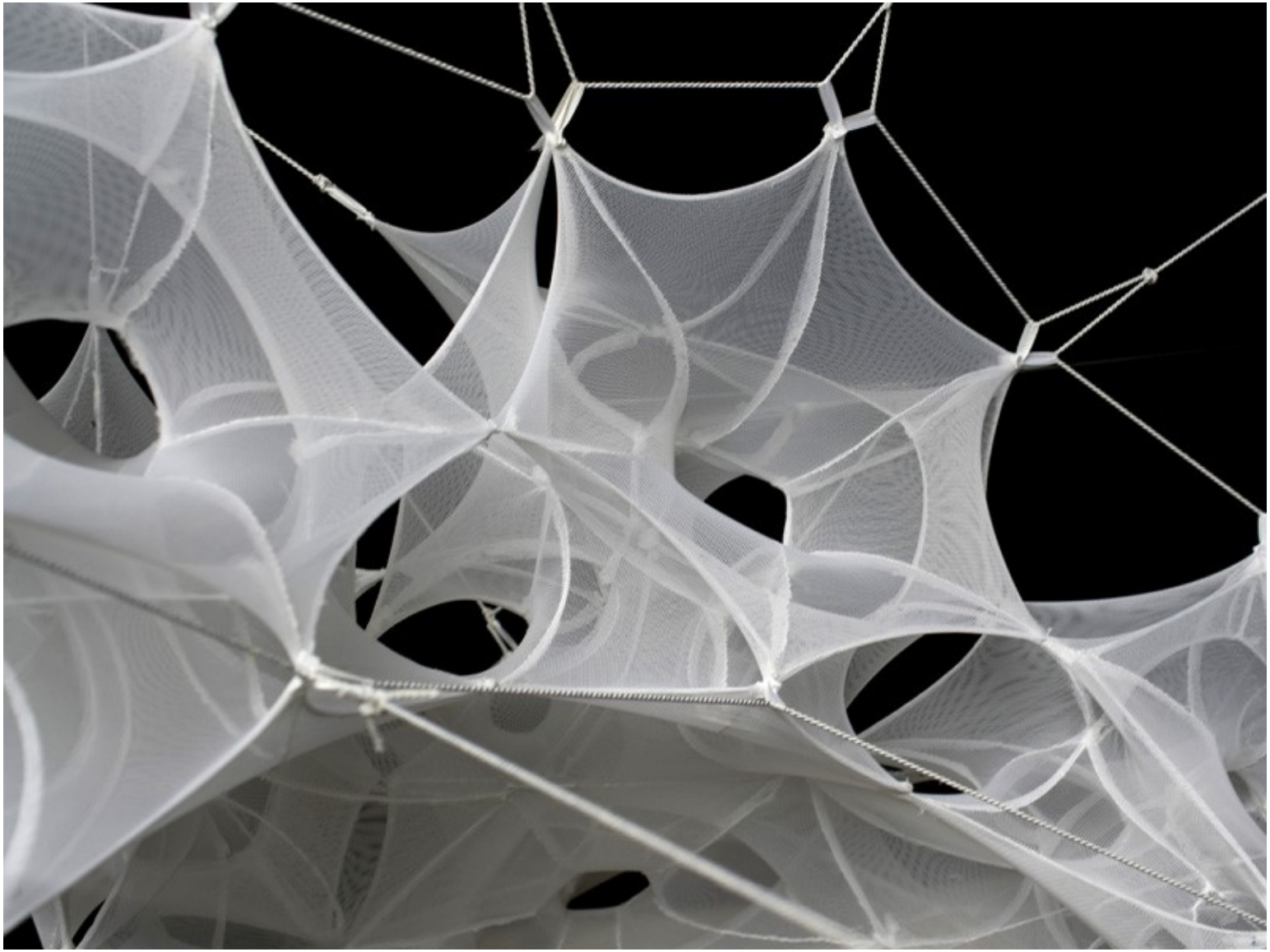
Boolean Operator / MARC FORNES / THEVERYMANY


Catani
SALON · ATELIER
Sti

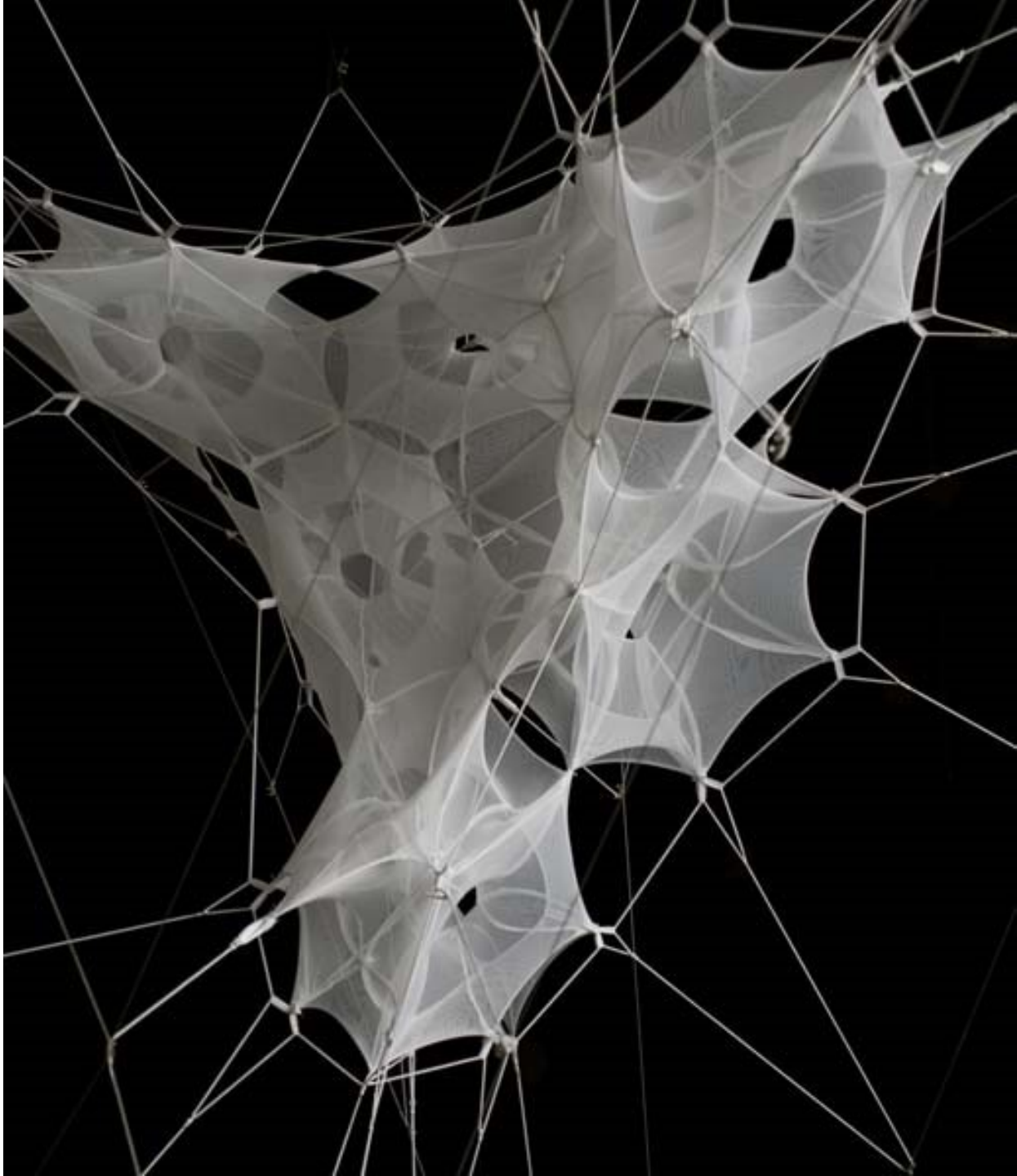


2011 ICD Stuttgart University
ICD Design Studio (Prof. A. Menges, S. Ahlquist)

2011 ICD Stuttgart University
ICD Design Studio (Prof. A. Menges, S. Ahlquist)



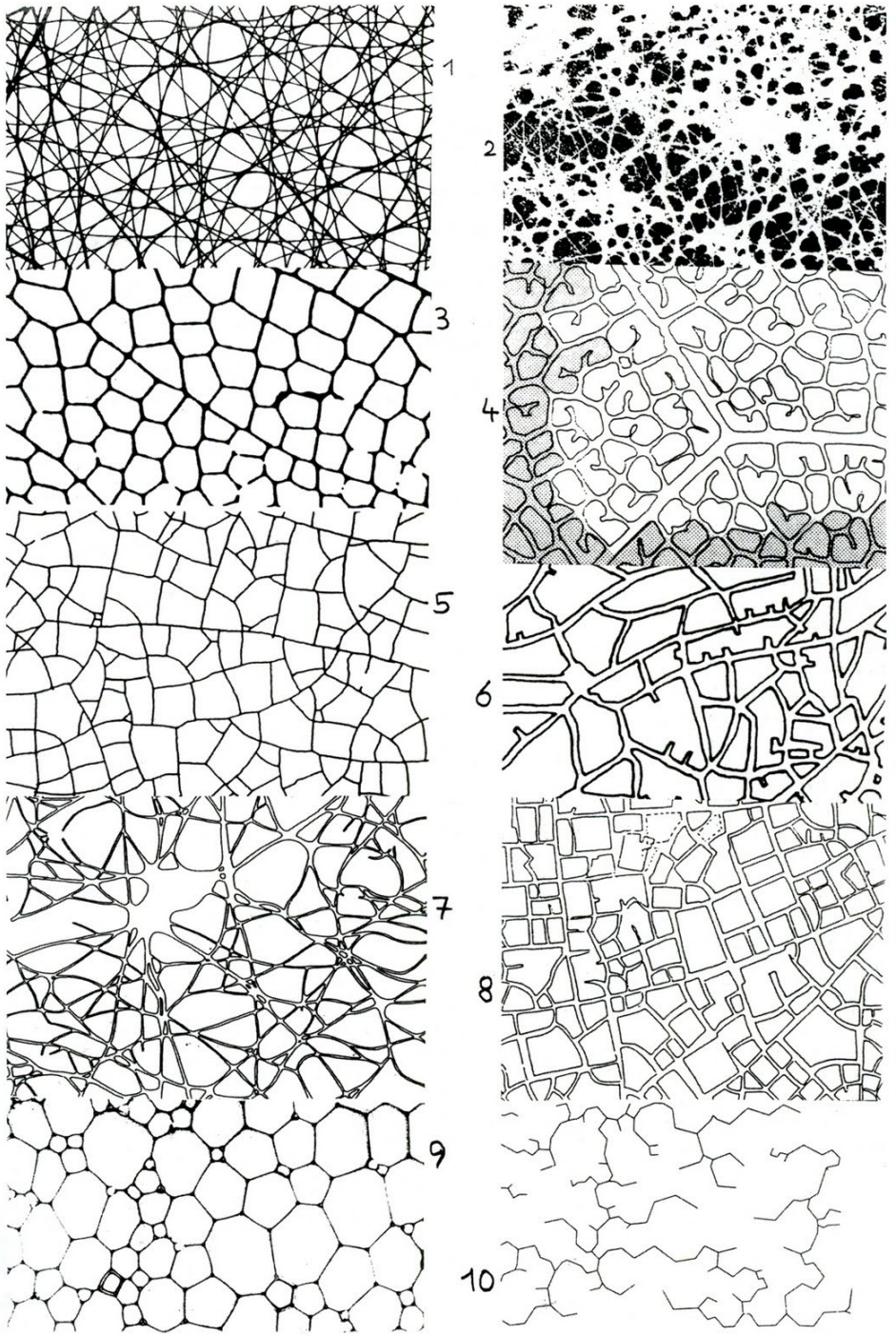
2011 ICD Stuttgart University
ICD Design Studio (Prof. A. Menges, S. Ahlquist)

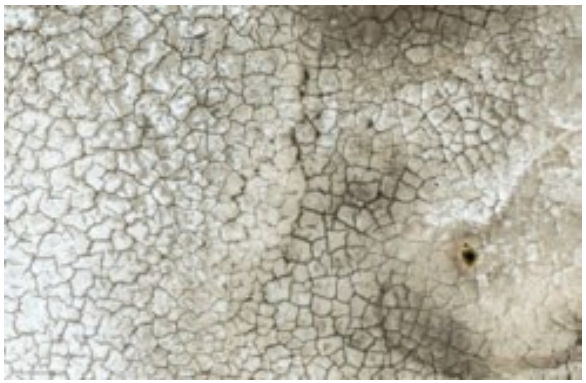


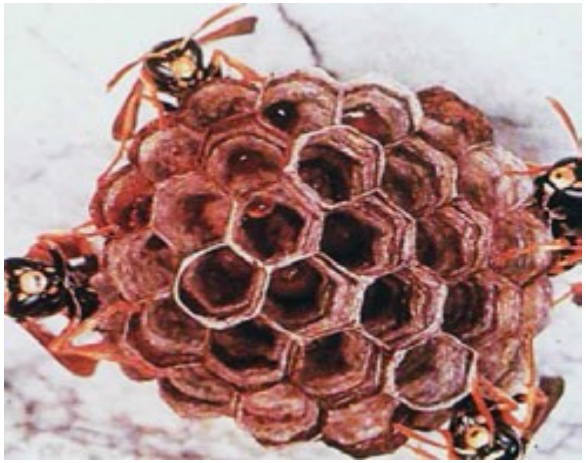
2011 ICD Stuttgart University
ICD Design Studio (Prof. A. Menges, S. Ahlquist)

Εξαγωνικές δομές

Google search → hexagonal structures

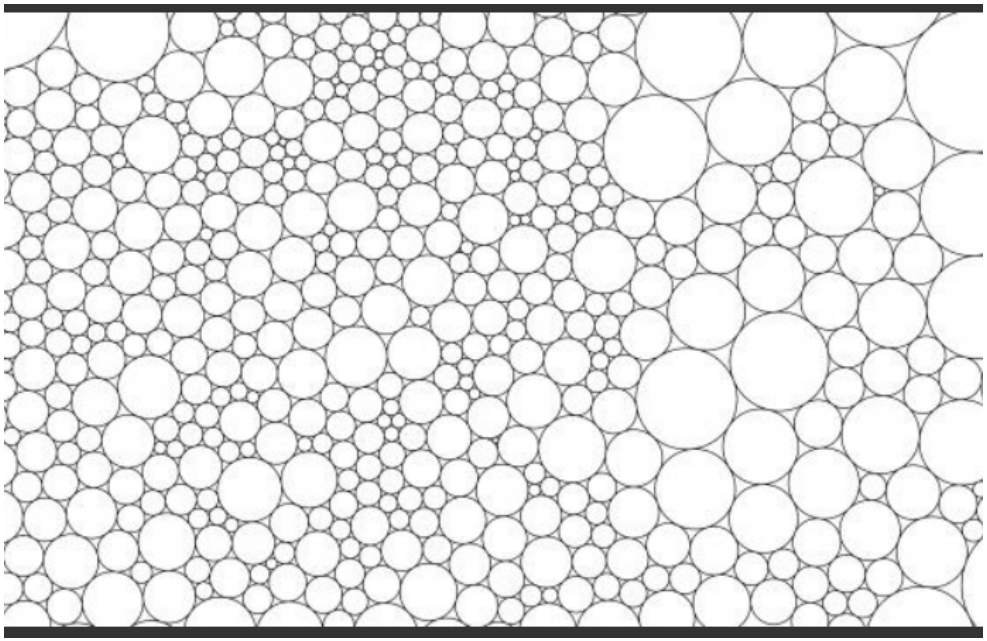


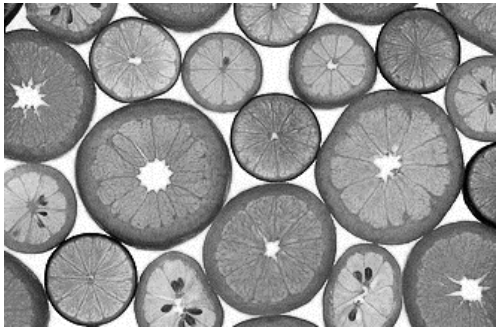


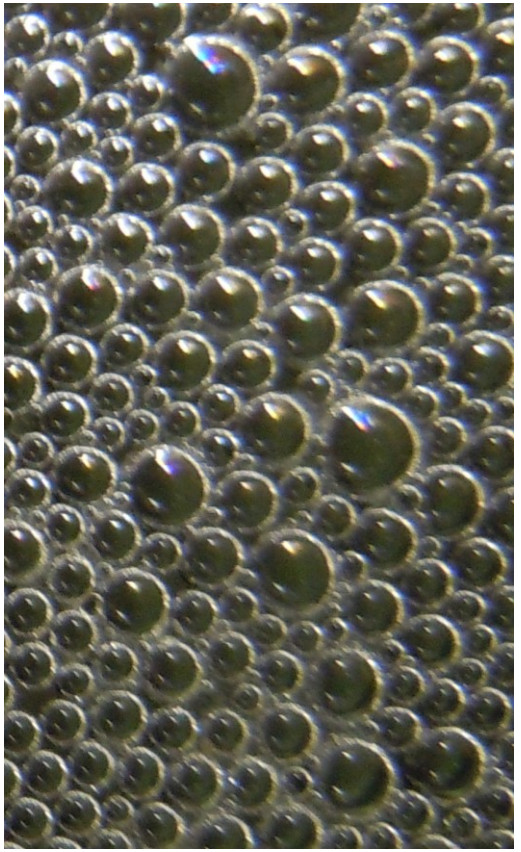


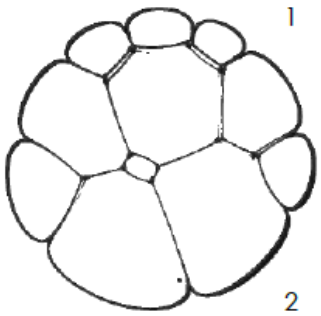
Μοντέλα φυσαλίδων

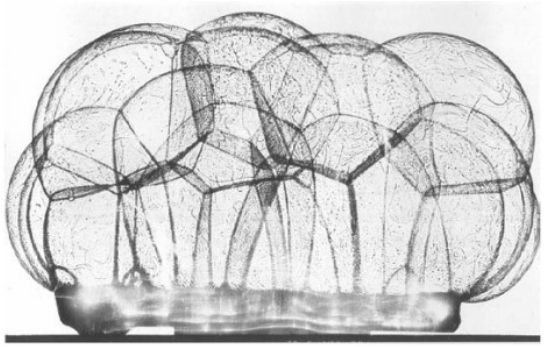
Google search → Bubble/Circle Packing models/algorithms











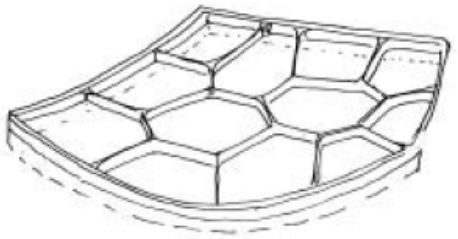
Διαγράμματα Voronoi
Google search → Voronoi diagrams

Soap bubbles

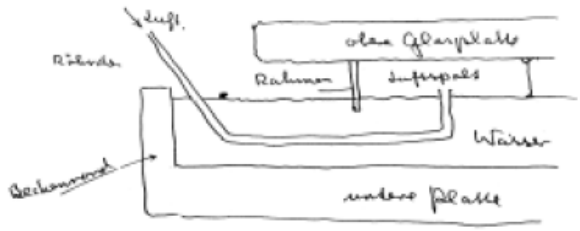
The experimental setup makes use of the Institut für leichte Flächentragwerke's minimal path apparatus (illus. 40). This involves a horizontally oriented glass plate suspended at a defined interval over the surface of a pool of water. The frame which is to be tested is hung underneath the apparatus' glass plate, with its lower edge submerged in the water (illus. 40). Then soap bubbles are blown into the gap in between until they completely fill the frame (illus. 66–68).

This method allows the network of a dragonfly's wing, for instance (illus. 43) to be compared with occupation by soap bubbles (illus. 44). All the bubbles' extensions touch the frame at a right angle. These are mainly straight with a few slightly crooked extensions in the corners.

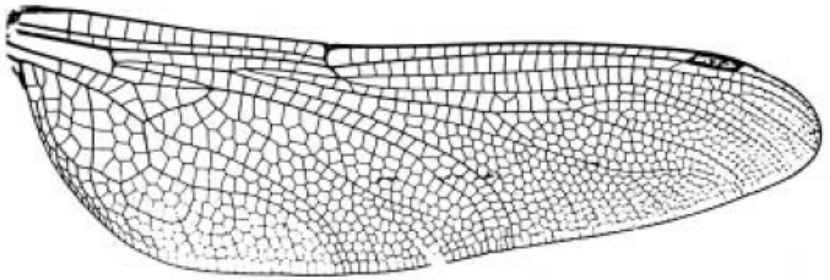
66



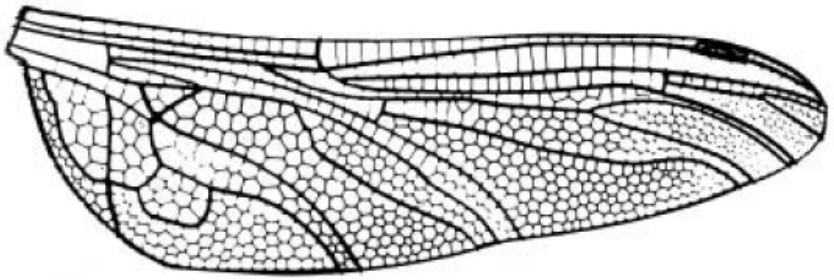
67



68

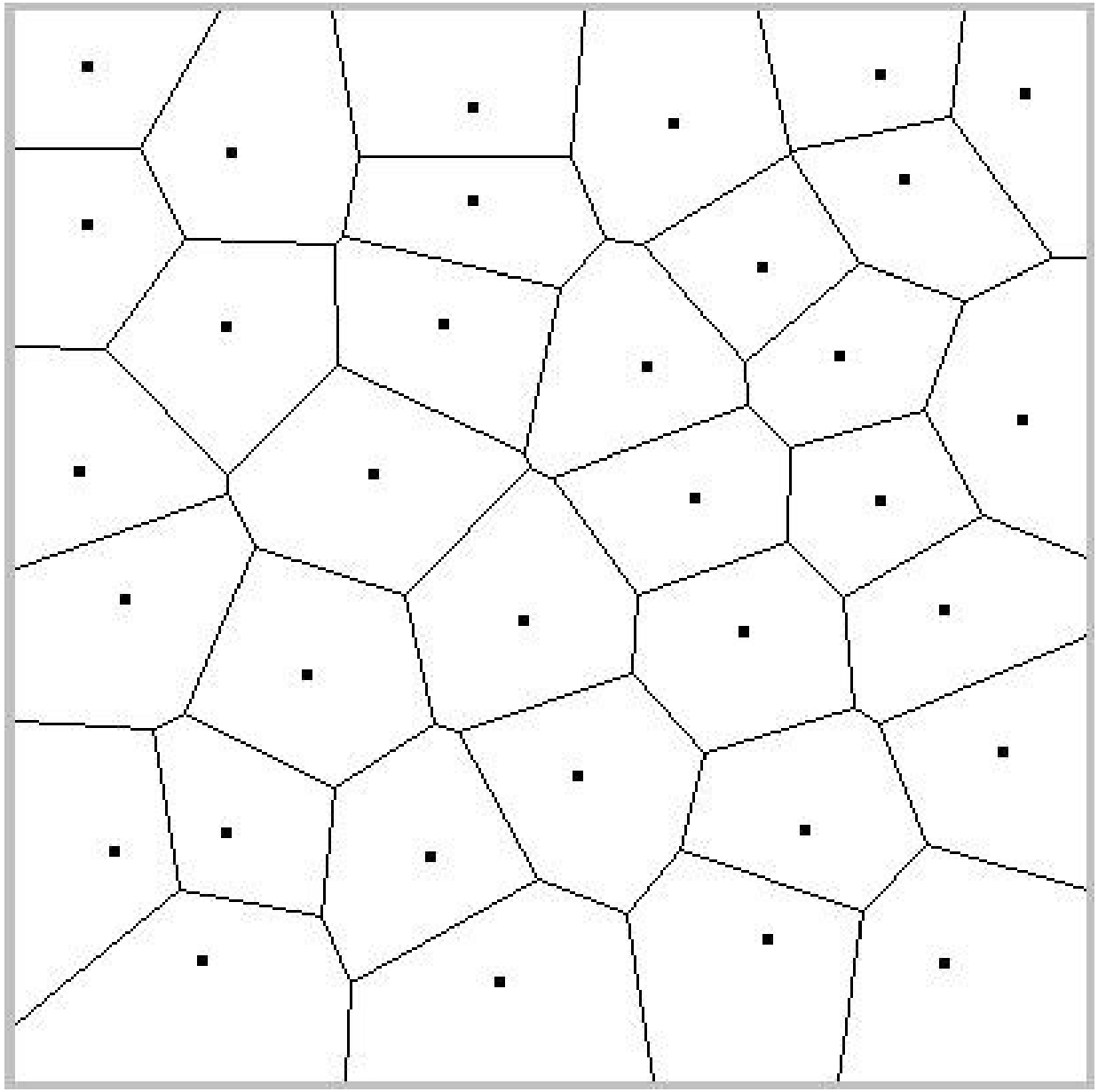


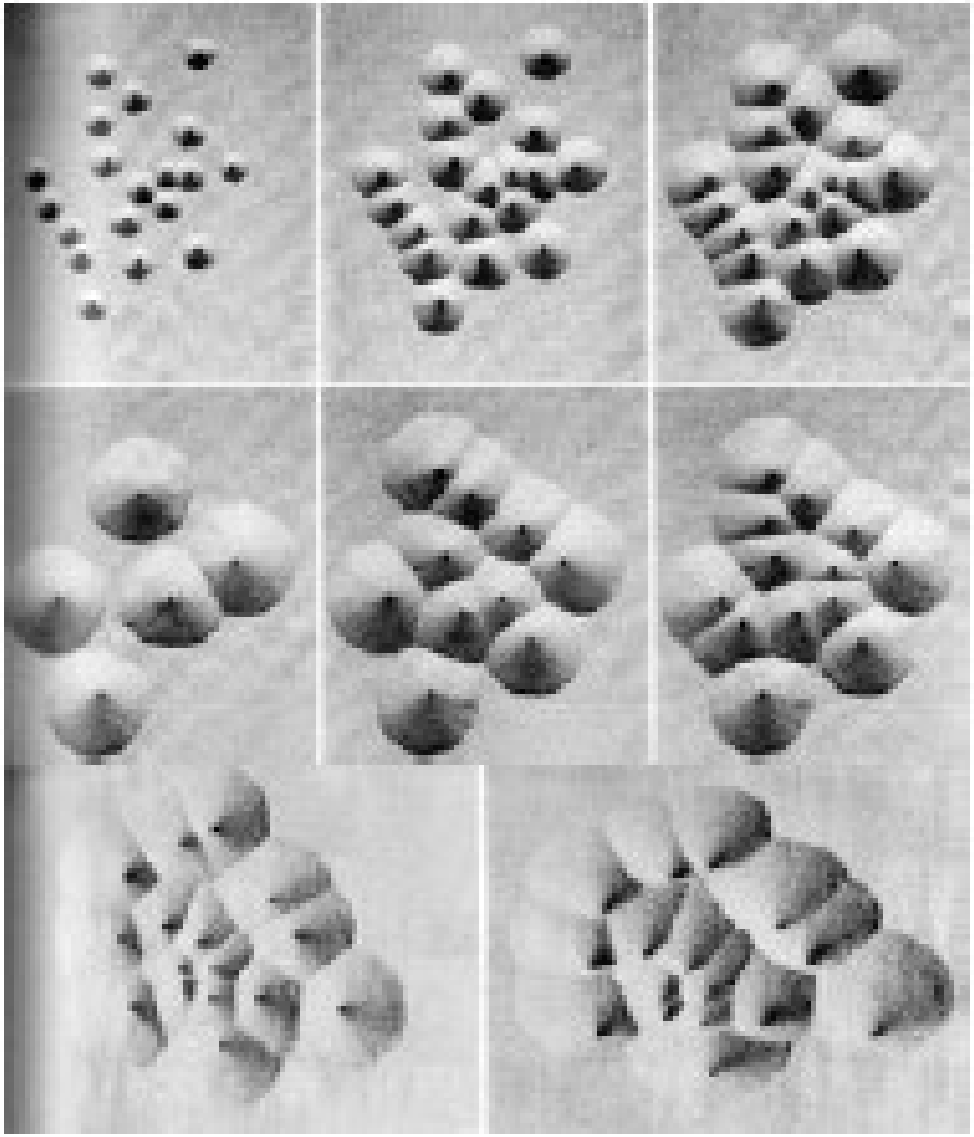
69



70

Διάγραμμα Voronoi





Μοντέλο άμμου. Διαφορετικές περιπτώσεις σχηματισμού ανάλογα με την τοποθεσία των οπών τόσο σε μήκος και πλάτος όσο και σε ύψος.