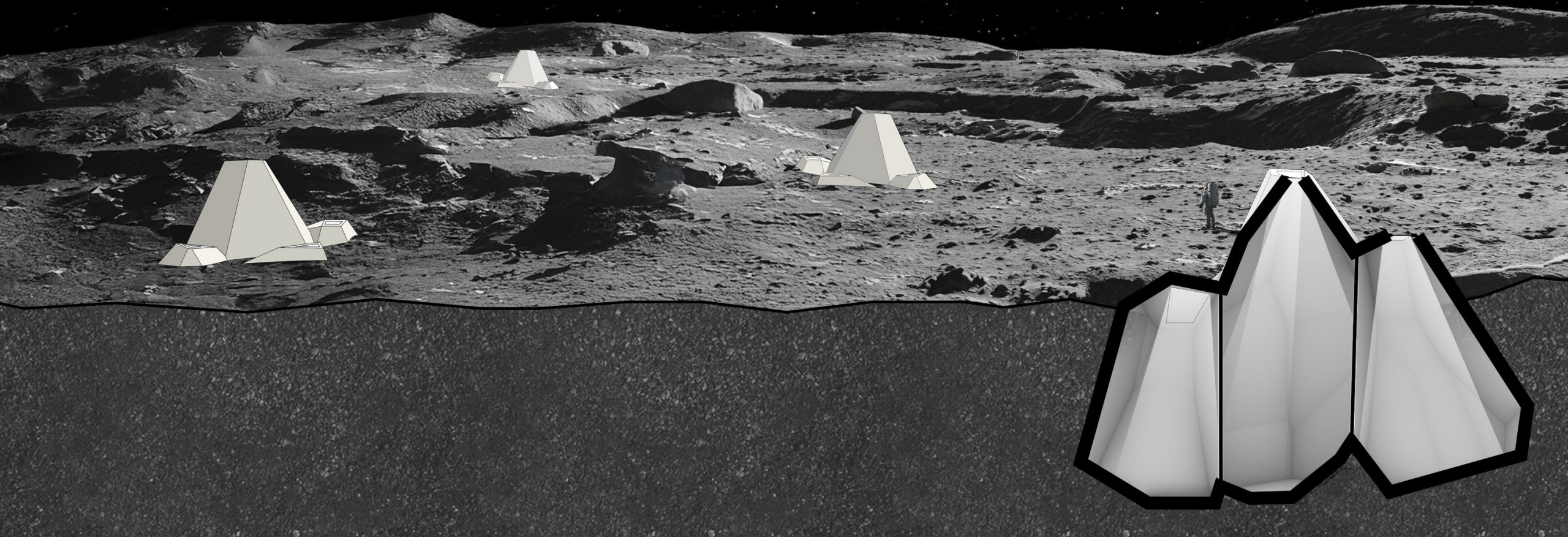
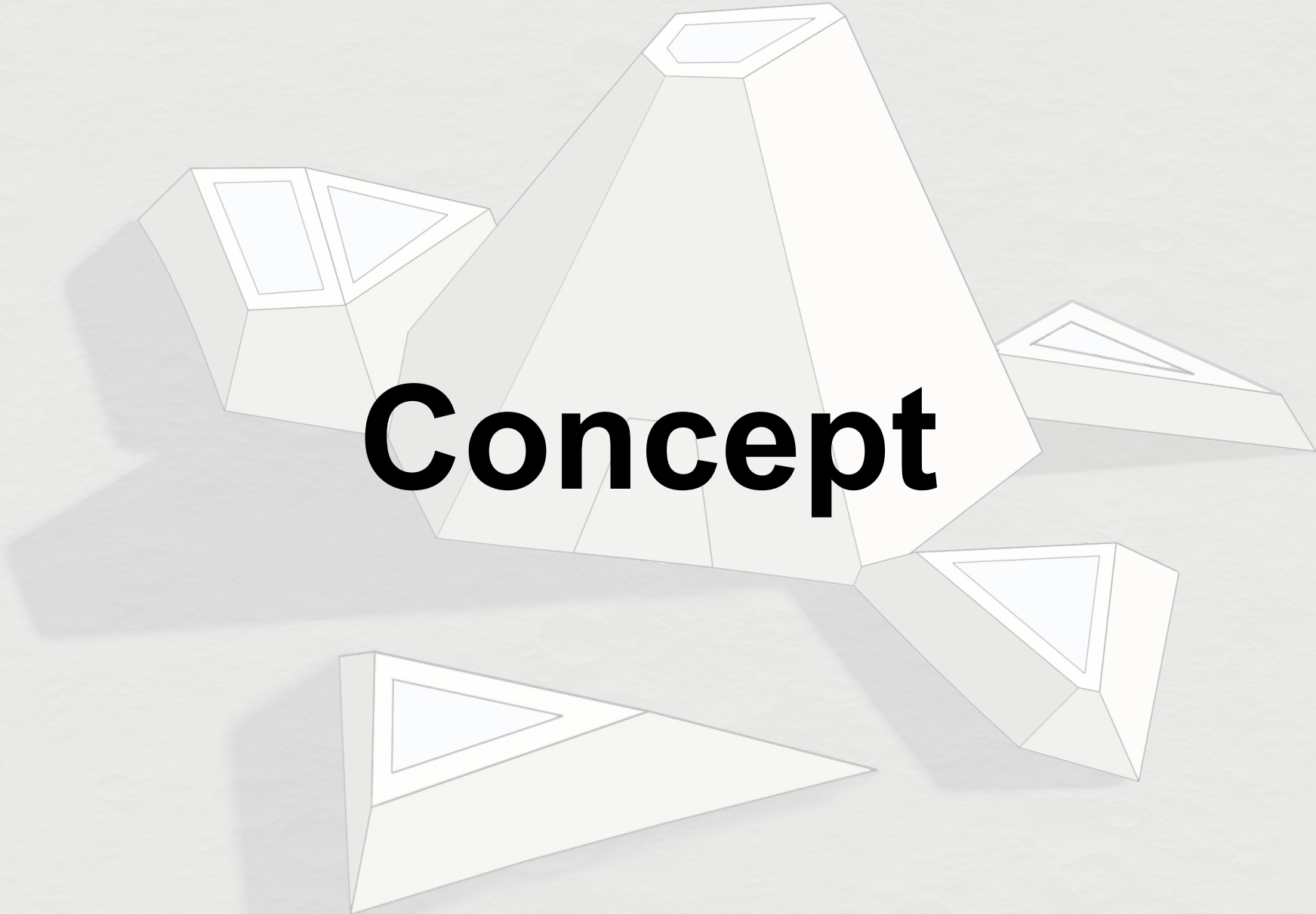


TuliPOD

Exploring Clustered Compounds on Moon

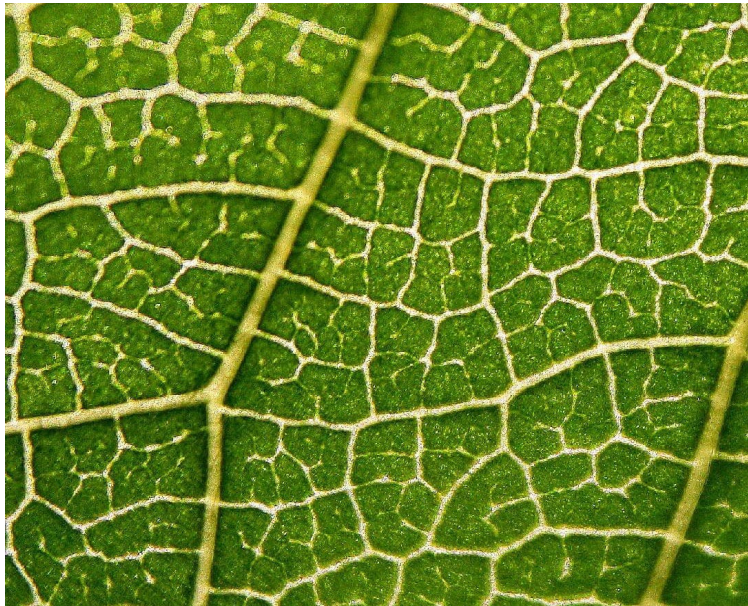
Workshop 1



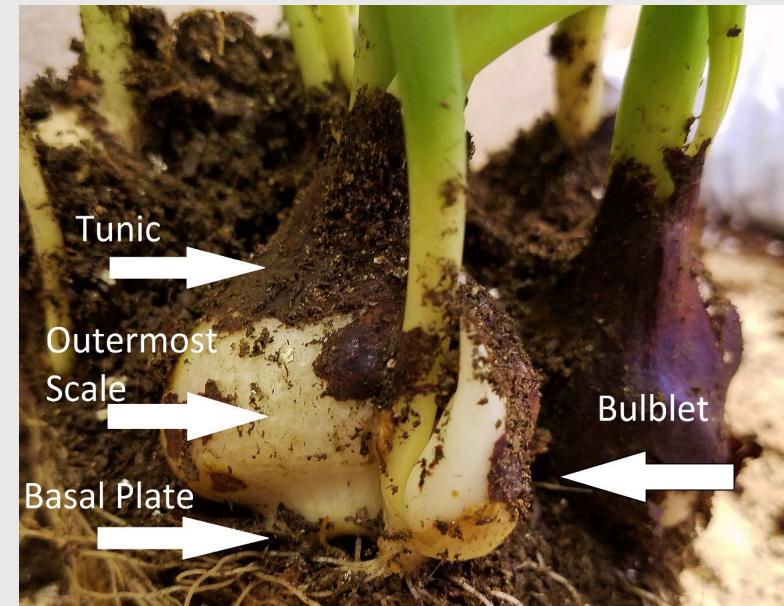
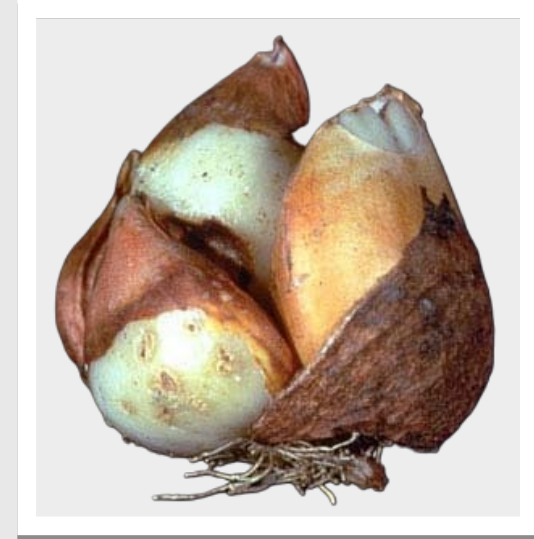
An abstract geometric composition featuring a central, tall, light gray pyramid with a white hexagonal top. Surrounding the base of the pyramid are four smaller, light gray triangular prisms, each with a white triangular top. The objects are rendered with soft shadows on a light gray background. The word "Concept" is overlaid in the center in a large, bold, black sans-serif font.

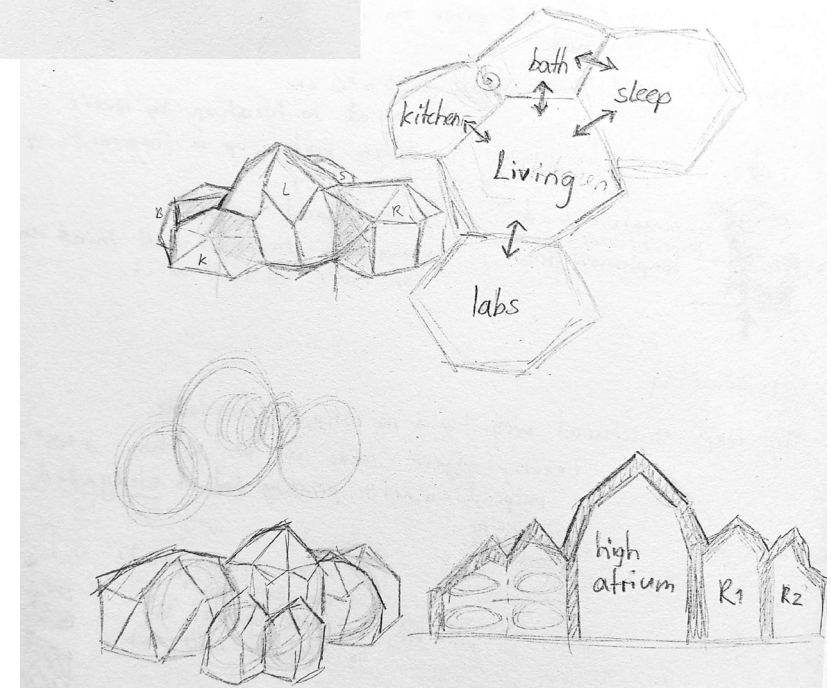
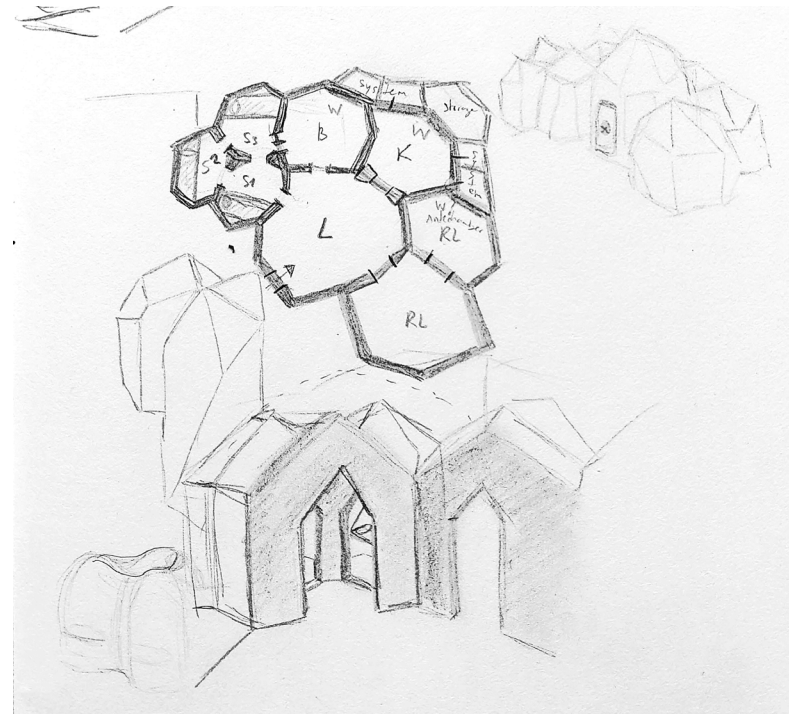
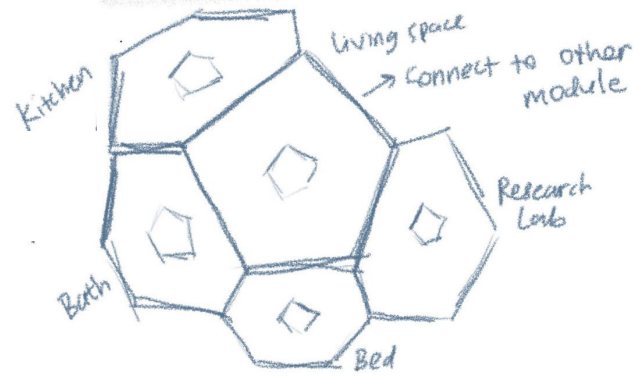
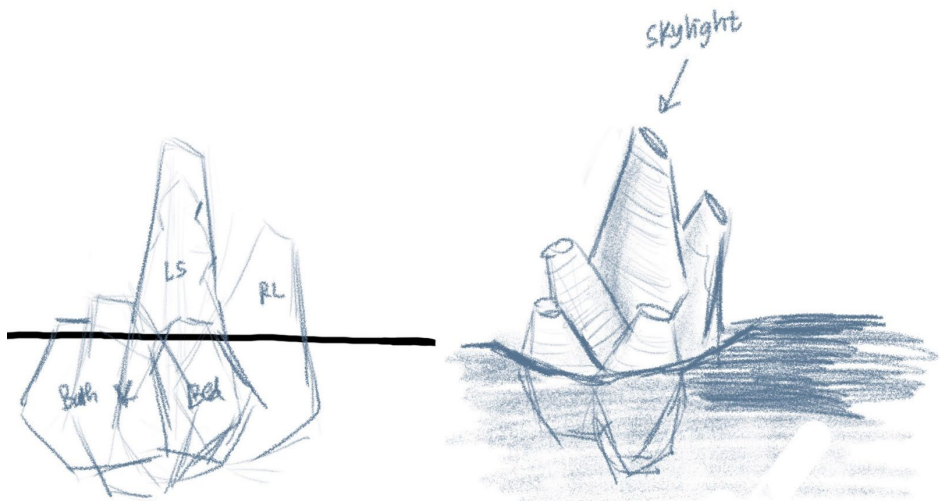
Concept

Voronoi geometry in nature

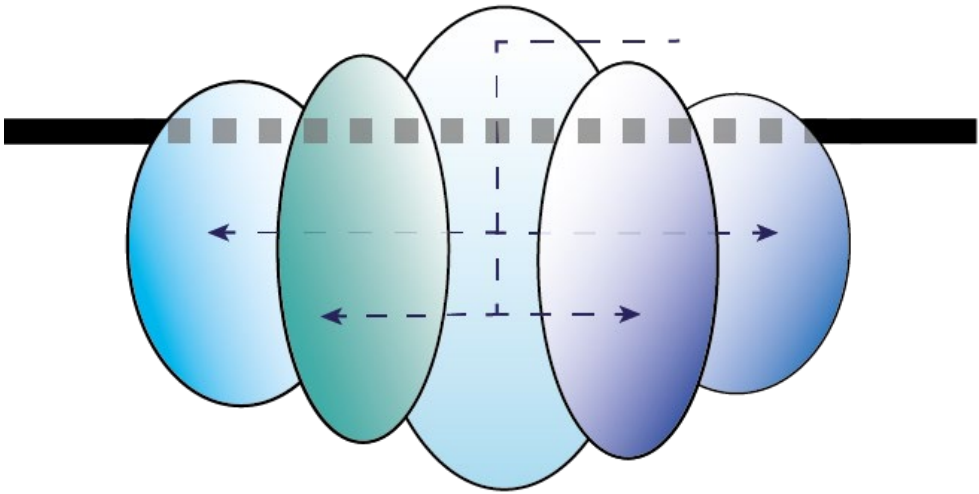


Underground formation in nature: Tulip bulbs

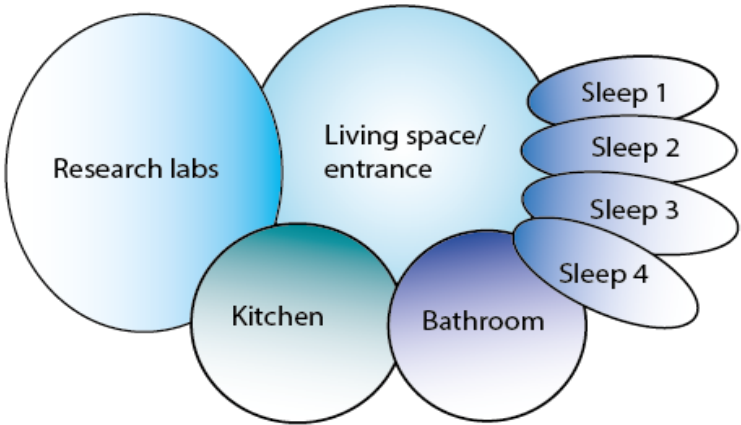
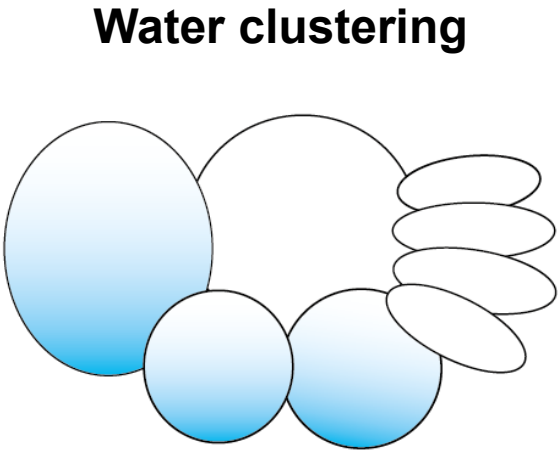




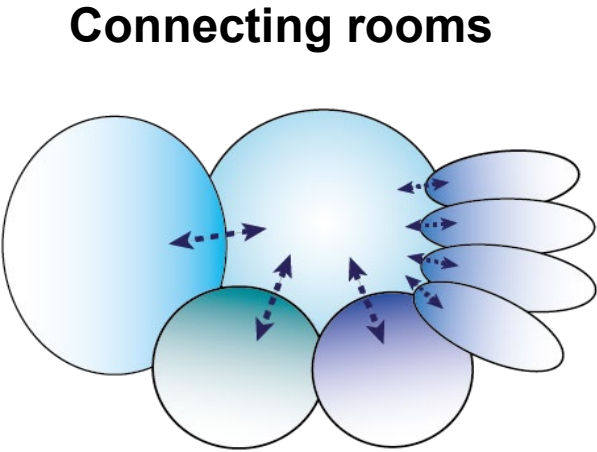
Synthesis tulip bulblets concept | **Concept diagrams**

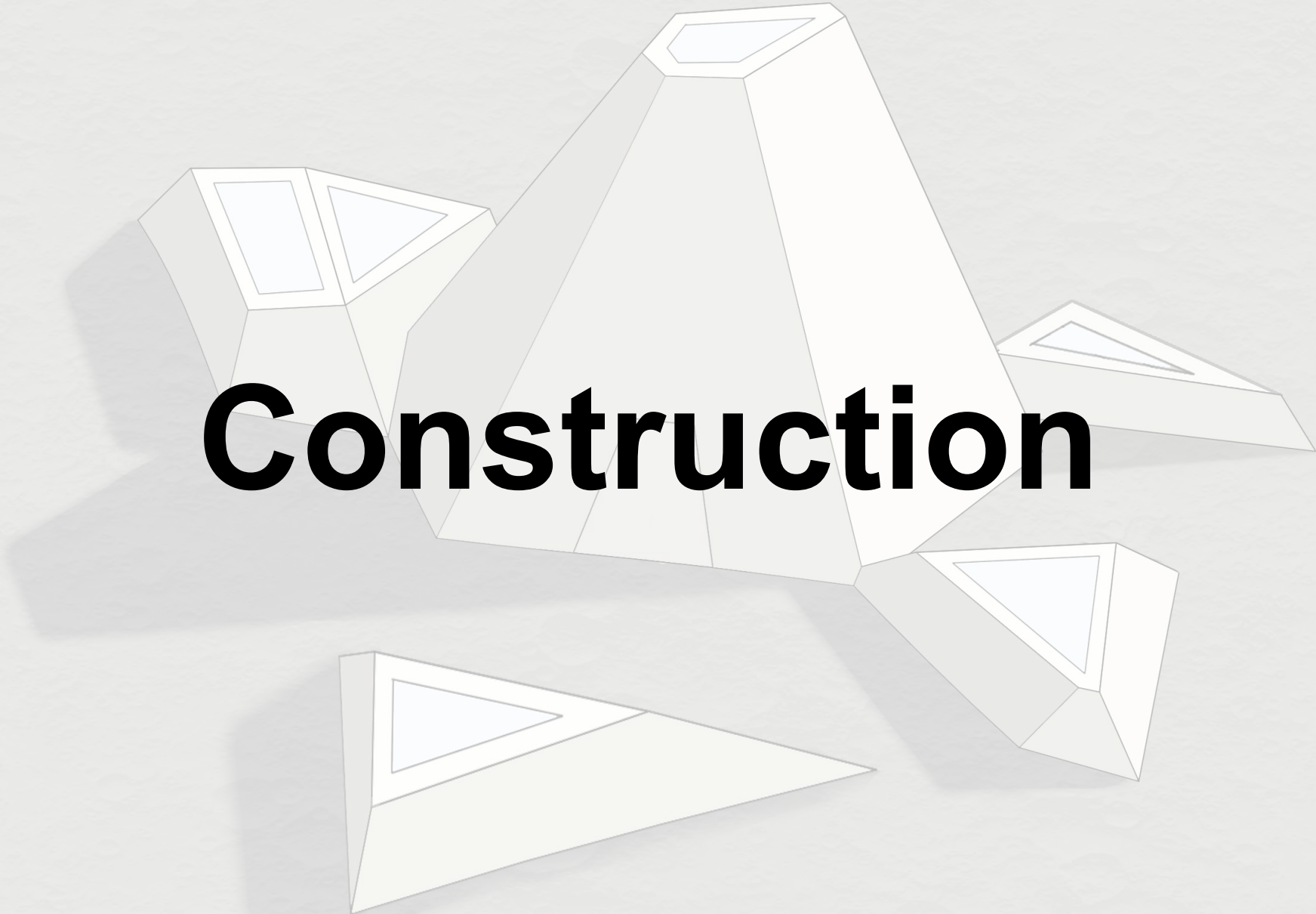


Section



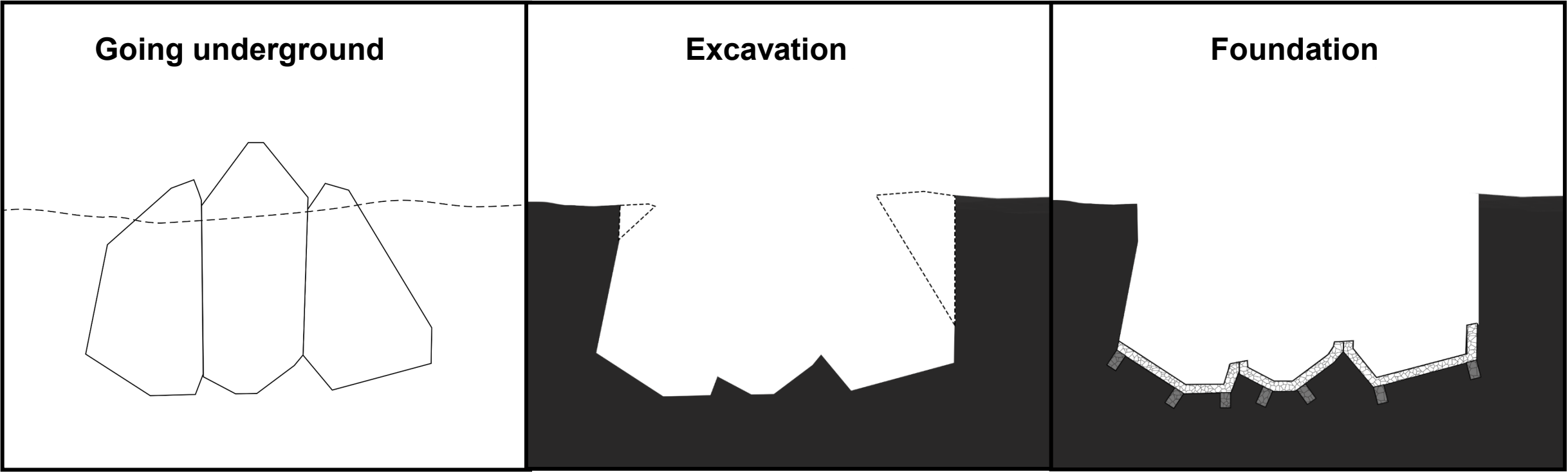
Plan



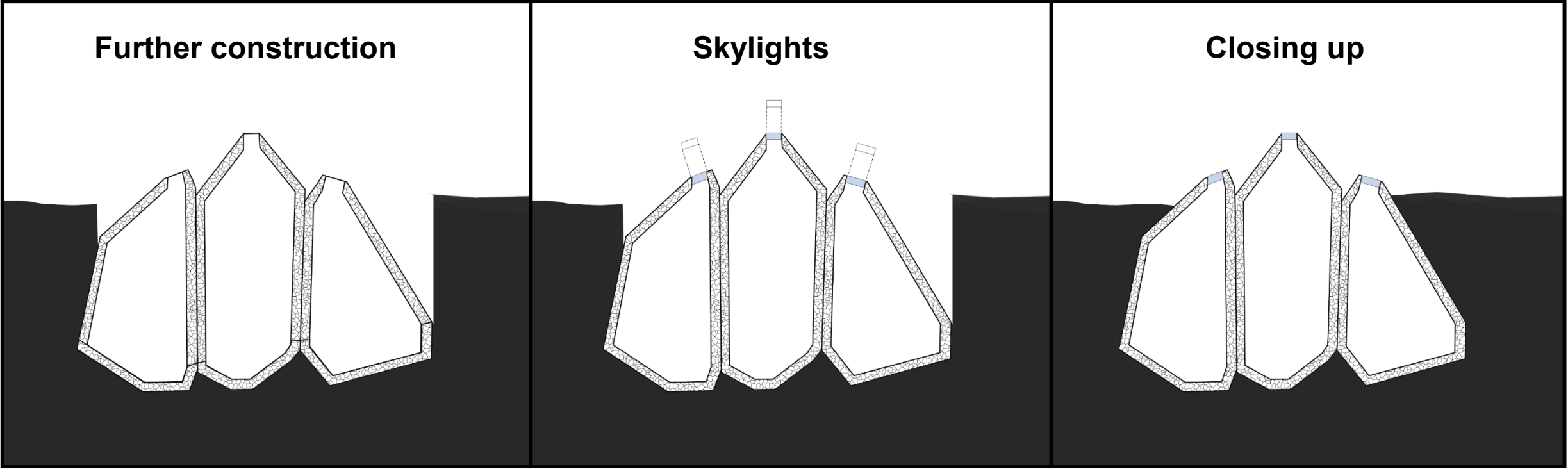
The word "Construction" is rendered in a bold, black, sans-serif font, centered on the page. The letters are constructed from various white and light blue 3D geometric shapes, including pyramids, prisms, and triangular blocks, which are arranged to form the structure of each letter. These shapes are set against a light gray background with a subtle, repeating pattern of small, light blue geometric forms. The overall composition is clean and modern, emphasizing geometric design and construction.

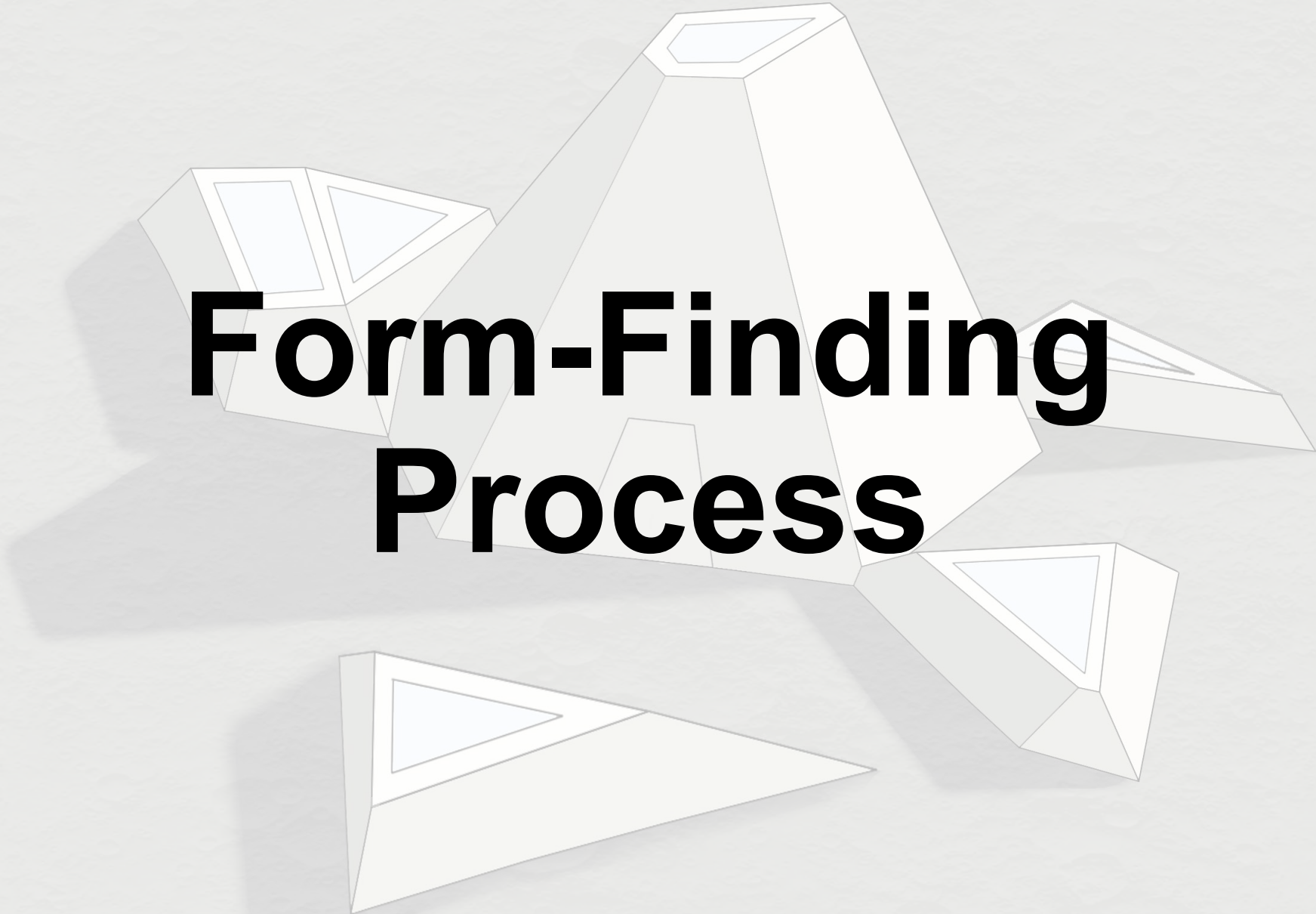
Construction

Construction Process |



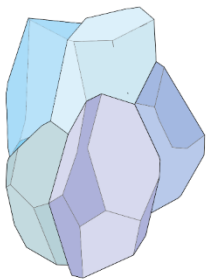
Construction Process |



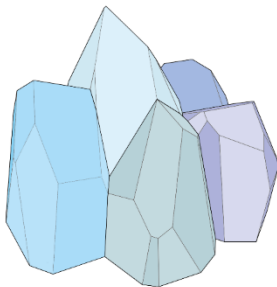


Form-Finding Process

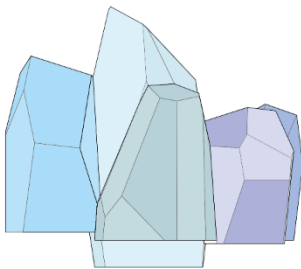
Form-finding process | Iterations



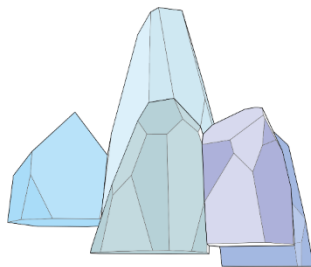
Starting shape: vertical cluster



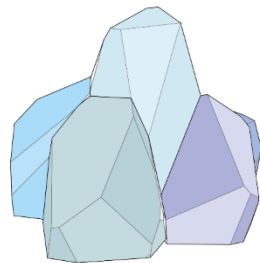
Iteration 1: flat bottom and central atrium



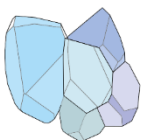
Iteration 2: different levels



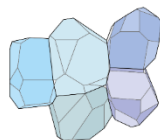
Iteration 3: enlarge atrium



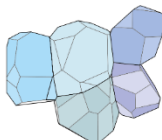
Iteration 4: bring together



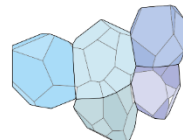
Iteration 5: change proportions



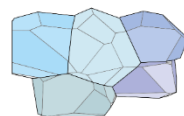
Iteration 6: 2-sided cluster



Iteration 7: change proportions

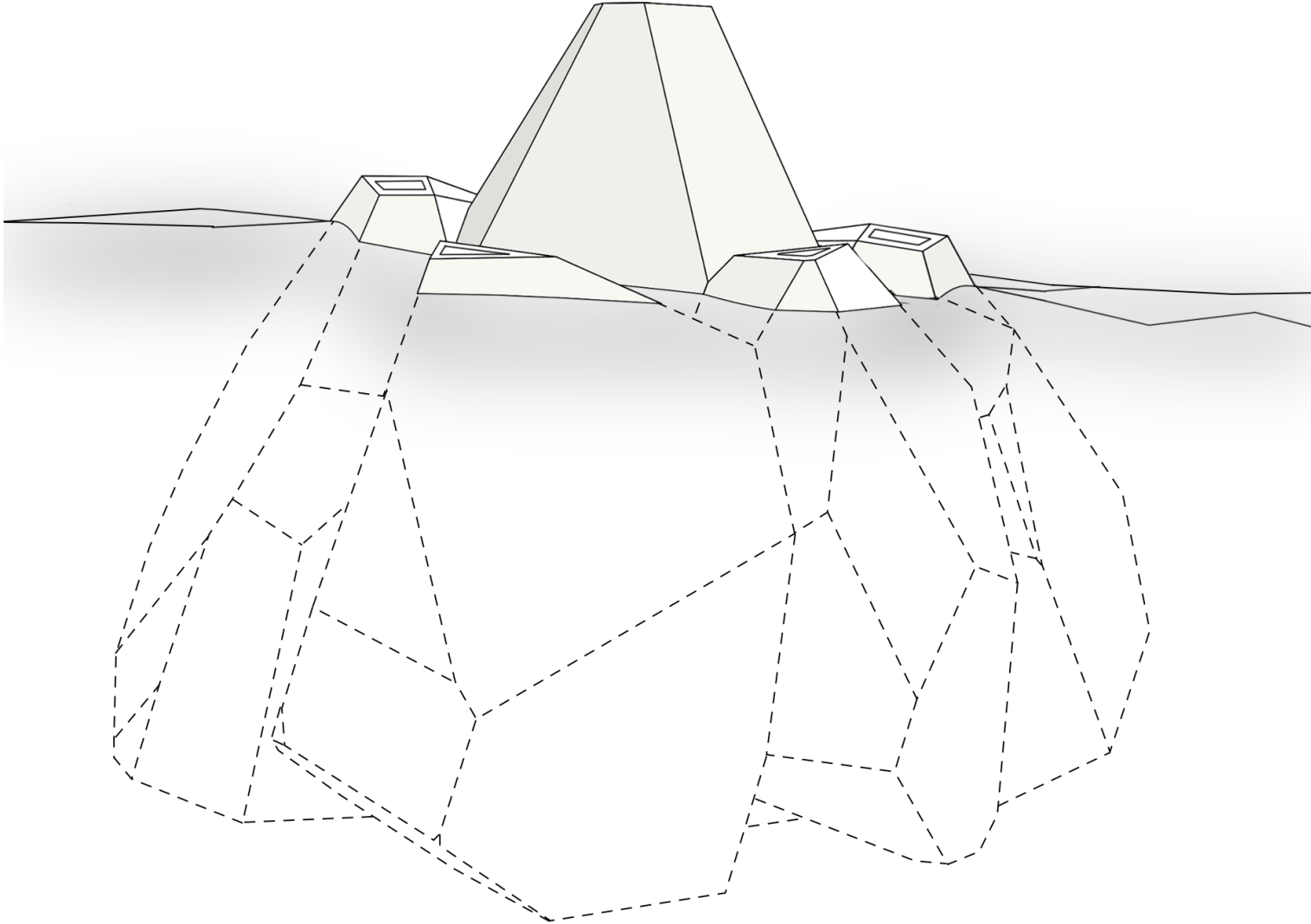


Iteration 8: no flat bottom



Iteration 9: multiple skylights

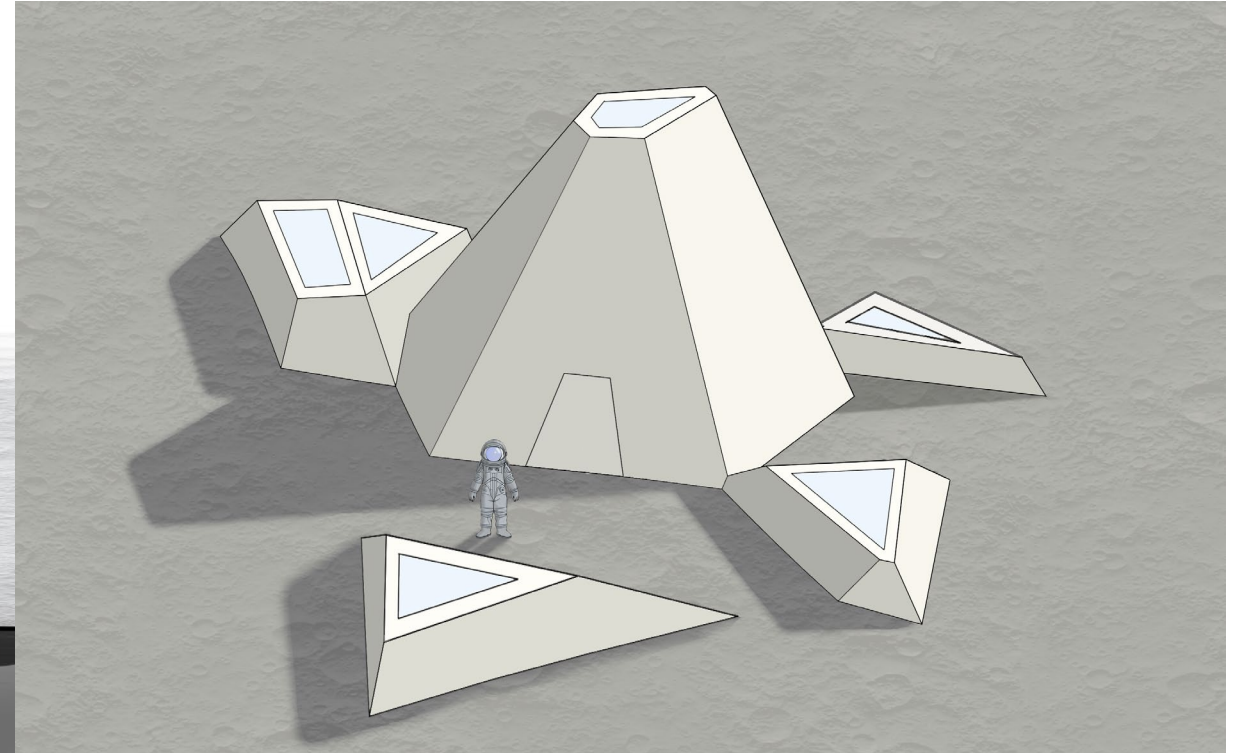
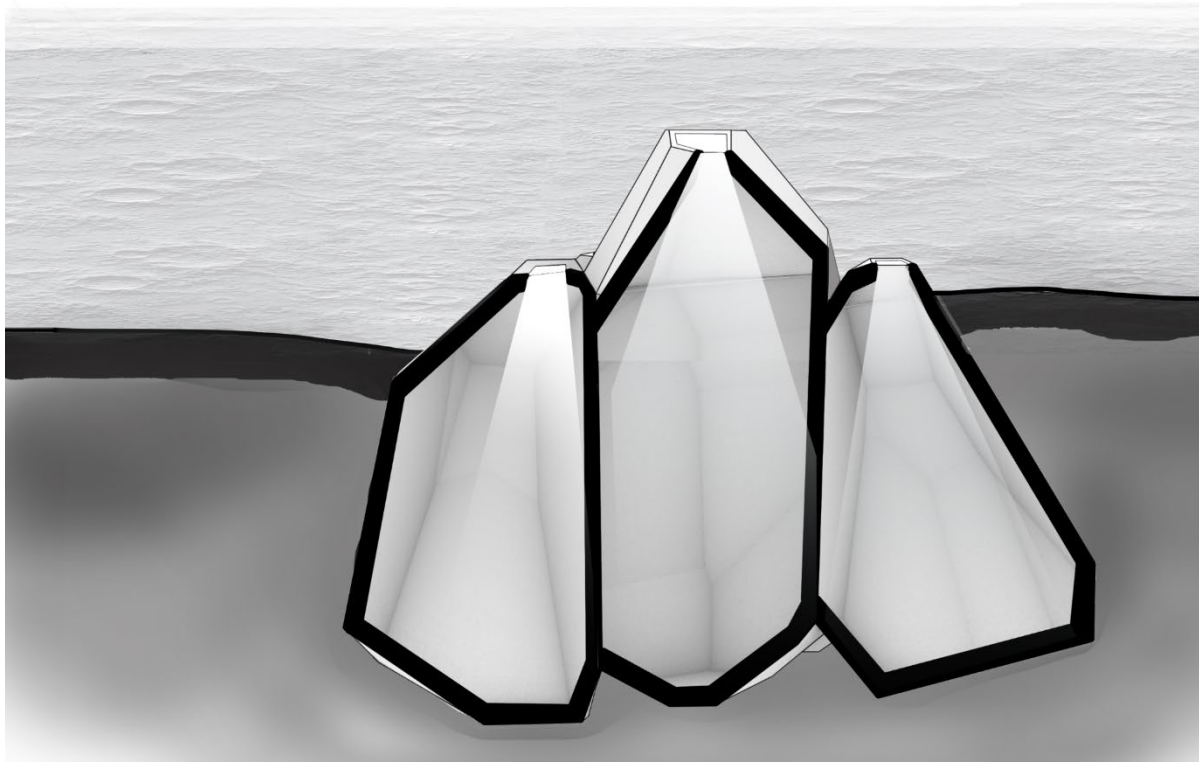
Form-finding process | Final Design



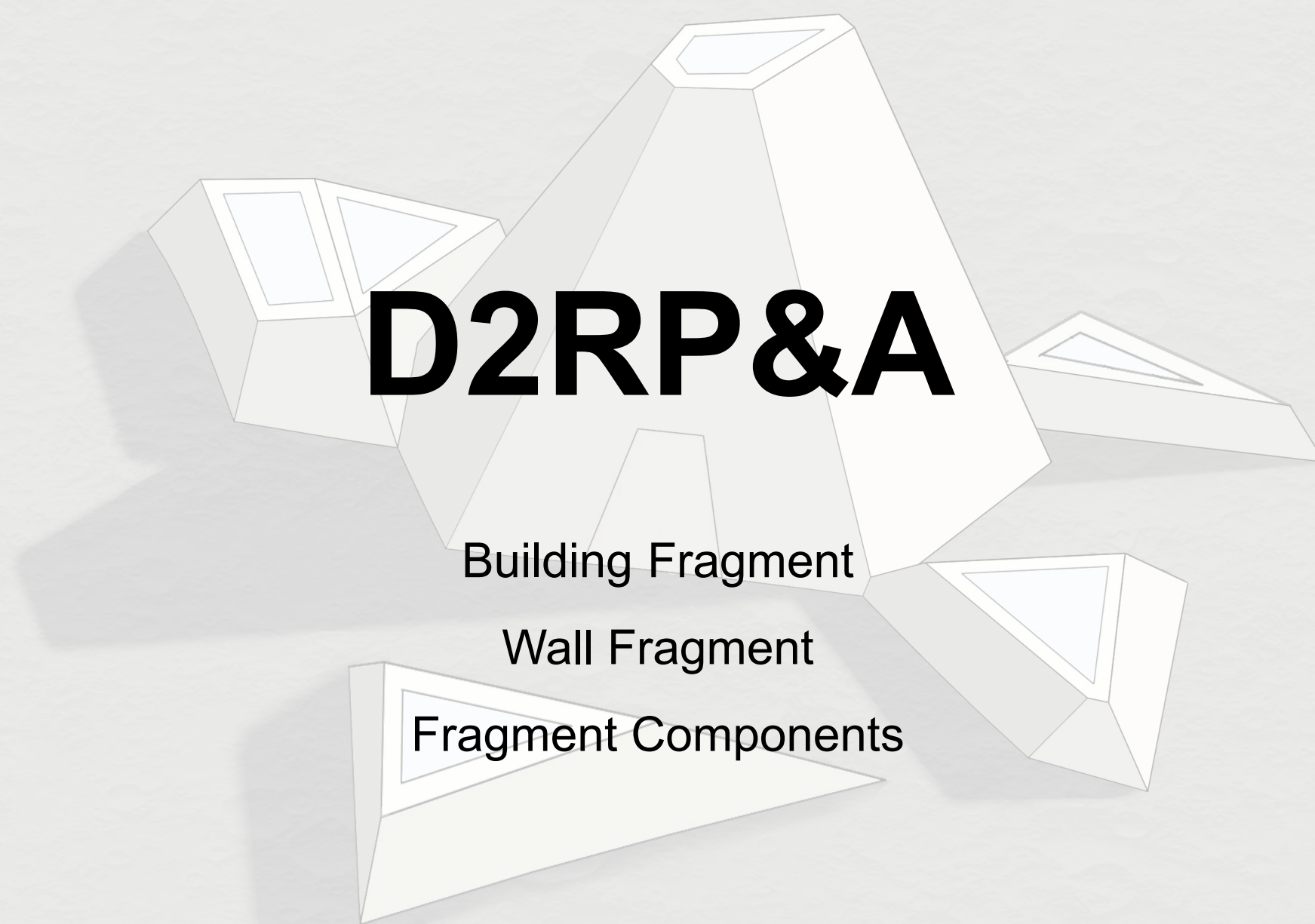
Back view - closed pod
underground

Form-finding process | Skylights

Front view - section



Skylights surface view



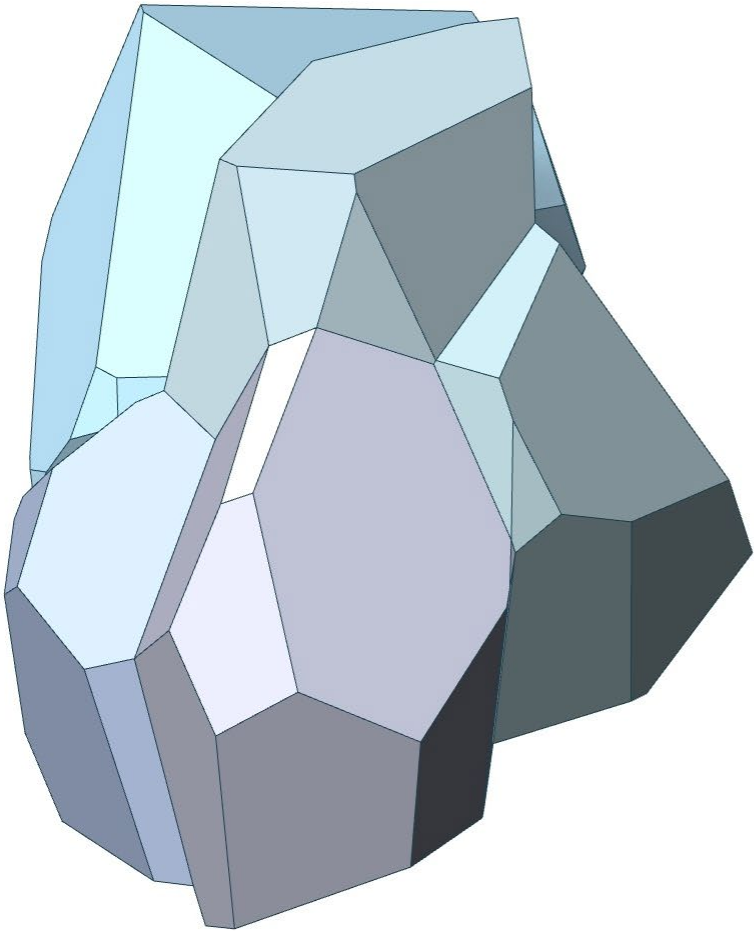
D2RP&A

Building Fragment

Wall Fragment

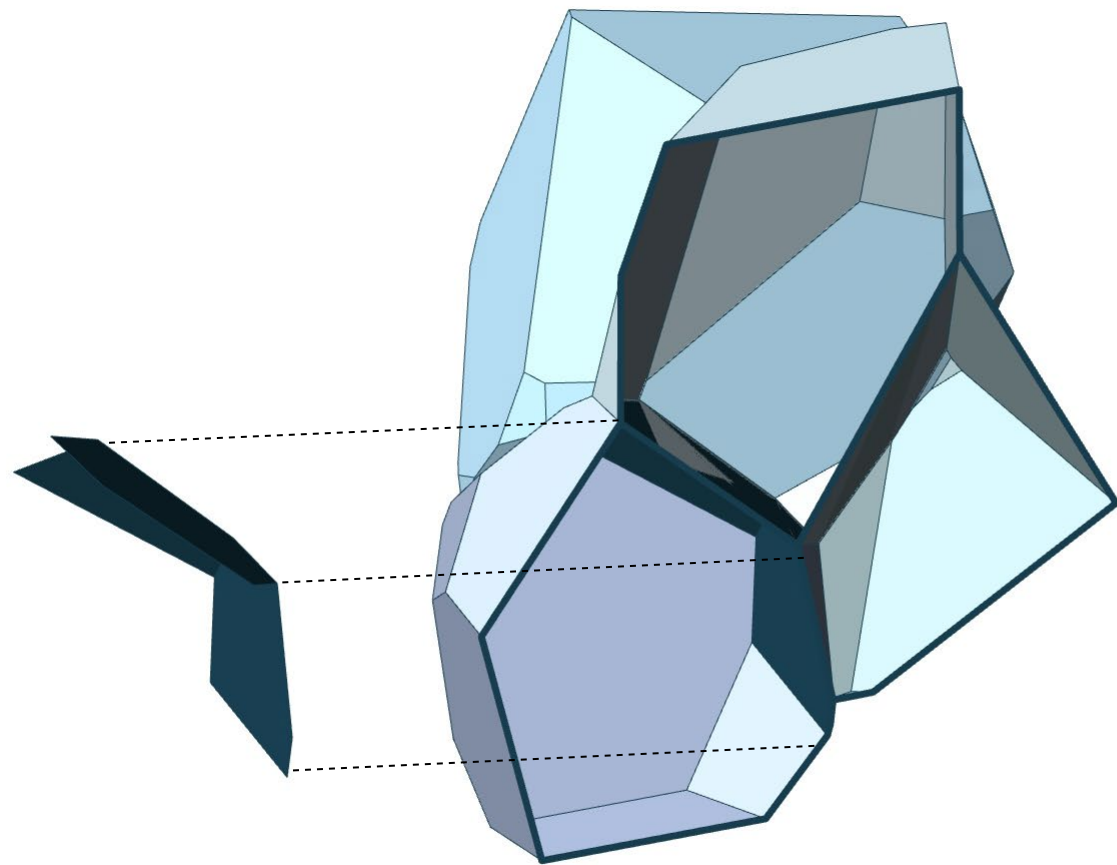
Fragment Components

Choosing Representative Fragment



D2RP&A
Building Fragment
Wall Fragment
Fragment Components

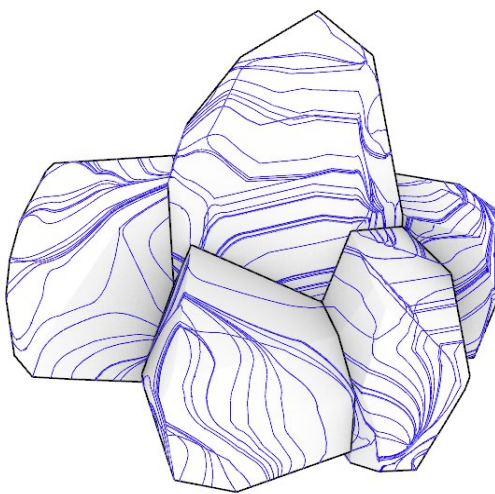
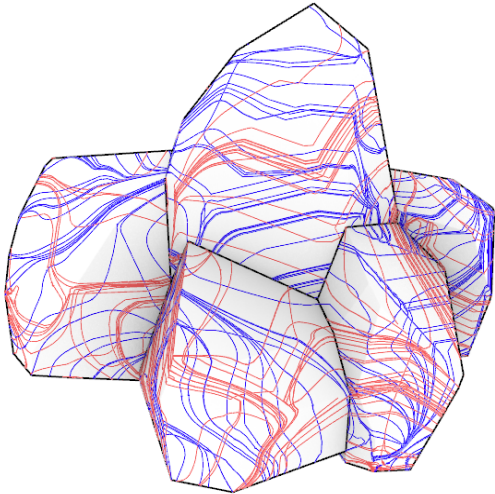
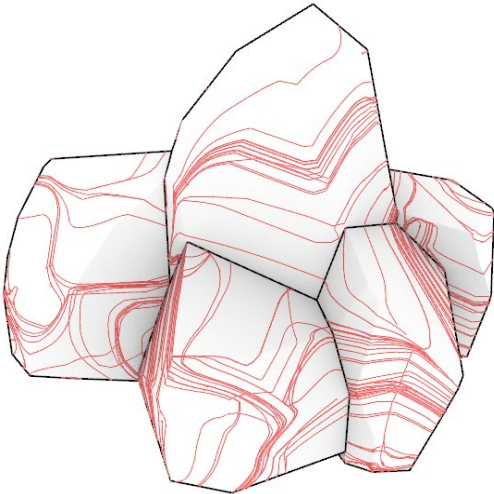
Choosing Representative Fragment



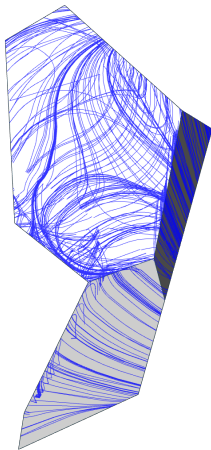
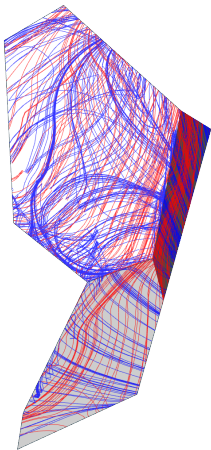
D2RP&A
Building Fragment
Wall Fragment
Fragment Components

Stress Diagram

Building



Fragment



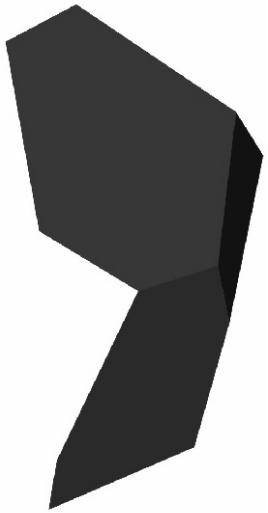
Compression

Overall

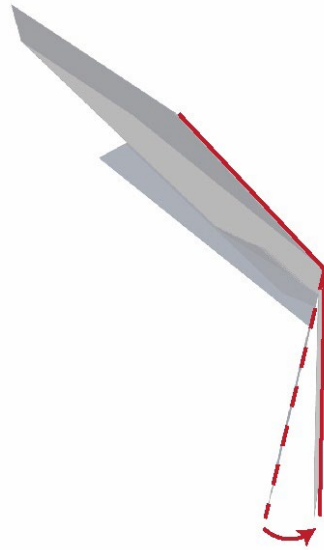
Tension

D2RP&A
Building Fragment
Wall Fragment
Fragment Components

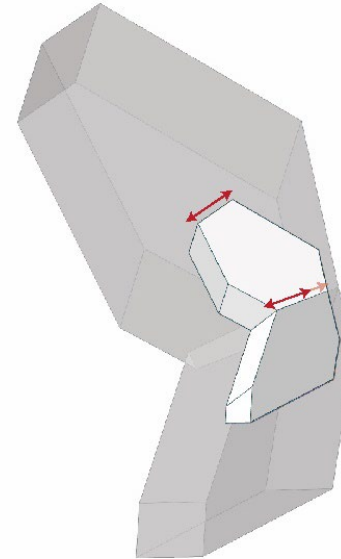
Fragment Extraction Process



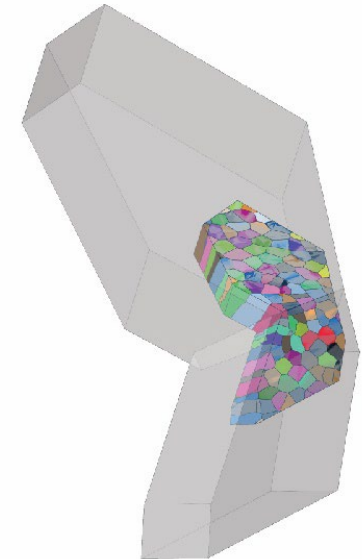
Choose representative
wall for robotic
production



Adjust angle, ensure
proper support in
turning point



Extract wall fragment
for voronoi iteration



Wall fragment with
voronoi iteration

Fragment Iteration



Seed 1

Component sizes too different



Seed 7

Regenerate seed

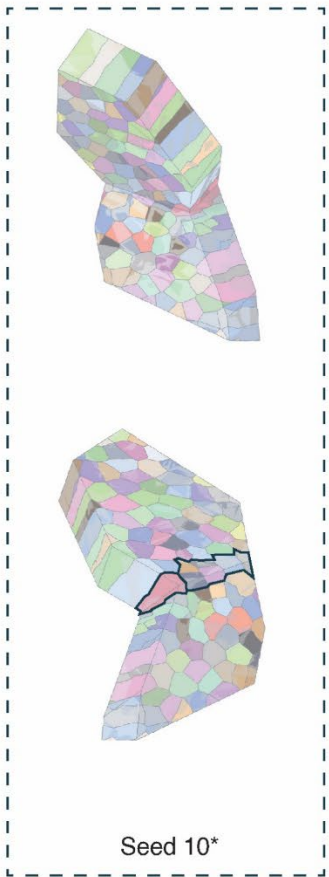
Components too big



Seed 10

Increase control point count

*Good proportion for most components
Components in turning point too tapered
may be problematic in milling
Components too vertical
need shorter components for compressive strength*



Seed 10*

Manually adjust points from the generated seed

*Point count 130
Reference top angle 0,
bottom angle 90*

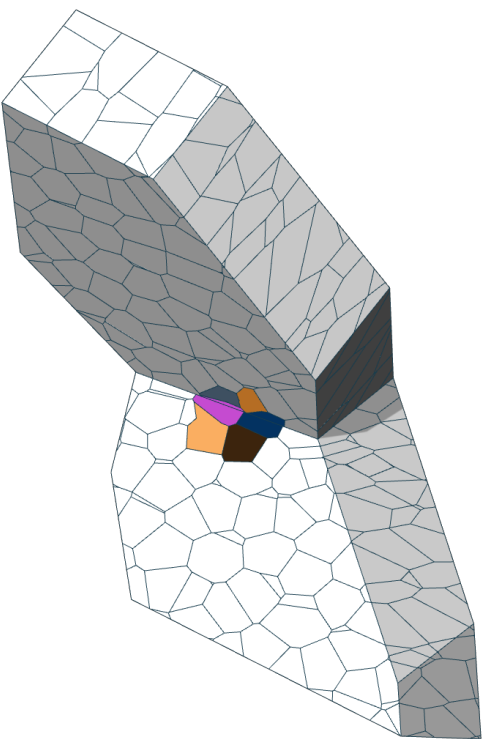
Goal achieved:

- (1) Laterally stretched and vertically compressed components
- (2) Generally even distribution and shape of voronoi geometry

Breakdown fragment into components

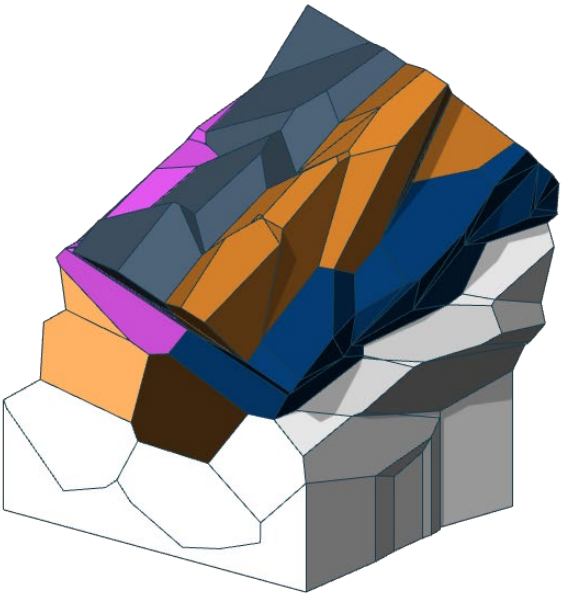


Chosen fragment composition

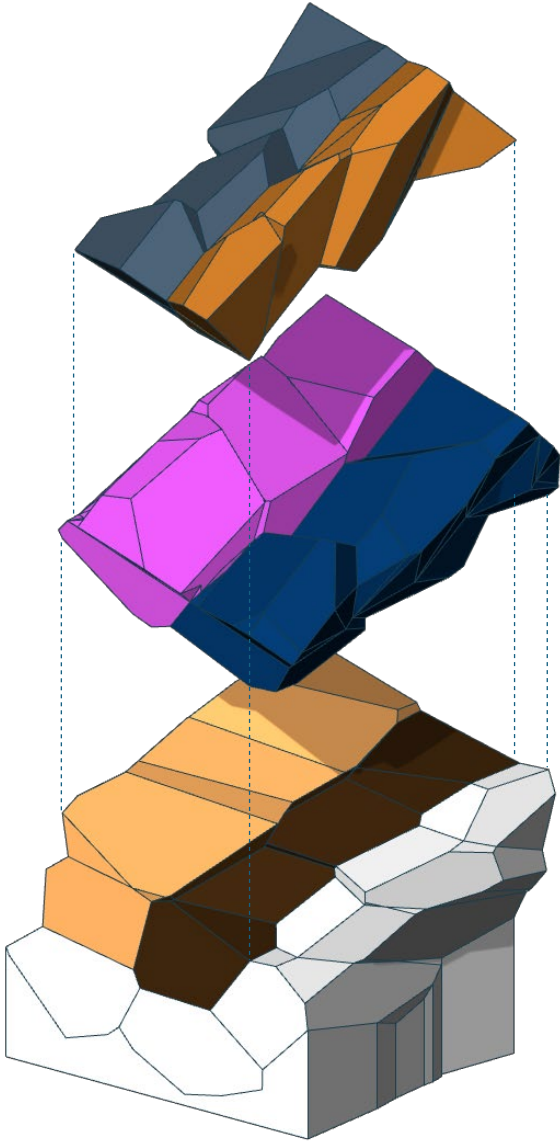


Chosen component to develop for production, to test stability

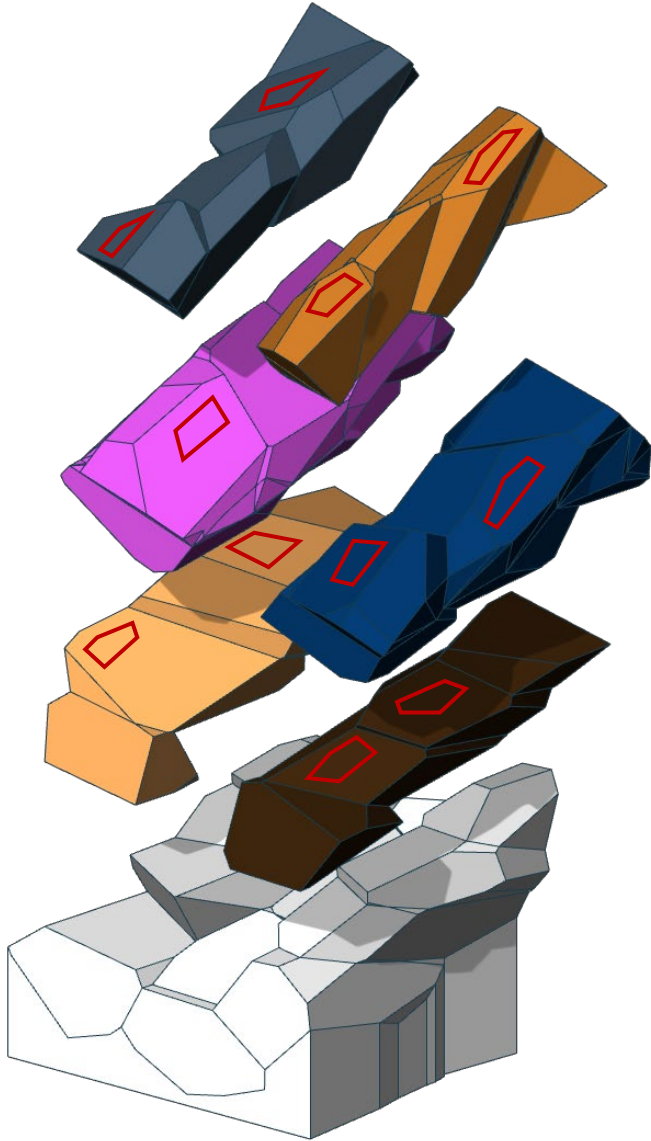
Fragment of 6 Components



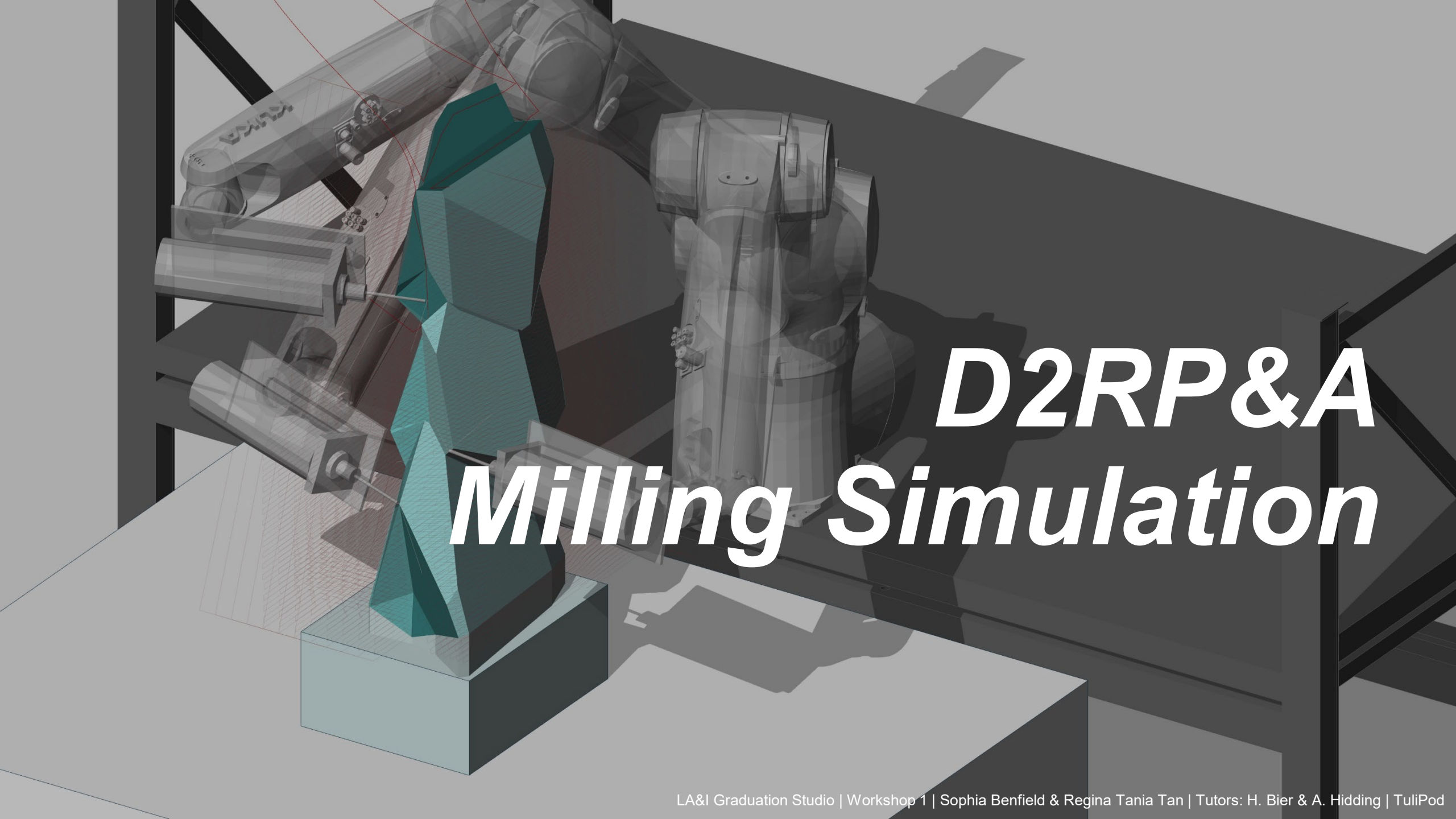
Chosen Component



Connection

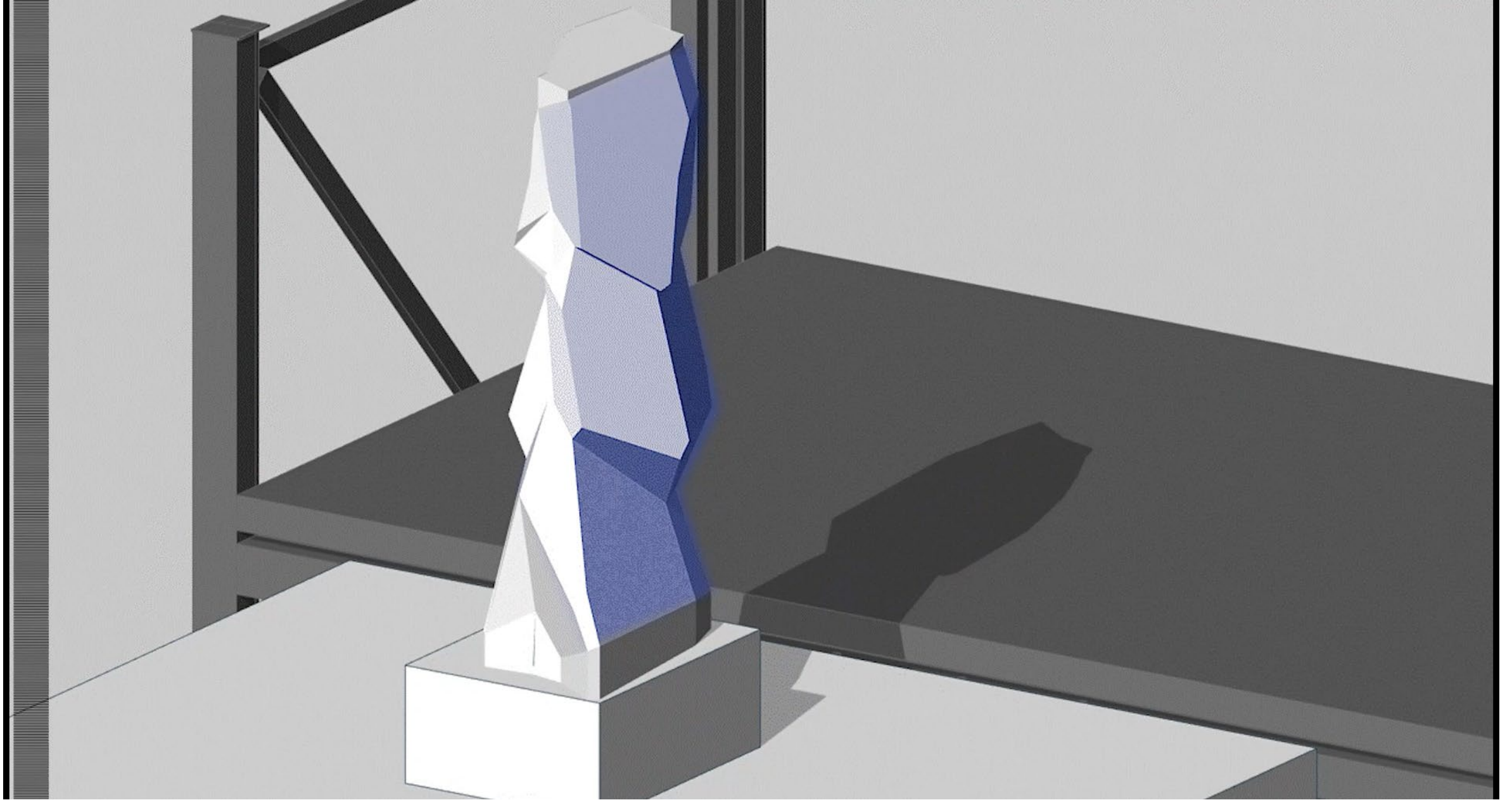


Milling Holes

A 3D simulation of a robotic arm performing a milling operation. The arm is shown in a semi-transparent grey, revealing its internal joints and structure. It is positioned over a teal-colored workpiece that is mounted on a light blue base. The workpiece has a complex, angular shape. The background is a dark grey, and the overall scene is rendered with soft shadows and highlights, giving it a realistic yet digital appearance. The text "D2RP&A" and "Milling Simulation" is overlaid on the right side of the image in a large, white, italicized font.

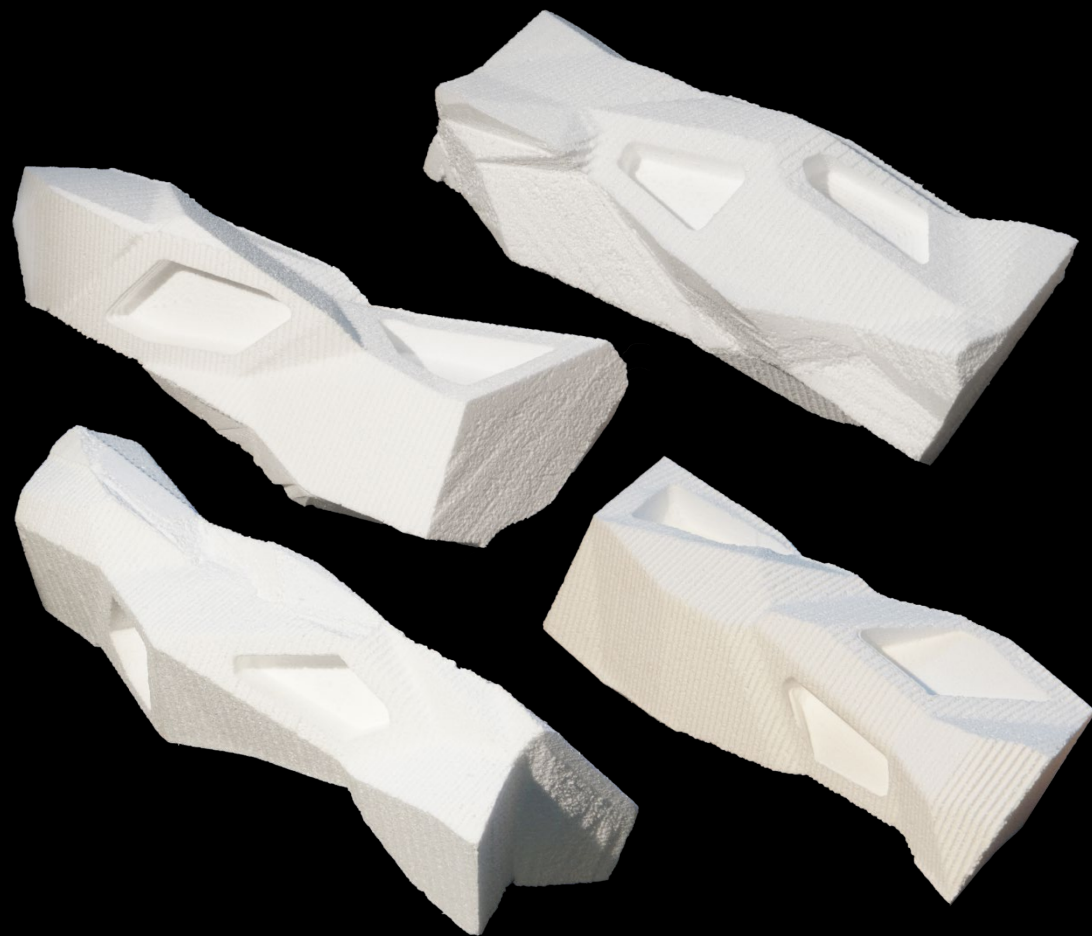
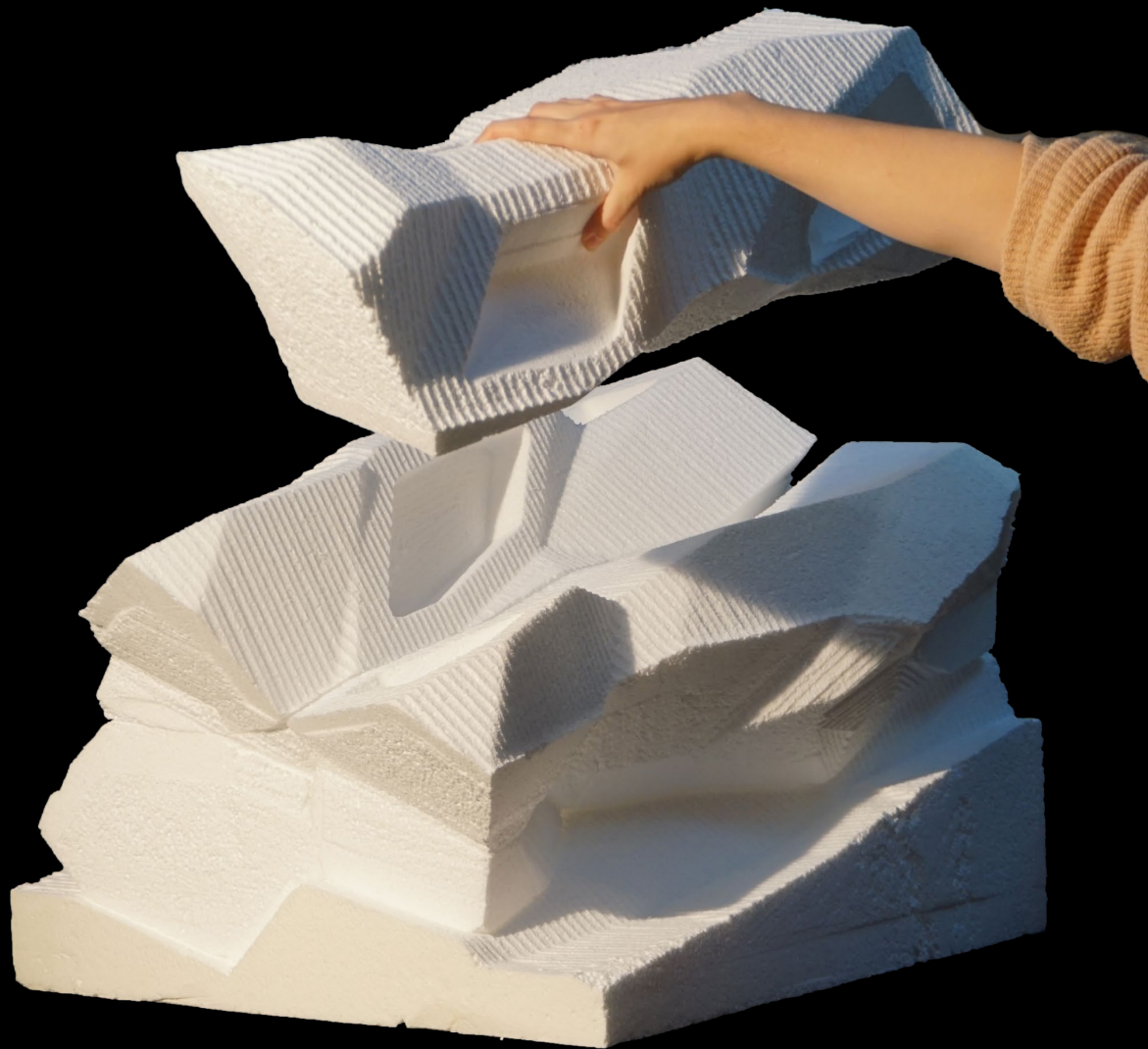
D2RP&A

Milling Simulation



D2RP&A
Building Fragment
Wall Fragment
Fragment Components

D2RP&A | Lunar Architecture Graduation Studio | Moonshot



D2RP&A
Building Fragment
Wall Fragment
Fragment Components