8PM

1AM in London (GMT), 10AM in Tokyo (GMT+9)

MINT Lab

Moderator: Todd N. Theriault, *Indiana University*

Panelists:

- Anna Loi, MINT Lab, University of Murcia

ENVISIONING INTELLIGENCES

Aurora Mititelu

Anna Loi

Anna Loi is a PhD candidate at the MINT Lab at the University of Murcia under Paco Calvo. She previously completed her Bachelor in International Forest Ecosystem Management at the Eberswalde University for Sustainable Development (HNEE) in Germany and a Master of Forestry at the Yale School of Environment (YSE) in the US, followed by several years of working in China at the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) in forest restoration and sustainable forest management projects all across Asia-Pacific. As such, she has a background in forestry and forest ecology she uses now to explore how theories of consciousness and intelligence relate beyond the individual to the community and group level in forests, especially in relation to phenomena, such as mycorrhizal networks, inosculation, clonality and forest ecology at large.

She is currently working under the MINT Lab project “Investigating Collective Intelligence in Forest Ecosystems.”

Are Forests Intelligent?
Scaling Cognition to the Community Level

Anna Loi

PhD Candidate

MINT Lab

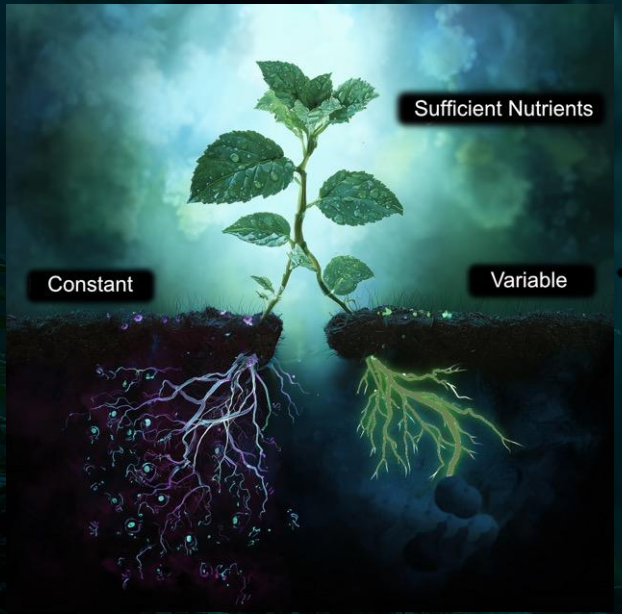
MINT LAB
minimal intelligence lab
laboratorio de inteligencia mínima

Goal-Directed Behavior

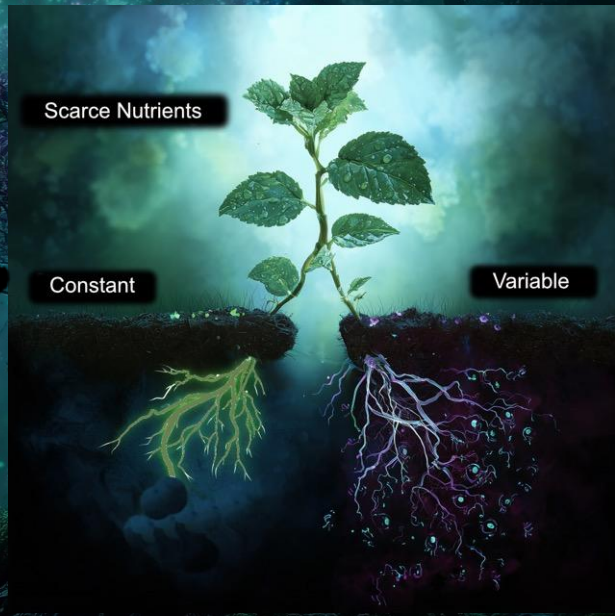
You may have heard of plant cognition…

Raja et al., 2020

Risk Sensitivity



You may have heard of plant cognition…



Dener, Kacelnik & Shemesh, 2016

You may have heard of plant cognition…

Learning by Association

Gagliano et al., 2016
Ponkshe et al., 2024


However, so far...

However, so far...

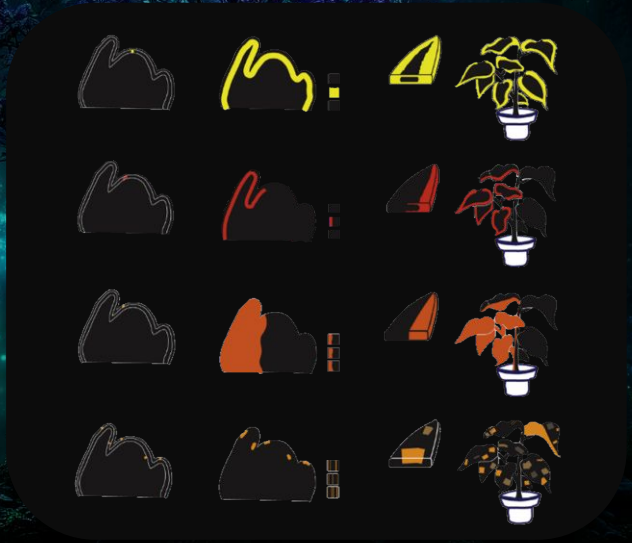
Centralization of Animals vs. Plants

Parise and Marder, 2023

Plants & Individuality

Clonality

Merging



Frank & Chitwood, 2016

Genetic Mosaicism

Clonality

DeWoody et al., 2008

Pando

Merging

Inosculation

Root Grafting

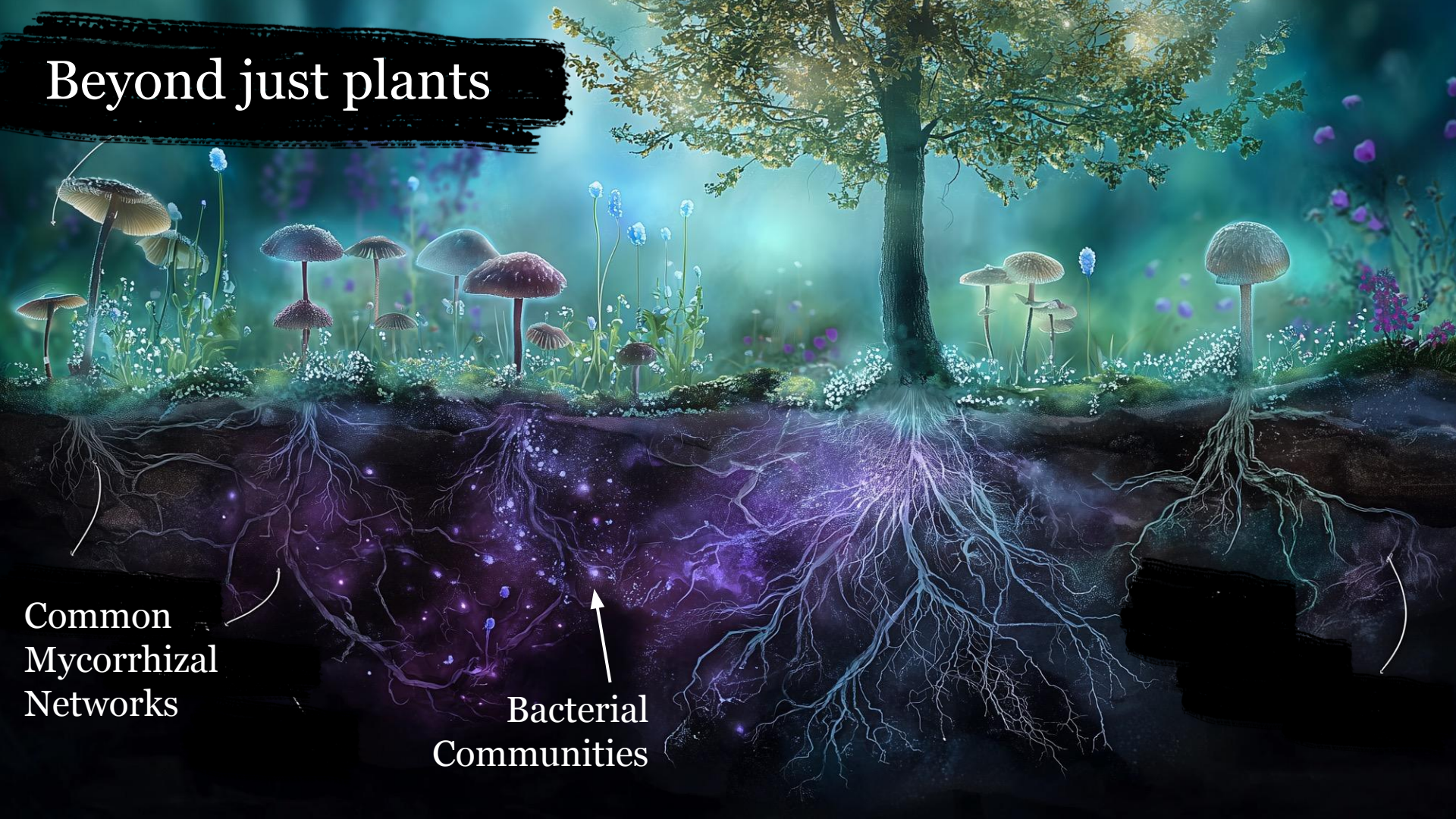
Franken Tree

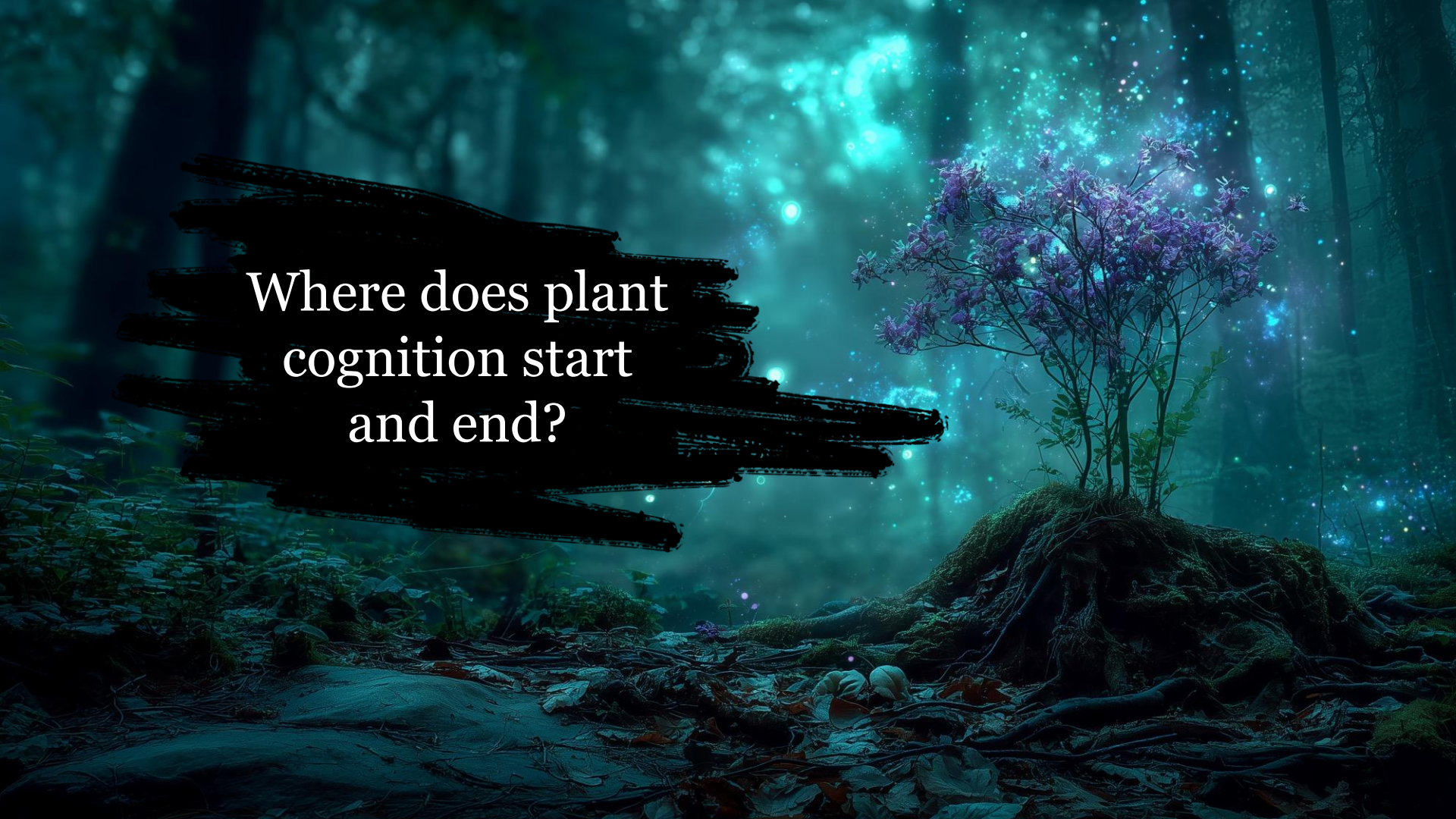
Genetic Mosaicism

Frank & Chitwood, 2016

The Major Oak

Beyond just plants




Where does plant cognition start and end?

Theories of Cognition

Brain

Body

Environment

Theories of Cognition

Embodied Cognition

Cognitivism

Extended Mind Theory
Ecological Psychology

Memory

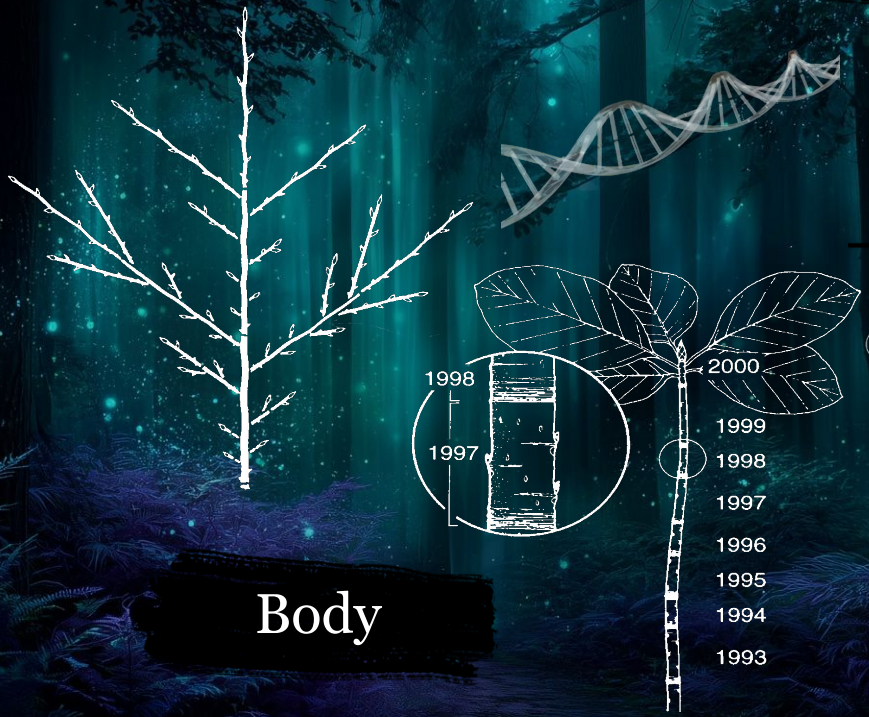
Brain

Body

Environment

Memory in Plants

Brain

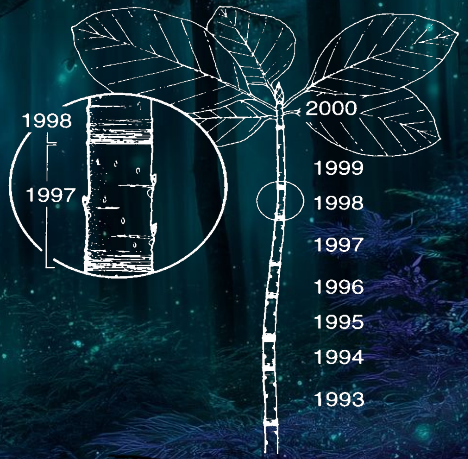


Body

Environment

Embodied Memory in Plants

Normal Shoot



Short Shoot

Fagus sylvatica

Roloff, 2001

Embodied Memory in Plants

1997

Normal Shoot

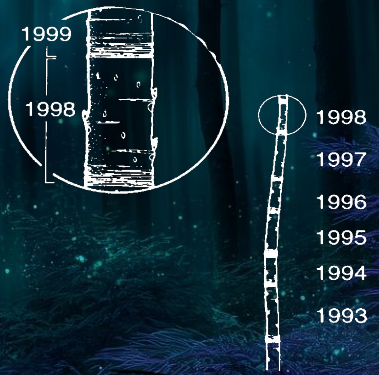
Short Shoot

Fagus sylvatica

Roloff, 2001

Embodied Memory in Plants

Normal Shoot

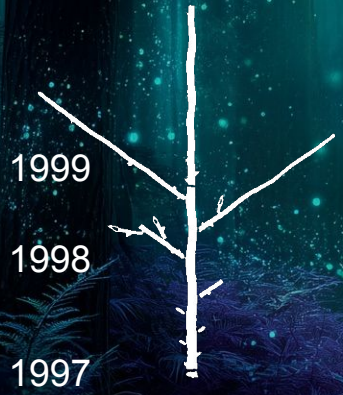


Short Shoot

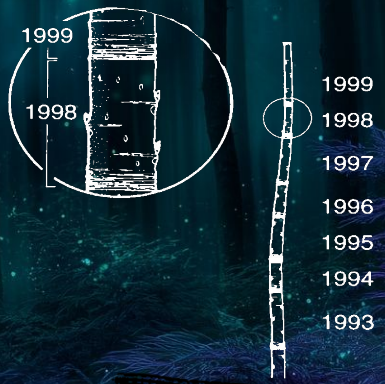
Fagus sylvatica

Roloff, 2001

Embodied Memory in Plants



Normal Shoot

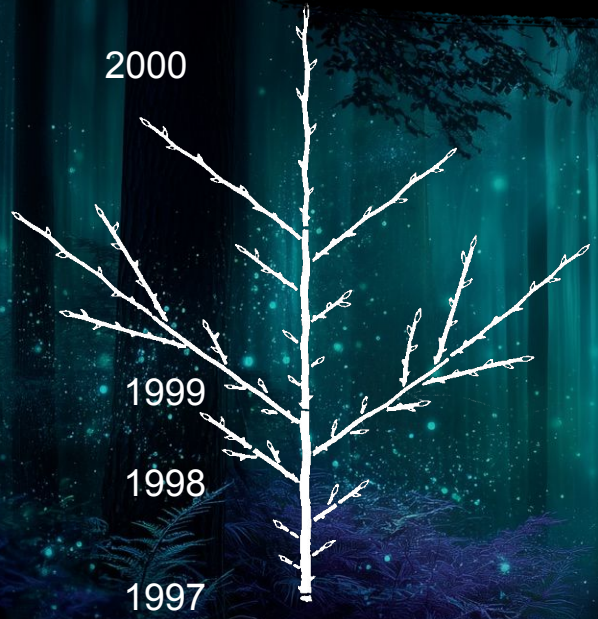


Short Shoot

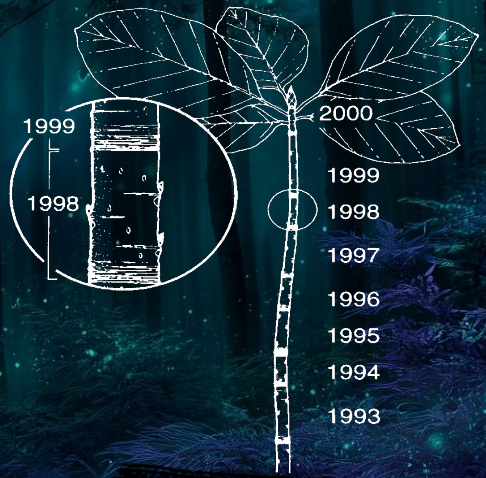
Fagus sylvatica

Roloff, 2001

Embodied Memory in Plants



Normal Shoot



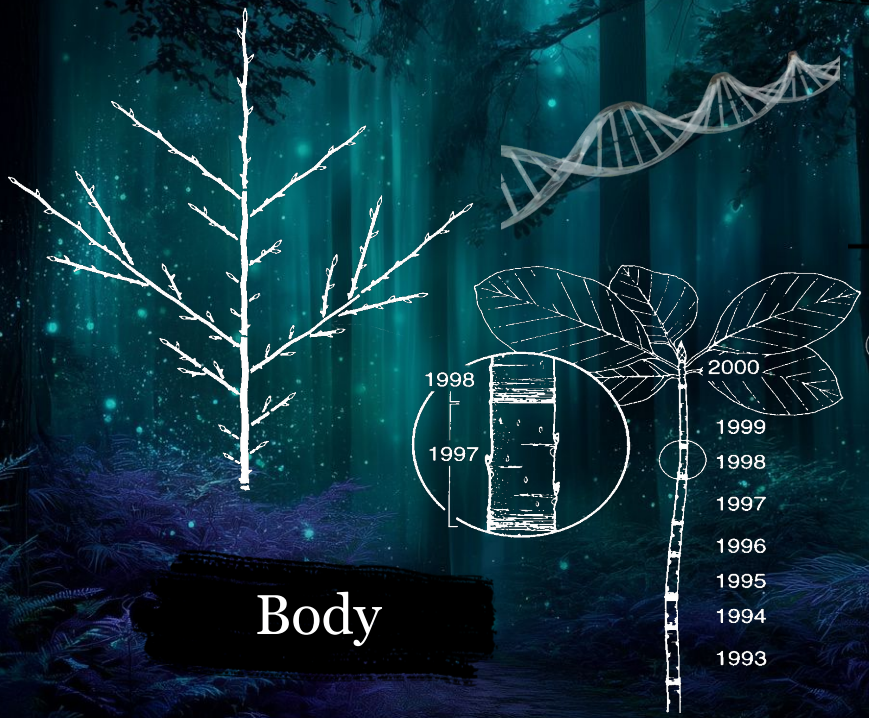
Short Shoot

Fagus sylvatica

Roloff, 2001

Memory in Plants

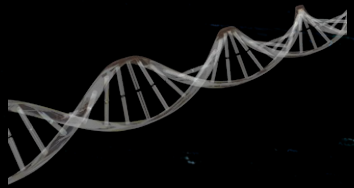
Brain

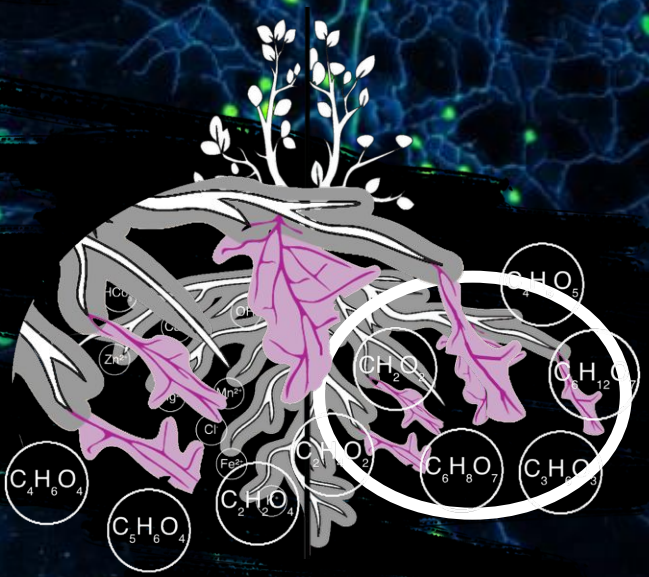


Body

Environment

Memory in Fungi

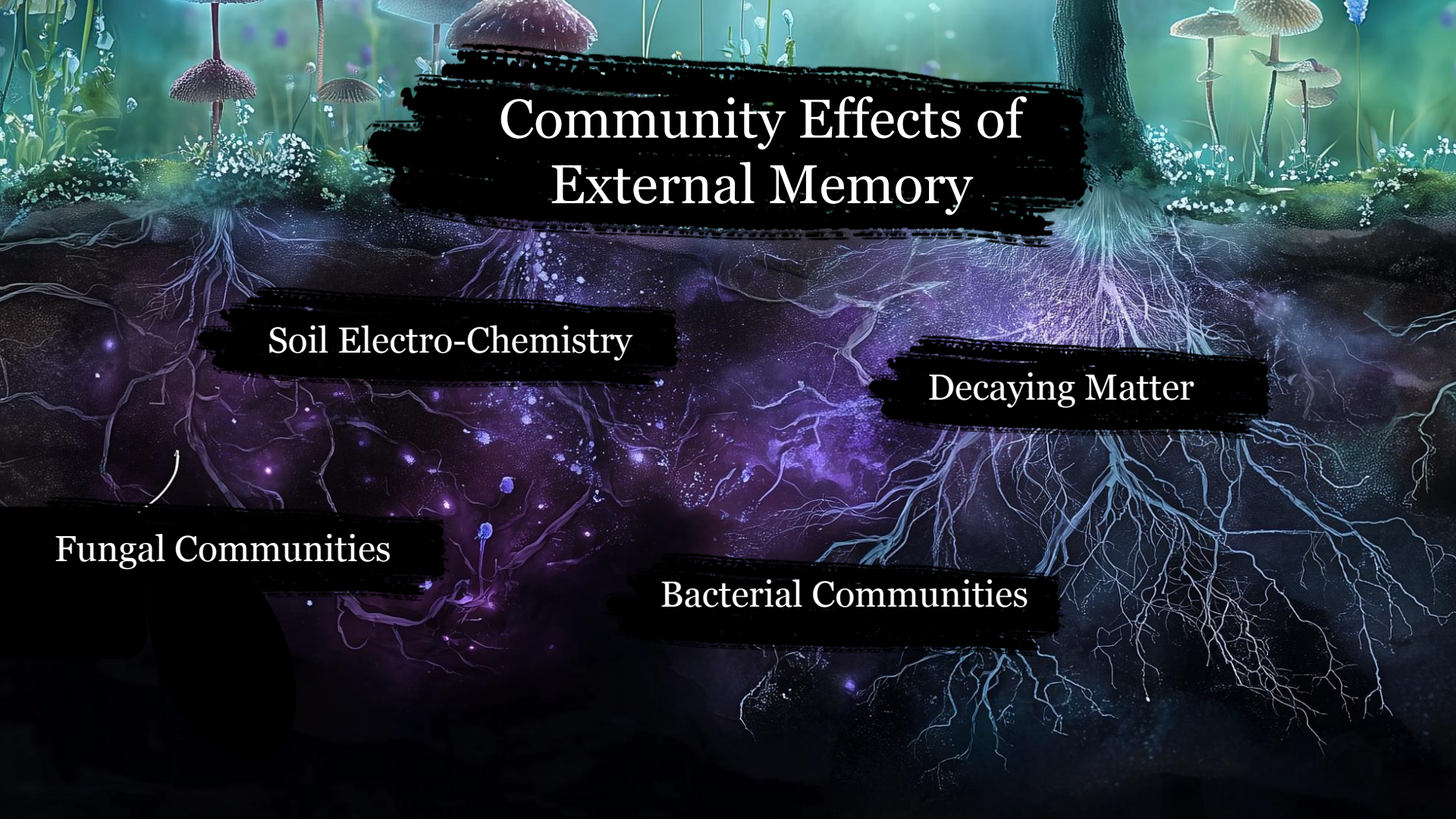


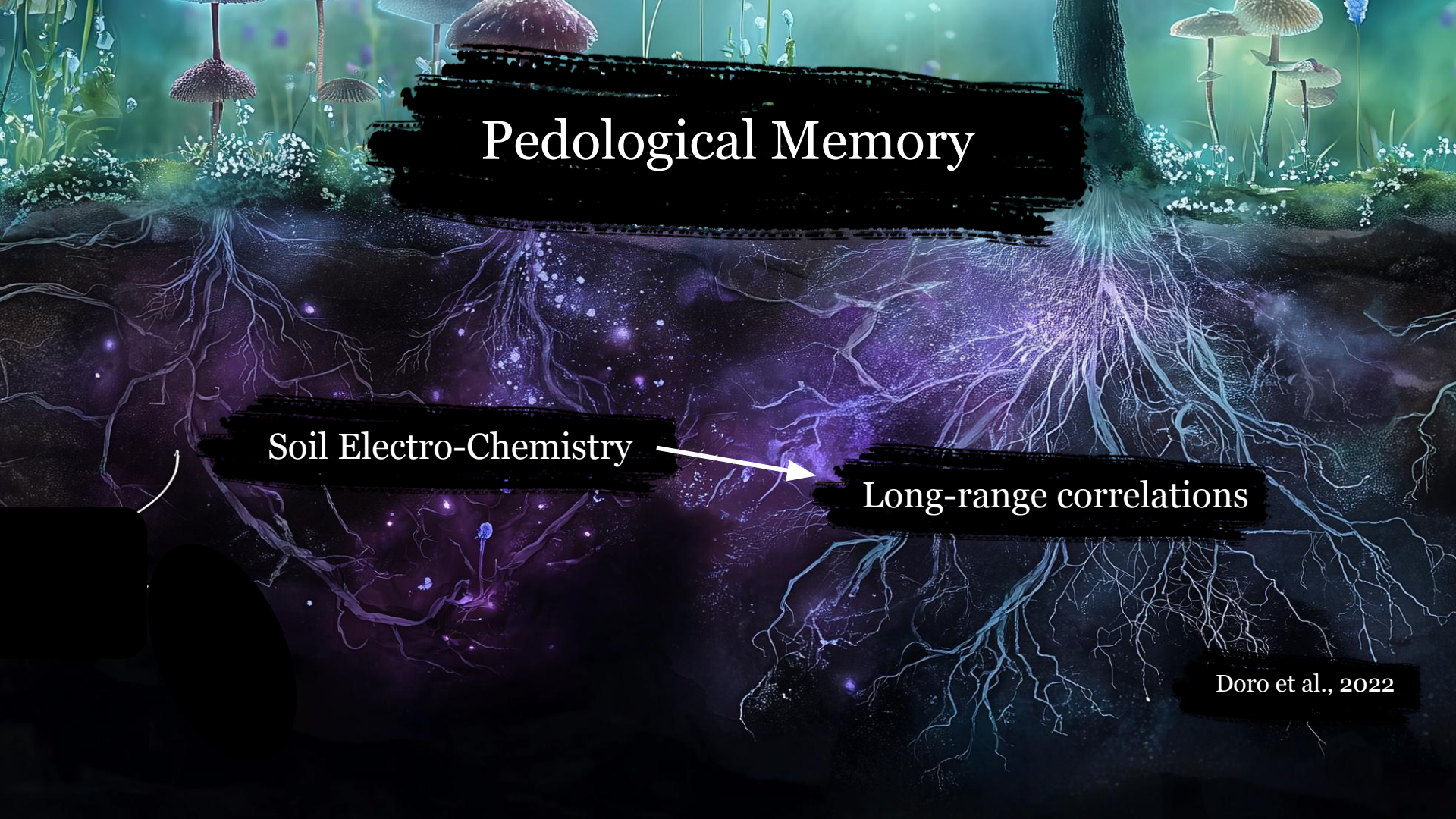


Brain

Body

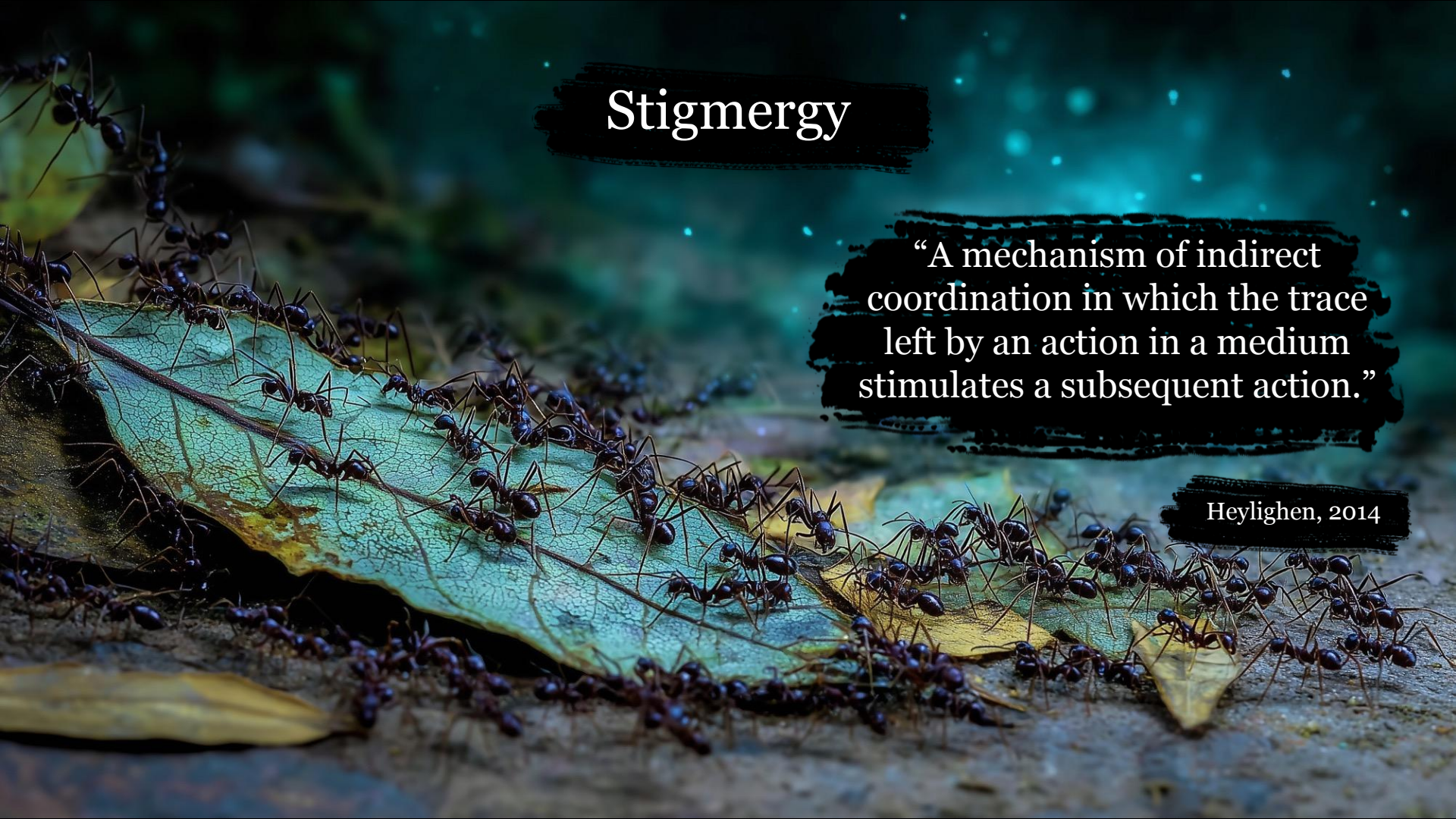
Environment


Community Effects of External Memory
Soil Electro-Chemistry
Decaying Matter
Fungal Communities
Bacterial Communities


Pedological Memory
Soil Electro-Chemistry
Long-range correlations
Doro et al., 2022


Ecological Memory

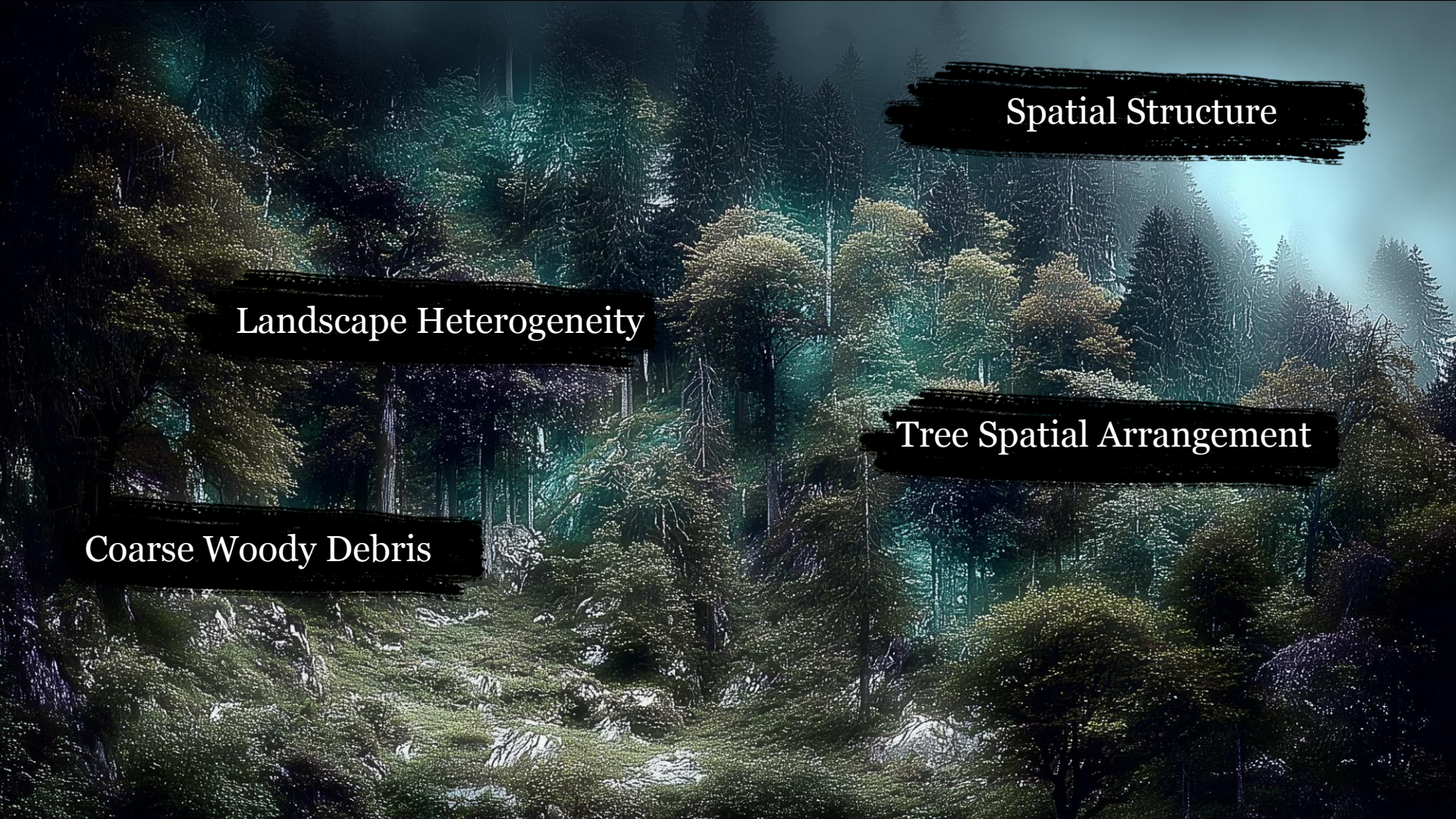
Stigmergy

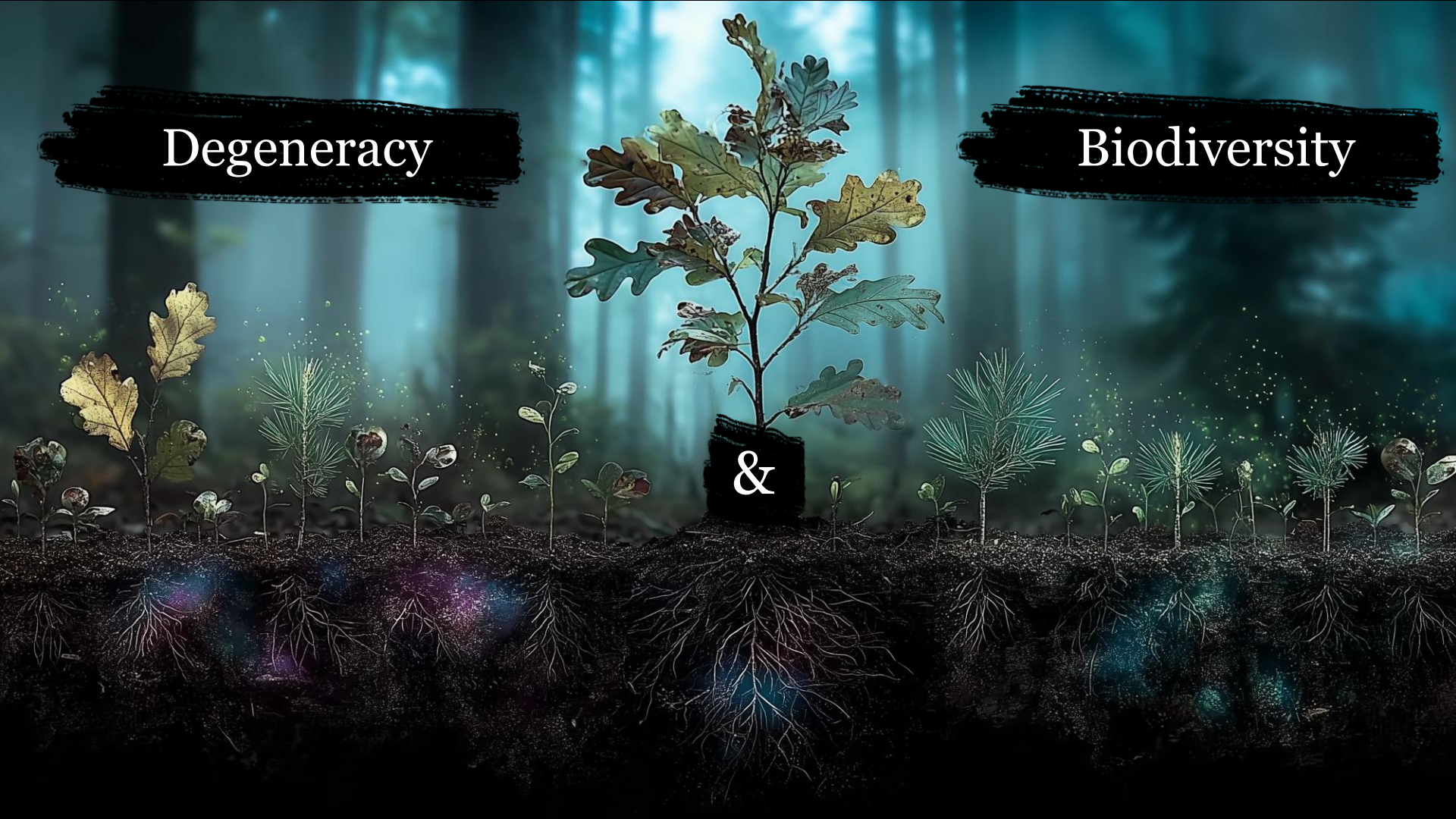


"A mechanism of indirect coordination in which the trace left by an action in a medium stimulates a subsequent action."

Heylighen, 2014


Beyond Memory:
Self-Organization
in Forests


Spatial Structure
Landscape Heterogeneity
Tree Spatial Arrangement
Coarse Woody Debris


Degeneracy
&
Biodiversity


Thank You!
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MINT LAB
minimal intelligence lab
laboratorio de inteligencia mínima

References

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24h Envisioning Intelligences
event slides and video recordings:

Call for exhibit submissions:
https://scimaps.org/call-for-submissions

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