



**Accelerate your
Quantum journey**
QAIventures

The Futures of emerging Technologies

Exploring ethical and social challenge through Visioneering

Wenzel Mehnert

- ▶ Background:
 - ▶ Cultural & Media Studies, STS, SF-Studies
 - ▶ Future Studies
- ▶ Dual affiliation:
 - ▶ Austrian Institute of Technology (AIT)
 - ▶ Technical University in Berlin (TU Berlin)
 - ▶ Alumni University of the Arts, Berlin (UdK Berlin)
- ▶ Imaginary Research
 - ▶ Particularly imaginaries of future technologies (e.g. Neurotech)

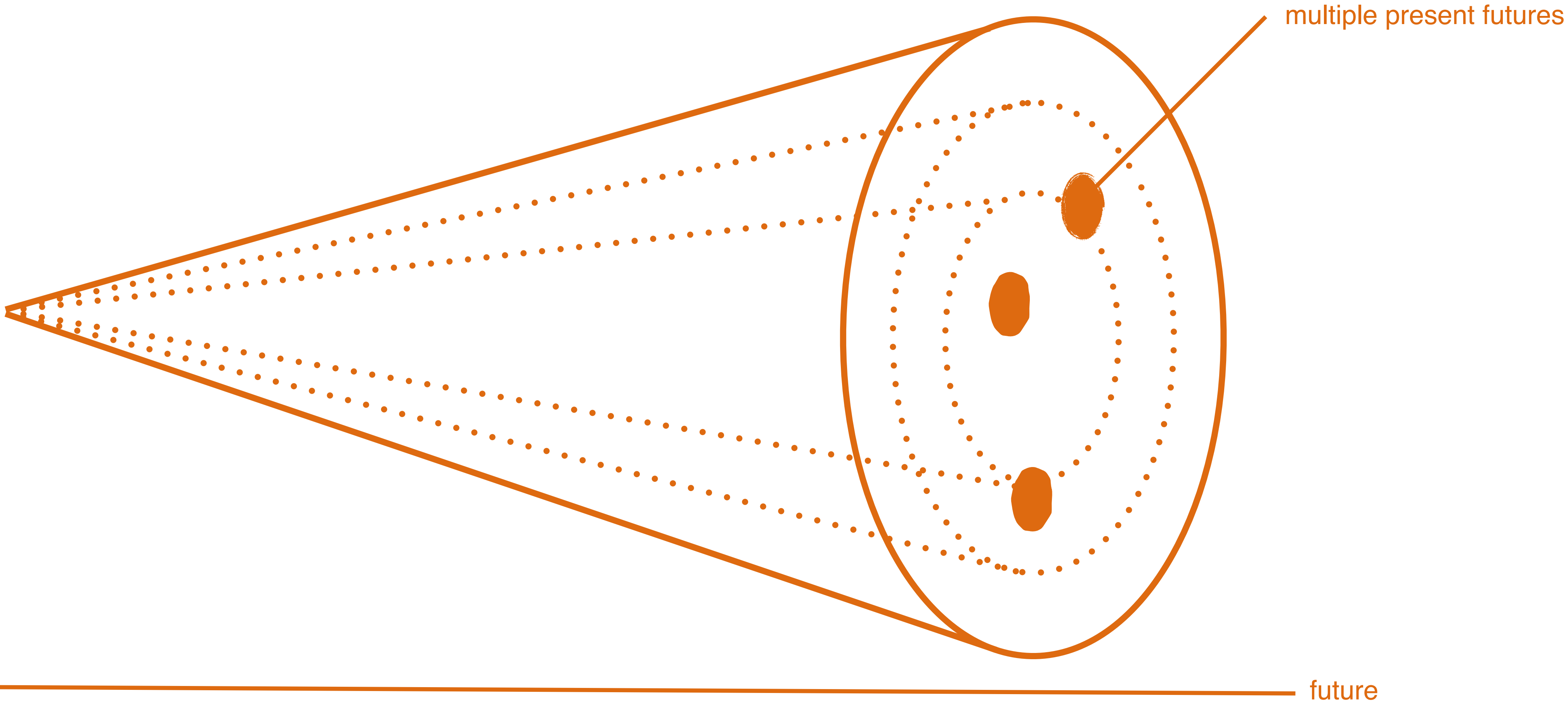


Future studies as Imaginary studies

(Imaginationsforschung)

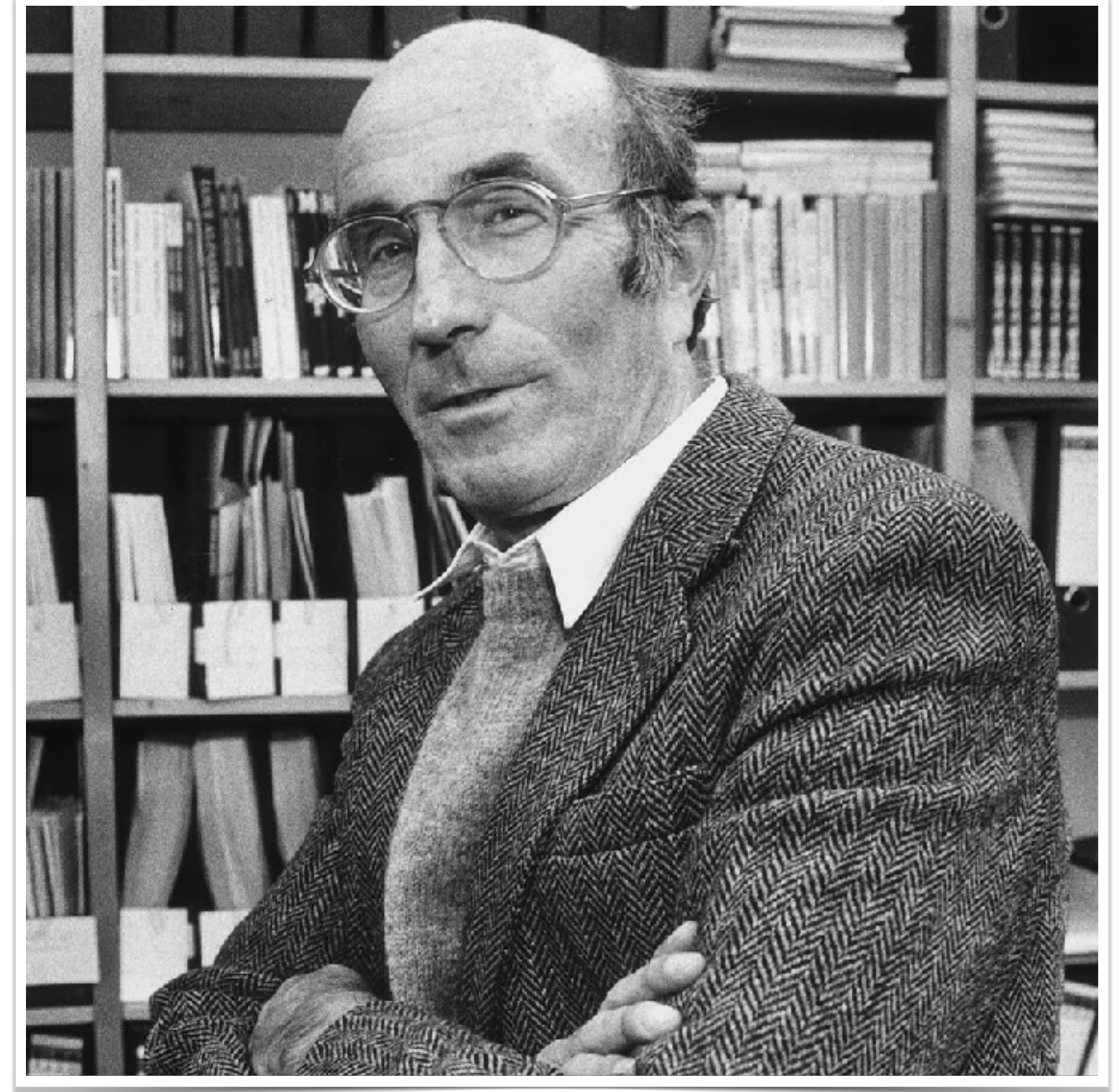
Different Futures

Futures Cone



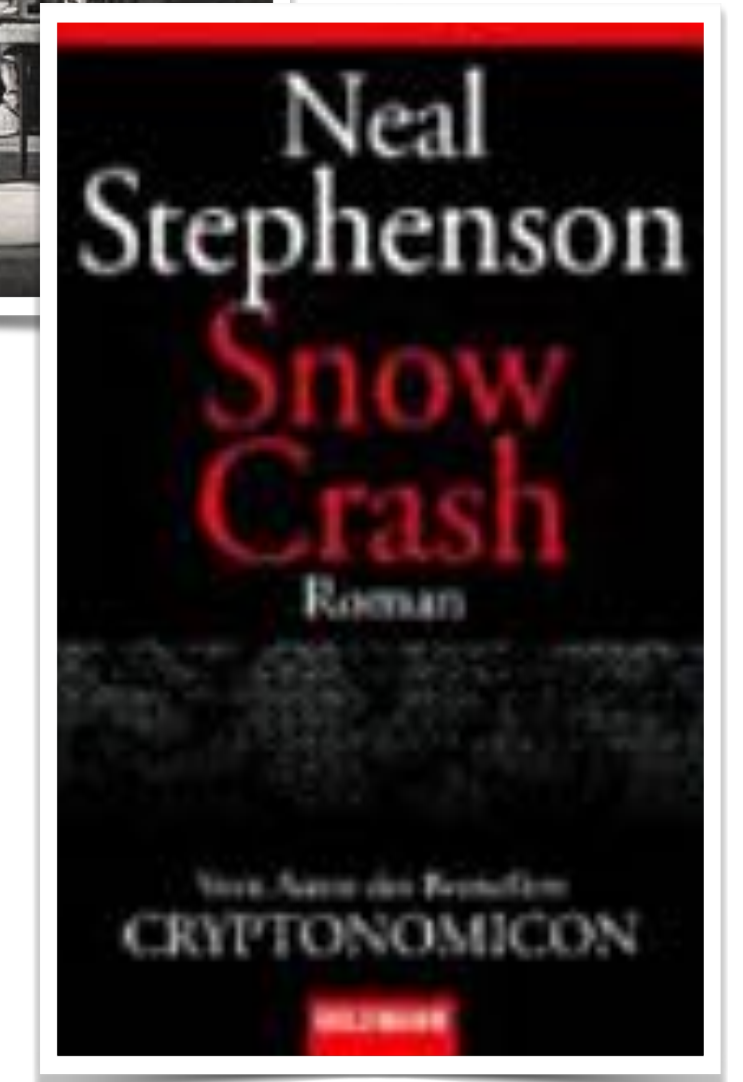
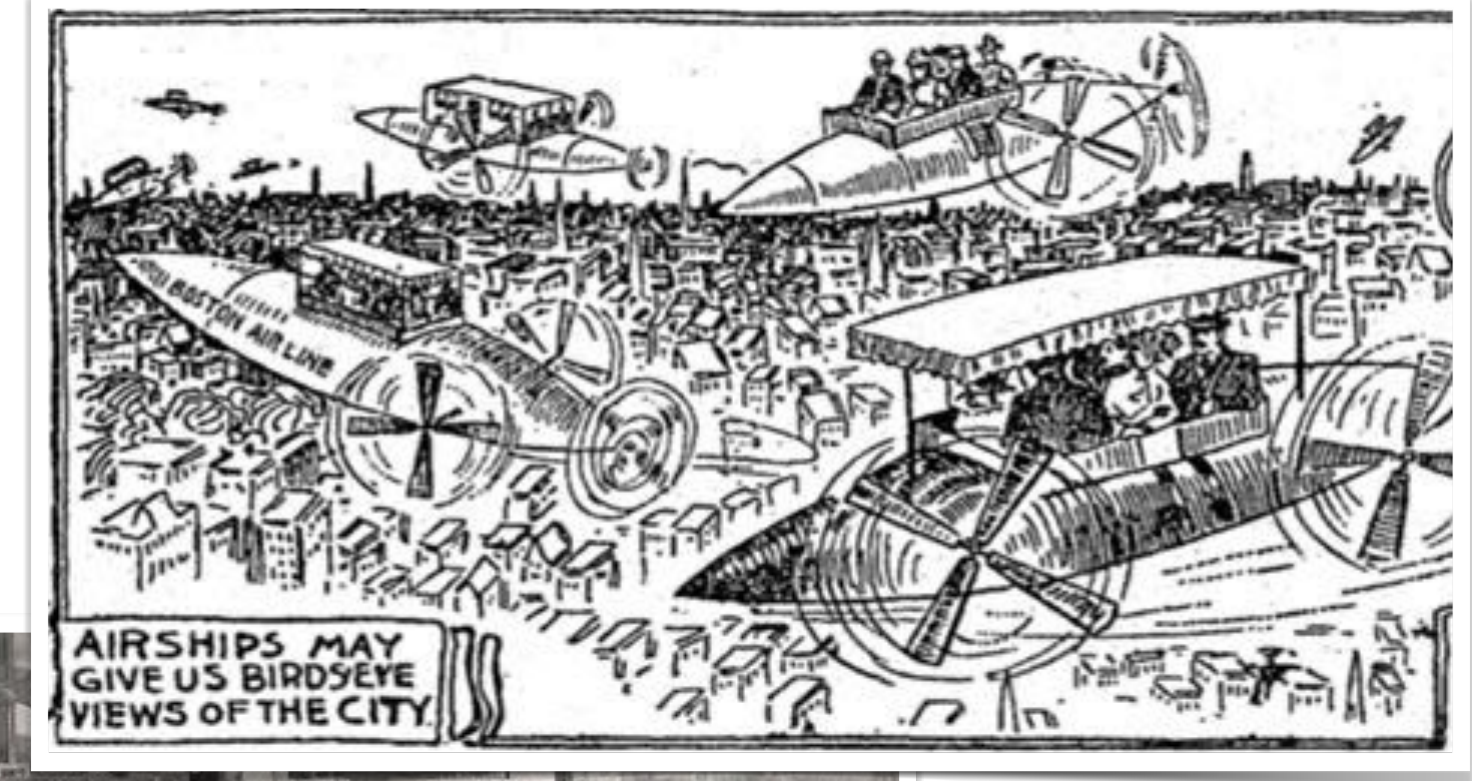
The Pluralisation of the future

- ▶ *The future* is a "warehouse of possibilities" (Luhmann, 1990, p. 120)
- ▶ *Future* distinguished in...
 - ▶ **Future present** - a moment later than now.
 - ▶ **Present futures** - present conceptions of possible future presences.



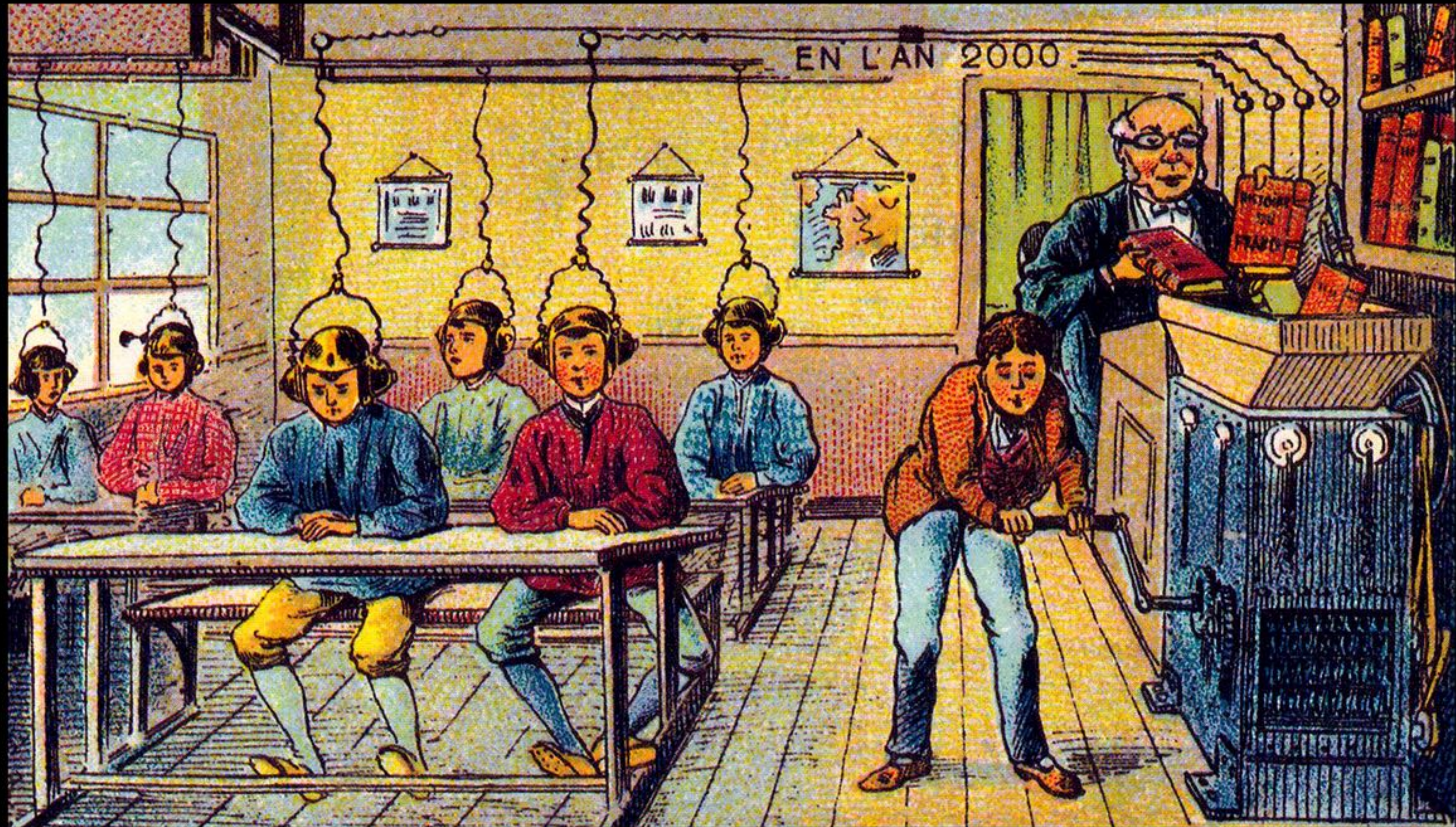
Different Concepts of Futures

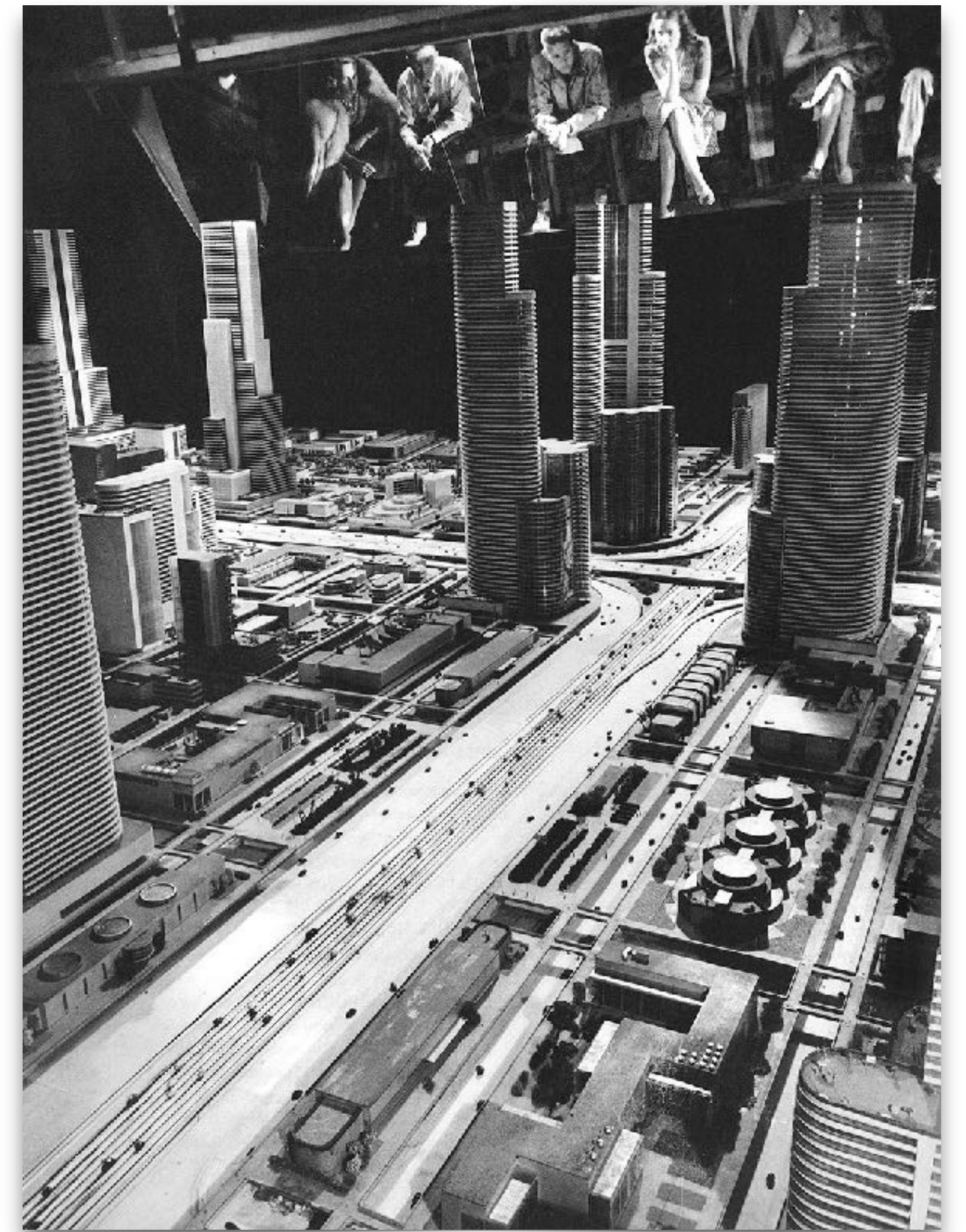
- ▶ **contested futures**
 - ▶ lost futures, forgotten futures and denied futures.
- ▶ **Imagined futures**
 - ▶ probable futures, plausible futures and possible futures.
- ▶ **preferable & unpreferable futures**
 - ▶ Visions, Utopia, *Leitbilder*
 - ▶ Dystopia, worst-case scenarios
- ▶ **inscribed futures**
 - ▶ past futures which have become our present
- ▶ **and many more...**





EN L'AN 2000.

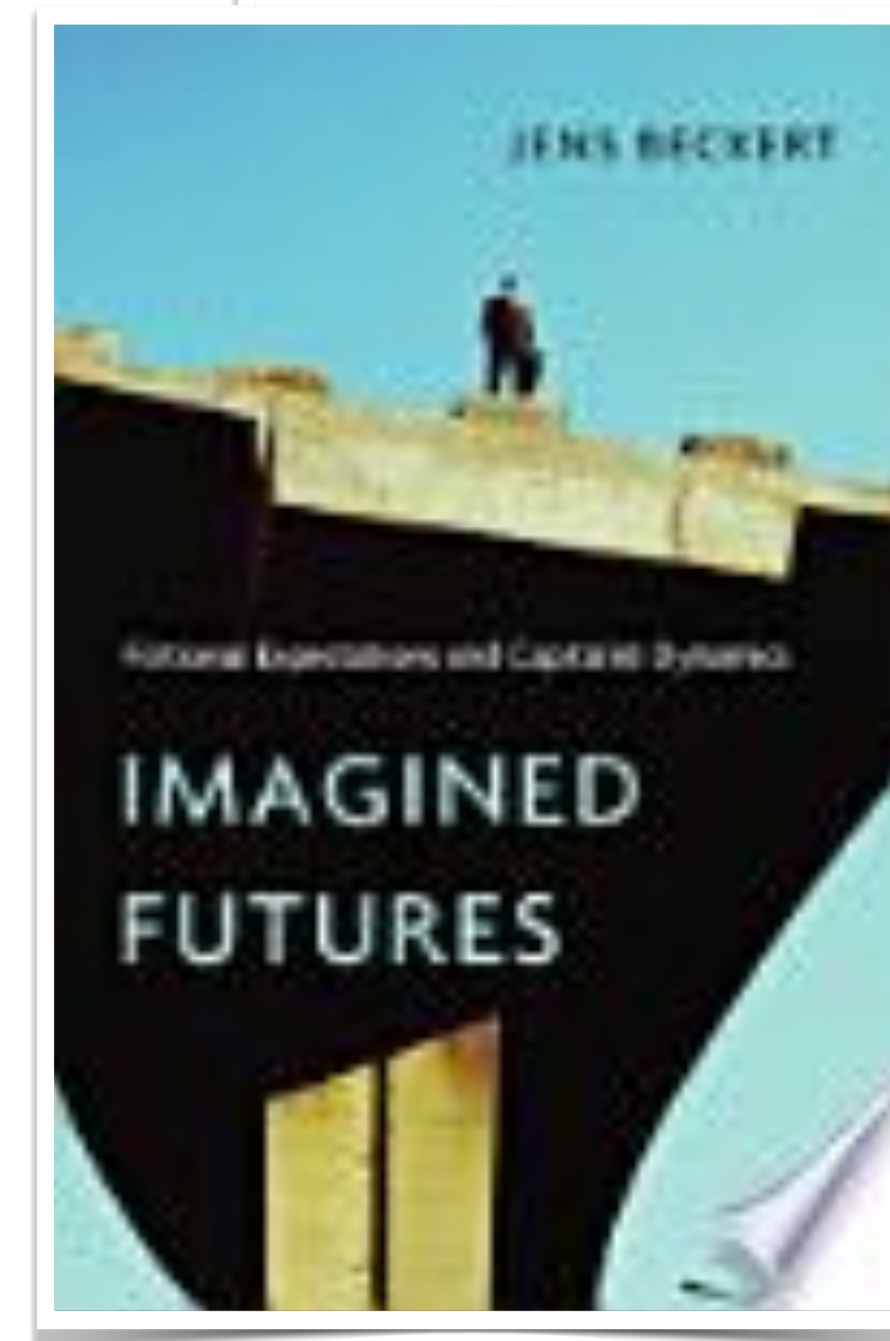




Preferable Futures

Preferable Technofutures

- ▶ Positive Futures, aka Visions
 - ▶ „How does the technology make the world a better place?“
- ▶ Visions hold values as they share ideas about how the world might **be better** or what the technology should **prevent**.
- ▶ Visions are used to...
 - ▶ ... communicate hopes and fears
 - ▶ ... align actions of a group of actors
 - ▶ ... create strategic alliances
 - ▶ ... create attention through hypes

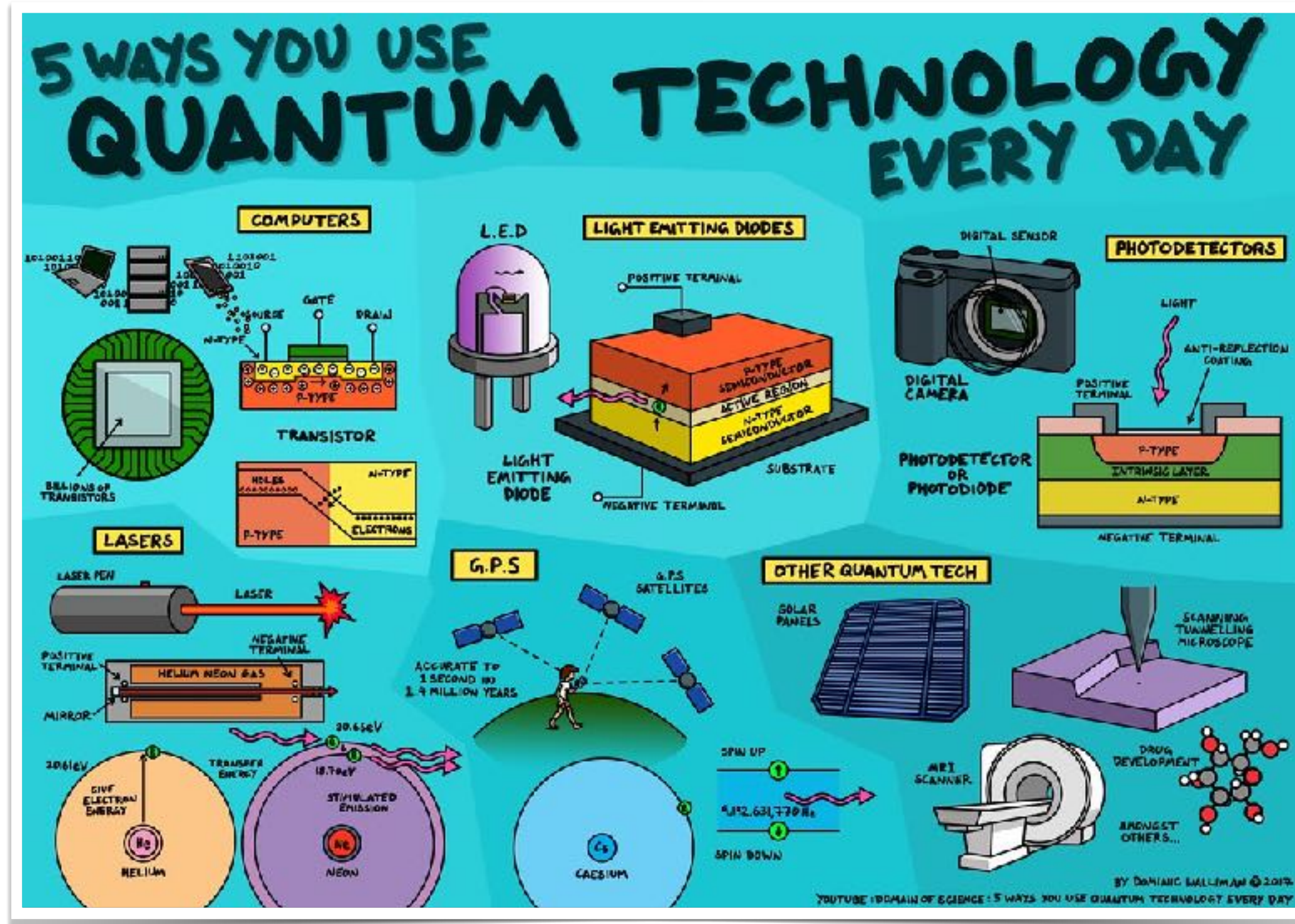


Examples from Neurotechnology

- ▶ Envisioning a new form of communication



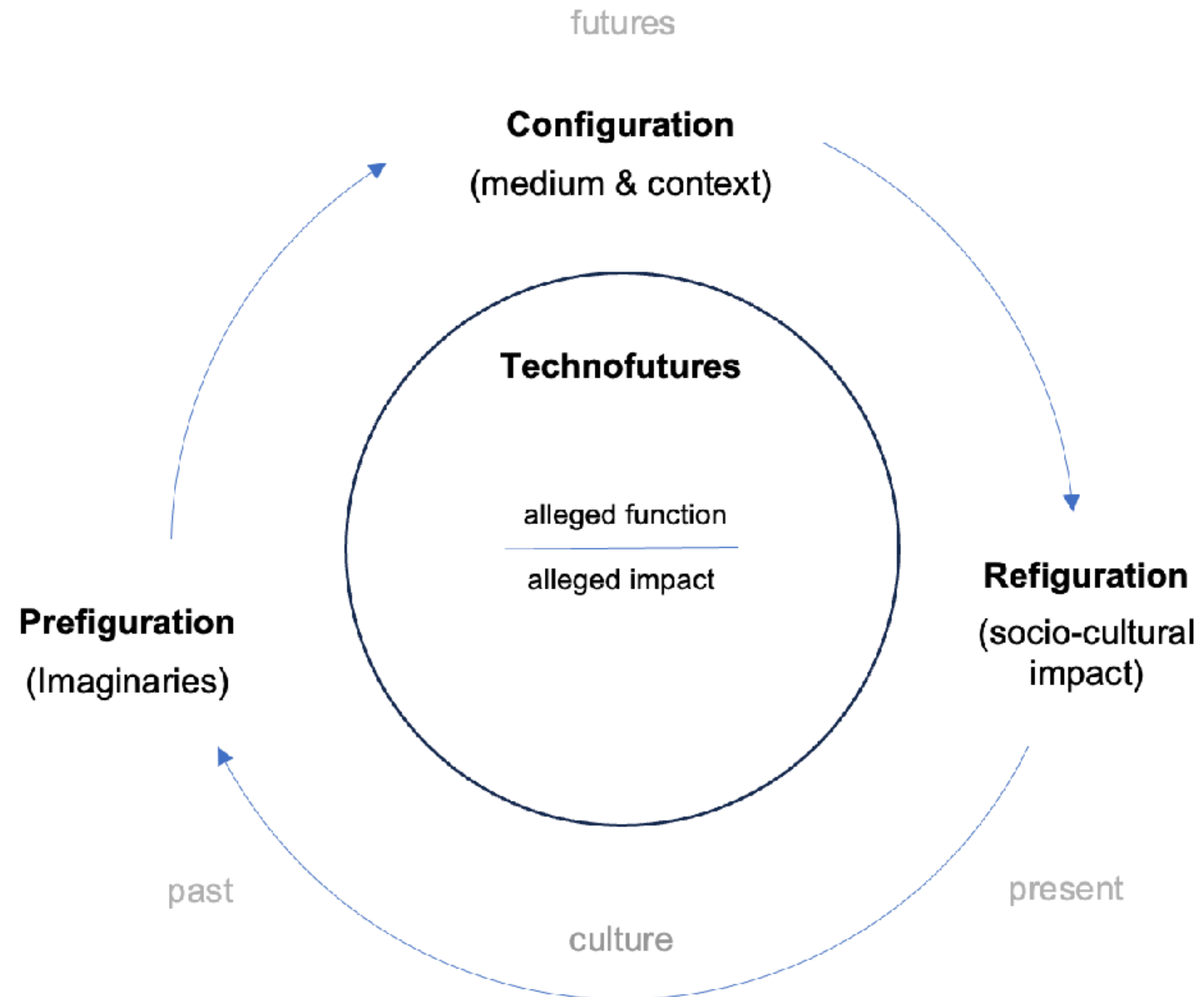
Visions of Quantum Technology



What do you think...

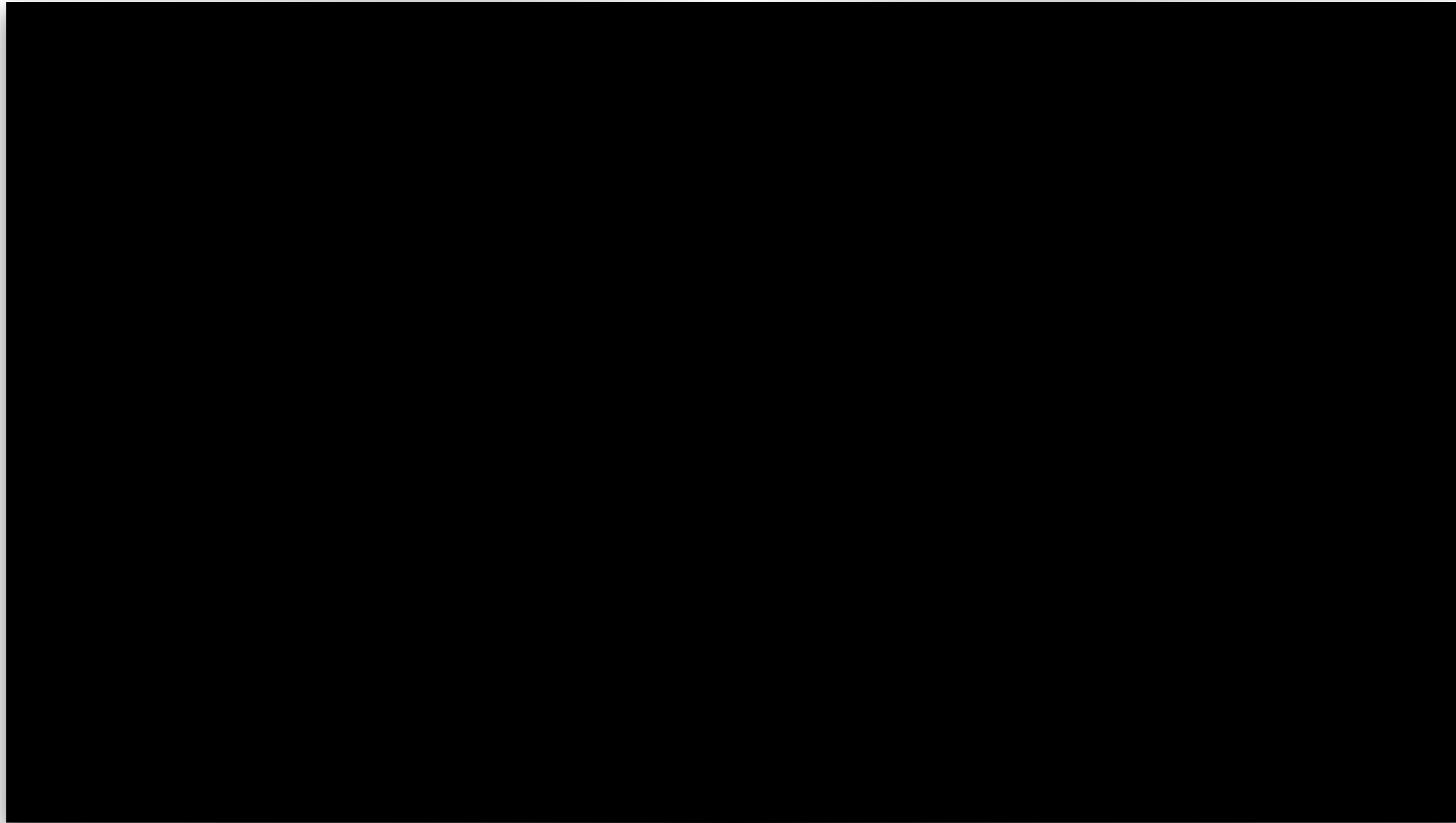
... how will Quantum Technology make the world a better place in ten years?

Technofutures as merging machines



Thin Futures

Smart Glasses



The Future mundane (Foster, 2013)

▶ **Everyday Futures**

- ▶ Insights into everyday life help to get a better understanding of *The Future* than any holographic interface ever could

▶ **Accretive space**

- ▶ *The Future* is not a unique visual singularity but a space, the new sits side by side with the old – „99% of the future is already here“

▶ **Partly broken space**

- ▶ In *The Future*, things will fail like the zoom call or the smart phone that runs out of battery.

▶ **Unintended Side-effects**

- ▶ „The street will find its own usage for things.“ (Gibson, 1984)

What do you think...

... how will Quantum Technology impact society in ten years?

... how will society impact Quantum Technology in ten years?

... and what are potential pitfalls to be aware of today?

Epistemic tools to identify ethical issues

INTERACTION JOURNEY

Use this tool to understand the potential future interaction with your technology/innovation more in-depth. This tool focuses on the perspective of stakeholders involved along the process of the interaction. It supports you in evaluating the impacts on specific values later on.

STAKEHOLDER INTERACTIONS WITH THE TECHNOLOGY / INNOVATION

BEFORE
DURING
AFTER

Stakeholder	Interaction	Impact
Stakeholder 1 (e.g. user)	Interaction 1	Impact 1
Stakeholder 2 (e.g. industry)	Interaction 2	Impact 2
Stakeholder 3 (e.g. government)	Interaction 3	Impact 3
Stakeholder 4 (e.g. society)	Interaction 4	Impact 4
Stakeholder 5 (e.g. environment)	Interaction 5	Impact 5
Stakeholder 6 (e.g. future generations)	Interaction 6	Impact 6
Stakeholder 7 (e.g. other technologies)	Interaction 7	Impact 7

ETHICAL CONSIDERATIONS

Value 1: ...

Value 2: ...

Value 3: ...

Date: _____ Team: _____

SYSTEM MAP

Use this tool to visualise the current state of the sociotechnical system in which your potential future technology/innovation would be integrated. Build on knowledge you have on the system.

SYMBOLS FOR VISUALISATION

ELEMENTS OF THE CURRENT SYSTEM

- Person
- Organization
- Location
- Process
- Technology
- Resource
- Information
- Relationship

CONNECTIONS

Use this tool to visualise connections, to map relationships and dependencies between elements, to highlight critical points of interaction, to show the flow of information, to identify potential risks and opportunities.

ETHICAL CONSIDERATIONS

Value 1: ...

Value 2: ...

Value 3: ...

Date: _____ Team: _____

IMPLICATION FAN

Use this tool to scope the potential long-term implications that your envisioned technology or innovation, an application might have for its surrounding sociotechnical system. This canvas guides and documents the discussion and supports you in describing and evaluating the impacts from an ethical perspective. Use these thoughts as a starting point for developing options for a responsible re-design.

THE ENVISIONED FUTURE

What technical implications does your application have? E.g. how does it impact other existing technologies, is it replacing something, is it pushing further developments, ...?

and this leads to... and this happens... and this happens...

and that leads to... and this requires... this results...

What technological prerequisites are necessary? E.g. infrastructure, ... of specific data, models, hardware, ...?

ETHICAL CONSIDERATIONS

Value 1: ...

Value 2: ...

Value 3: ...

Date: _____ Team: _____

Stakeholder Futures

Integration of Stakeholders

- ▶ **Integration of other perspectives & values to...**
 - ▶ ... become aware of unknown unknowns
 - ▶ ... identify ethical issues and counteract
 - ▶ ... align development on the needs of the (non-)users
- ▶ **Challenges to be aware of**
 - ▶ ... how to identify relevant?
 - ▶ ... how to find a common ground and language?
 - ▶ ... how to align common visions?
 - ▶ ... how to integrate results into the actual development process?
 - ▶ ... how to translate values into code / design / architecture?

Example: Techethos

- ▶ **The TechEthos game: Ages of Technology Impacts**

- ▶ techethos.eu

- ▶ **Overview:**

- ▶ 20 workshops
 - ▶ Dec 2022 – March 2023
 - ▶ 6 countries (Austria, Czech Republic, Romania, Serbia, Spain, Sweden)
 - ▶ 331 participants (XR, NT and Climate Engineering)

- ▶ **Objective:**

- ▶ Elicit attitudes & values to inform regular guidelines



What do you think...

... who would be relevant stakeholders for quantum technology?

Wrap Up & Take-Aways

Wrap up & main takeaways

- ▶ There are multiple Futures in the present
- ▶ Each future holds values that might conflict with others
- ▶ Becoming aware of the futures we follow and discuss the implicit values helps to create responsible technologies

Thank you!

Wenzel Mehnert

wenzel.mehnert@ait.ac.at

