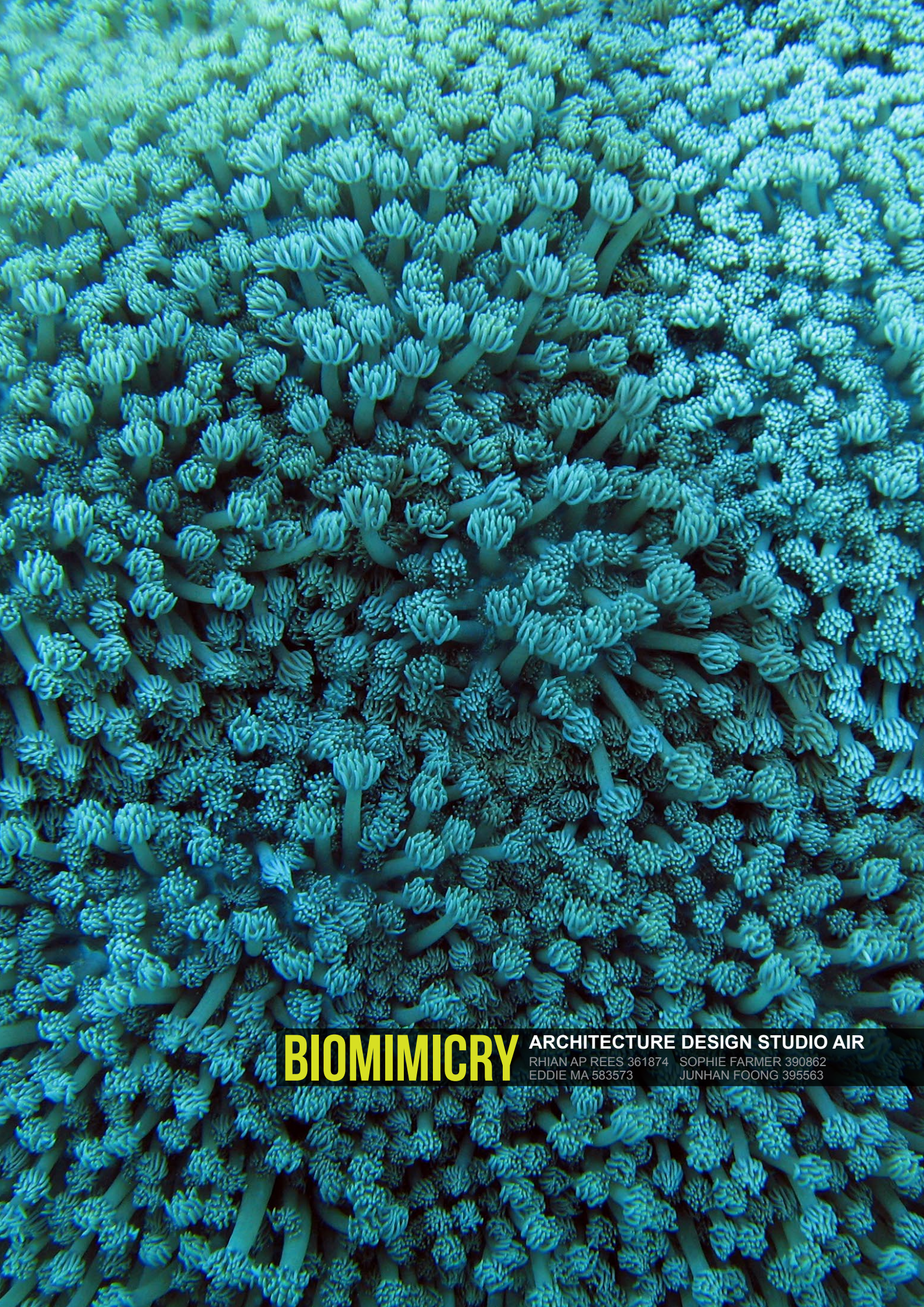


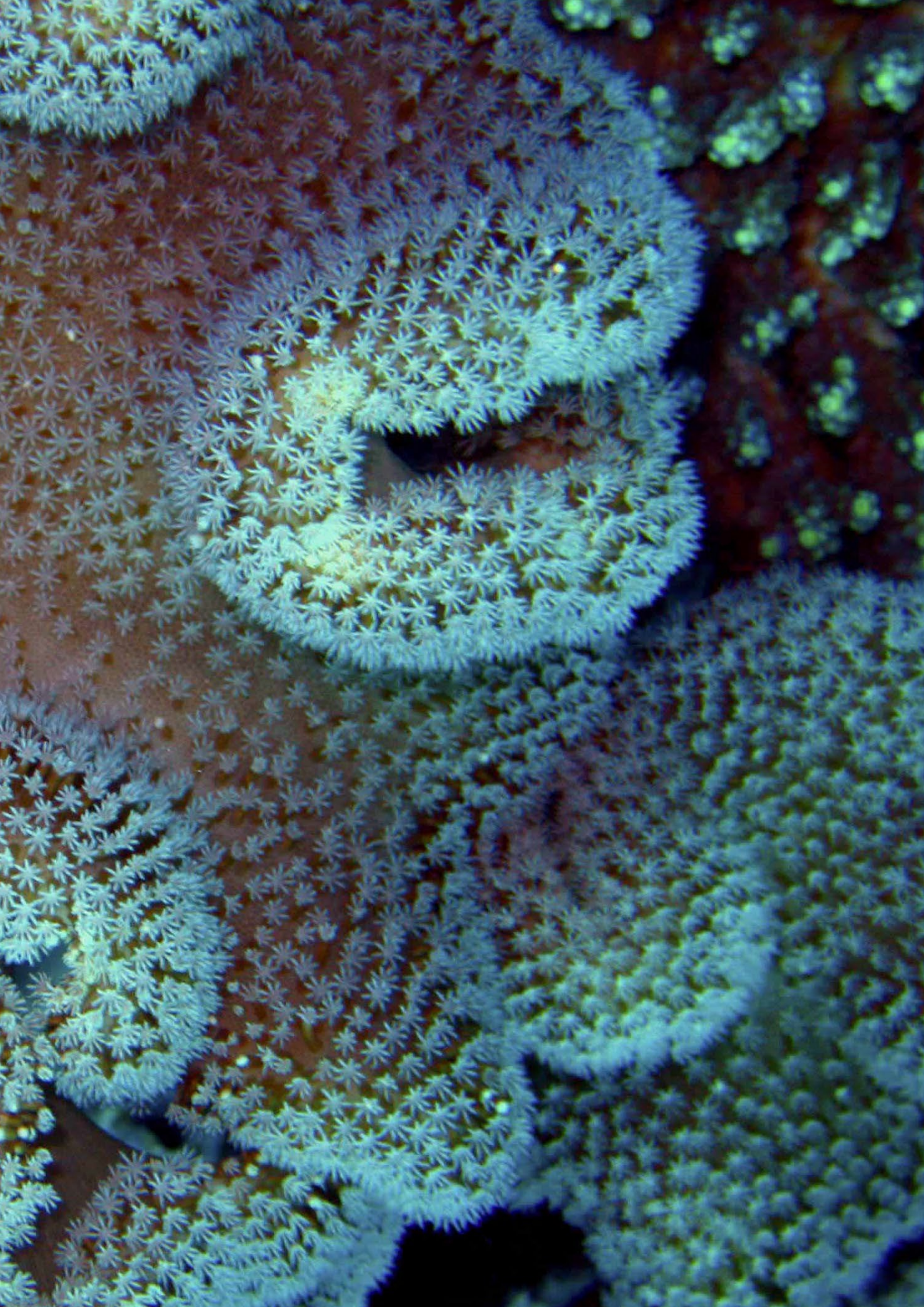
BIOMIMICRY

ARCHITECTURE DESIGN STUDIO AIR

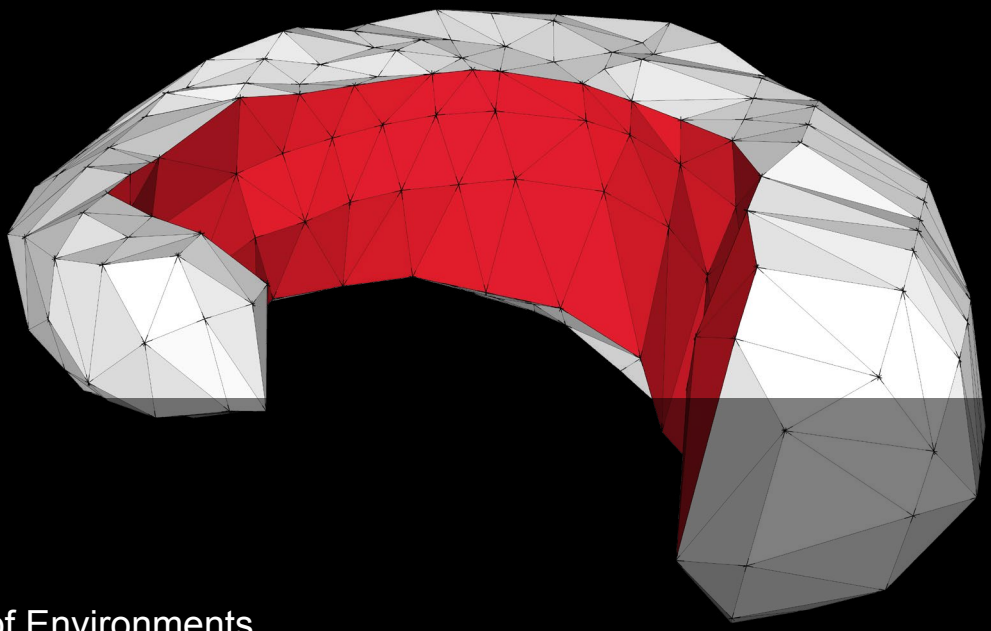
RHIAN AP REES 361874 SOPHIE FARMER 390862
EDDIE MA 583573 JUNHAN FOONG 395563

1

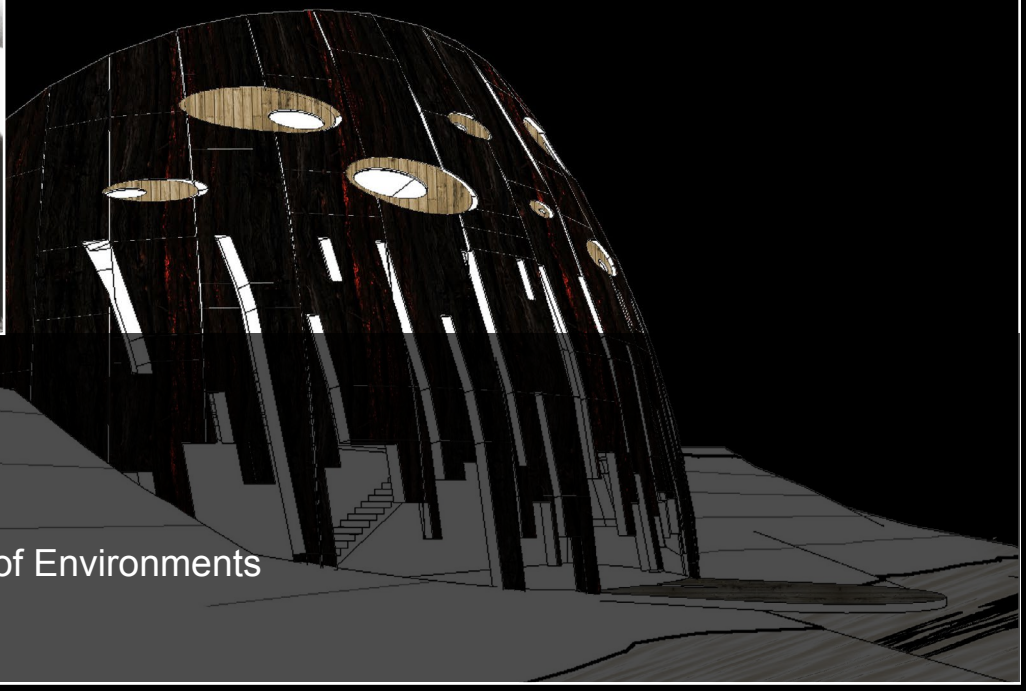
INTRODUCTION: WHO ARE WE?



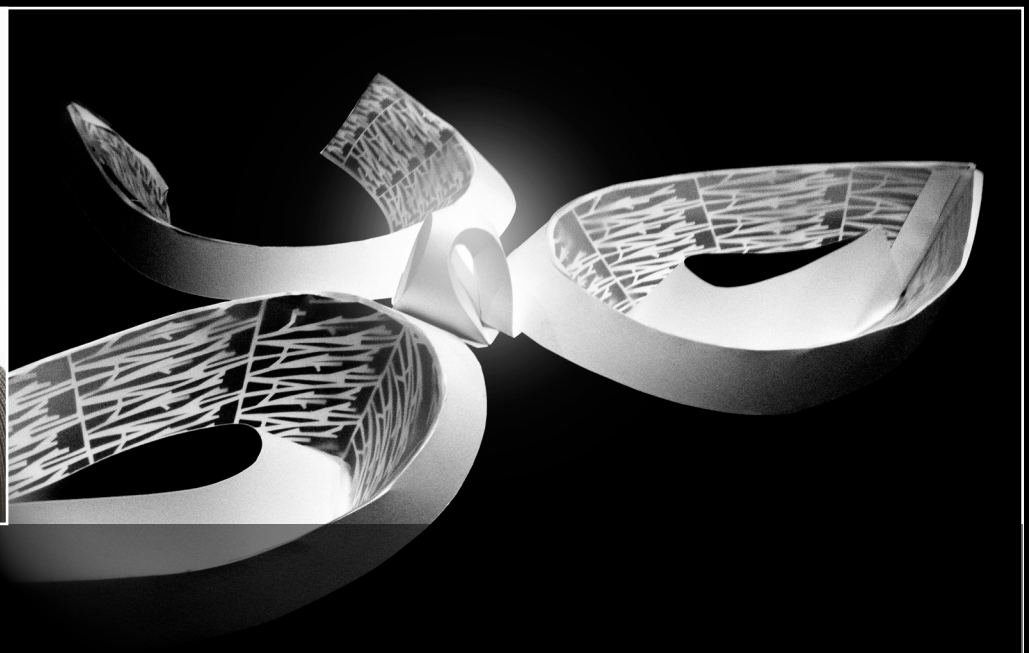
1 WHO ARE WE?



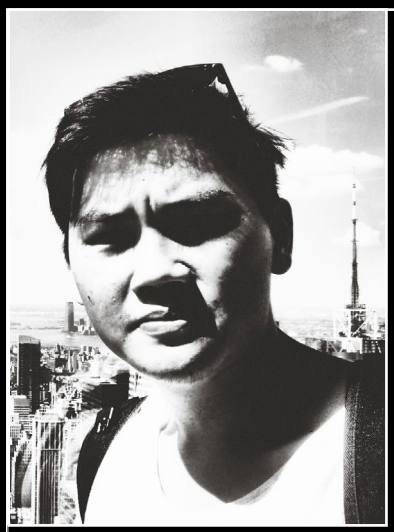
Information
Rhian Ap Rees
21 years old
Birmingham, UK
Third Year Bachelor of Environments
Architecture Major



Information
Eddie Ma
22 years old
Sydney, Australia
Third Year Bachelor of Environments
Architecture Major



Information
Sophie Farmer
20 years old
Melbourne, Australia
Third Year Bachelor of Environments
Architecture Major

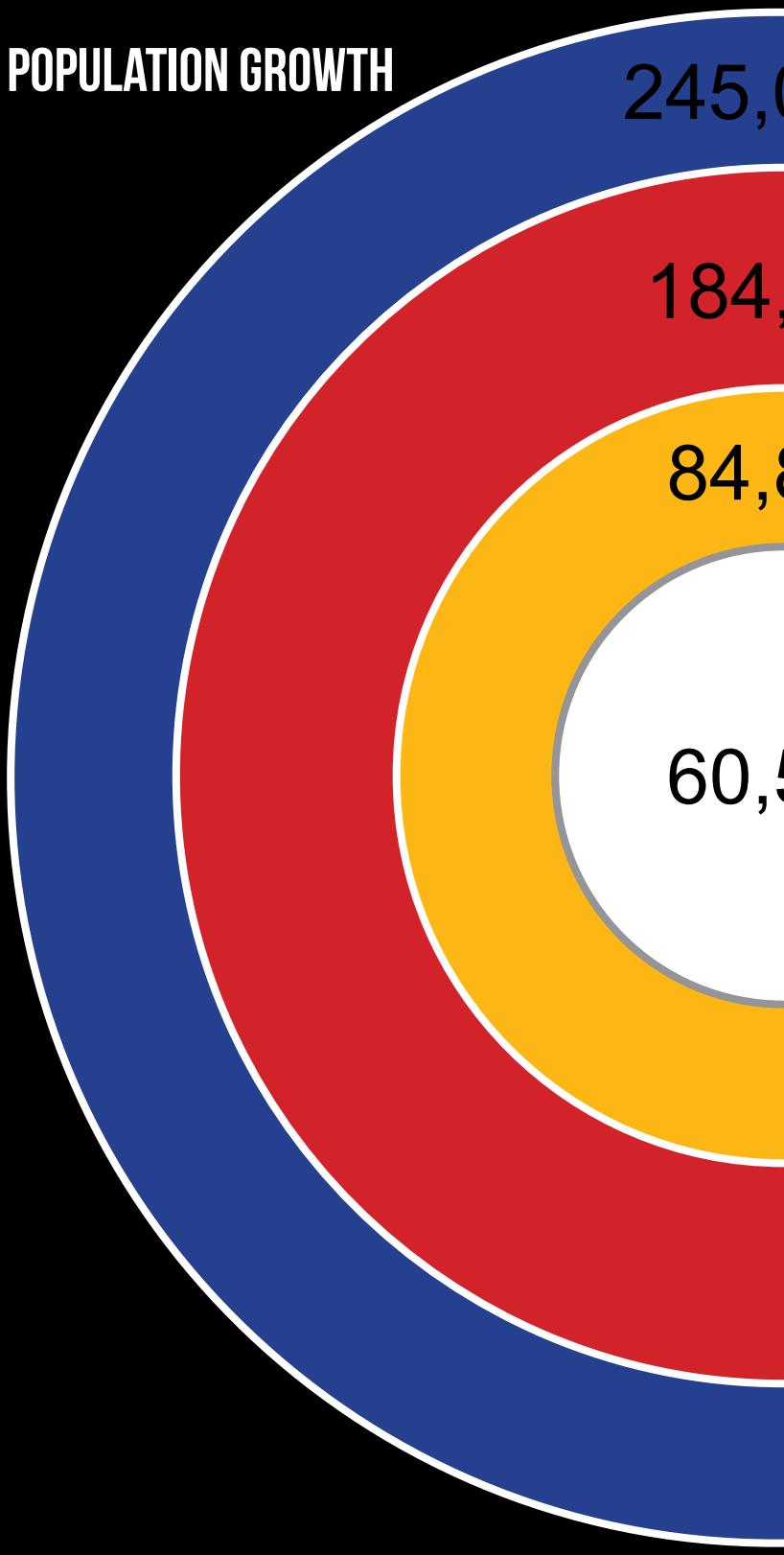


Information
Junhan Foong
22 years old
KL, Malaysia
Third Year Bachelor of Environments
Architecture Major

2

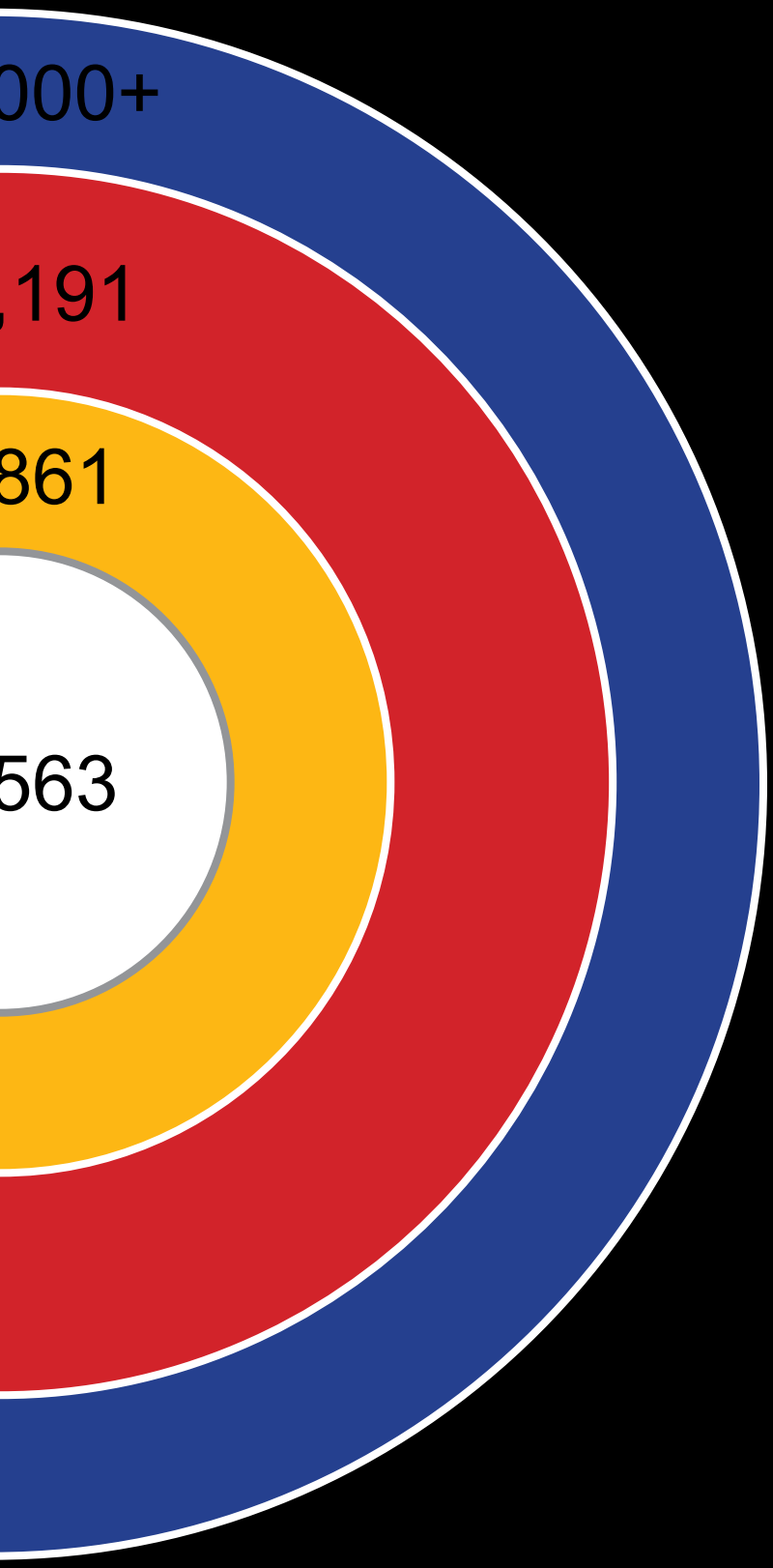
WHY BIOMIMICRY?

2 WYNDHAM + GROWTH



YEAR

- 1991
- 2001
- 2012
- 2020


000+
,191
861
563

WYNDHAM

= GROWTH

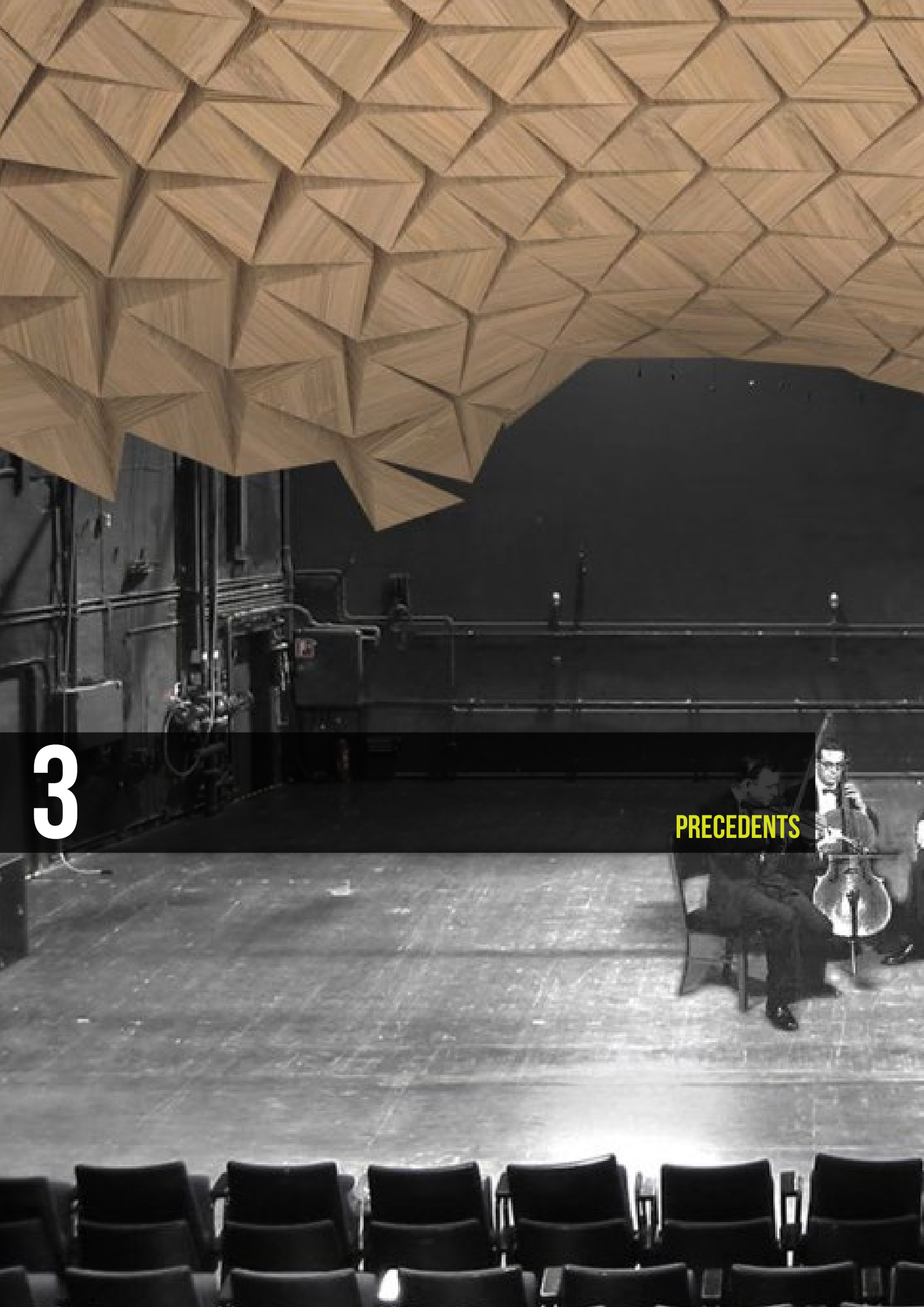
BIOMIMICRY

2 DEFINITION

BIOMIMICRY

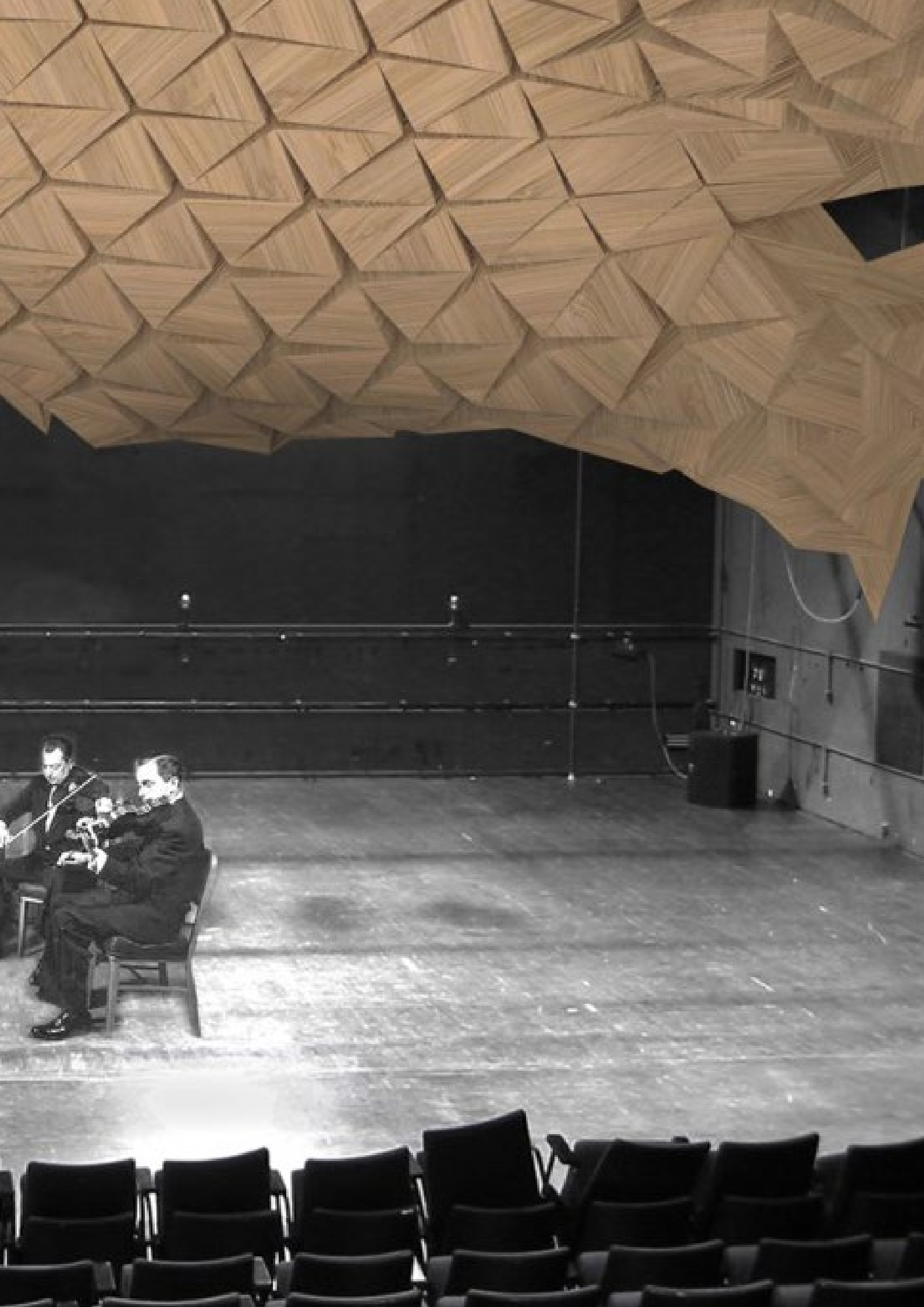
THE EXAMINATION OF NATURE
PROCESSES, AND ELEMENTS T
INSPIRATION FROM IN ORDER T

, ITS MODELS, SYSTEMS,
O EMULATE OR TAKE
TO SOLVE HUMAN PROBLEMS.



3

PRECEDENTS



3 PRECEDENTS

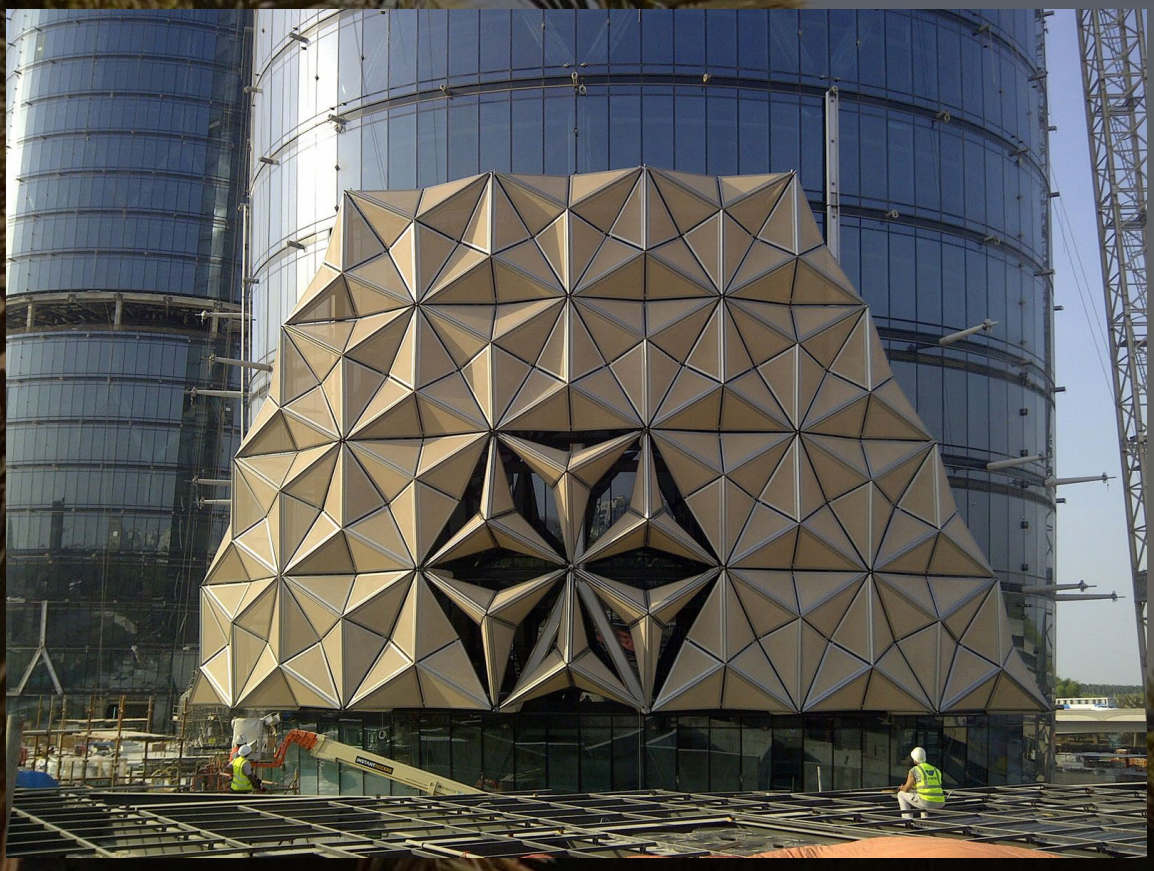
ICD / ITKE UNIVERSITY OF STUTTGART

ICD / ITKE RESEARCH PAVILION

This project explores the potential of biomimetic design strategies for performative morphology in architecture using computer-based design methods. The sea urchin's plate skeleton morphology was achieved using a modular system of polygonal plates and a particular joining system, which allowed the pavilion to have high load bearing capacity.

BIOMIMICRY

3 PRECEDENTS

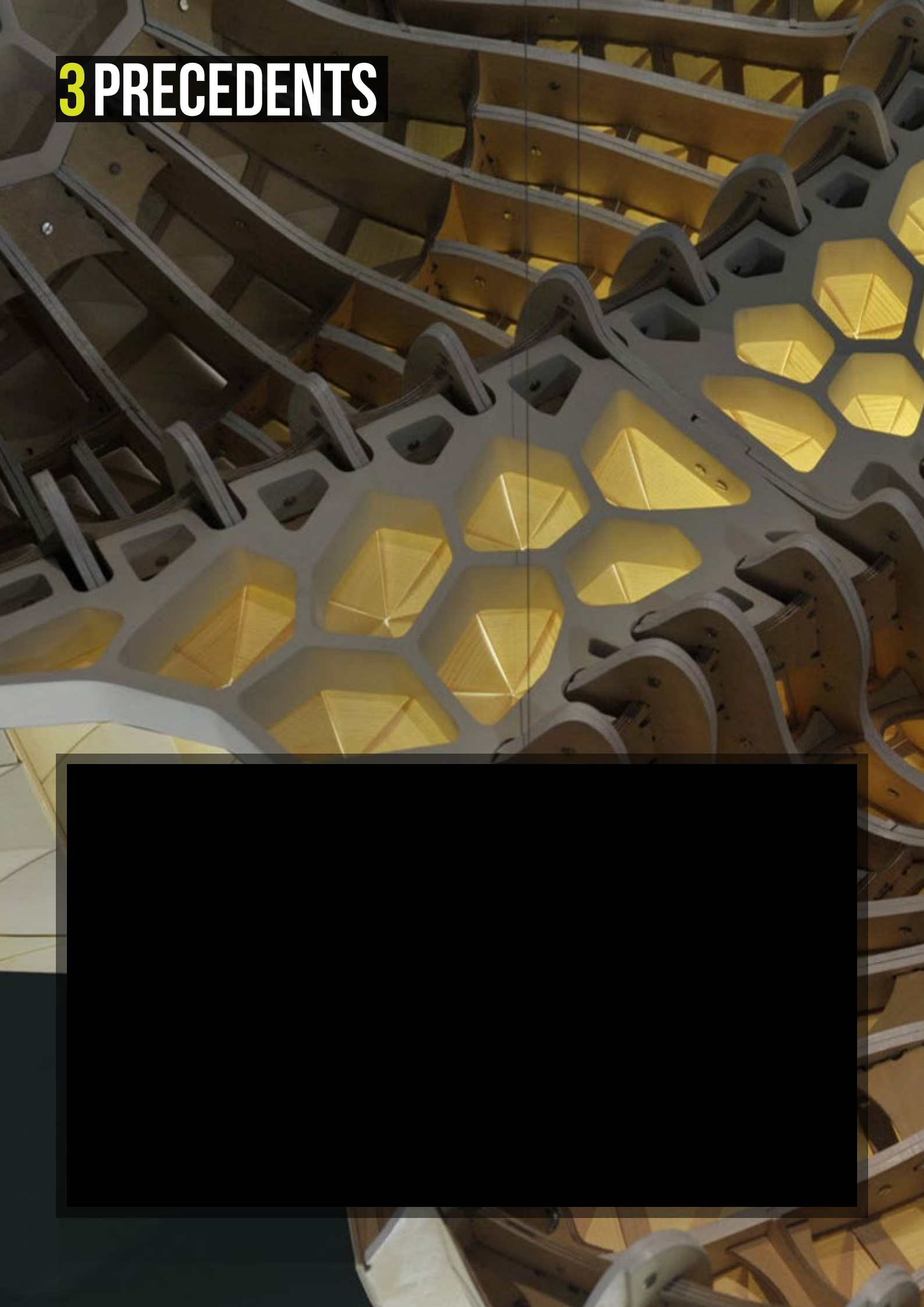


AEDAS ARCHITECTS

AL BAHAR TOWERS RESPONSIVE FACADE

For this responsive facade, which takes cultural cues from the “mashrabiya” (a traditional Islamic lattice shading device), a parametric description for the geometry of the actuated facade panels was used in order to simulate its operation in response to sun exposure and changing incidence angles during the different days of the year.

3 PRECEDENTS

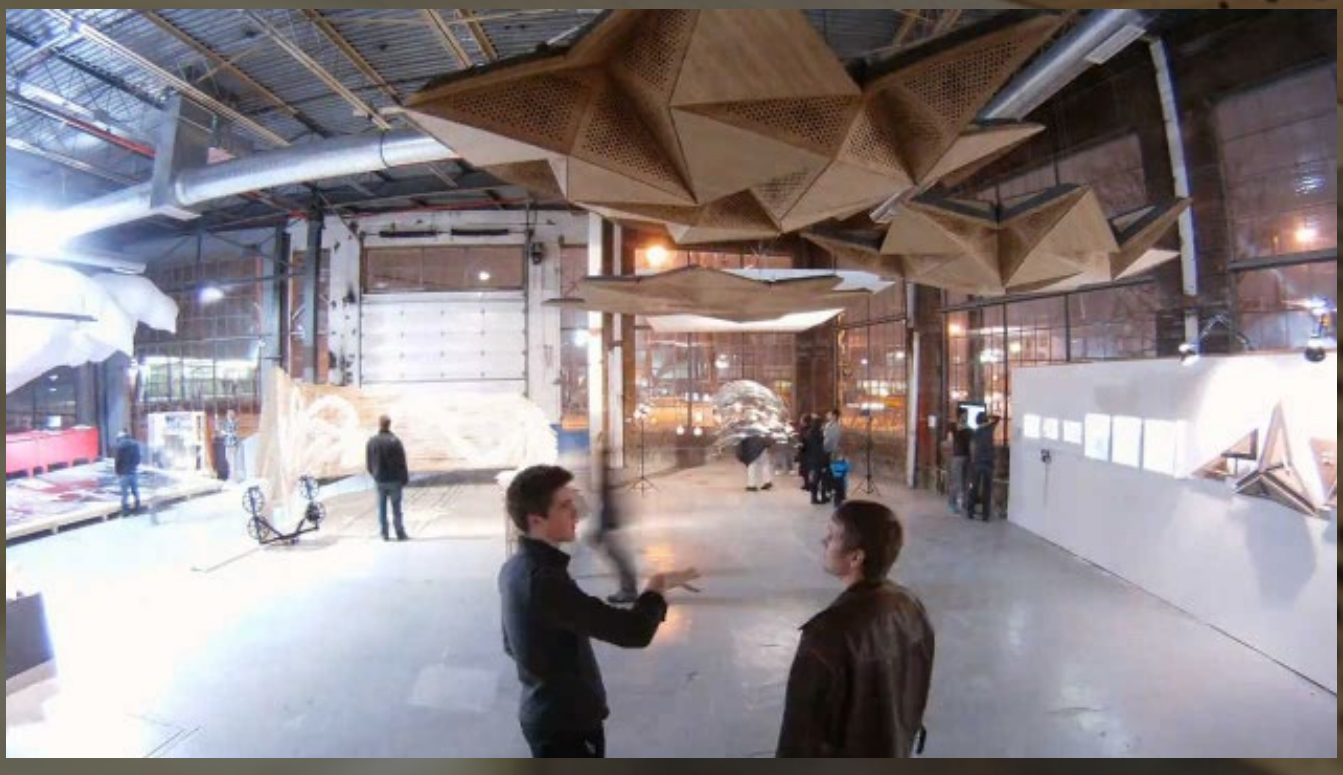


ACHIM MENGES & STEFFEN REICHERT

HYGROSCOPE: METEOROSENSITIVE MORPHOLOGY

This wooden model, suspended within a glass case, explores the principles of responsive architecture. When the humidity level within the case rises, the system reacts by ventialting the air without any equipment or electricity.

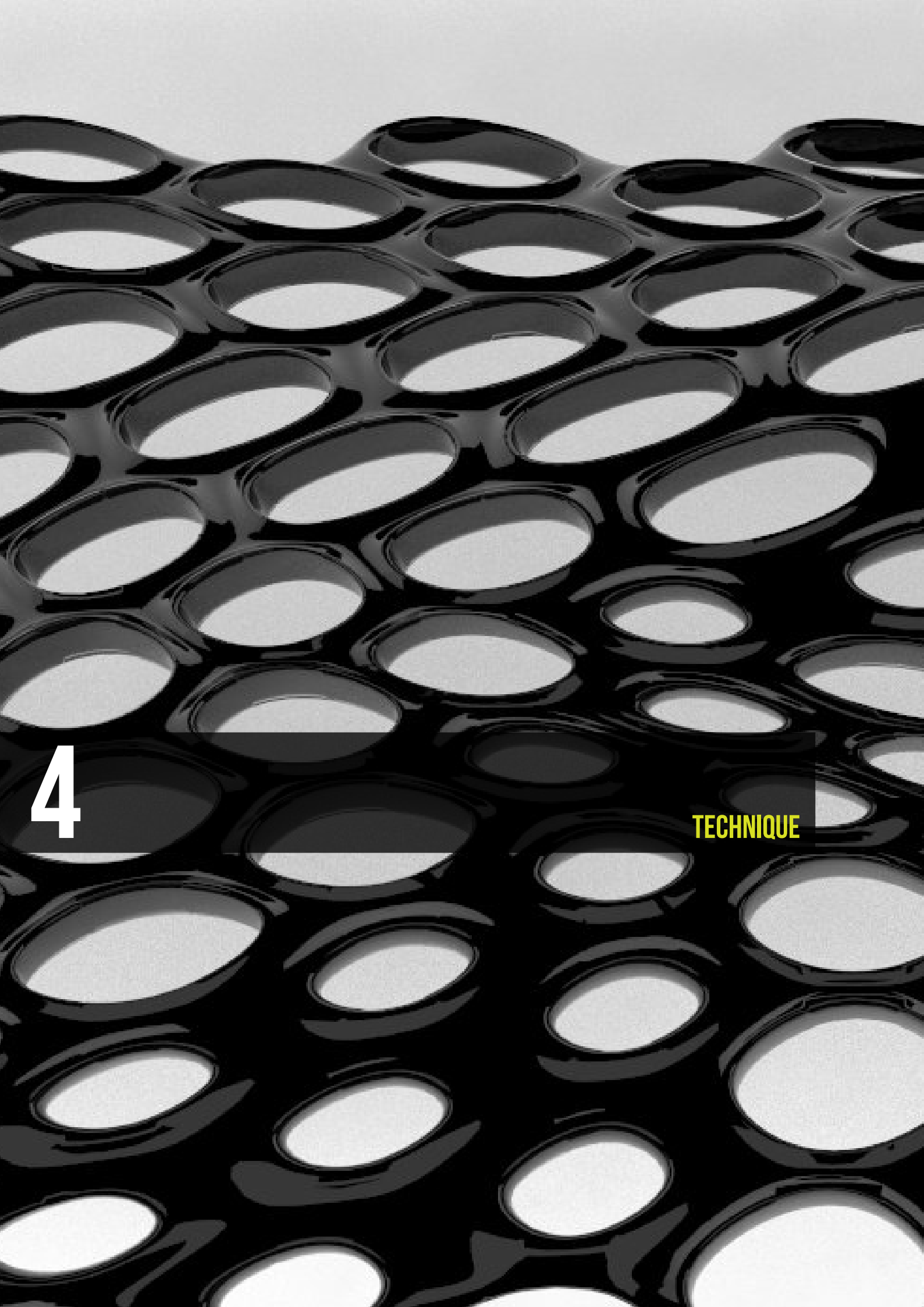
3 PRECEDENTS



RVTR

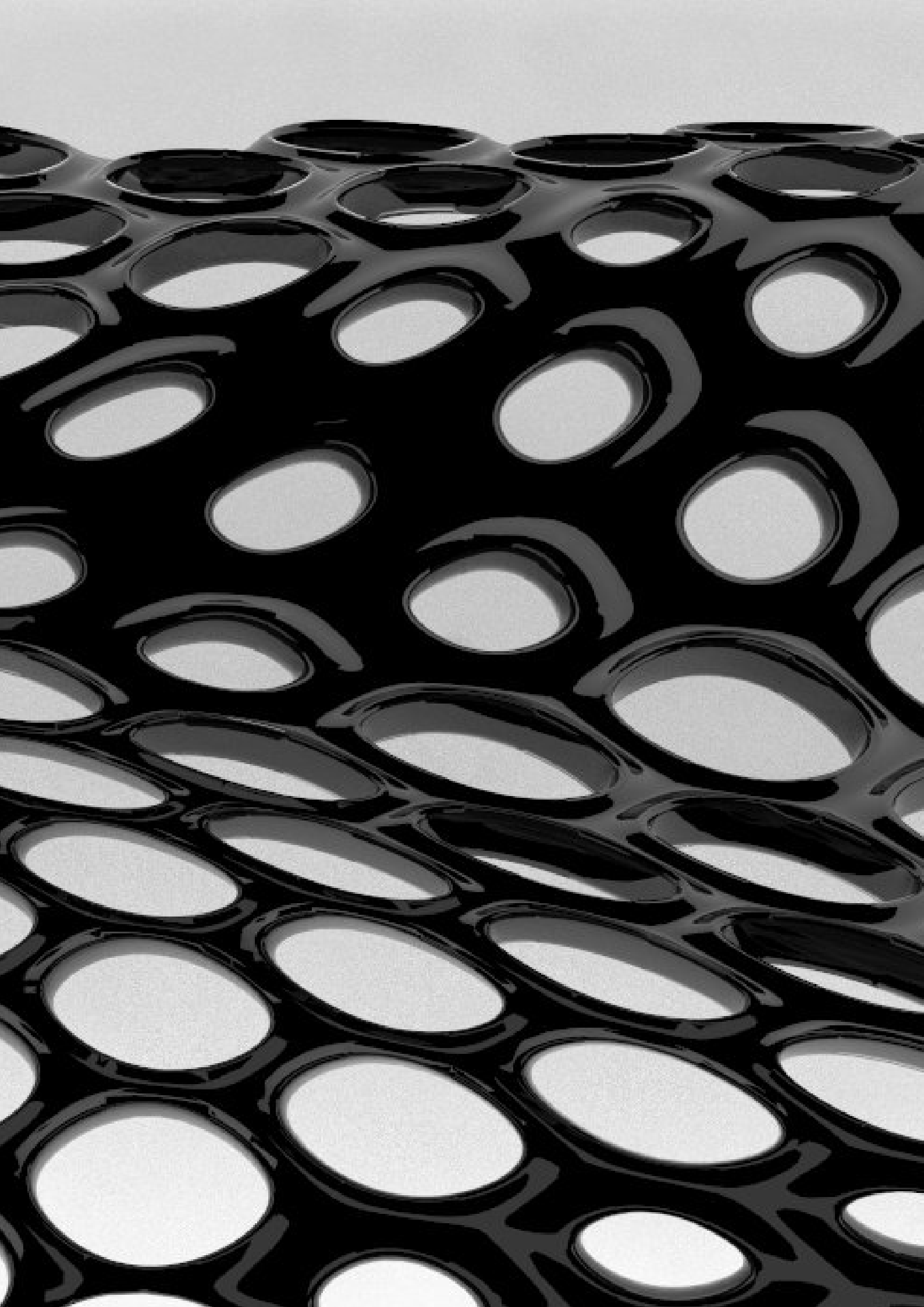
RESONANT CHAMBER

This is an interior envelope system that deploys the principles of rigid origami to transform the acoustic environment through dynamic spatial, material and electro-acoustic technologies

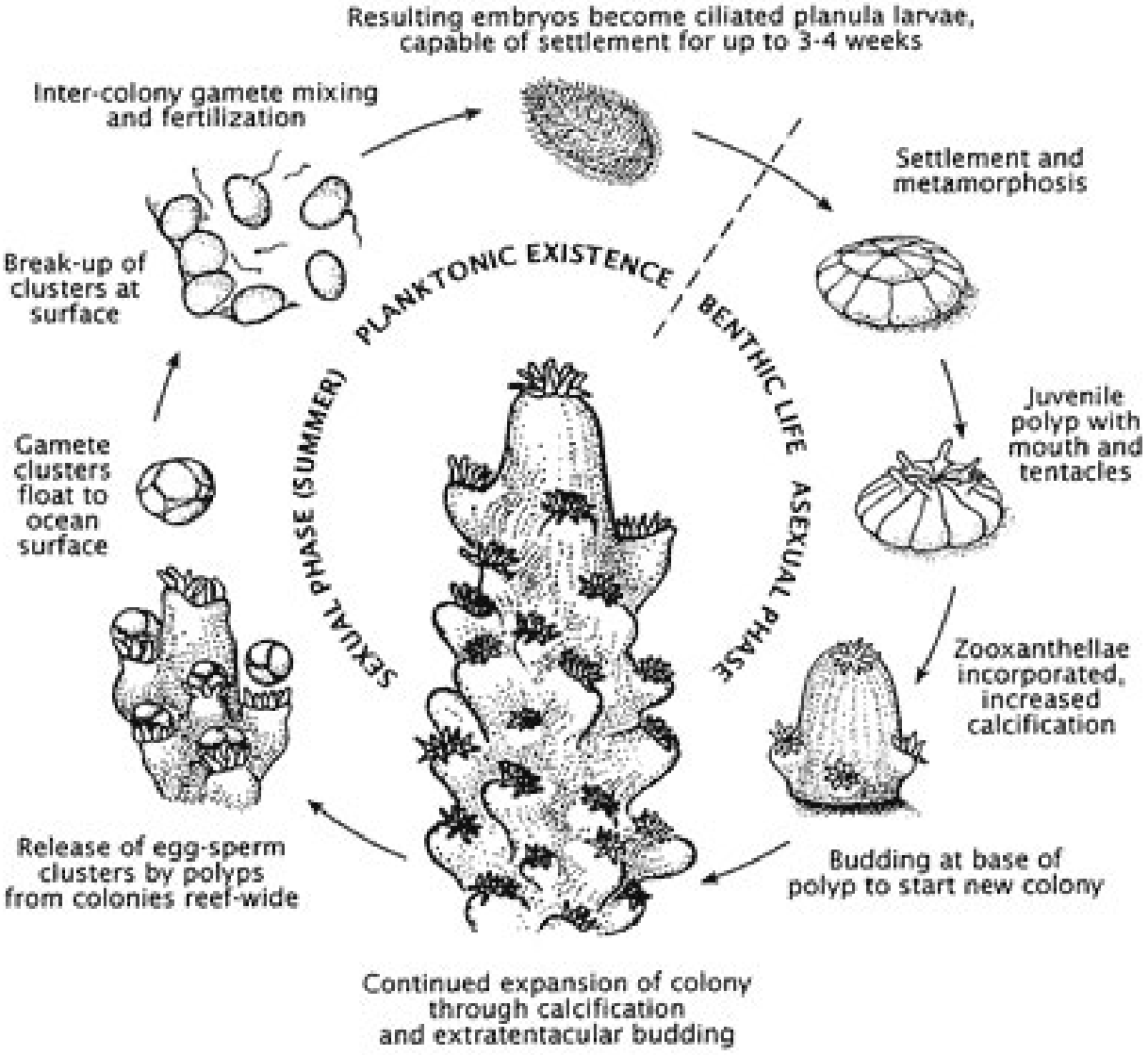


4

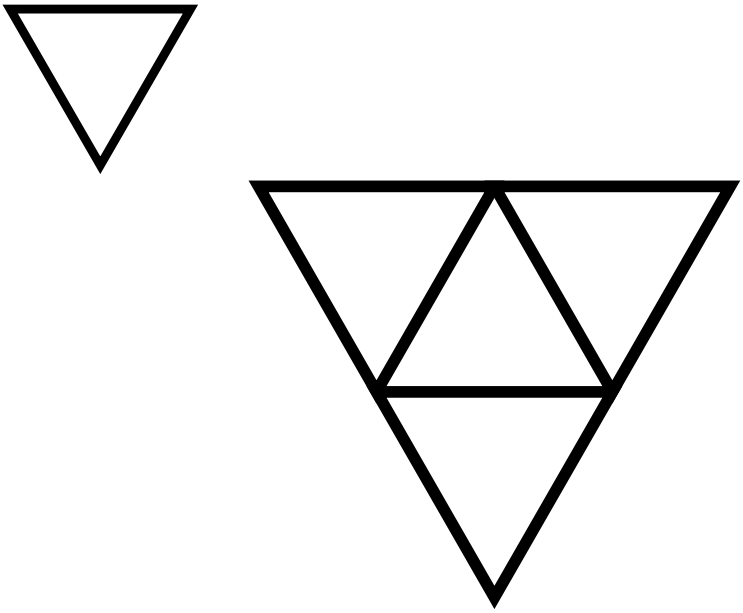
TECHNIQUE

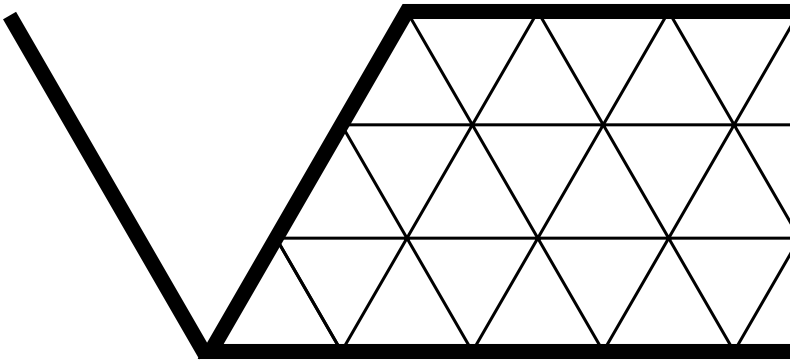


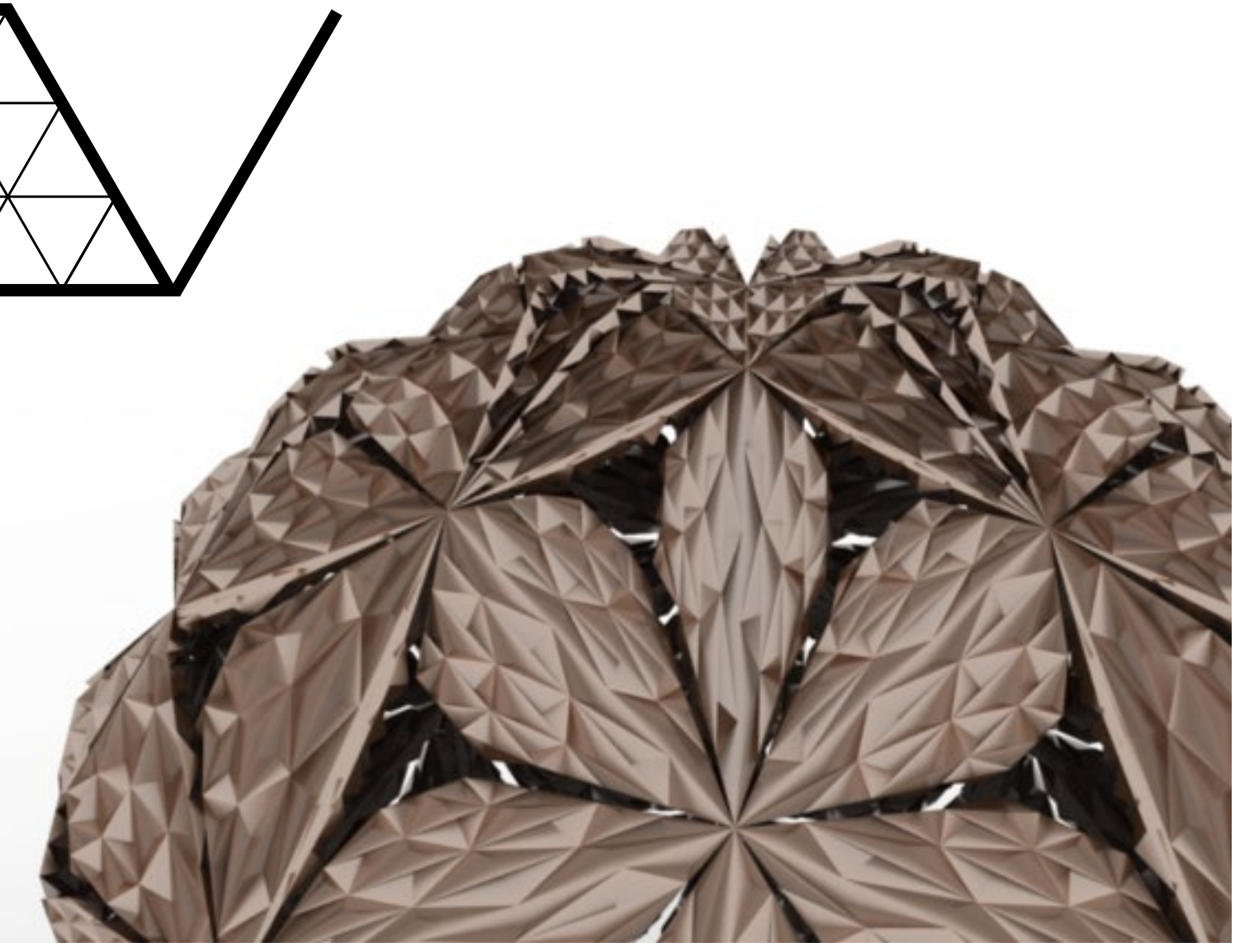
4 CORAL POLYPS


Resulting embryos become ciliated planula larvae, capable of settlement for up to 3-4 weeks
Inter-colony gamete mixing and fertilization
Settlement and metamorphosis
Break-up of clusters at surface
PLANKTONIC EXISTENCE
BENTHIC LIFE
Juvenile polyp with mouth and tentacles
Gamete clusters float to ocean surface
SEXUAL PHASE (SUMMER)
ASEXUAL PHASE
Zooxanthellae incorporated, increased calcification
Release of egg-sperm clusters by polyps from colonies reef-wide
Budding at base of polyp to start new colony
Continued expansion of colony through calcification and extratentacular budding

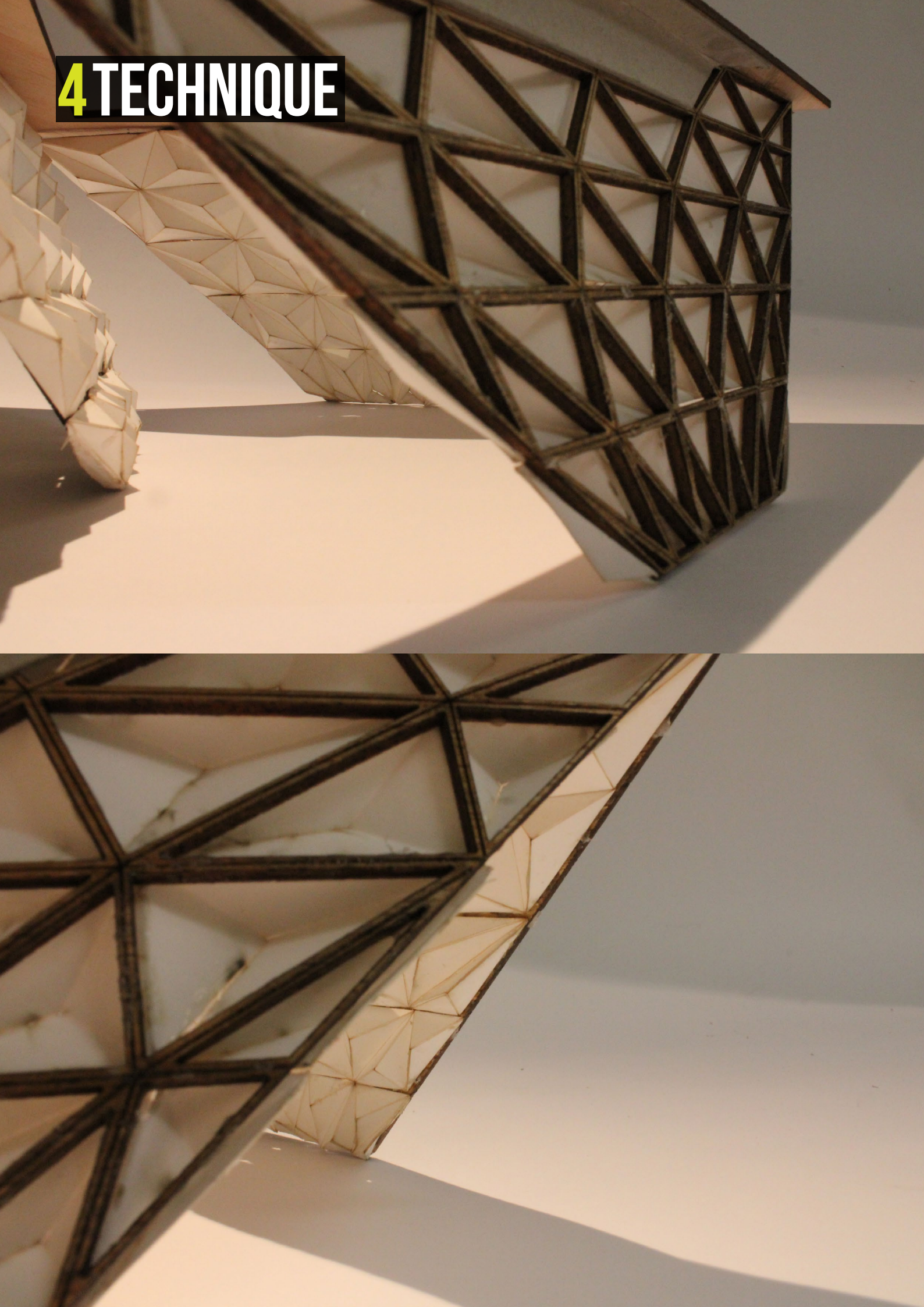
4 TECHNIQUE

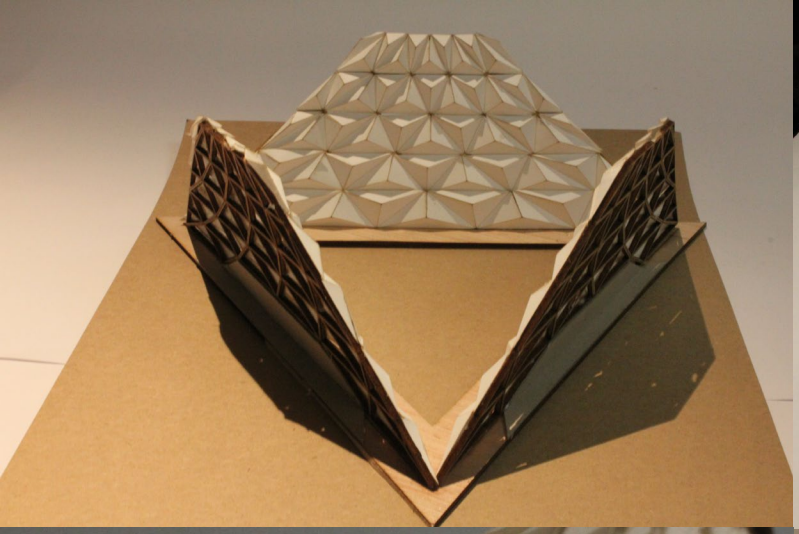
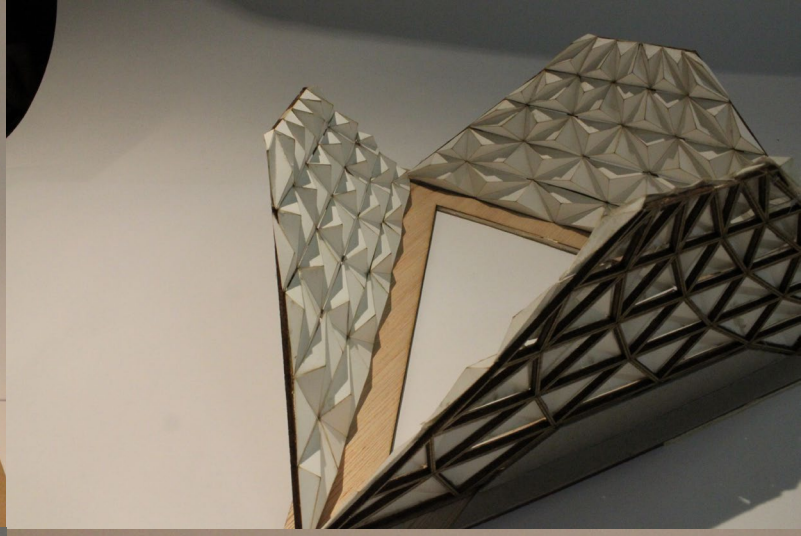
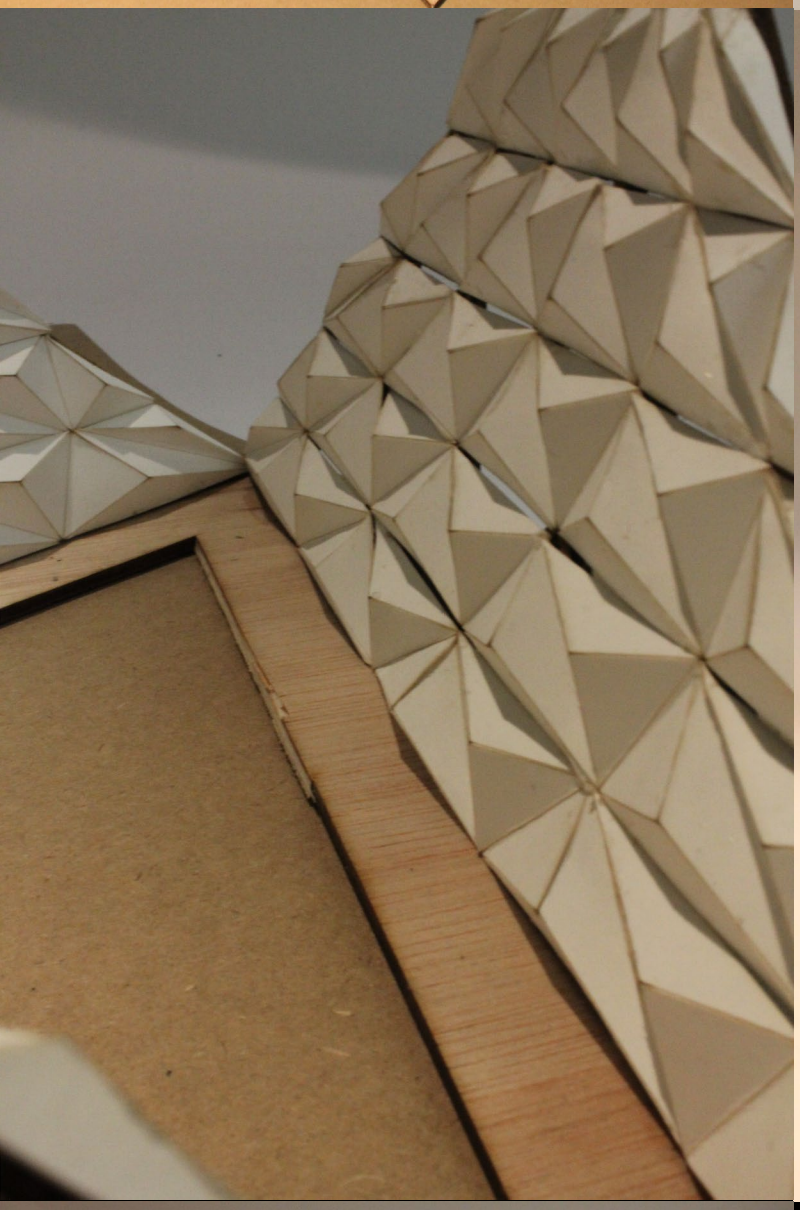


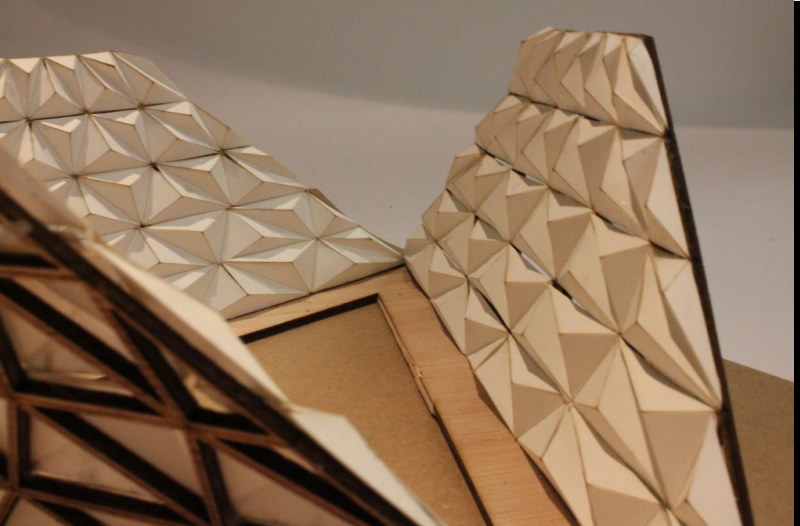




4 TECHNIQUE





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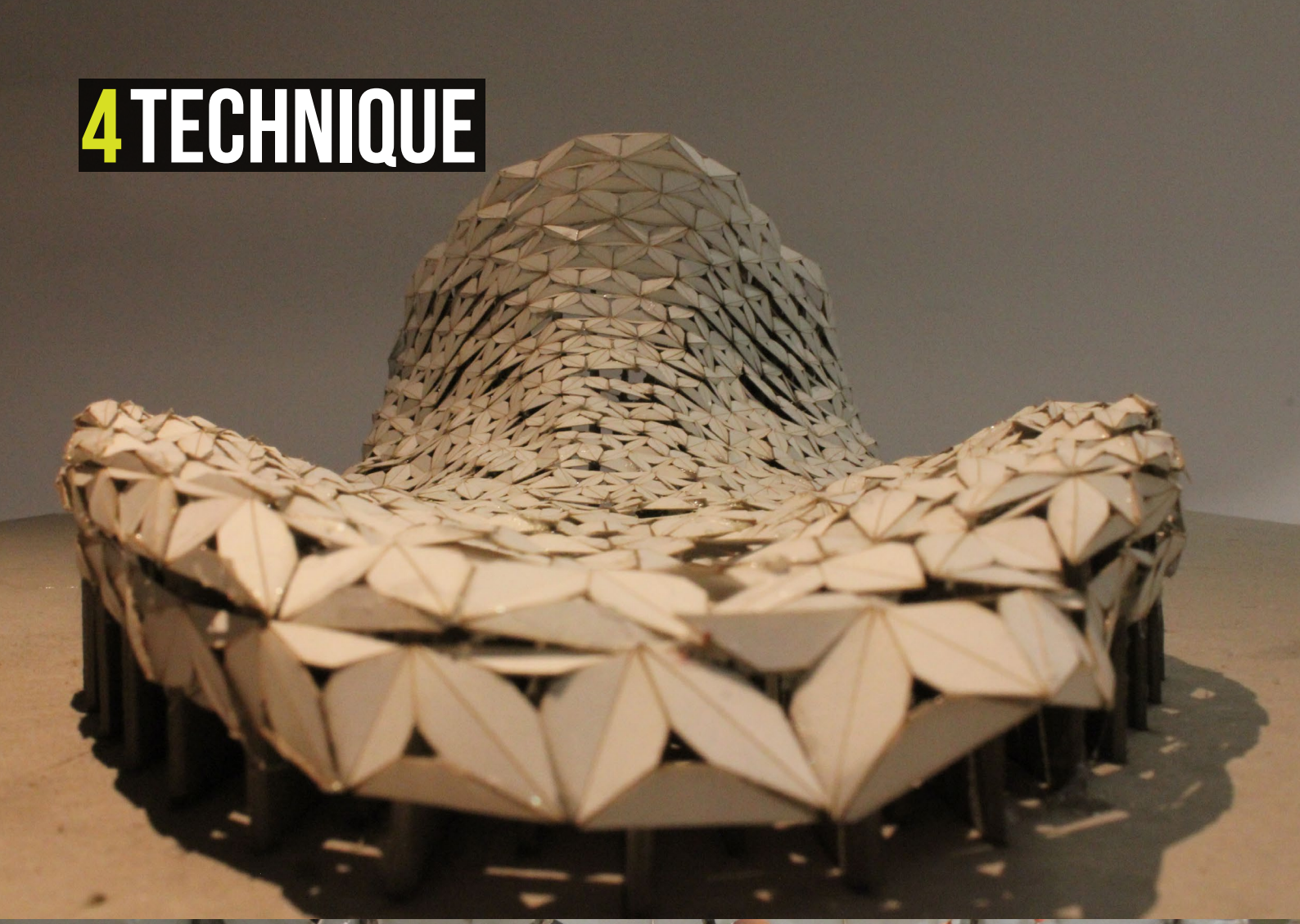
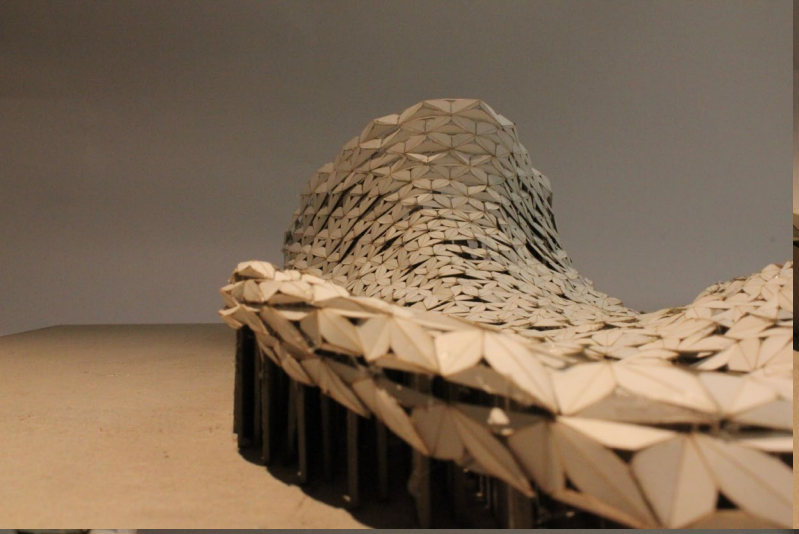
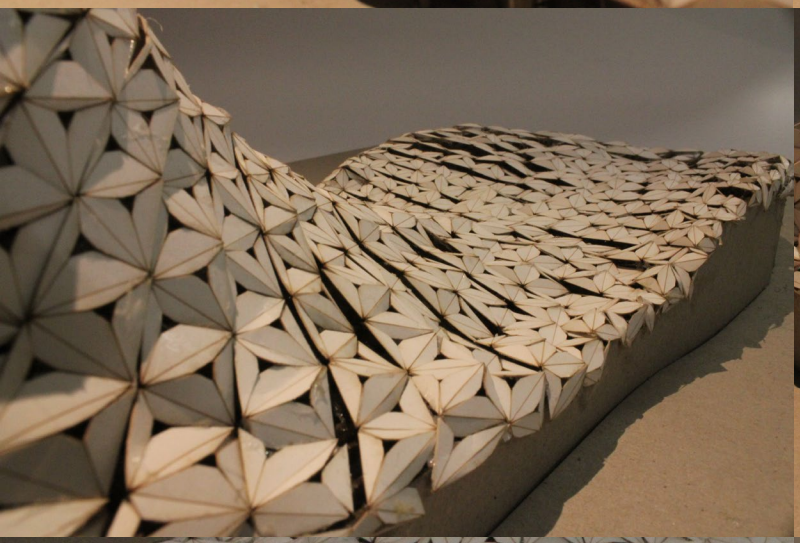
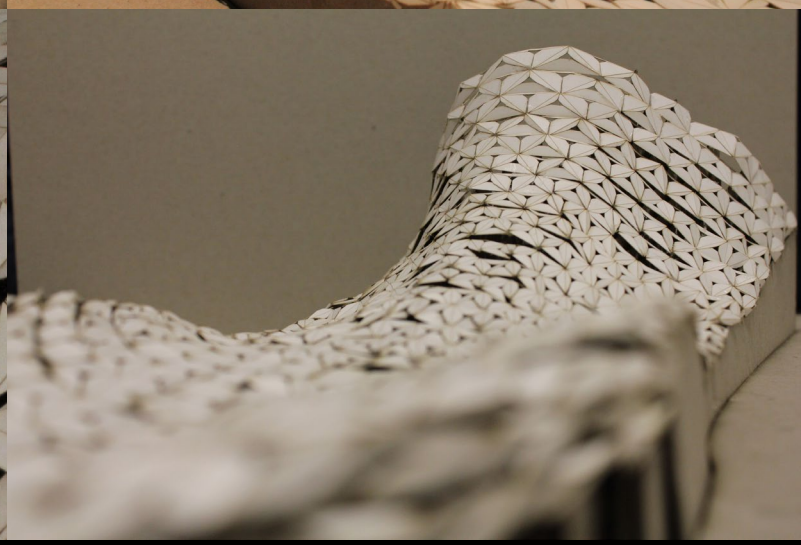
4 TECHNIQUE







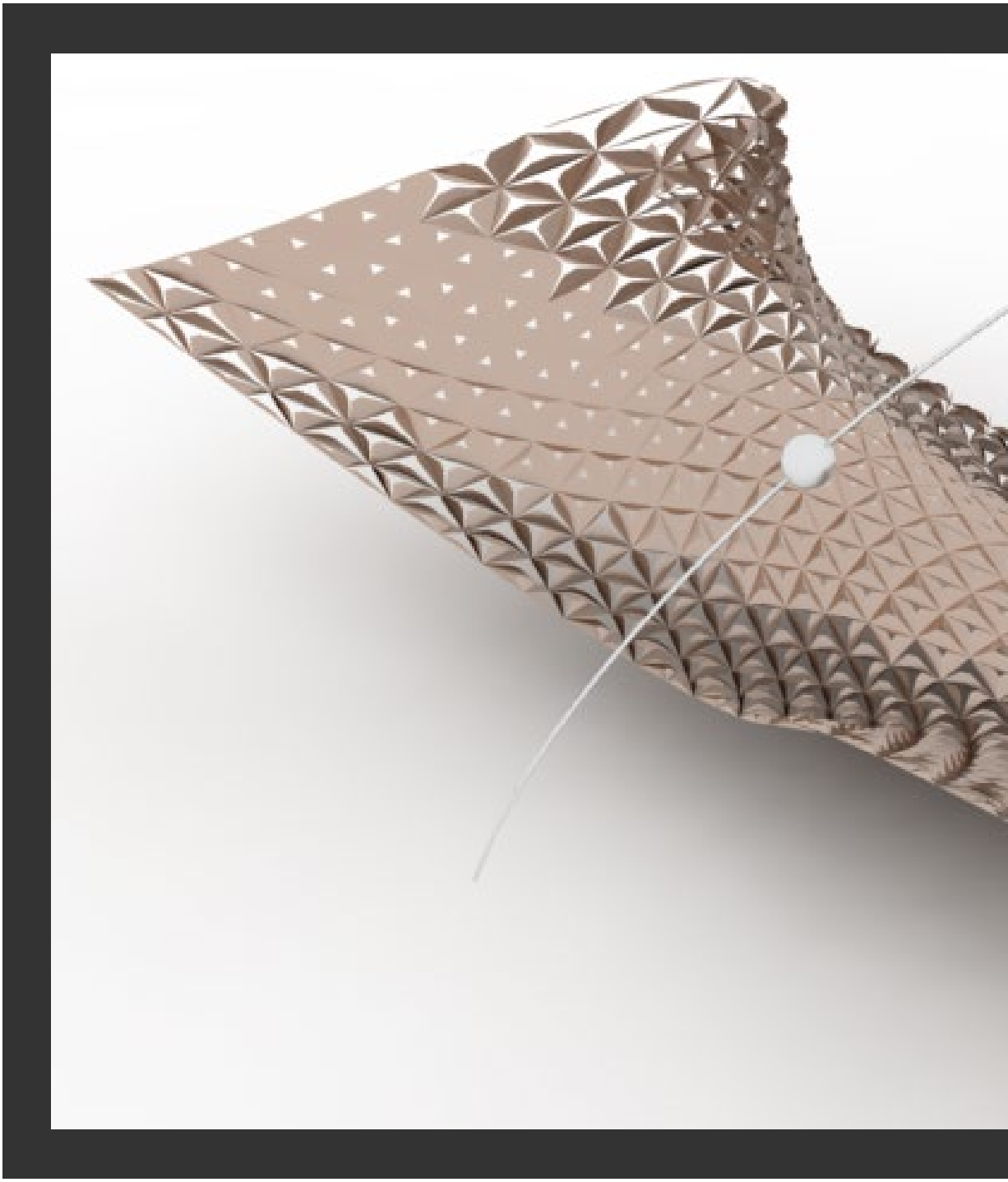



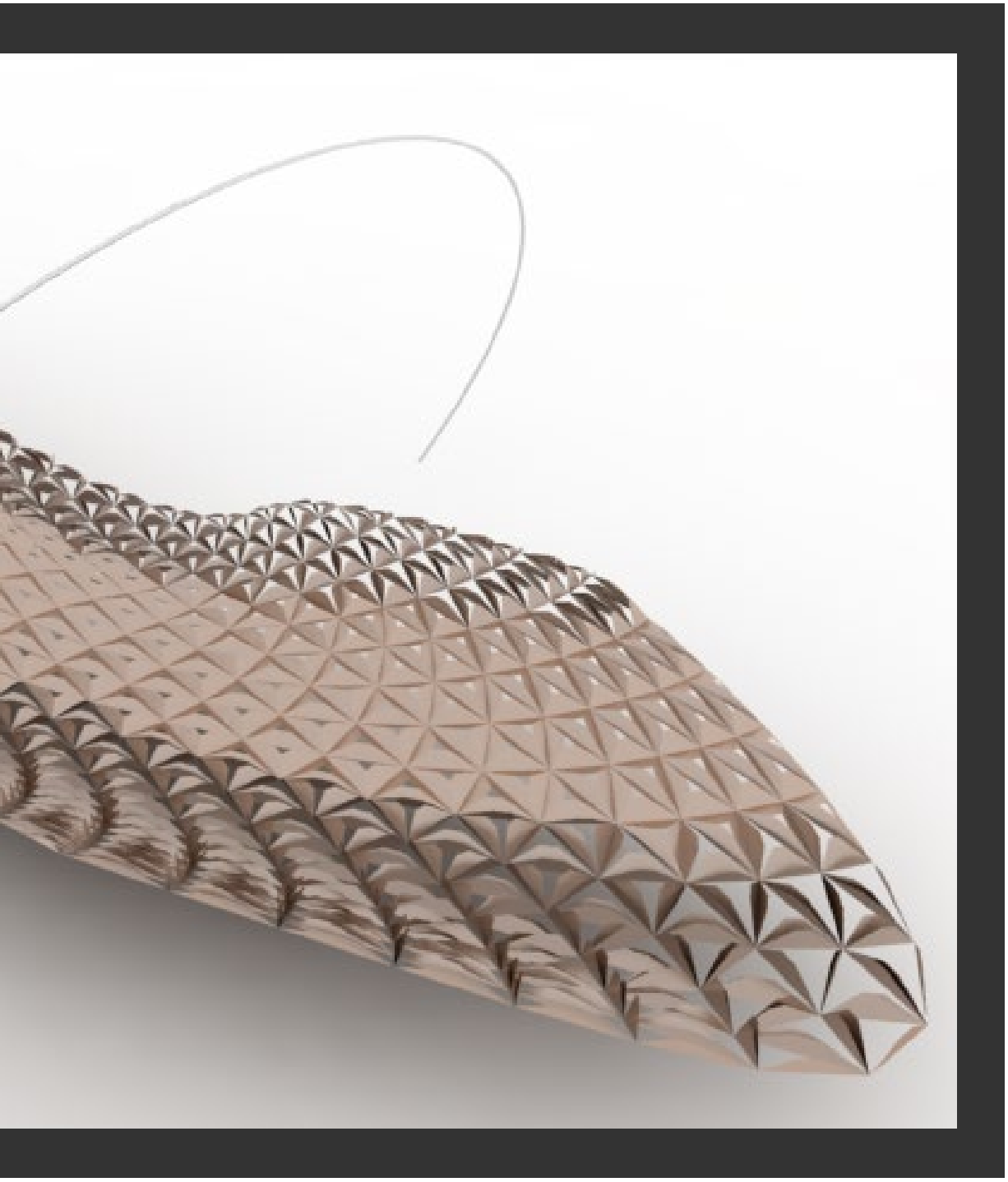
BIOMIMICRY

5

APPLICATION

5 SUN PATH SURFACE





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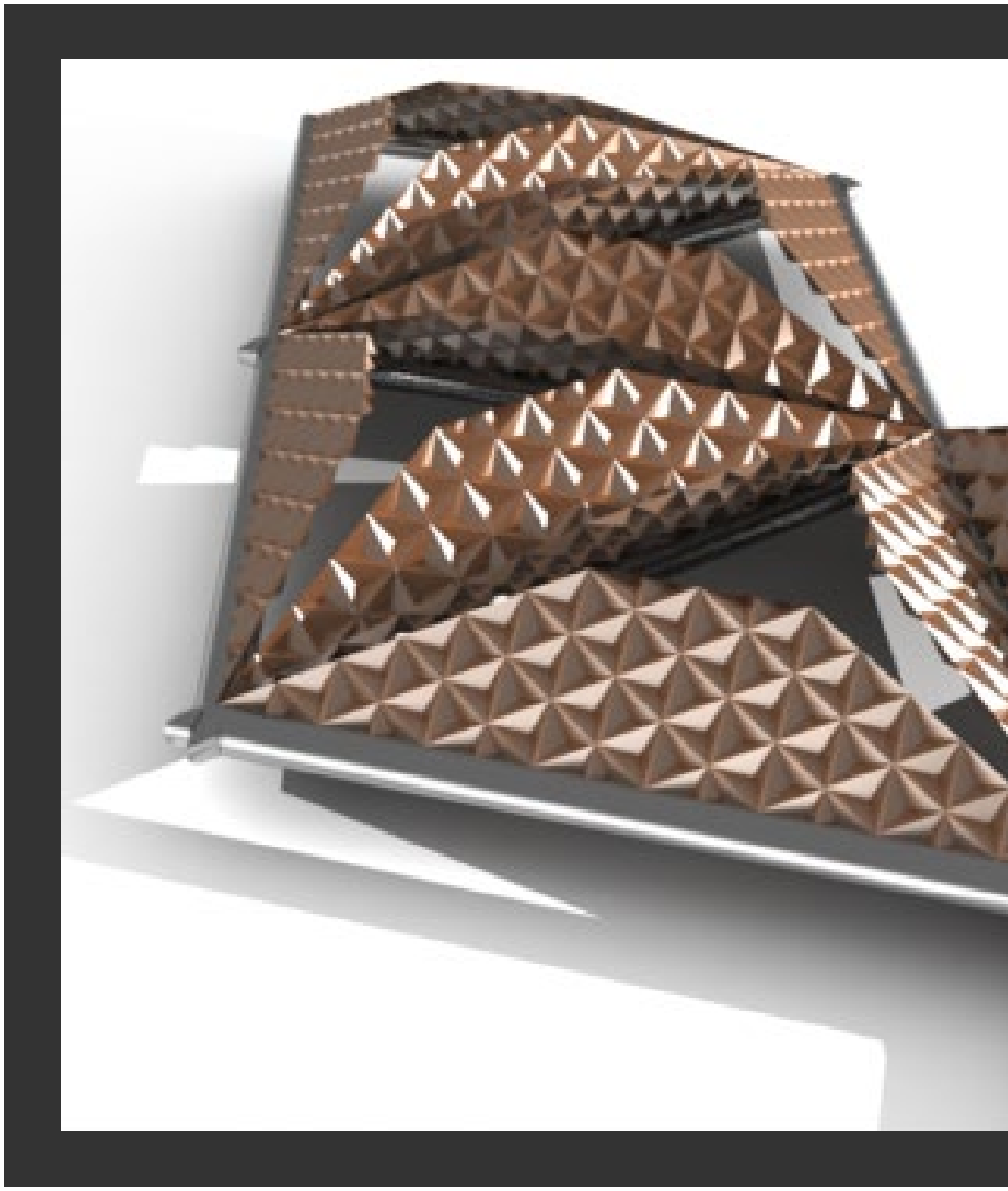

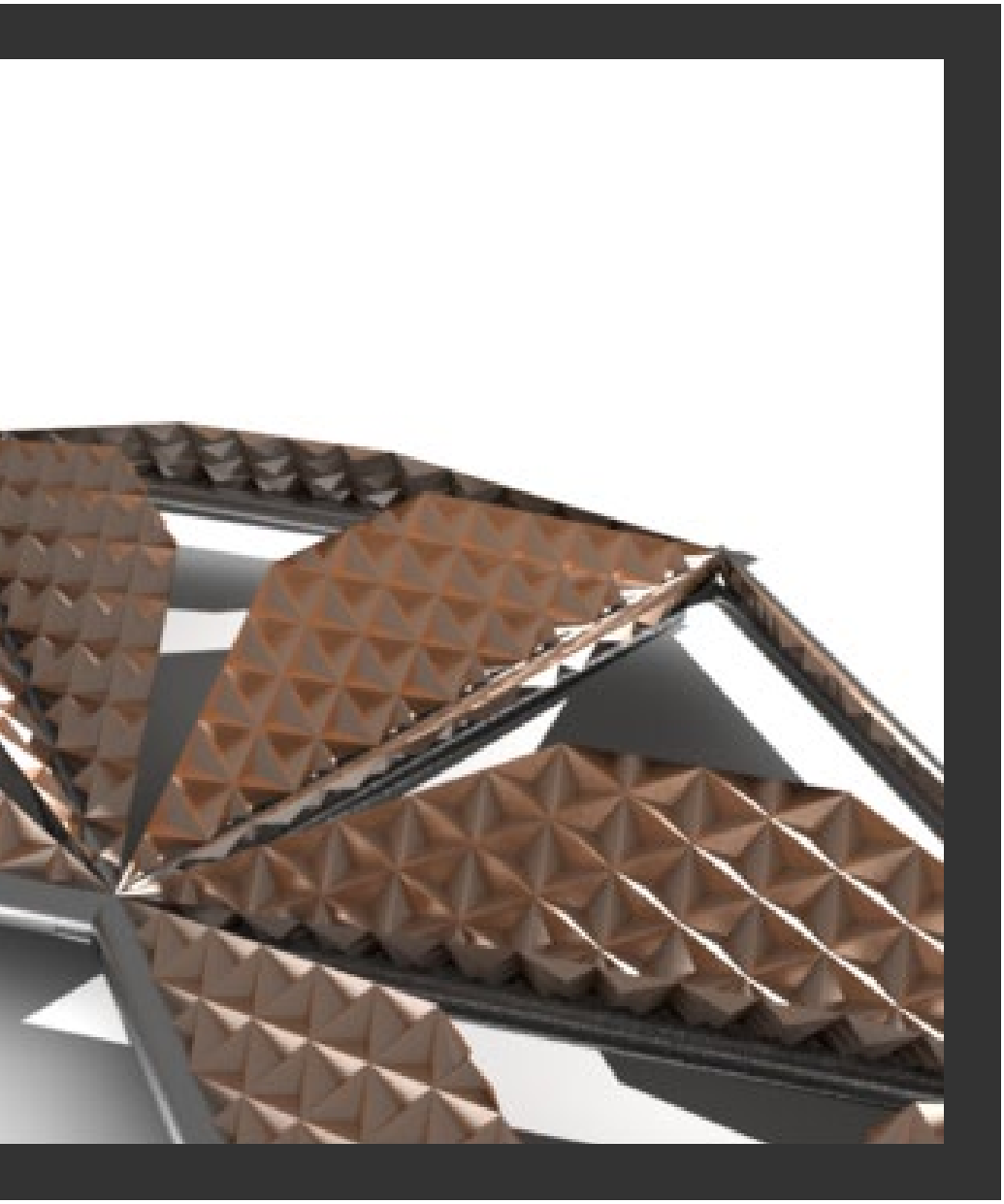

5 ADAPTABILITY

REFERENCE LIST

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