

critical
Infrastructure
lab



Governing infrastructures: keeping compute infrastructures within planetary boundaries

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geopolitics

standards

people + planet

profit + control

environment

infrastructures

Keller Easterling

Extra- state craft: The Power of infra- structure space

‘Infrastructure sets the invisible rules that govern the spaces of our everyday lives’

‘changes to the globalising world are being written, not in the language of law and diplomacy, but rather in the language of infrastructure’

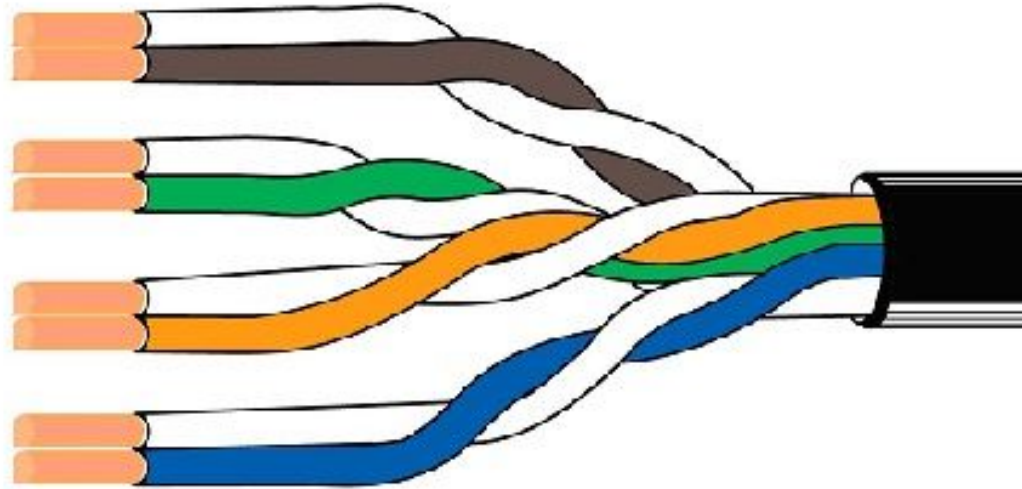
Keller Easterling 2014. Extrastatecraft: The Power of Infrastructure Space. Verso Books.

standards

environment

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geopolitics



Theorizing: Environment, materiality, and infrastructure



Hogan (2015) - computing infrastructures are very much material

Gabry's (2016) - environmental data making a computable planet

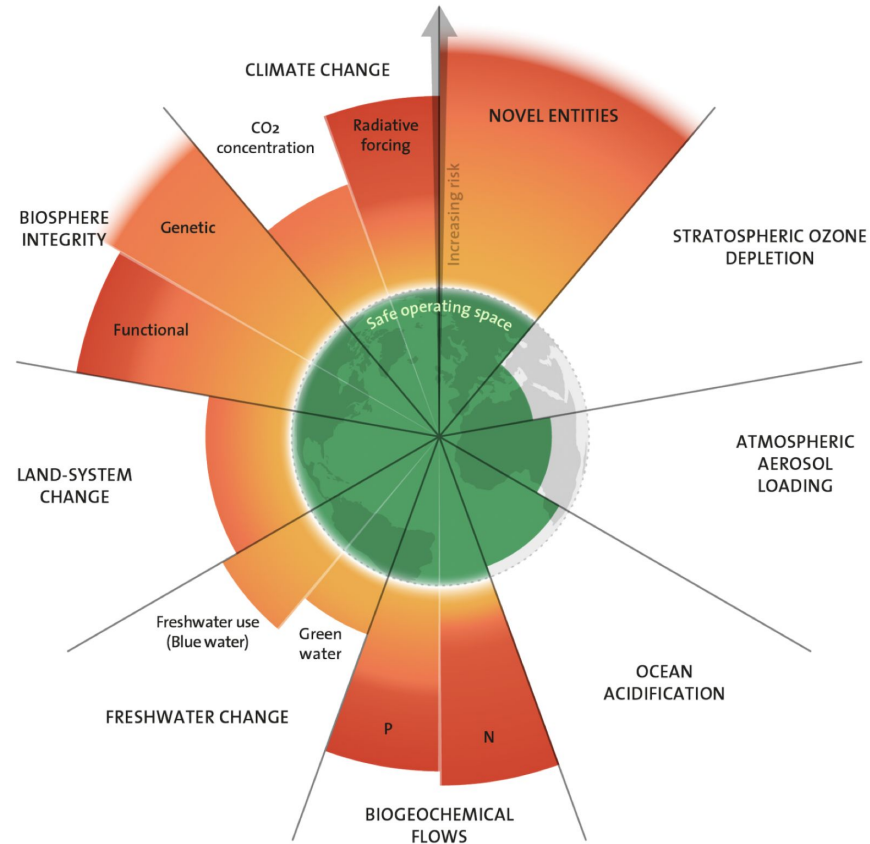
Starosielski & Walker (2016) - sustainable media

Brodie & Velkova (2021) Cloud ruins and impermanence of infrastructural sites

Pasek, Vaughan and Starosielski (2023) - impossible to know the sectoral footprint → relational footprinting

Marquet (talk EASST/4S) material limits are driving changes in data centre market

Assumption: Social and planetary boundaries



The 2023 update to the Planetary boundaries. Licensed under analysis CC BY-NC-ND 3.0. Credit: "Azote for Stockholm Resilience Centre, based on in Richardson et al 2023".

Governance Spaces

IETF/IAB

Document analysis

Optimizing for energy
consumption

Scalar Mismatch

Data Centers

Data Centers

Interviews and participatory
action research

Designing in scarcity

Return of the State

Making-as-a-Method

Organic data centre

Experiments / co-design

From Extraction to
Regeneration

Alternative
computing trajectories



Internet Architecture Board

How are environmental problems and solutions framed and what is missing from these narratives?

IETF approach to sustainability

Why

Niklas and Dencik's (2021) observation that it is "the formulation of new policy areas, [...], provide a window into what priorities, interests and concerns currently shape" a governance field (Niklas & Dencik, 2021)

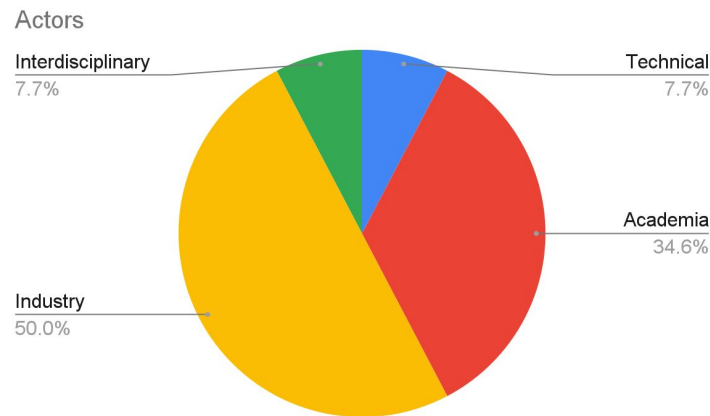
What

Bacchi (2012) notion of **problematization** suggests that problems are better regarded as problem representations. Ways of expressing certain aspects as problematic and thereby also co-creating a corresponding solution.

Industry discourse on problem and solutions

Internet Architecture Board's (IAB) workshop entitled
“Environmental Impact of Internet Applications and Systems.

- Document analysis
- Inductive thematic analysis
- 26 papers (excl. my own contribution)

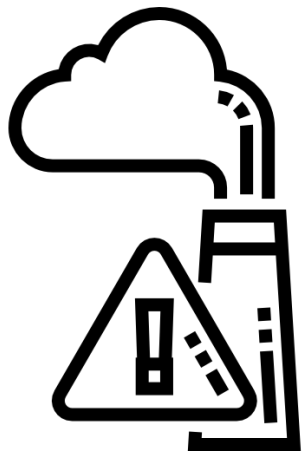


Dominant discourse



- Digitization is crucial for economic and social progress
 - Computing has a negative impact on the environment but can support carbon reduction in other sectors or assessing claims on the role technology play in the reduction of carbon emissions domains such as transportation, building, manufacturing, agriculture, and energy
 - Lack of accurate and granular information of carbon footprint and energy consumption
-

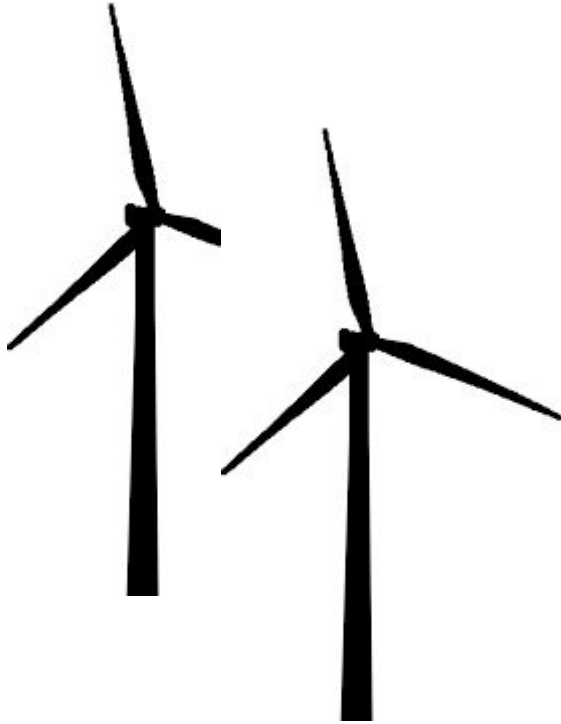
Framing of the problem



- Climate change is a threat to human life
- Internet increasingly contributes to the global carbon footprint
- Extraction and production of hardware has an environmental toll
- Lack of accurate and granular information of carbon footprint and energy consumption

The technical community wants to act, but is limited in its mandate

Framing solutions



- Measurements
 - Green energy
 - Spatial temporal routing
 - Green routing
 - Scheduling of tasks - renewable energy abundance
 - Sleep mode
-

Scalarly mismatch

- The internet governance community has not come to grips with the idea that the network is an environmental problem in itself
 - The **belief in growth**, abundance of natural resources, and sustainability through innovation shapes their understanding of sustainability.
 - Sustainability becomes a **justification regime** for the internet's existence and growth in a world in crisis.
-

Scale and misalignment

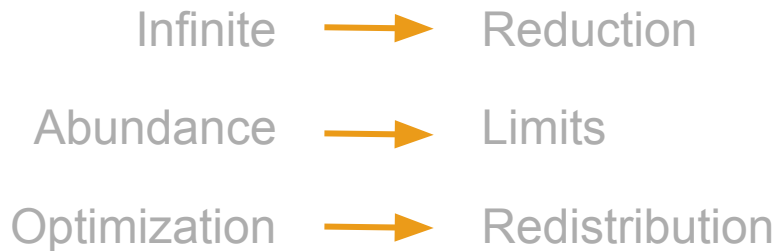


Liboiron (2021, p. 84) does not use the term scale in the traditional economic sense but in relation to governance processes

Scalar mismatch describes this process, where interventions do not match the scale of the actual problem

Right scale for the actual problem?

Maxigas and ten Oever (2023) use the concept of ‘infrastructure ideology’ to theorize about how different worldviews become embedded in infrastructure and these in turn shape societies → all see nature as a resource to be extracted



Infrastructures of Digital Sovereignty



EU to build AI gigafactories in €20bn push to catch up with US and China

Up to five sites with power-hungry supercomputers and datacentres planned to drive AI 'moonshots'

● [Europe live - latest updates](#)



EN

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Available languages: English

PRESS RELEASE | Apr 9, 2025 | Brussels | 4 min read

Commission sets course for Europe's AI leadership with an ambitious AI Continent Action Plan

The European Commission is pleased to announce the launch of the AI Continent Action Plan, which sets out the EU's strategy for AI leadership.

More compute for a burning planet



Research approach

Infrastructural object: data centres

Research interests: How can we govern the data centre industry differently?

Methods: 20+ interviews and 3 participatory action research workshops; **defamiliarisation as a method** (Bell et al 2005; Kaomea 2003) to provisionally break apart the worldviews and explore demands and practices that would otherwise remain unimaginable

Dominant frame on data centers



Baseline: digitization is crucial for economic and social progress

Issues:

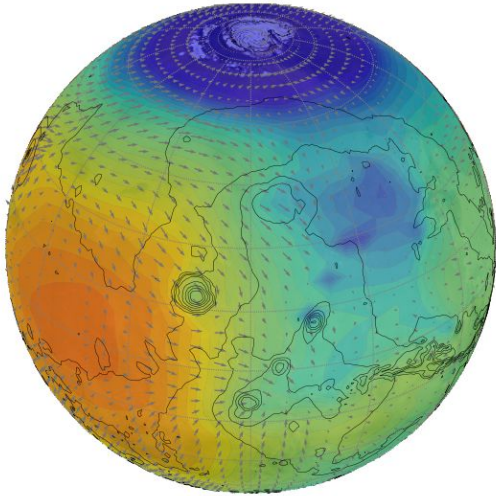
- Energy and water consumption
- Pollution
 - Water: heat and salinization
 - Energie: carbon emissions, flaring, backup system
- Industrial monoculture

Solutions: efficiency and optimization, renewable energy sources, and ability to serve as a battery for fluxes in the grid

Who: the market

Sustainability through data collection

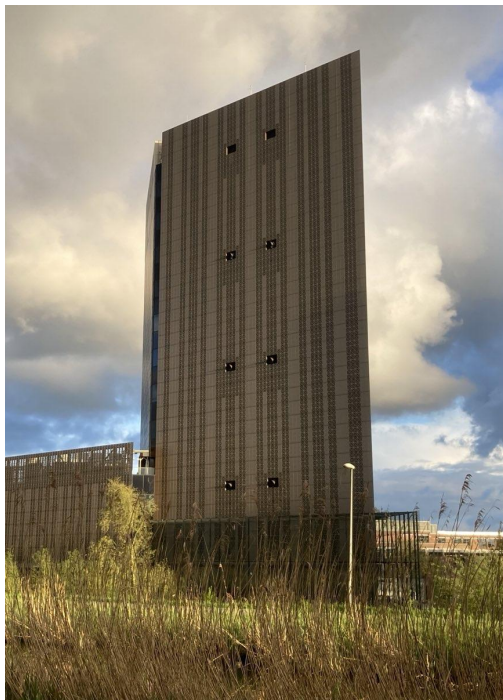
rooted in a **mode of governance** that Andrejevic describes as 'a persistent attempt to collapse the political into the technical as if the solution to societal and political conflicts were simply a matter of **imperfect information**' (Andrejevic, 2020, p. 101).



Flipping the script



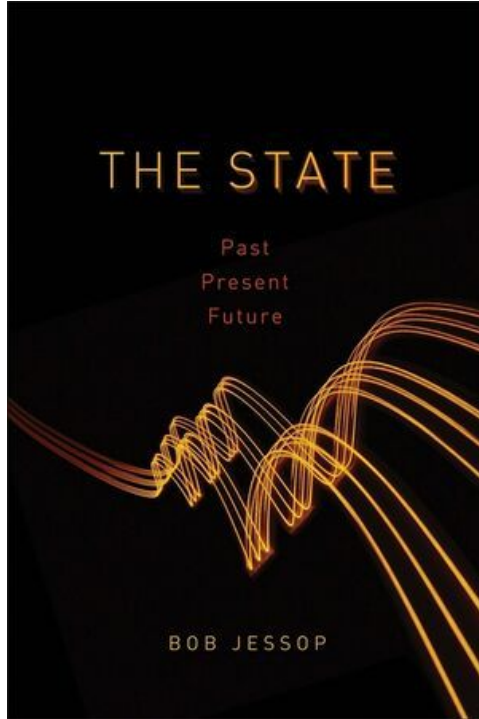
Designing in scarcity



- ‘Categorise AI uses’ → Public interest to transcend contemporary infrastructural politics
- ‘How much compute is needed? → Limiting unnecessary AI
- End of life and planned obsolescence
- Investment in new types of compute

It is about choice and prioritisation

Return of the state



The state repositioned as the key power-holder

- operate at scale
- rational and democratically established rule-based order
- prioritises societal wellbeing over capital accumulation

Articulation for a completely different state

A different state?

Foucauldian notion of governmentality

- a dialectic relation between the political rationalities, the discourse that justifies governance
- “technologies of government”

(Lemke 2002)

Desire for different state with a political rational

The imagined state echoes a certain nostalgia to the Western European welfare state, where the state provided for its citizens and in turn was trusted to be a competent entity that wields its power to ensure that social, economic, and human rights are protected.

+ Stronger role of the state,
tech governance becomes a
social justice concern

- Focus is on redistribution
and access and are less
about dismantling colonial,
extractive, and exclusionary
structures

Organic data centre



Towards alternative technological trajectories



In times of polycrisis, it is hard to keep an open mind and resist “a closed world”

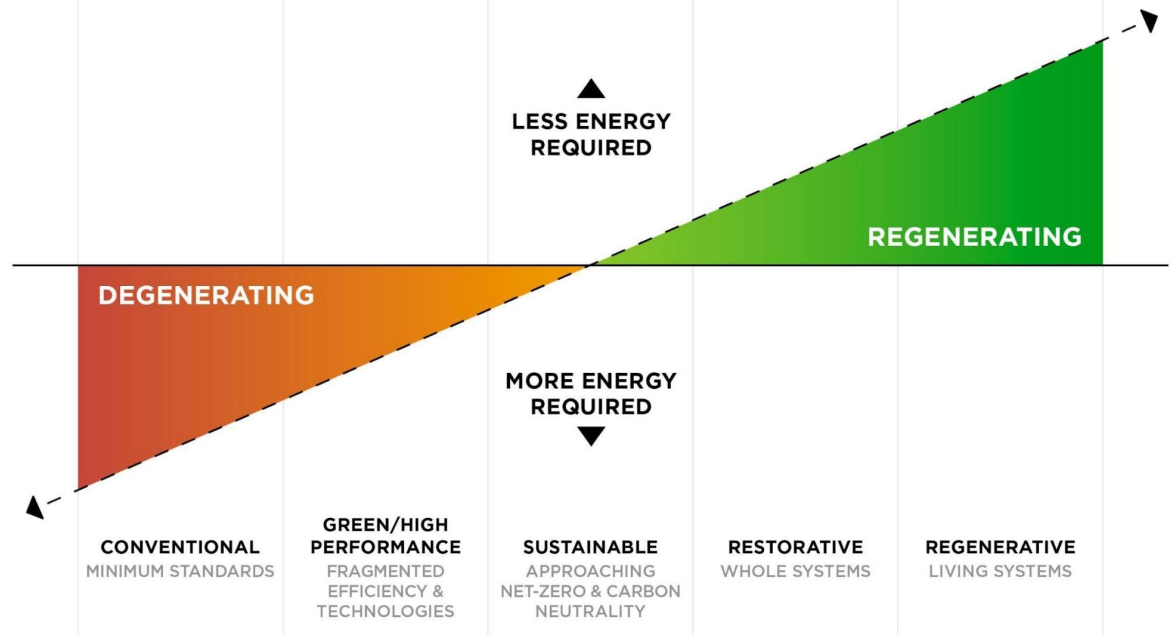
(Edwards 1996: 310)

How can we move towards “an open world”, if “it is easier to imagine the end of the world than the end of capitalism”?

(Jameson 2003: 76; 2005: 199)

From extraction to regeneration

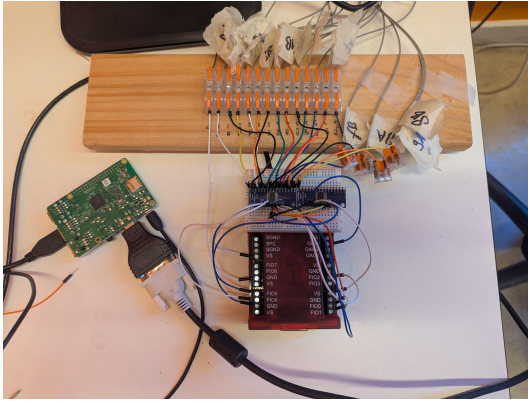
From doing things better to doing better things (Reed 2007)



Making-as-a-method

- Experiment with changing the materiality of infrastructures to render infrastructures visible, contestable, and reconfigurable
 - Test how current silicon-based computing and fossil fuel dependencies can be replaced with natural materials and biological processes.
-

Materiality of infrastructure



Material conditions shape the possibilities and limitations of social and economic activity.

- Tim Ingold (2013) calls “correspondence with materials,” foregrounding the agency of organic matter in shaping technological practice.

Not about functional prototypes

Rearticulate what computation could become
if re-sourced from ecological and locally
available substrates

Electrical garden by Sunjoo Lee (2025)



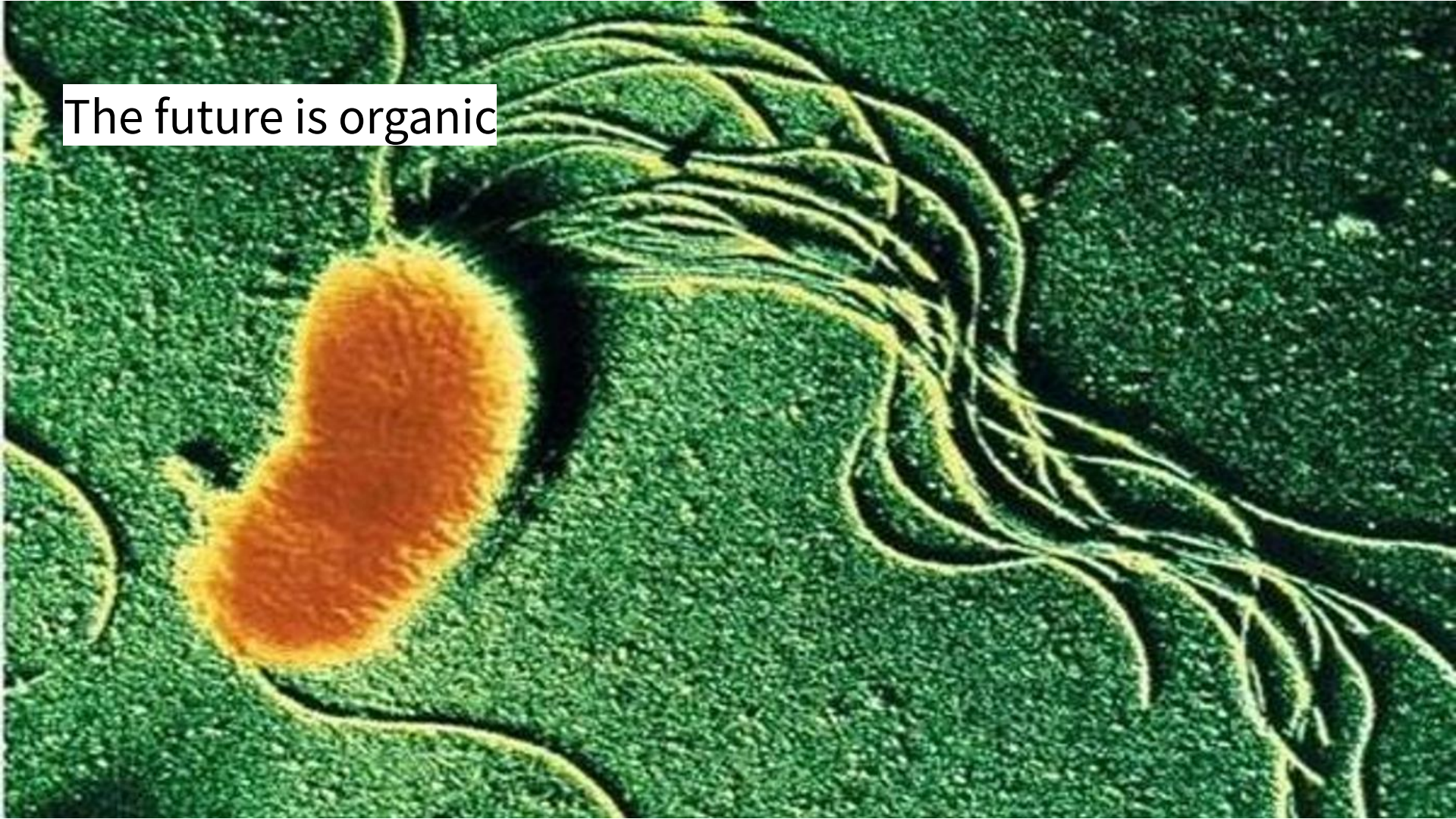
People and planet oriented compute

Replacing silicon-based computing and fossil fuel dependencies with natural materials and biological processes challenge the commonplace understanding of 1) progress through technology advances and 2) sustainability through scale and efficiency.

Alienation	→	Relational
Scale	→	Scaling
Extraction	→	Moving with



The future is organic



critical Infrastructure lab



we research power and contestation in transnational media infrastructures. the critical infrastructure lab aims to create space to co-develop alternative infrastructural futures that center people and planet over profit and capital. we aim to do this by establishing a community around three infrastructural subtopic (geopolitics, standards, environment), producing a sound body of research, and developing actionable policy recommendations and strategic insights. do you want to know more? have a look at [our slide deck](#) or [send us a message](#).

upcoming activities

open reading group infrastructure reading group ↓

#

open reading group environment reading group ↓

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event sanctions, standards, and sovereignty: examining power in communication networks with infrastructural ideologies, centre internet et société (cis), paris april 2024 ↓

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vacancy postdoc infrastructural ideologies in the eu, russia, and china may 2024 ↓

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vacancy phd position in infrastructural ideologies in the eu, russia, and china may 2024 ↓

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