



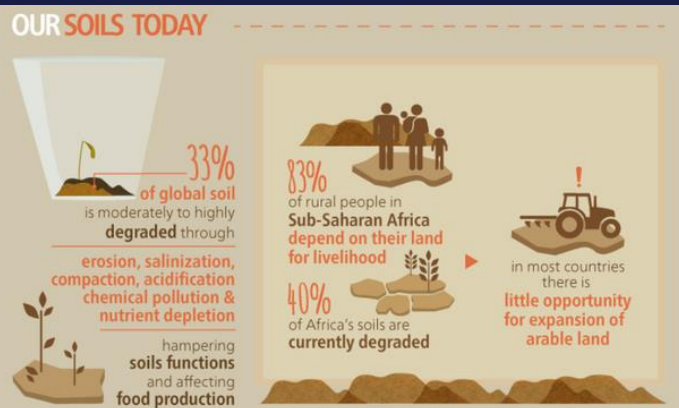
FOod REsilience Living Lab (**FORELL**): a proposed Soil-Food Living Lab linking soil health to food sustainability and climate adaptation.

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Nikos Tziolas

SPECTRA
LAB

WHY THE GLOBAL SOIL SHORTAGE THREATENS FOOD

SOILS ARE THREATENED



60-70% of soils in Europe are considered "unhealthy".

Healthy soil has amazing water-retention capacity

Every 1% increase in organic matter results in as much as

25,000

gal of available soil water per acre.

Source: USDA-NRCS



Functional soils play a key role in the supply of clean water and resilience to floods and droughts.

Soil is disappearing

Case study of Canada

Canada, Land Cover 2000



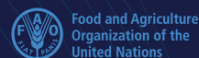
From 1972-2011 Canada lost 3.9 million hectares of farm land.



Soil erosion costs Canadians 3.1 billion annually.

Source: Soil Conservation Council of Canada (SCCC)

FOOD AVAILABILITY RELIES ON SOILS



Healthy soil is key to feeding

9



by 2050

Source: www.fao.org/soils-2015

SYSTEM-BASED APPROACHES



From Farm to Fork:
Our food, our health, our planet, our future

The European Green Deal

Moving towards a more healthy and sustainable EU food system, a corner stone of the European Green Deal



Make sure Europeans get healthy, affordable and sustainable food



Tackle climate change



Protect the environment and preserve biodiversity



Fair economic return in the food chain



Increase organic farming



Healthy Soils



Foundation of



Sustainable Food Production



Contributing to



Food & Nutrition Security



Unsustainable soil management

Climate change

Soil sealing

Salinization

Soil contamination

Acidification

Safe Nutrient rich Diversified Adequate Stable Resilient

Healthy Soils



Foundation of



Sustainable Food Production



Contributing to



Food & Nutrition Security



Soil moisture depletion

Soil erosion

Loss of organic matter

Soil compaction

Reduction of soil biodiversity

Nutrients depletion

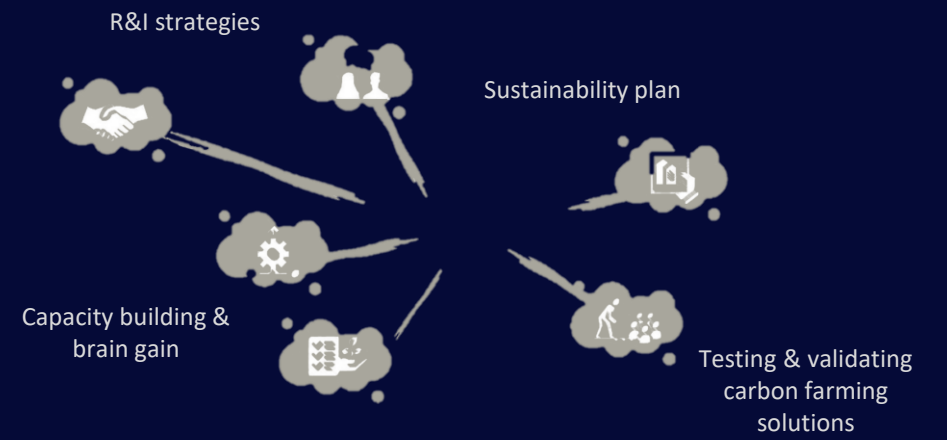
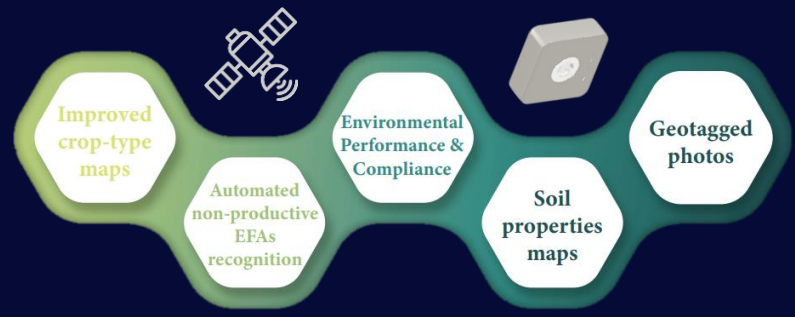
Soil Health monitoring



Co-development

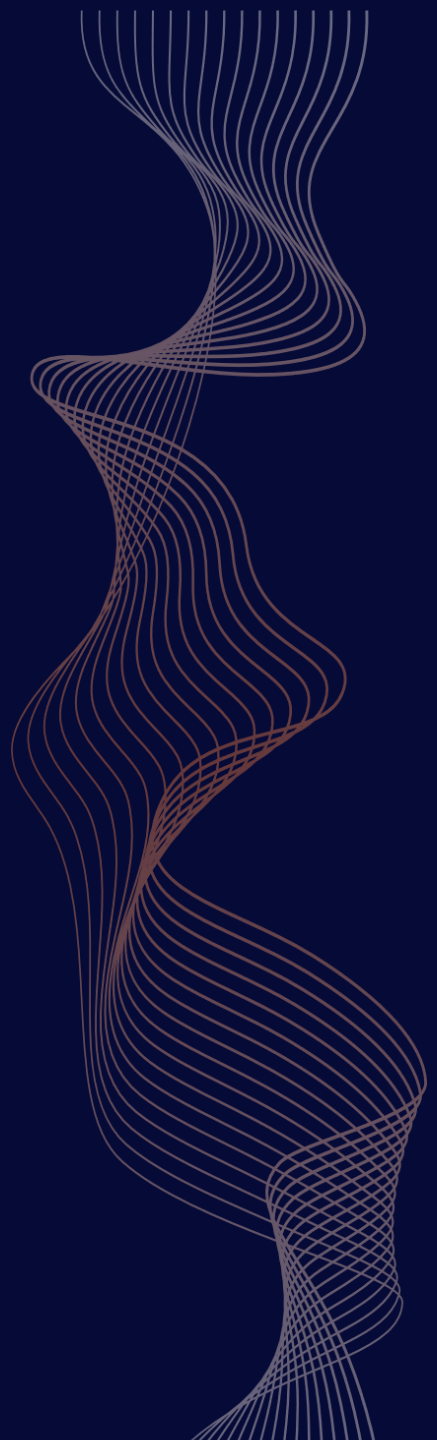
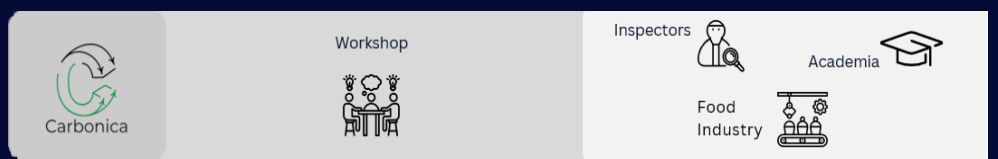
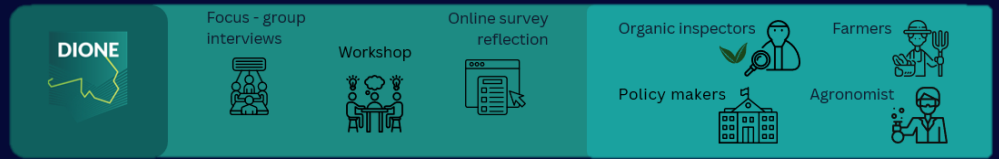
Co-development

Tools / Services



Co-approach actions

Co-approach actions



Food sustainability assessment

Toolbox

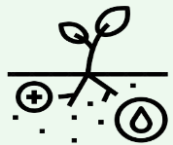
Spectroradiometers



Services



Purity index



Organic Farming compliance marker



Soil quality report

Prevent food fraud

Facilitate certification process



Monitoring performance of the organic and GI food supply chains

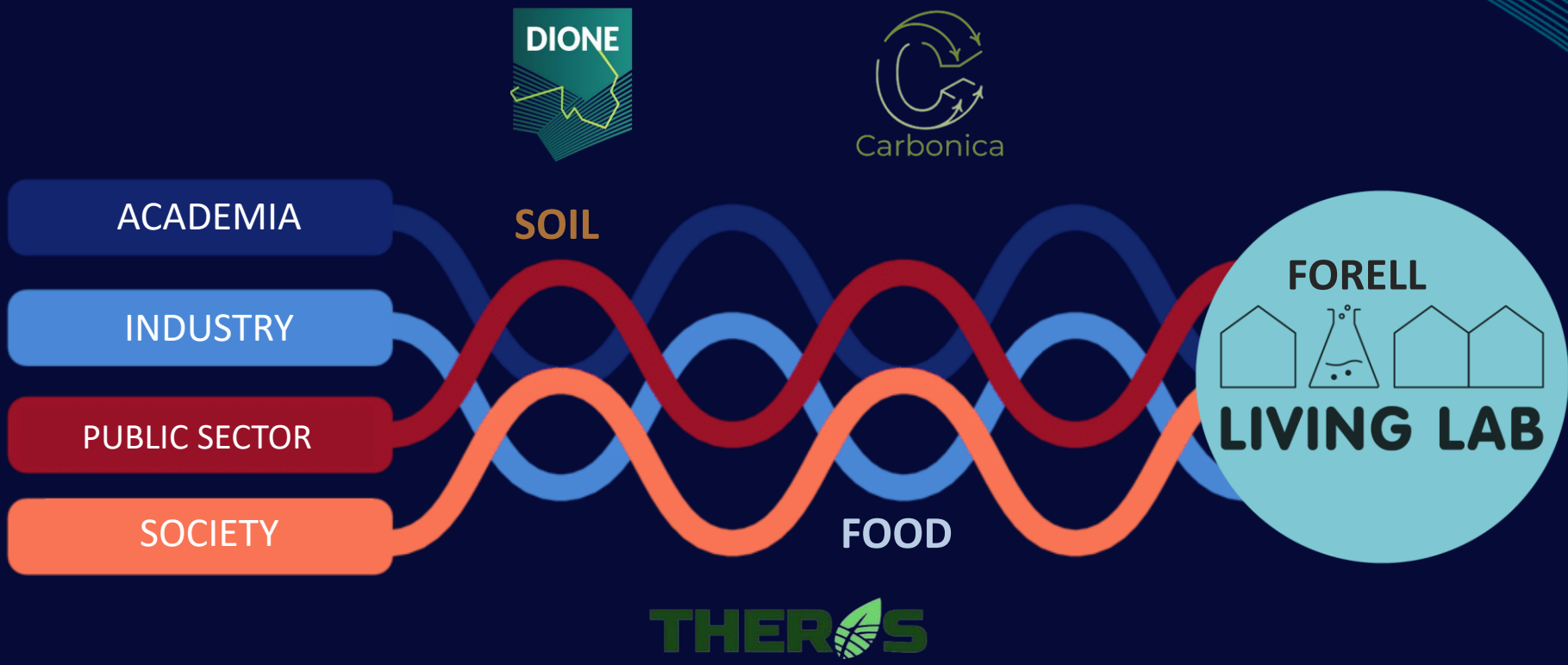
Increase transparency, traceability, trust and security in the organics and GIs supply chain



Sustainability of organic farming systems and ensure



Rapid and cost-effective verification of organic and GI food products





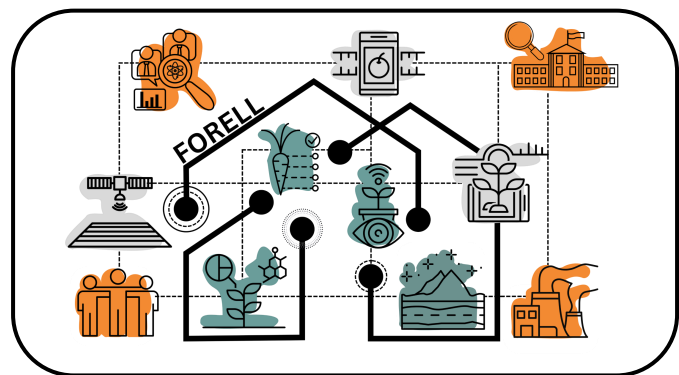
Integrated digital toolbox to modernize CAP area-based compliance checks & assessing environmental impact



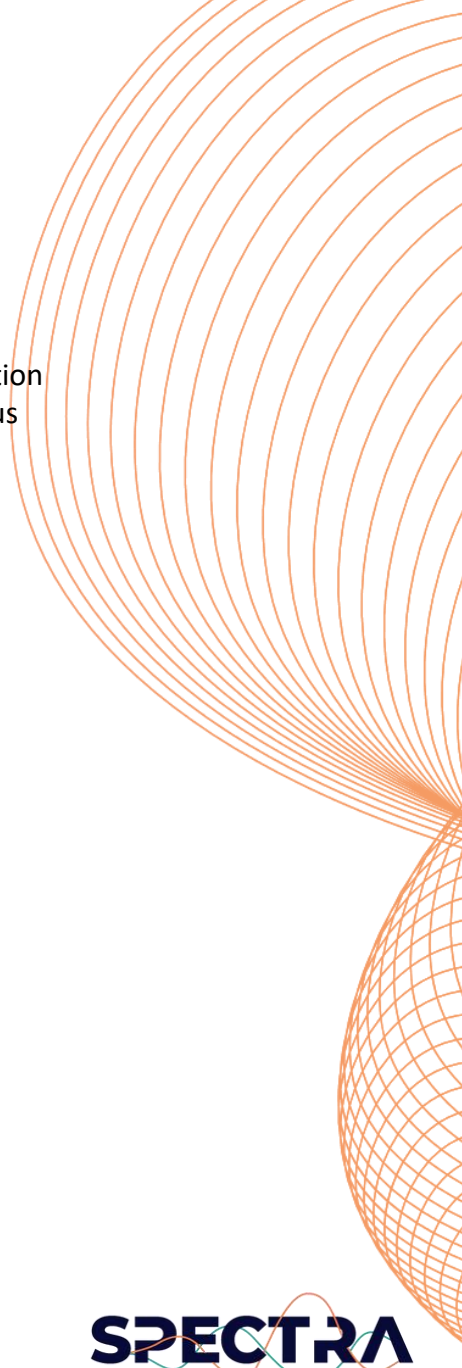
Excellence HUB connecting carbon farming innovation ecosystems of Greece, North Macedonia & Cyprus

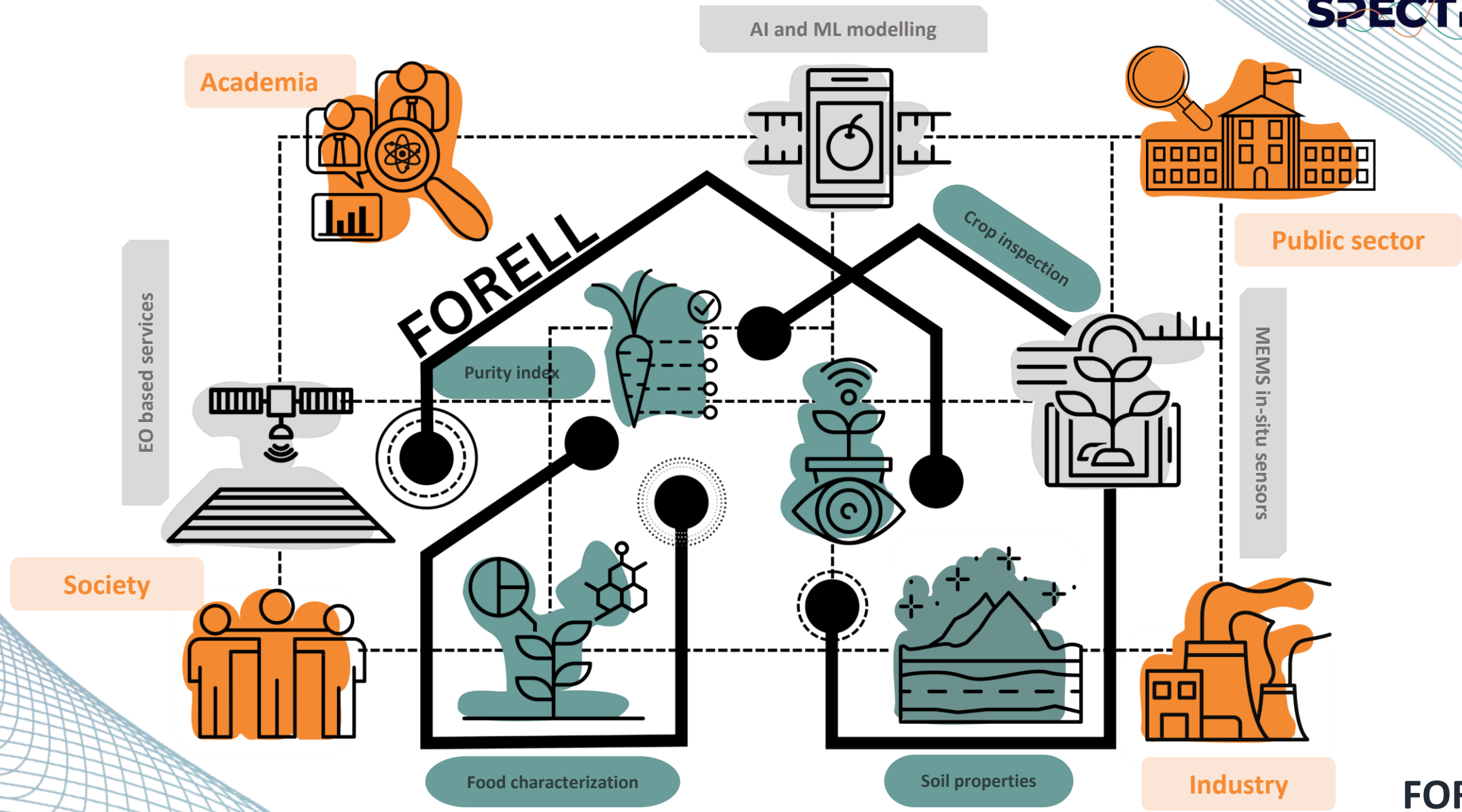


AI & photonics solutions for the detection of adulterations and non-compliances in organic & GI food supply chain



FORELL
A Proposed
Agroecosystem Living Lab





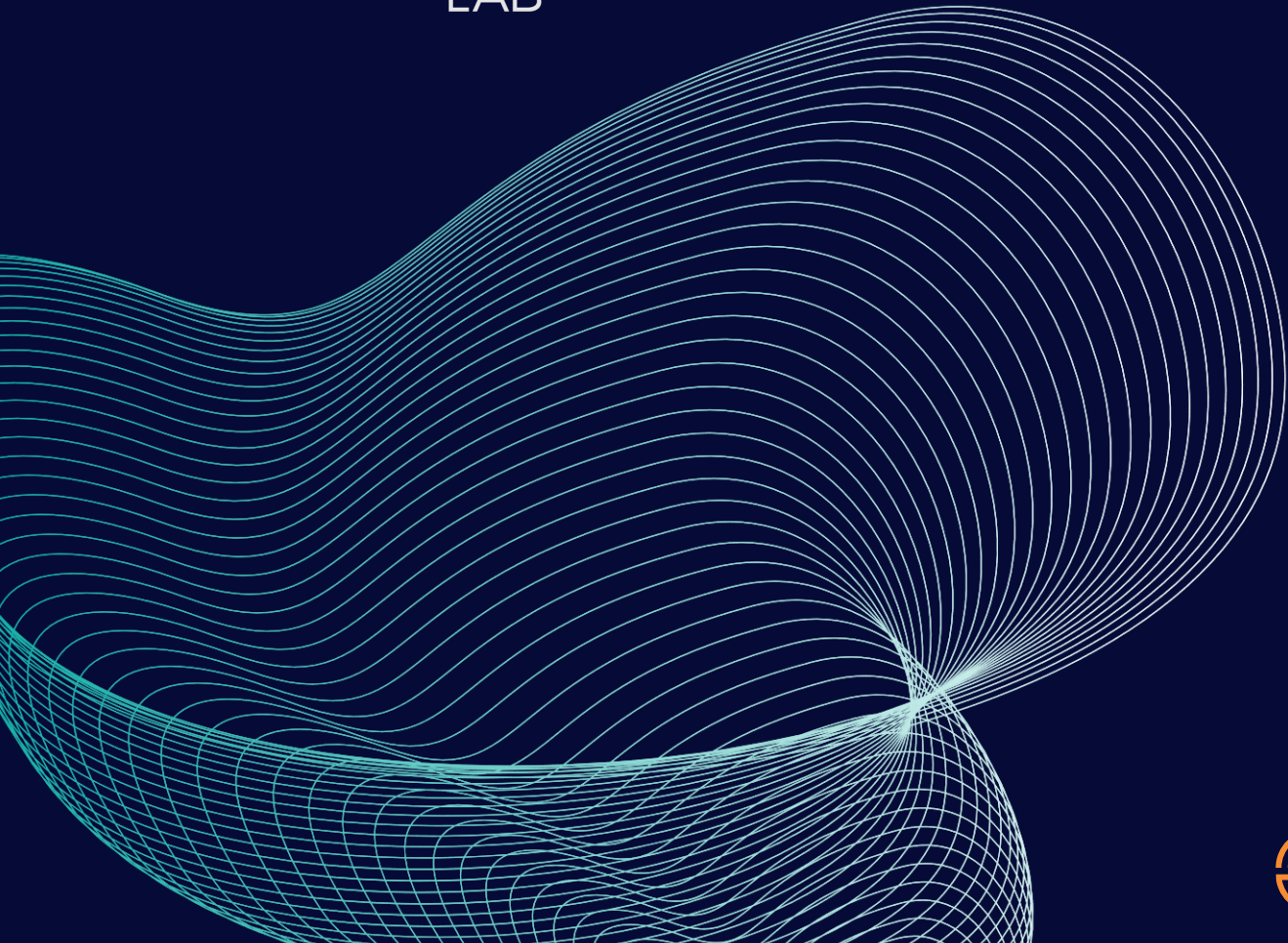
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 <https://spectralab.gr/>

 Spectra Lab, AUTH

 @spectralabgr



Thank you for your attention!

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