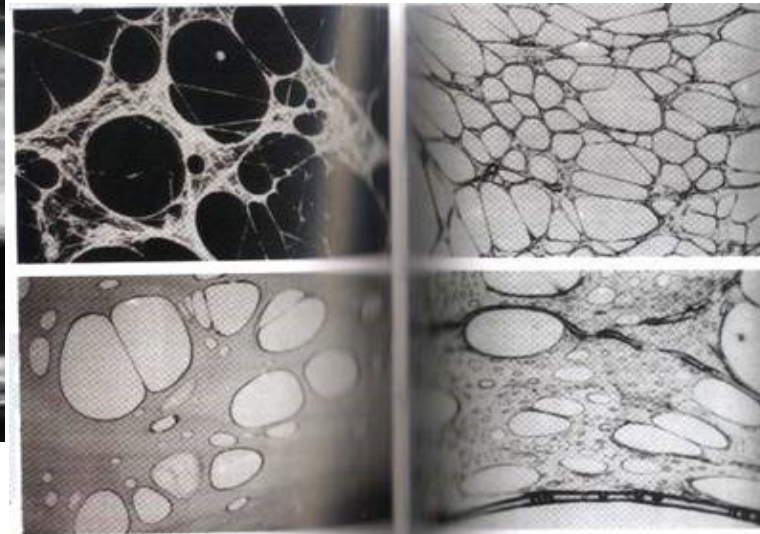
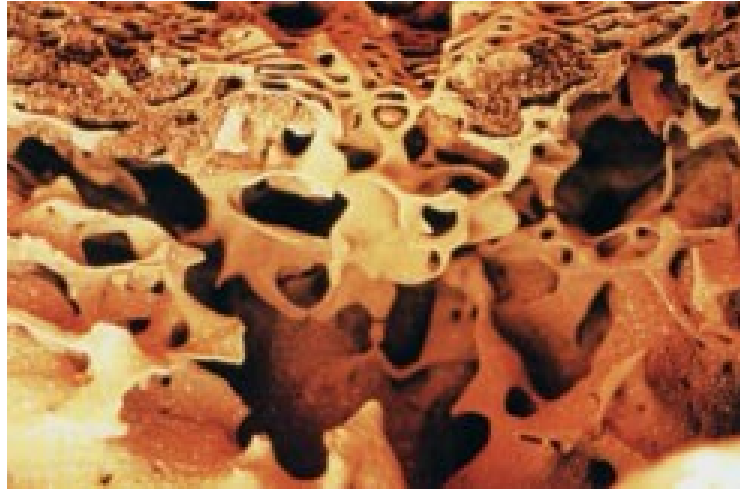


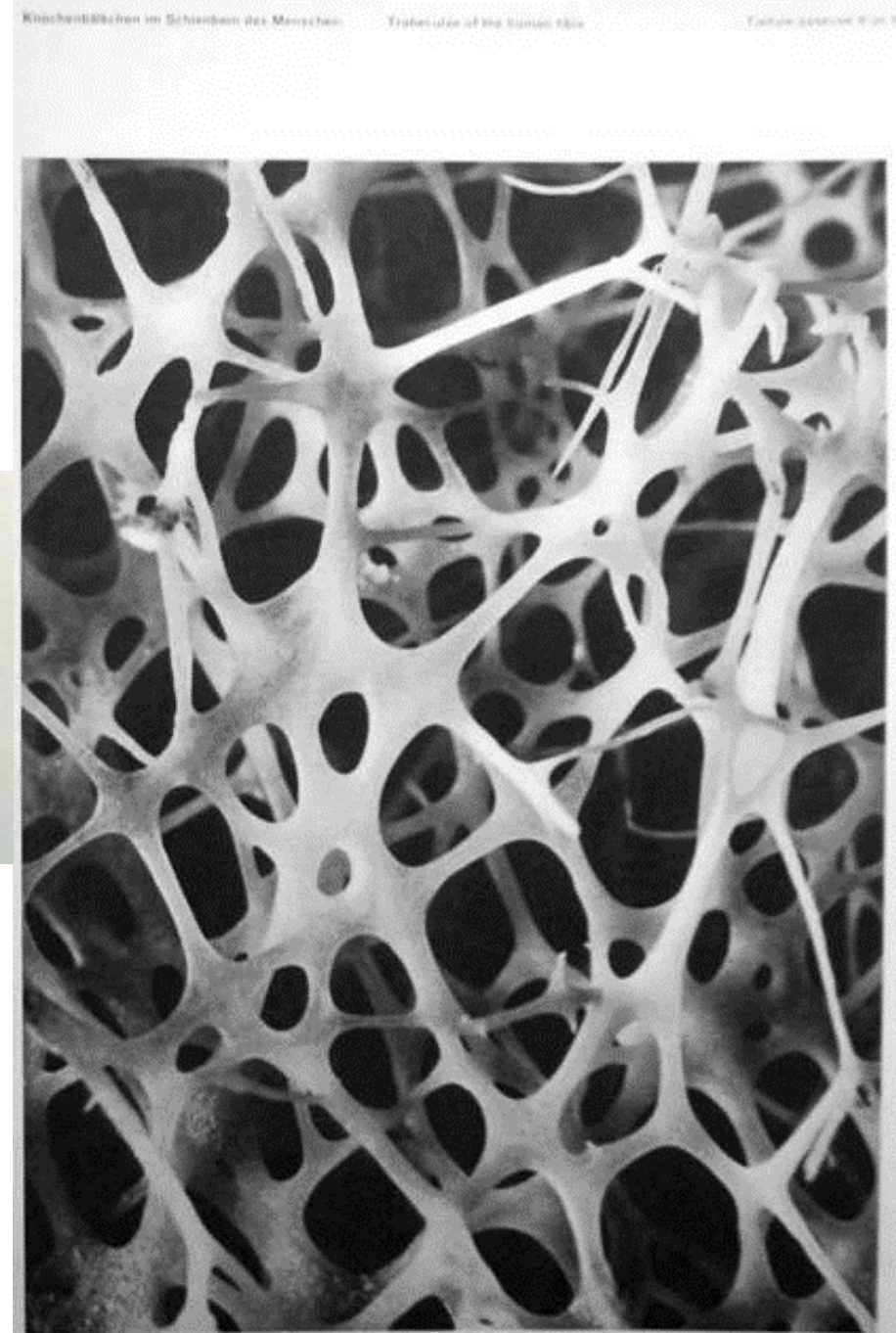
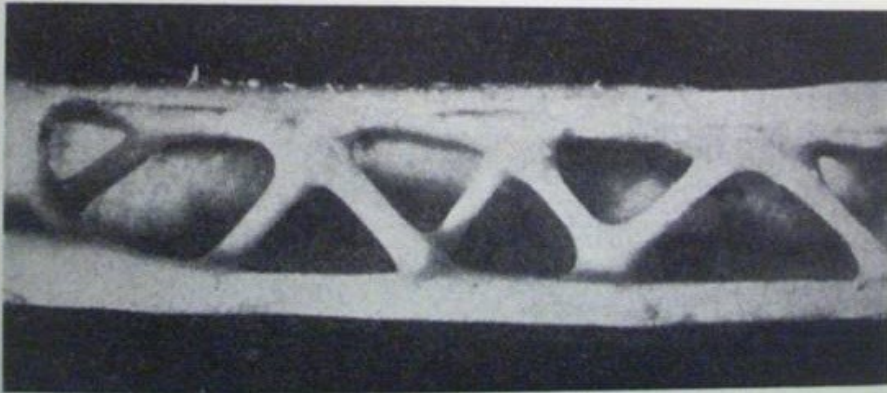
Φυσικές δομές οι οποίες μπορούν να αναχθούν σε γεωμετρικά μοτίβα και μαθηματικές επιφάνειες

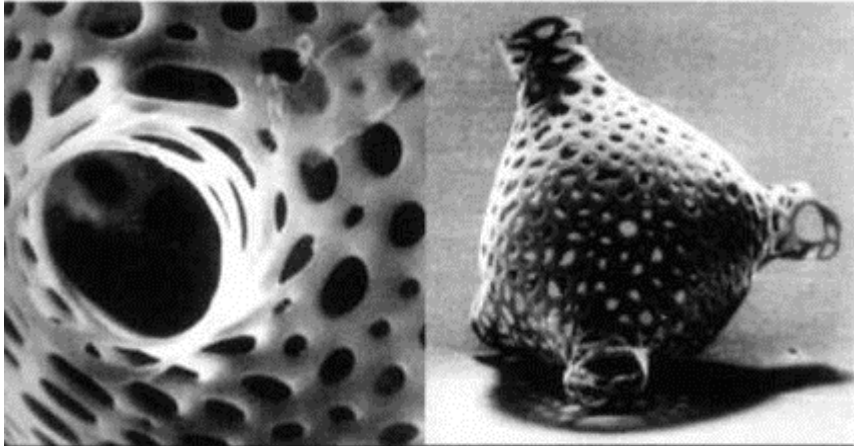
- Ελάχιστες επιφάνειες
- Εξαγωνικές δομές / Voronoi
- Circle/Bubble packing

κλπ

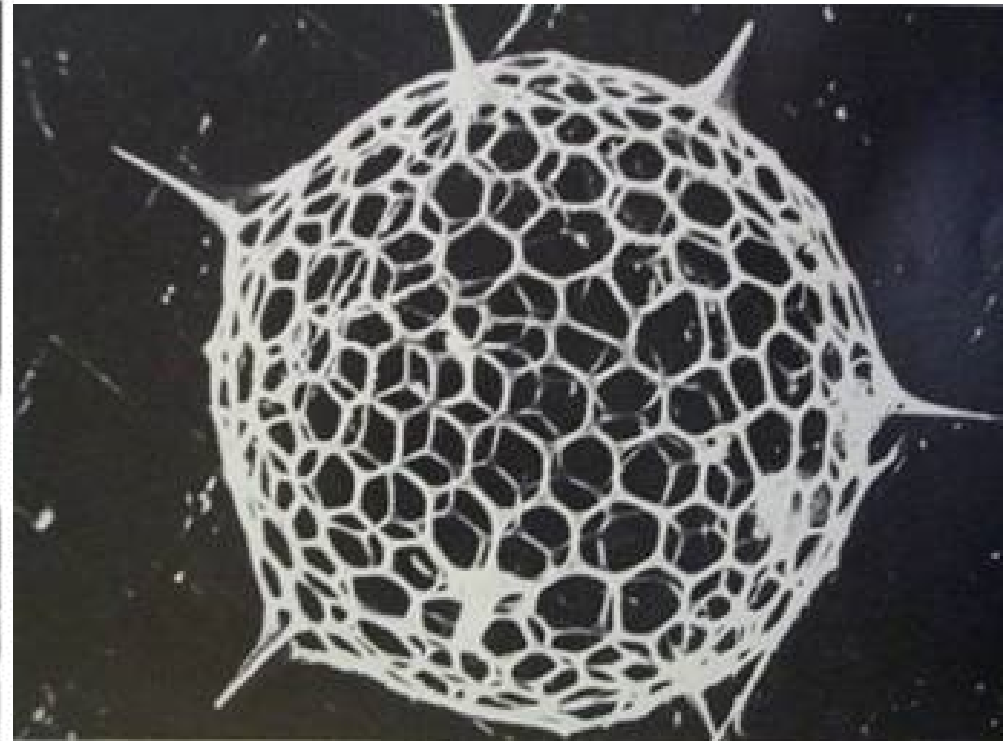
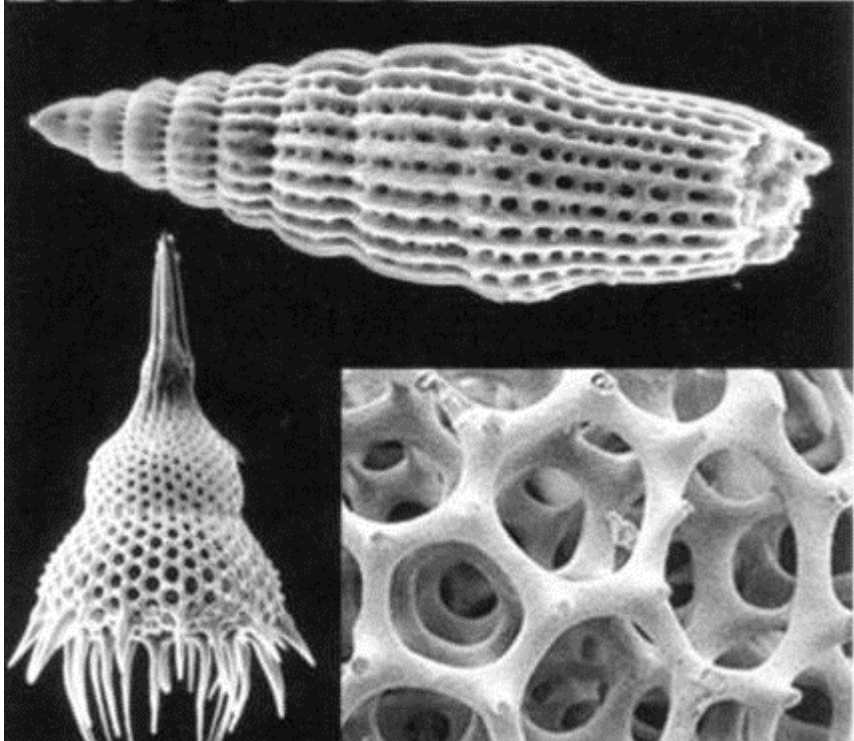


Εσωτερική δομή οστών

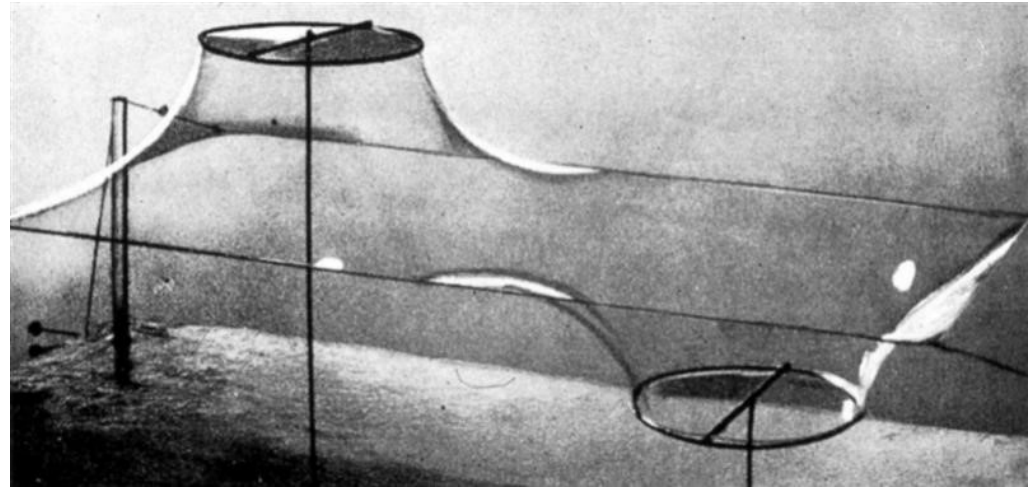




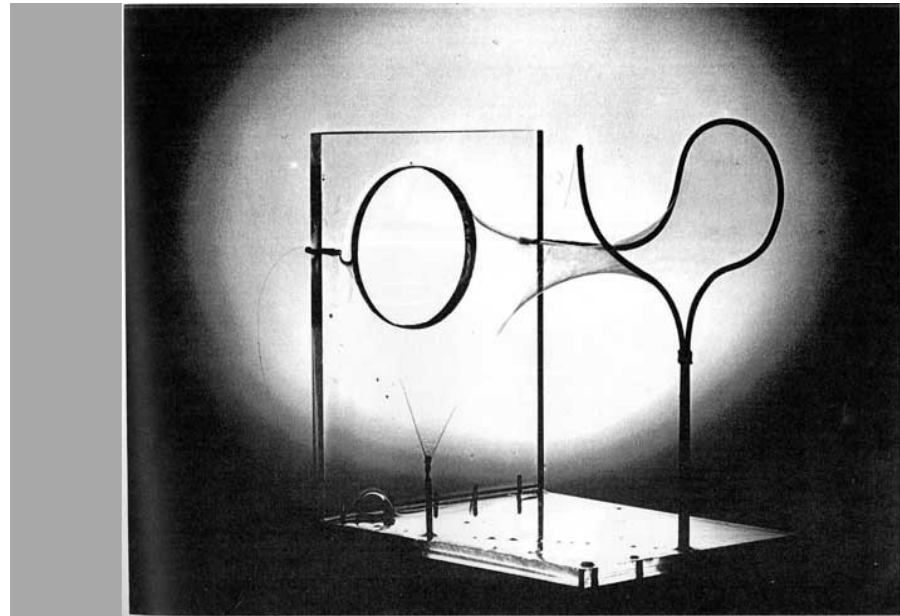
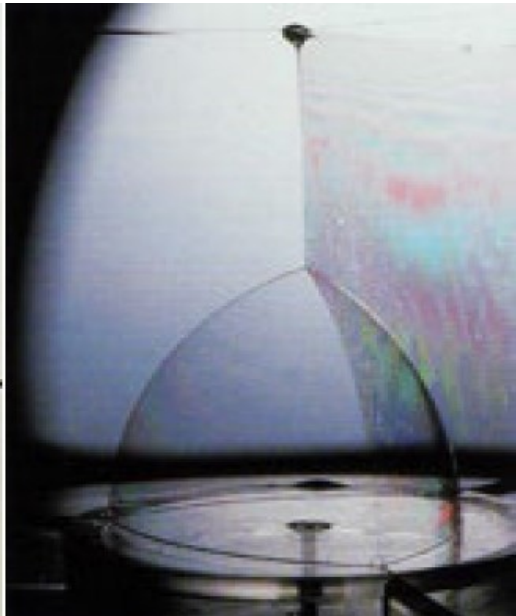
Σκελετοί Radiolarians

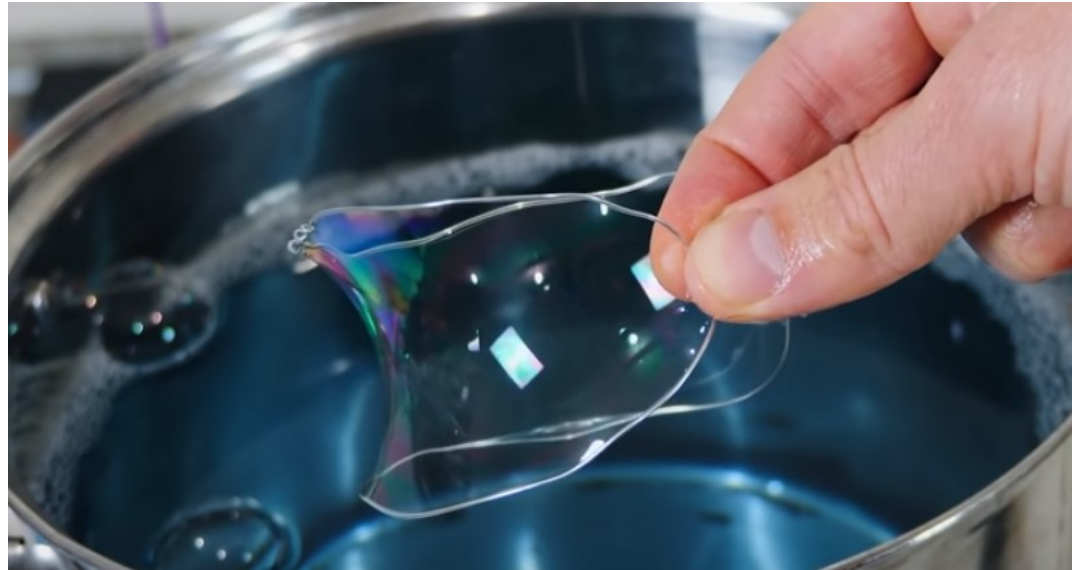
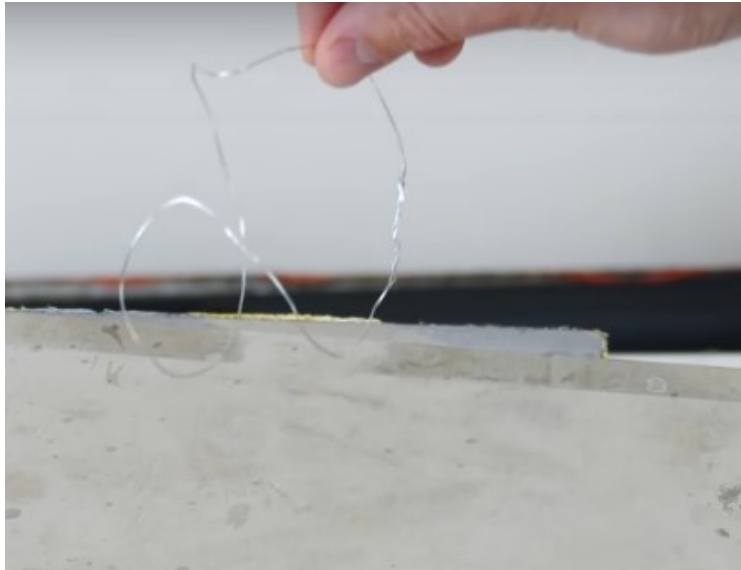




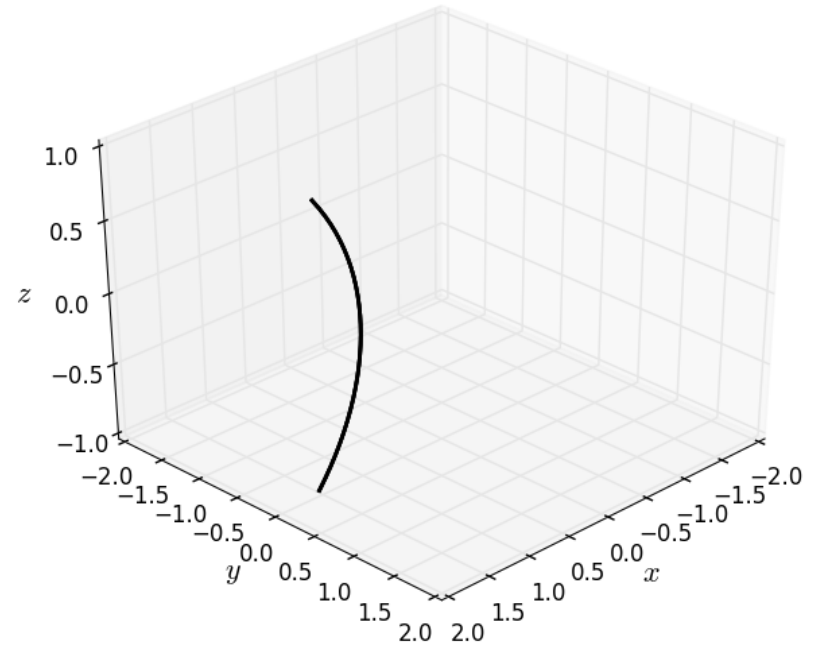
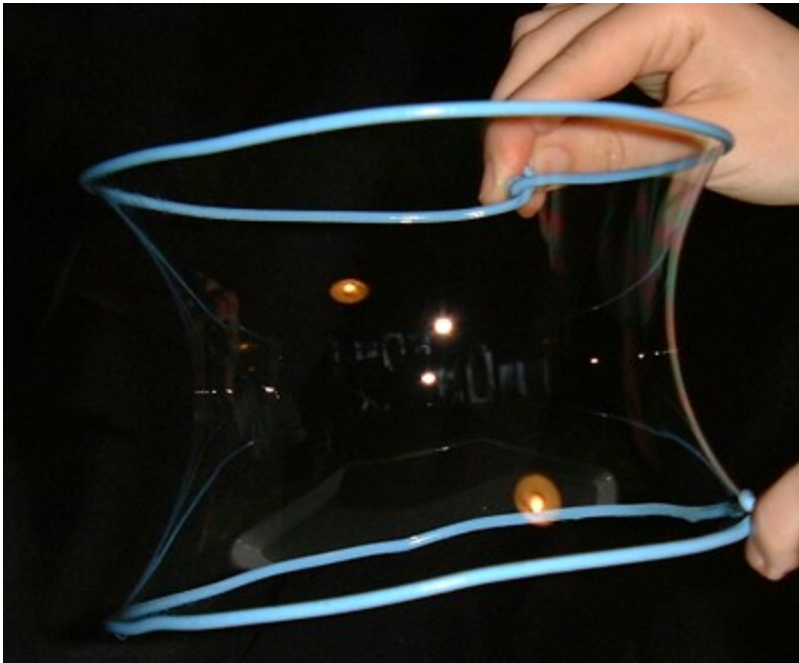


Υγρά φιλμ σαπουνιών για την εύρεση των ελαχίστων επιφανειών





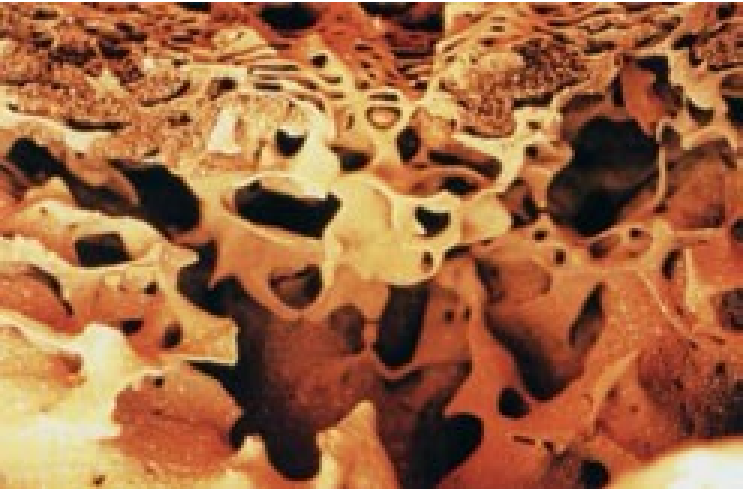
Σελοειδείς (υπερβ. παραβολ).



Catenoid

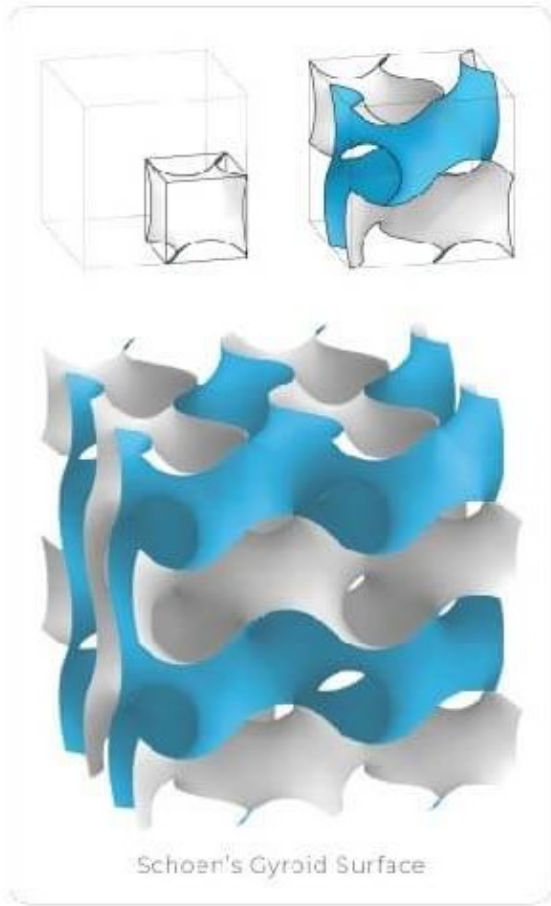


Helicoid

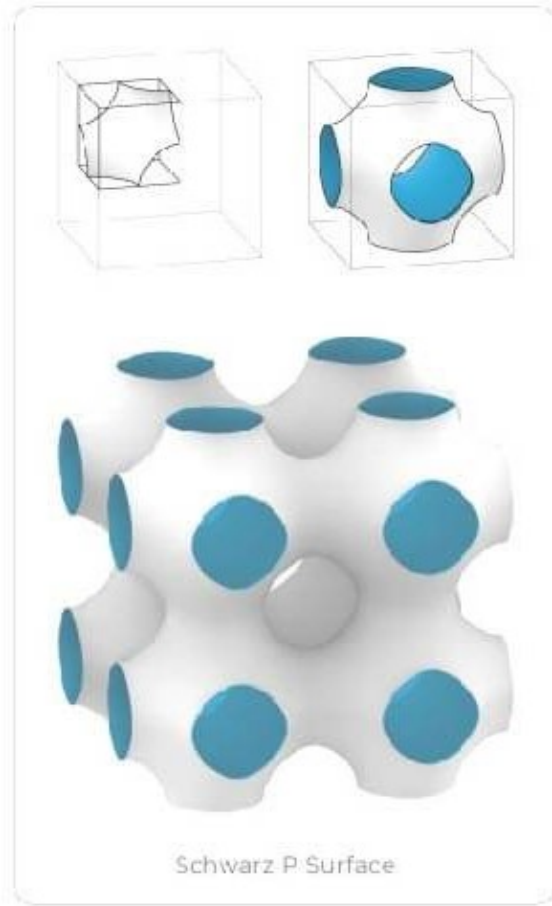


Τρία από τα πολλά είδη ελάχιστων επιφανειών
Google search → Periodic minimal surfaces – sponge surfaces

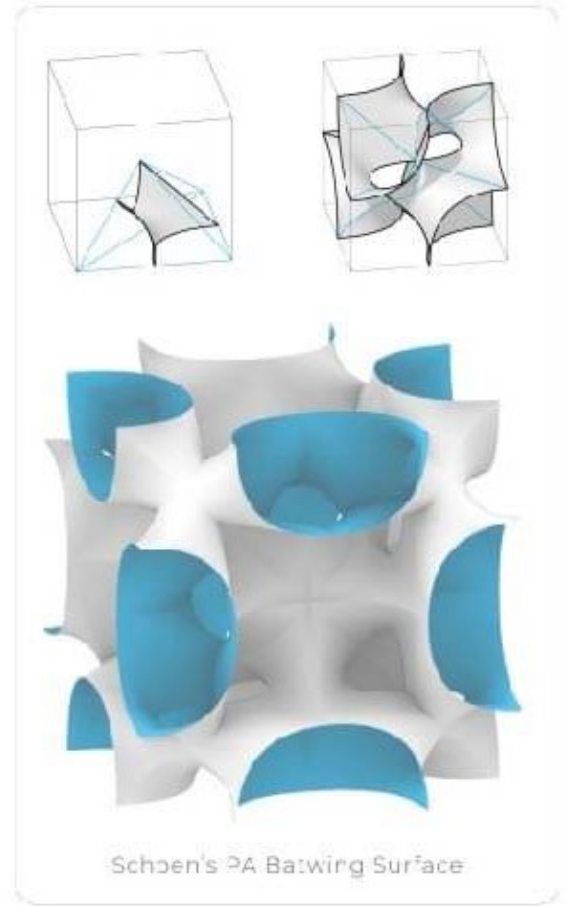
Gyroid Surface

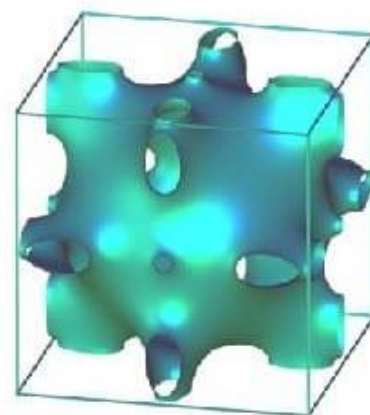
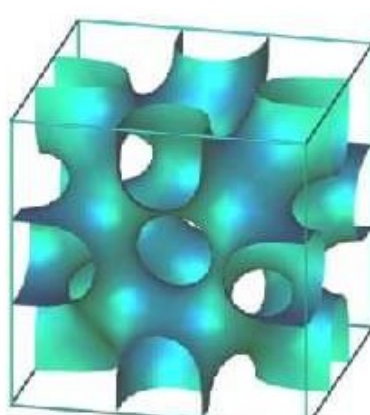
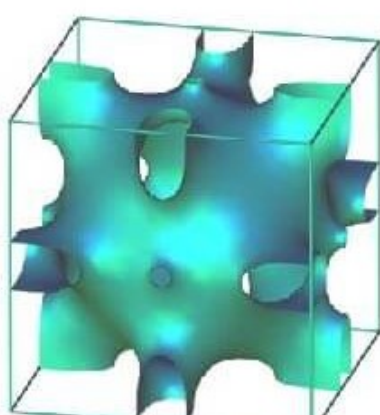
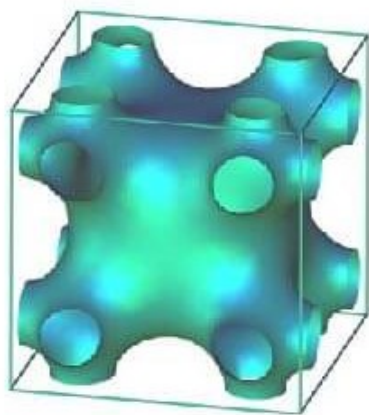
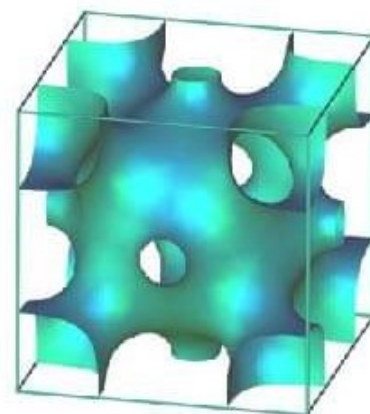
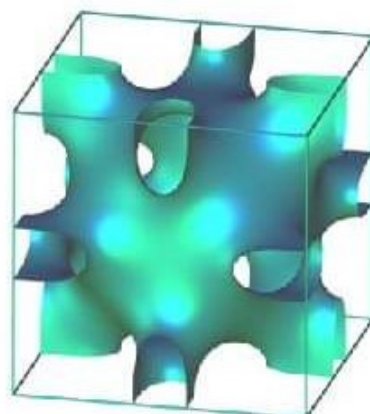
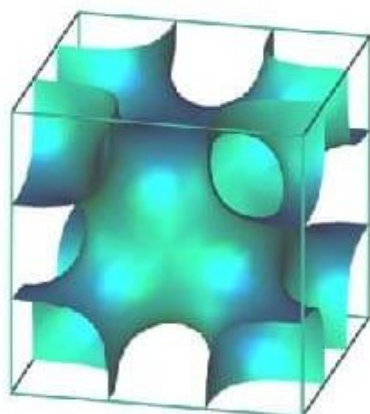
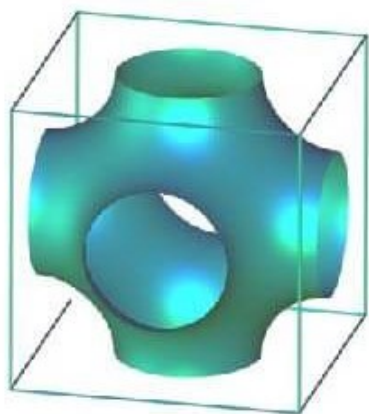


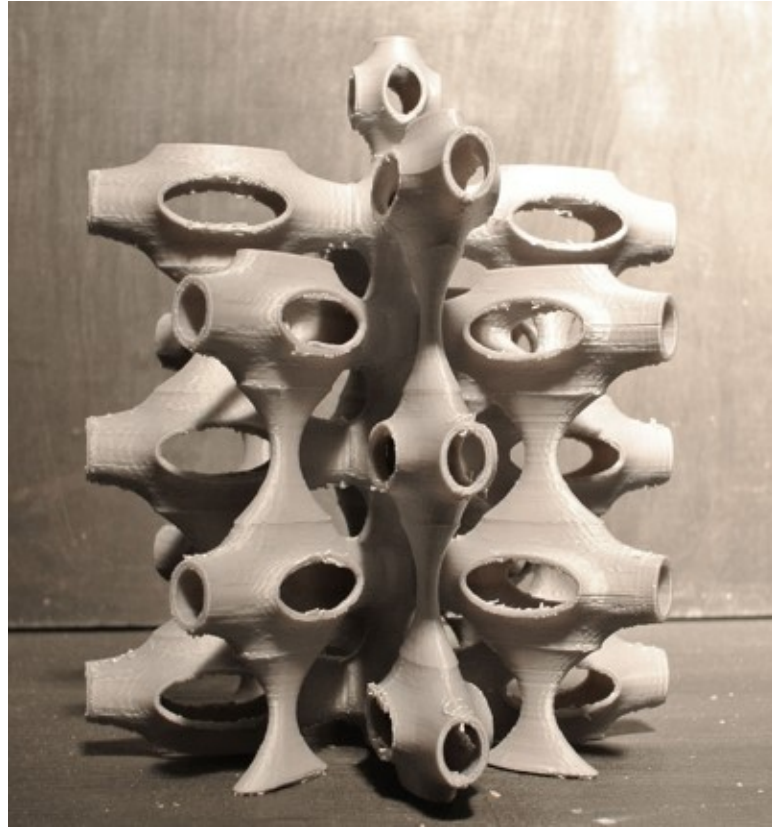
Schwarz P Surface

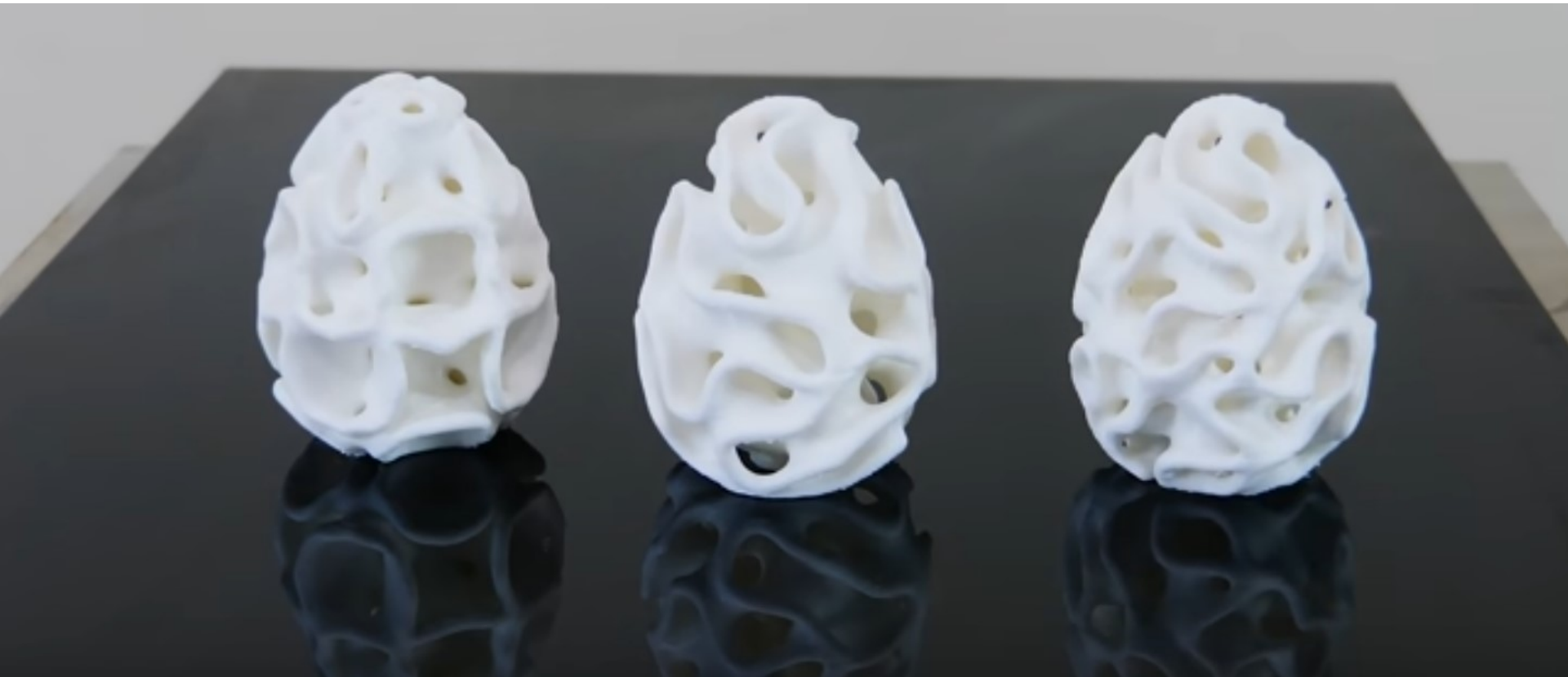


Schoen's PA Batwing Surface













Harbin Opera House MAD Architects China
Hufton + Crow



Μέθοδοι μοντελοποίησης ελάχιστων επιφανειών μέσω Kangaroo plugin Google search → Minimal Surface From Mesh/mesh relaxation

AdvDig Week13-2 Kangaroo Minimal Surface From Mesh

The image displays two side-by-side screenshots of a Rhino 5.0 software interface, showing the Kangaroo plugin workflow for creating a minimal surface from a mesh. The left screenshot shows the initial state with a red mesh of a cross-like shape. The right screenshot shows the result after relaxation, where the mesh has deformed into a smooth, curved minimal surface. Both screenshots show the Grasshopper script with components like 'wbEdges', 'Springs', 'Clothed', 'Naked', 'Cull I', and 'Points'. The interface includes a top menu bar, a toolbar, and a command line. The bottom of the image shows a video player interface with a play button, a progress bar, and the text 'Μετακινήστε με κλίση για λεπτομέρειες' (Move with the mouse for details).

23:07 / 25:07

Μετακινήστε με κλίση για λεπτομέρειες

23:12 / 25:07

Μετακινήστε με κλίση για λεπτομέρειες

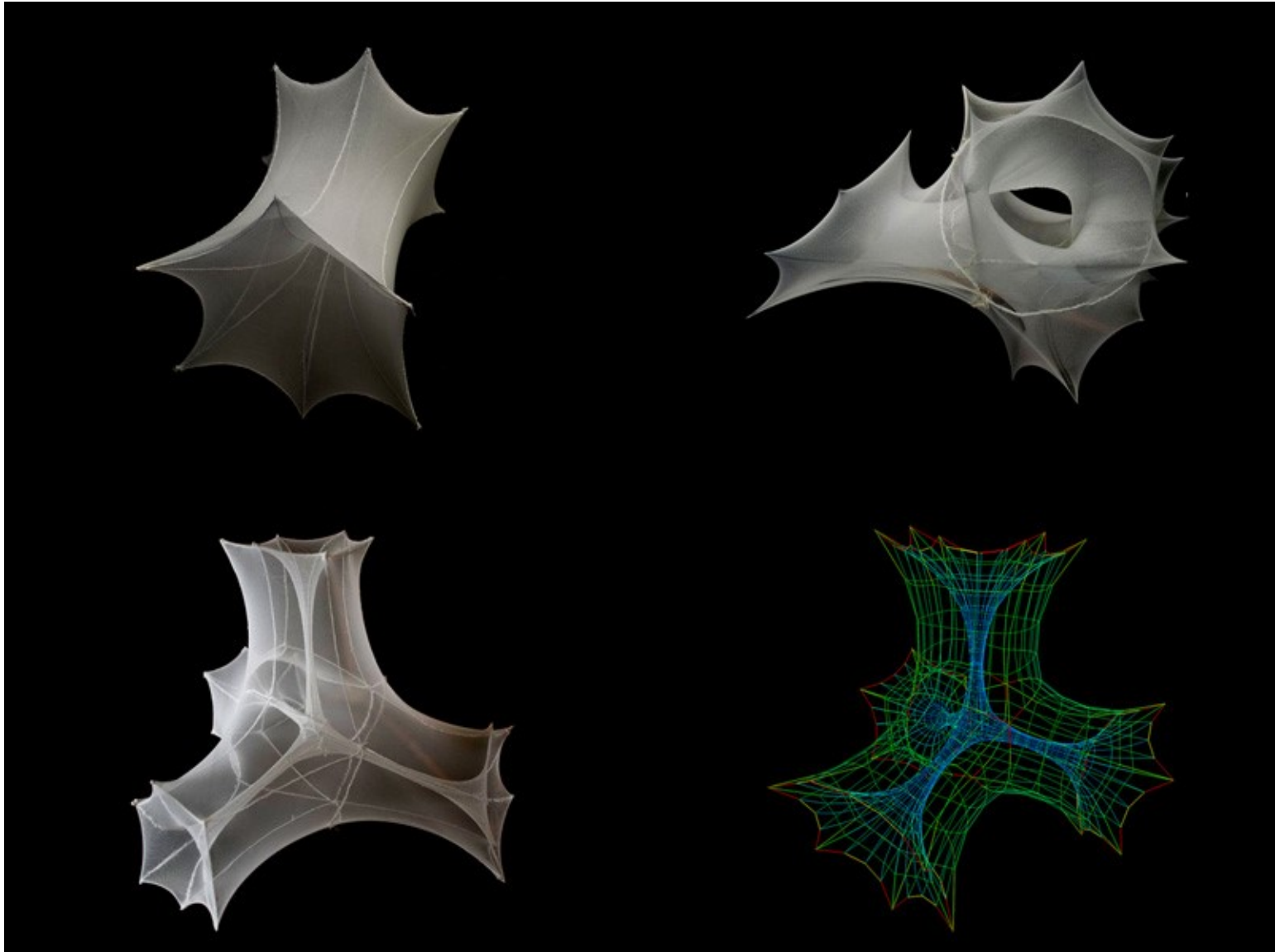


GREEN VOID, LAVA Sydney, Australia; Stuttgart, Germany



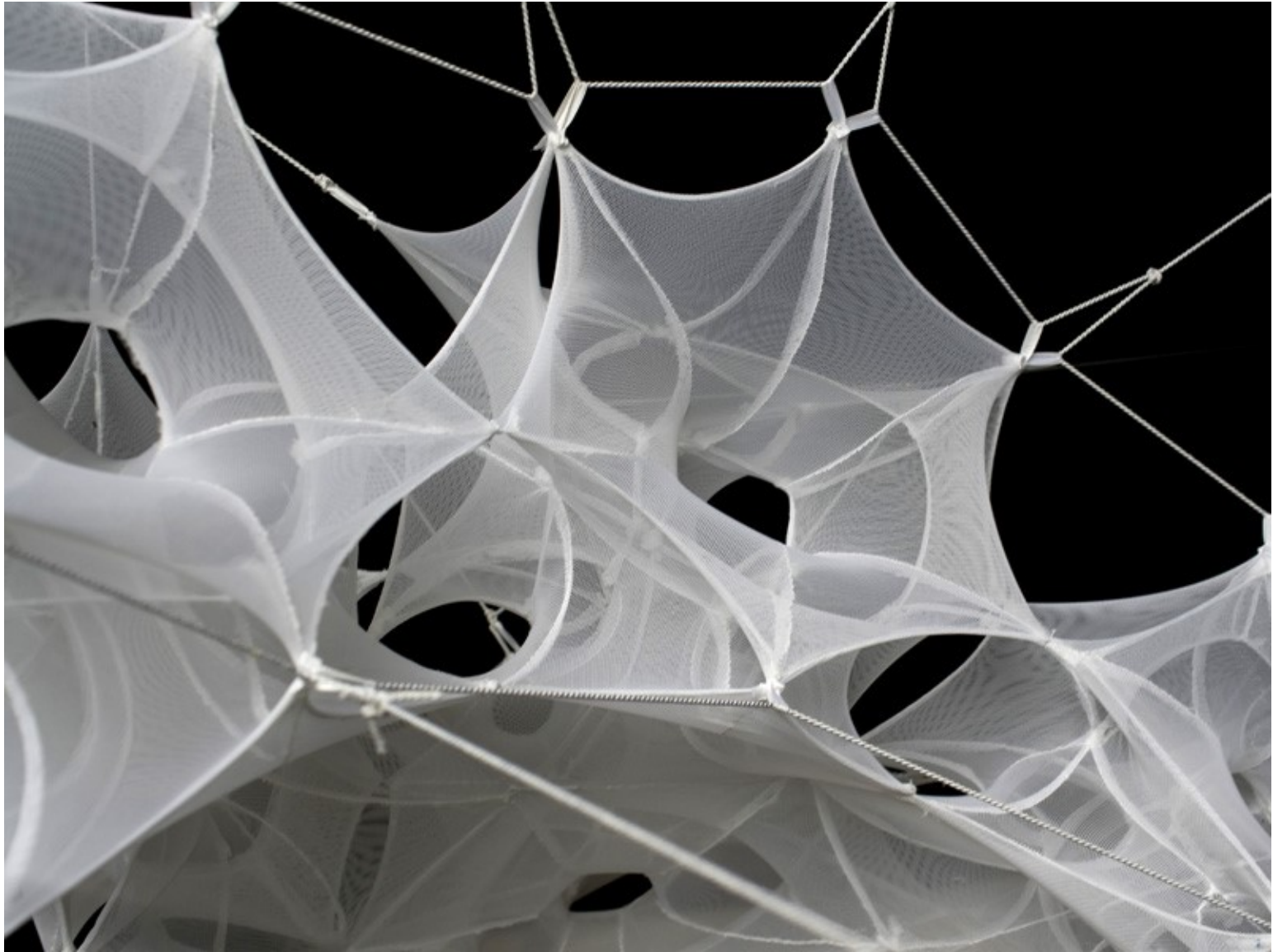
Boolean Operator / MARC FORNES / THEVERYMANY





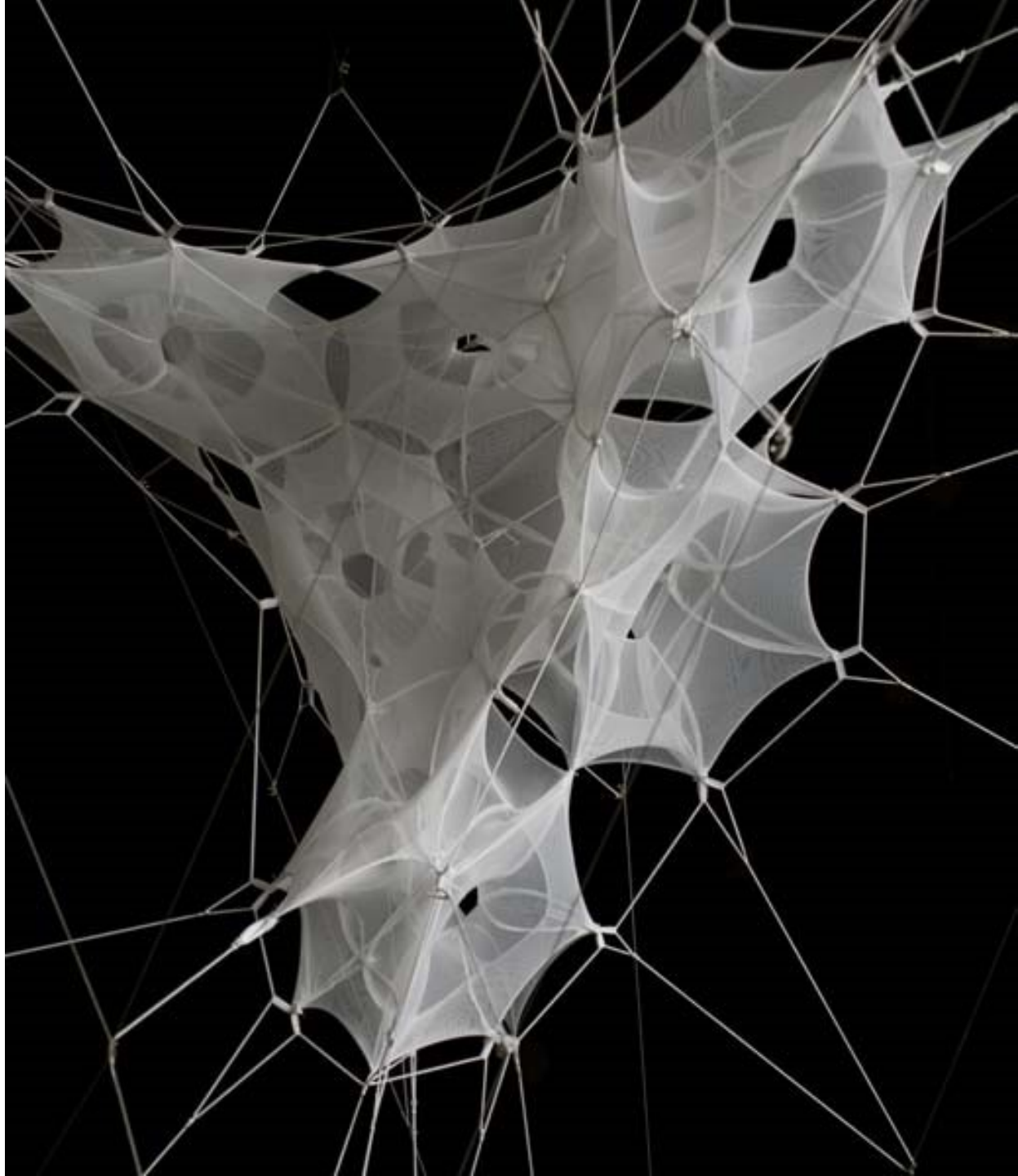
2011 ICD Stuttgart University
ICD Design Studio (Prof. A. Menges, S. Ahlquist)





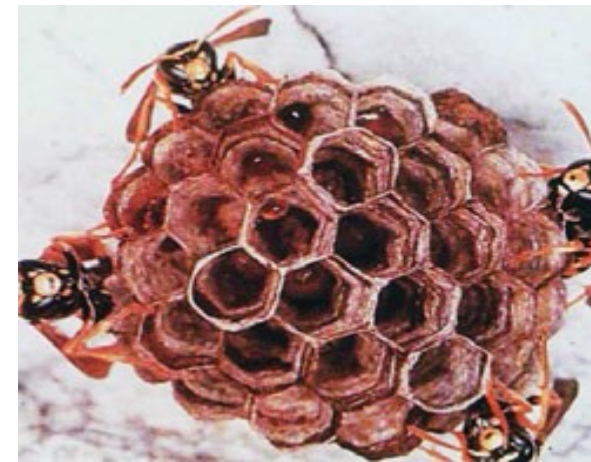
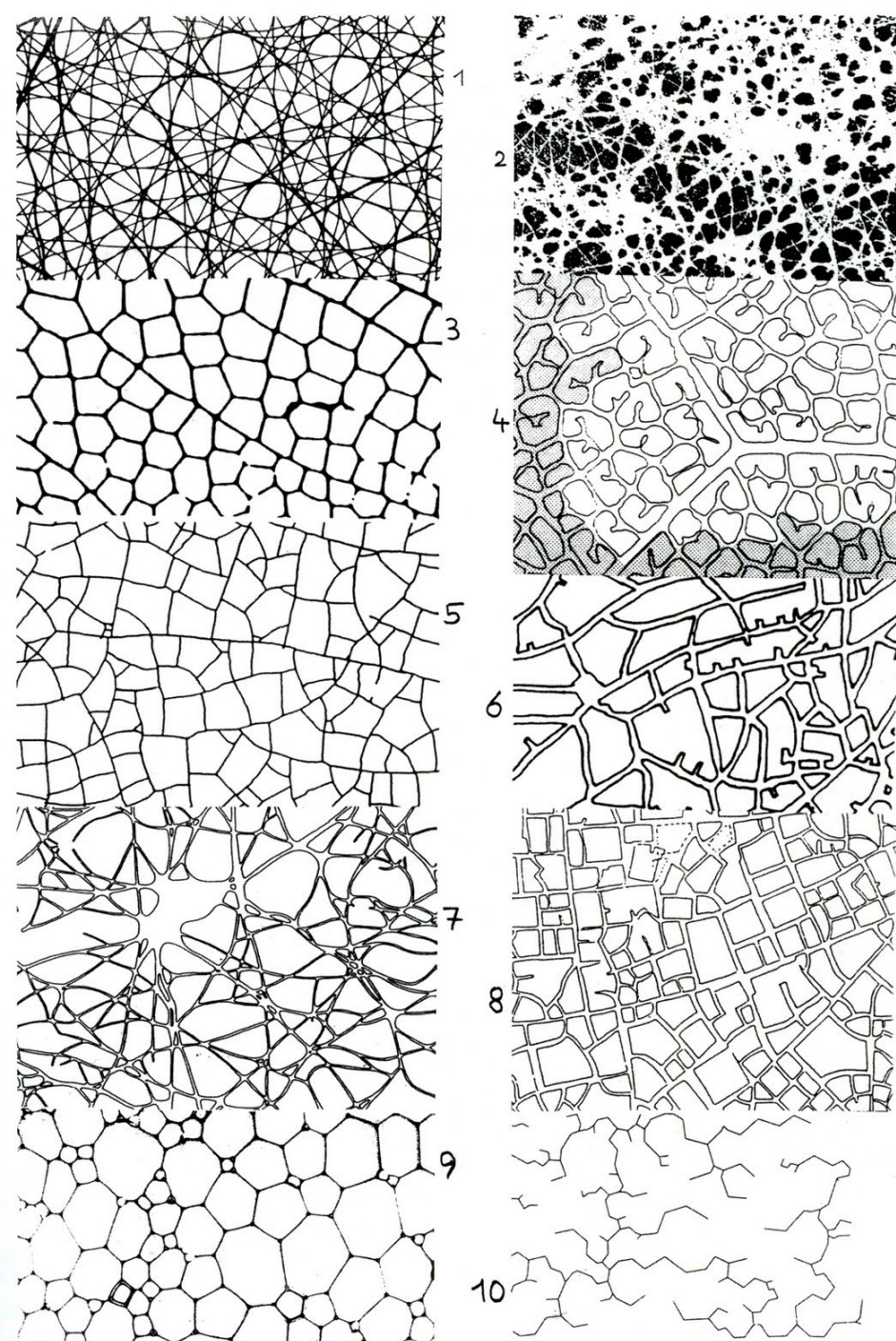
2011 ICD Stuttgart University
ICD Design Studio (Prof. A. Menges, S. Ahlquist)

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



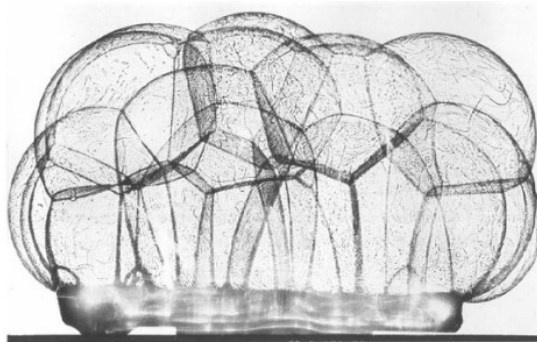
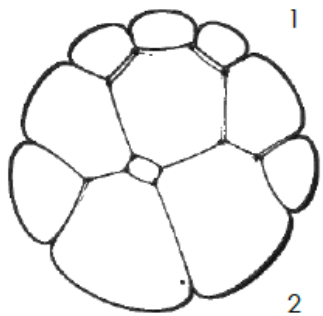
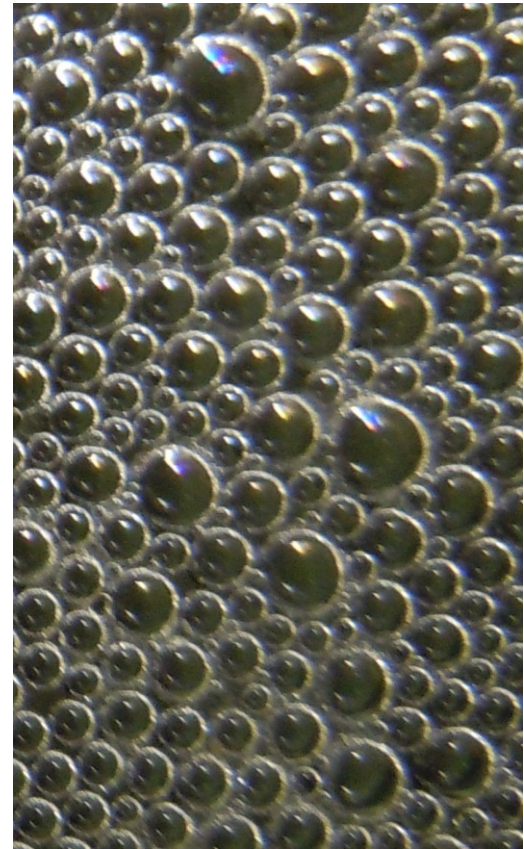
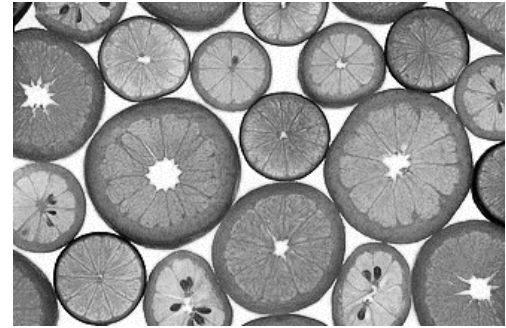
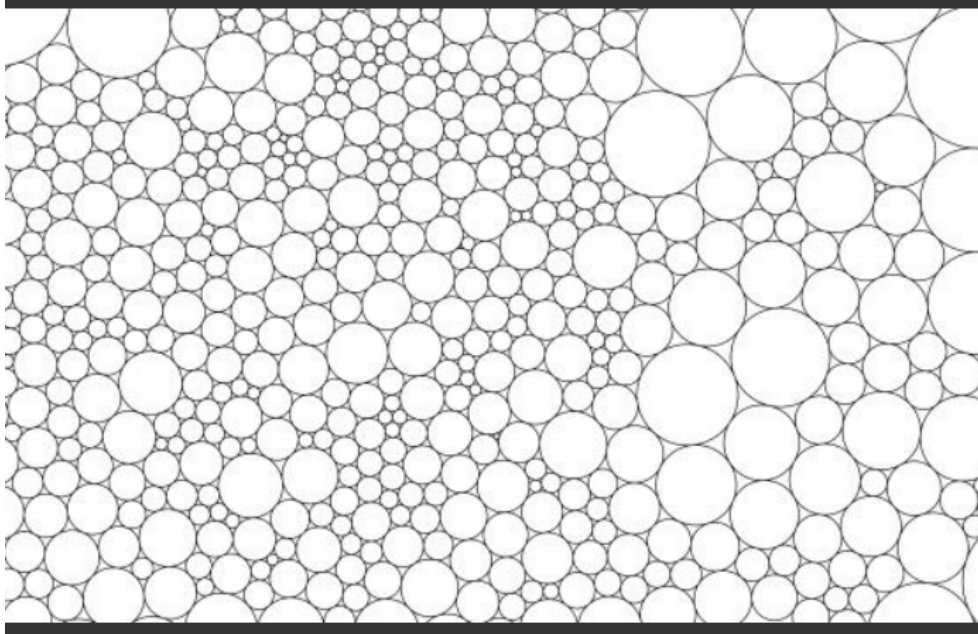
Εξαγωνικές δομές

Google search → hexagonal structures



Μοντέλα φυσαλίδων

Google search → Bubble/Circle Packing models/algorithms



Διαγράμματα Voronoi

Google search → Voronoi diagrams

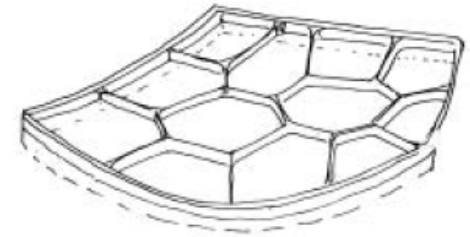
Soap bubbles

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).

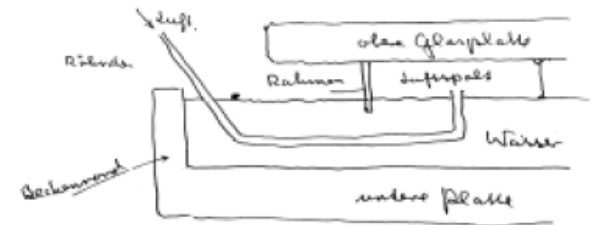
This method allows the network of a dragonfly's wing, for instance (illus. 43) to be compared with occupation by soap bubbles (illus. 44). All the bubbles' extensions touch the frame at a right angle. These are mainly straight with a few slightly crooked extensions in the corners.



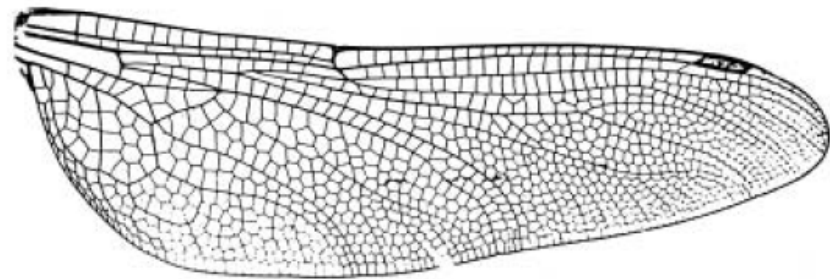
66



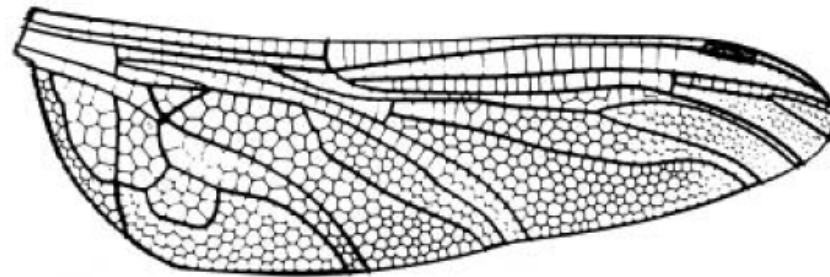
67



68

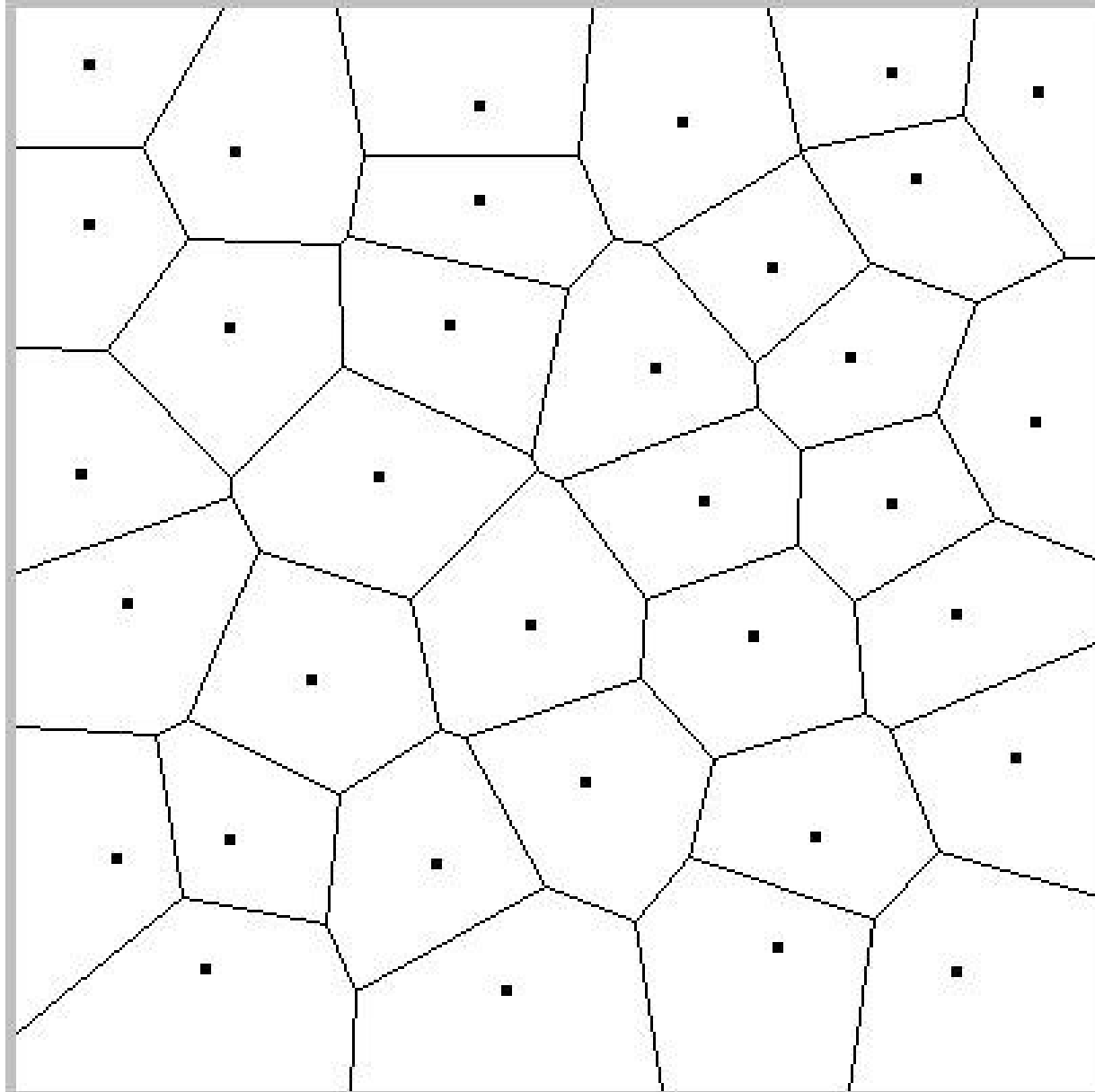


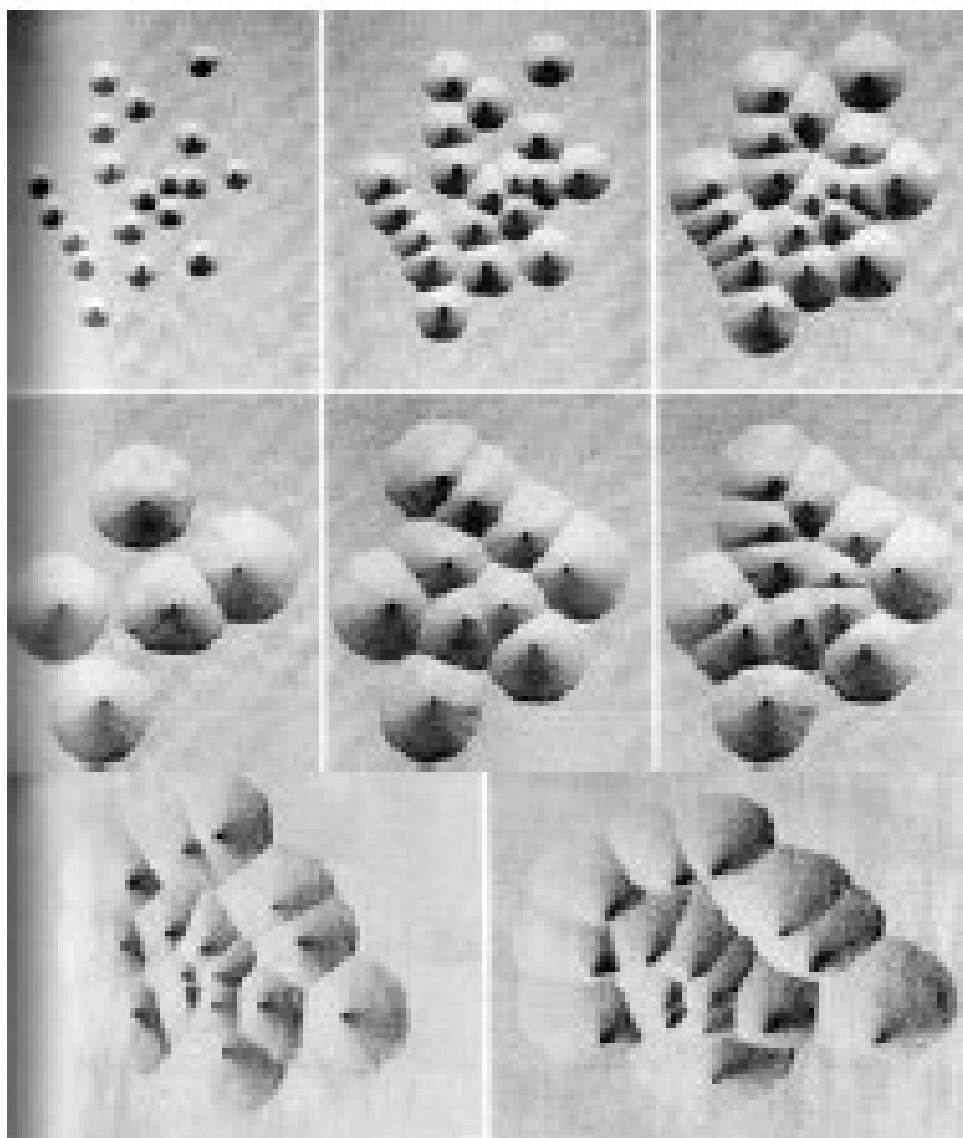
69



70

Διάγραμμα Voronoi





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

