Engage4BIO

Cyanobacteria

The Project

Cyanobacteria-powered 3D printing for carbon-efficient construction

- Responds to the 40% GHG emissions from the global AEC (Architecture, Engineering, Construction) sector
- Replaces high-emission cement processes with cyanobacteria-driven biomineralization
- Utilizes $CaCO_3$ formation and soil stabilization via photosynthesis
- Fixes atmospheric CO_2 actively, making the process carbon-negative
- Integrates biological cement into additive manufacturing workflows
- Uses sand-based mixtures and robotic 3D printing
- Optimizes porosity and light penetration to promote cyanobacterial photosynthesis
- Links computer-aided design with bio-processes for scalable, eco-efficient construction
- Bridges architecture, microbiology, and digital fabrication
- Contributes to a regenerative and sustainable built environment

Team – Perla Armaly-Bathish & Yuval Berger

- Researchers in living building materials and bio-based construction
- Specialize in CO_2 fixation and biomineralization using cyanobacteria and microalgae
- Develop biologically informed 3D printed components for carbon reduction
- Work at Technion – Israel Institute of Technology
- Research conducted at:
    - Disrupt.Design Lab (Faculty of Architecture and Town Planning)
    - Lab of Applied Genomics & Food Microbiology (Faculty of Biotechnology and Food Engineering)
- Supervised by Asst. Prof. Shany Barath, Prof. Yechezkel Kashi, and Dr. Lubov Iliassafov
- Interdisciplinary approach merging architecture, biology, and robotics

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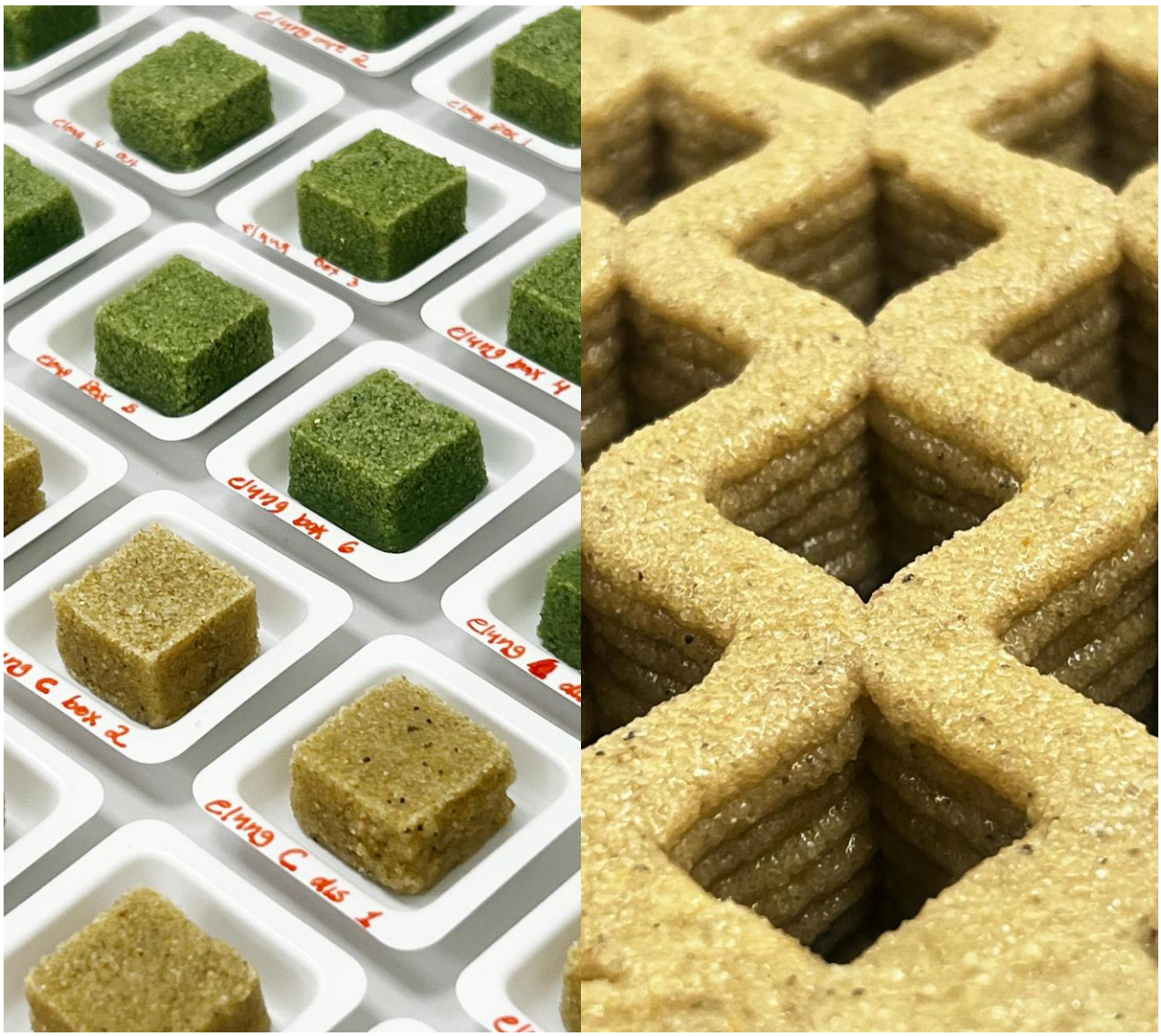

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> “Multi-stakeholder engagement to strengthen regional bioeconomy value-chains”

Consortium :

ZSI

WAGENINGEN UNIVERSITY & RESEARCH

APRE Agenzia per la Promozione della Ricerca Europea

bay Bay Zoltán Nonprofit Ltd. for Applied Research

EAEA European Association for the Education of Adults

Moholy-Nagy művészeti egyetem university of art and design budapest

ArtEZ

CLIC

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Metropolia University of Applied Sciences

Panormitanae Studiorum Universitatis Siciliae

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www.engage4bio.eu

info@engage4bio.eu

@Engage4BIO