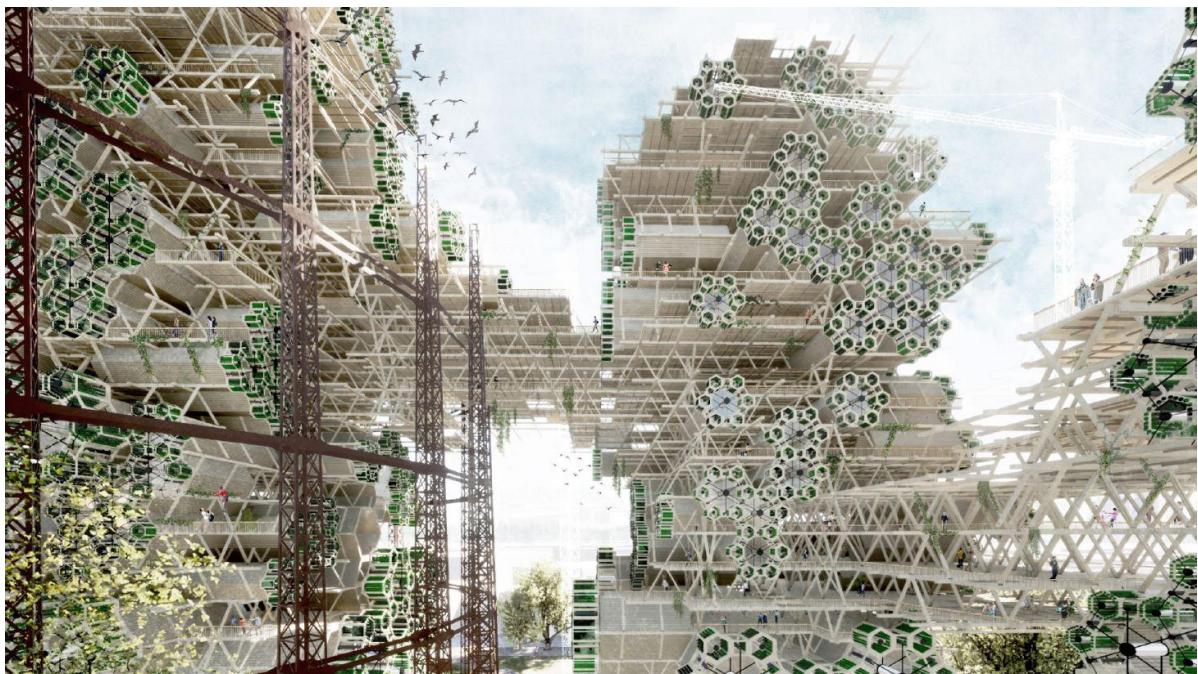


ECO-PARAMETRIC ARCHITECTURE

Tutors: Toby Burgess and Arthur Mamou-Mani



Zainab Kahn, *The Spirulina Bank*

DS10: Sustainability first. DS10 looks for novel solutions to sustainability issues in all its forms. We value digital exploration on the threshold between structure and ornament, coupled with thorough material testing and are interested in realistic and efficient buildings that contribute to a more sustainable society.

Brief 01: 3D Lattices/ Urban Crystallography & Self-Sufficient Bio-Machines

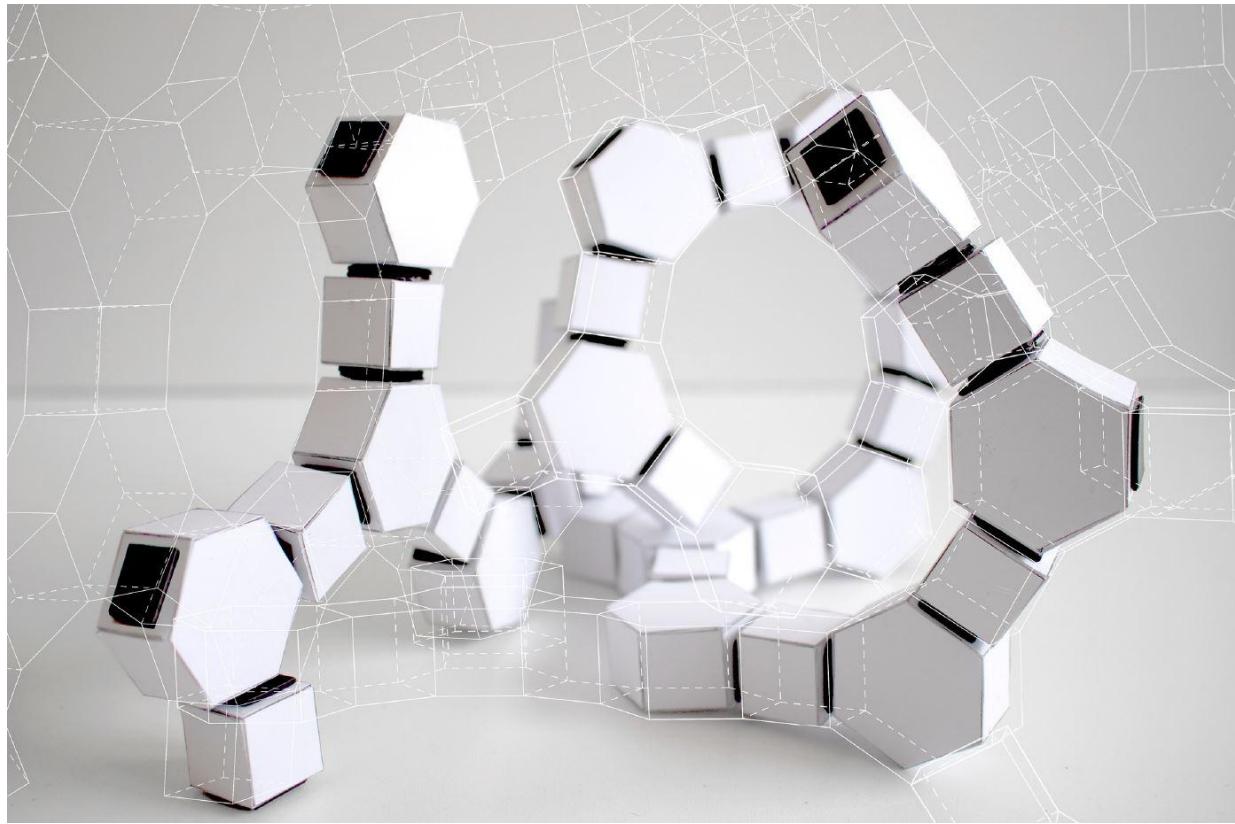
At the start of the year, coupled with Grasshopper training we will be looking at lattices as a granular spatial organising principle. From molecular systems to quasi-crystals, nature organizes itself through space efficient, resilient and complex arrangements. We would like to start the year with a study of all these three-dimensional systems as an exercise to understand the many ways structures can be arranged in space. Using timber struts and nodes, or surfaces and hinges, whether defining space packing volumes or porous three dimensional grid shells, the modularity of the systems allows us to work at all scales. However for the first brief we expect you to **design and build a self-sufficient small scale bio-machine** interacting with the given sites. Like a tree absorbing carbon whilst creating timber and fruits, your architectural system will be a blend of technology and nature in the urban context.

Brief 02: Eco-Parametric Urban Infrastructures to combat climate change

Nature does not make waste, everything is reused and feeds back into the system. DS10 will learn from this by applying the principles of permaculture, regenerative agriculture and renewable energy generation to propose Eco-Parametric Urban Infrastructures. You will design and test large scale infrastructures tightly interwoven into and above the urban fabric of London's train tracks which immersively integrate nature into the city using your 3D lattices as a reference. **We are seeking new architectural ideas which address energy needs in the age of the circular economy.** Your mixed use infrastructure will create energy and deal with its waste to close the loop whilst helping people live better and healthier lives and create an economy in the process. Proposals may include self sufficient communities and economies, cradle to cradle business ideas, inhabited bridges forging connections between different sides of the tracks and structures which actively contribute to the area such as carbon capture devices, solar collectors, pollution scrubbers etc.

Site: The underused spaces over the existing railway tracks of central London will form the foundations for exciting large scale mixed use structures, creating new connections and a new hyper dense and hyper sustainable urban fabric.

Output: Rather than a traditional paper portfolio we will focus on digital representation techniques such as animations, high quality digital renders which explain the process of your work. You will become a member of the WeWantToLearn.net community (1.7 million viewers) sharing your research and studio submissions to inspire and contribute to the wider design community. Blog posts will form part of your portfolio submission.



Zainab Kahn, *The Spirulina Bank*

INITIAL COMPONENTS:

- 01 timber = compressive elements
- 02 steel cables or chains-tensile elements
- 03 rope strings = tensile elements
- 04 connection detail to be composed of steel ring

ADDITIONAL COMPONENTS

- 05 trees and hedges using the wall as a substrate to grow on (green wall)
- or creeper plants using the structure as support: e.g. Ivy, Wisteria, Honeysuckle, jasmin, etc.
- Espalier fruit tree technique

How will I solve access? How will I achieve a waterproof structure? How will I achieve wall thickness? How will I ensure fire safety? Foundations? How are windows going to work in combination woven wall?

Nikola Wolkova, *Rewilding Tensegrity*