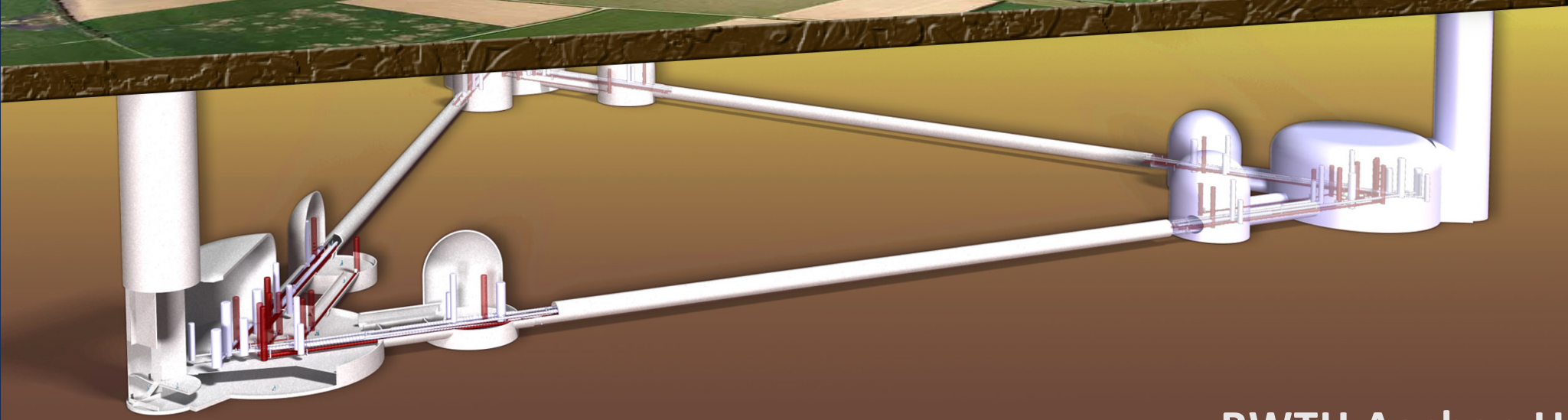


Einstein-Telescope



Einstein - Telescope

Location:

- in a geologically stable and quiet region

Underground:

- less seismic noise
- less Newtonian noise

1 detector per corner:

- complete field-of-view
- access to polarization
- directional sensitivity

2 interferometers per detector:

- extended frequency range
- follow signals for hours

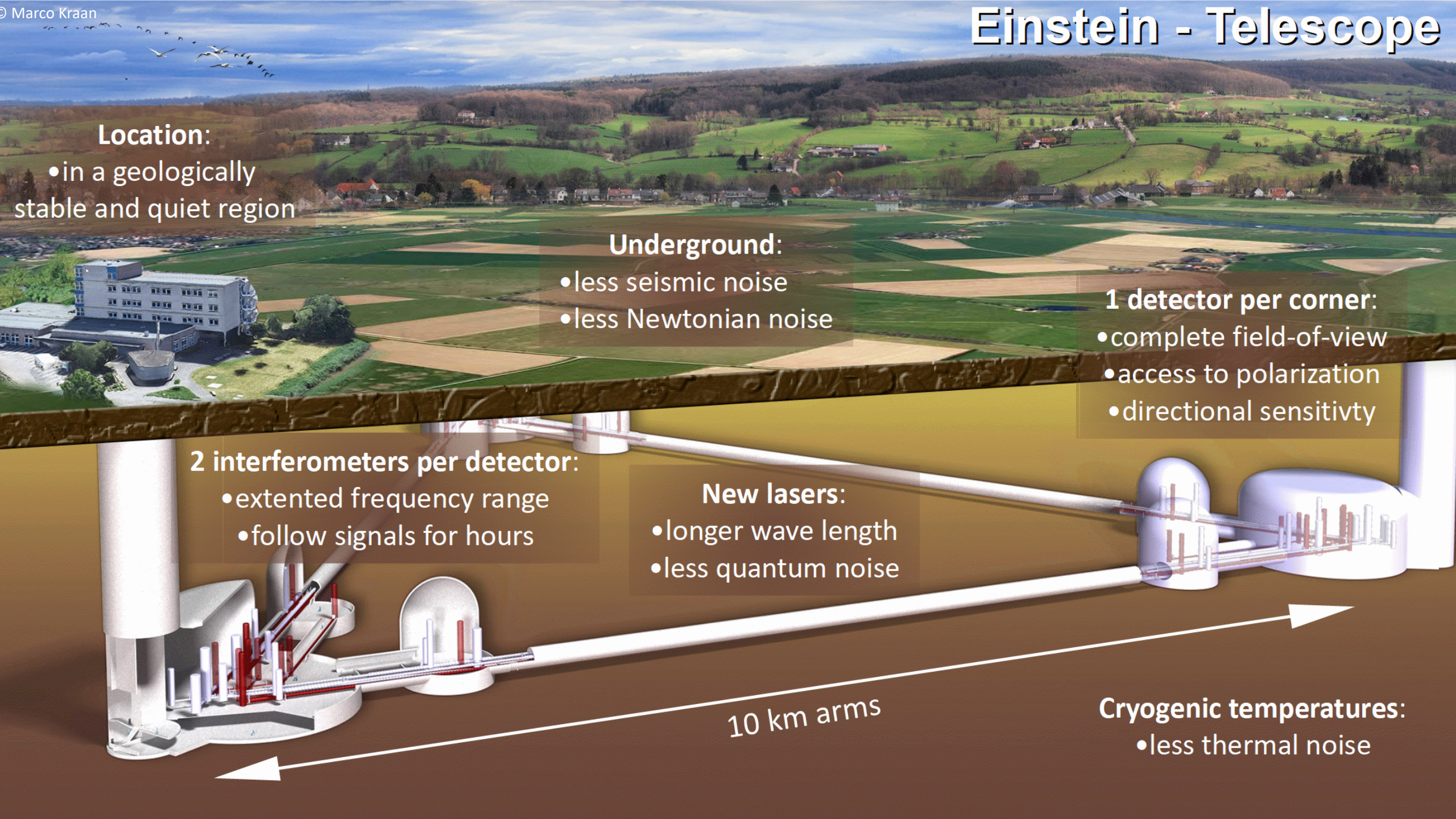
New lasers:

- longer wave length
- less quantum noise

10 km arms

Cryogenic temperatures:

- less thermal noise



Computing Resources

ET Computing Centre

- operation of telescope
- data acquisition
- low latency pipelines
- data calibration
- data distribution
- data long term storage

- collaborative tools
- management tools

Offline Computing

- data analysis

- distributed resources
- responsibility of the research institutions

Theory

- calculation of templates

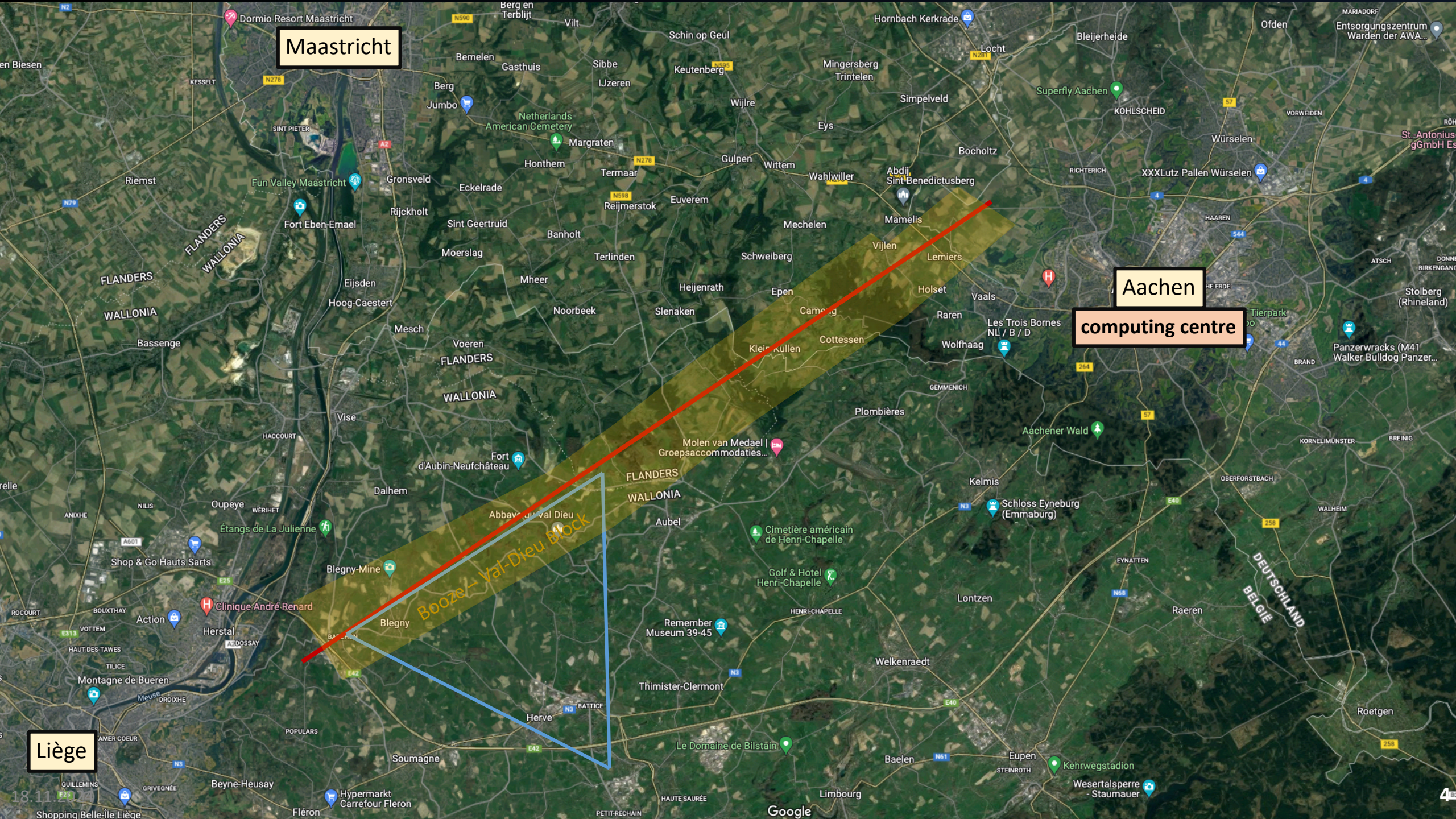
- distributed resources
- responsibility of the research institutions

Maastricht

Aachen
computing centre

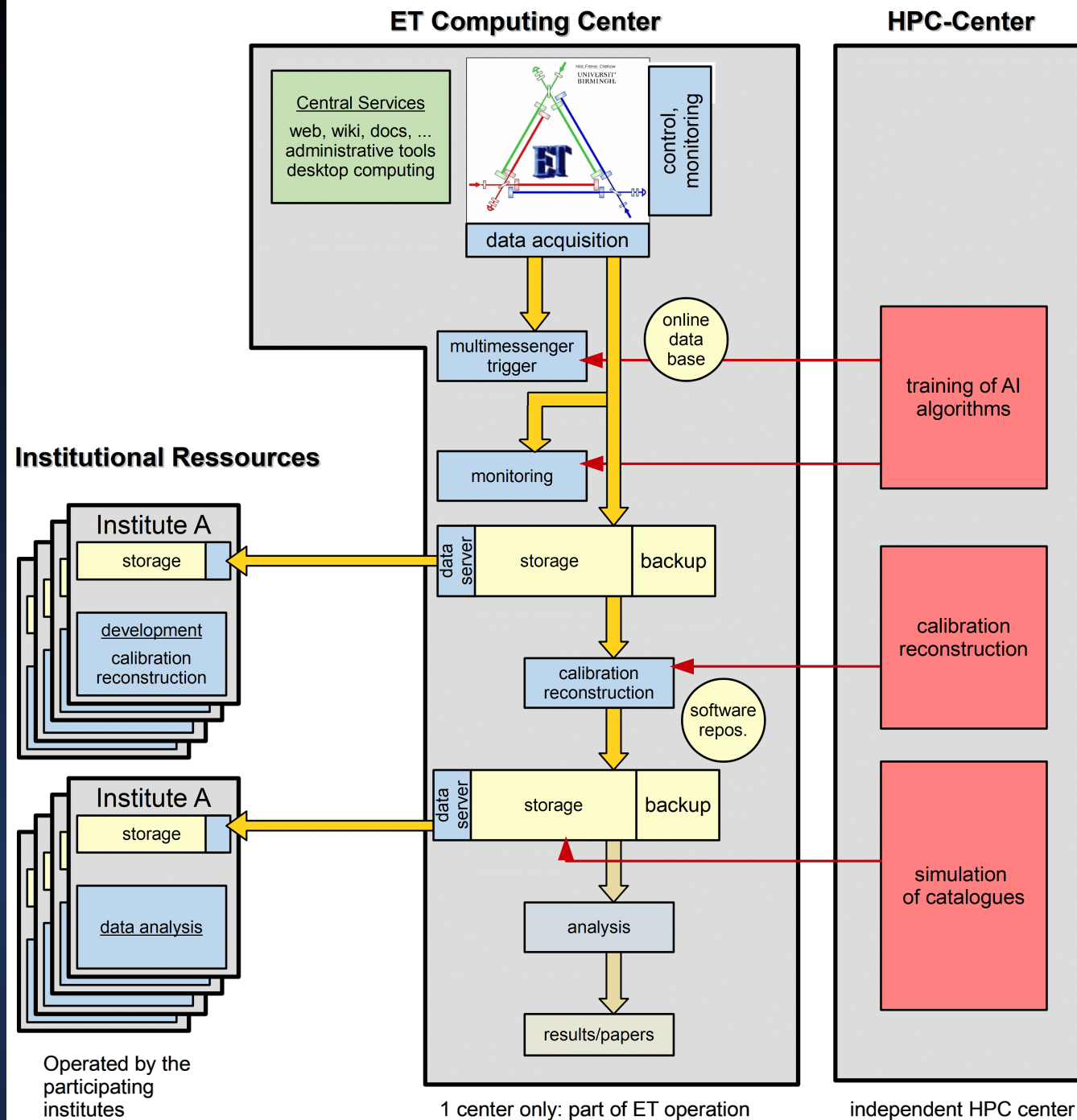
Liège

Booze - Val Dieu Bock



Concept

Just a very first idea!



Power Consumption

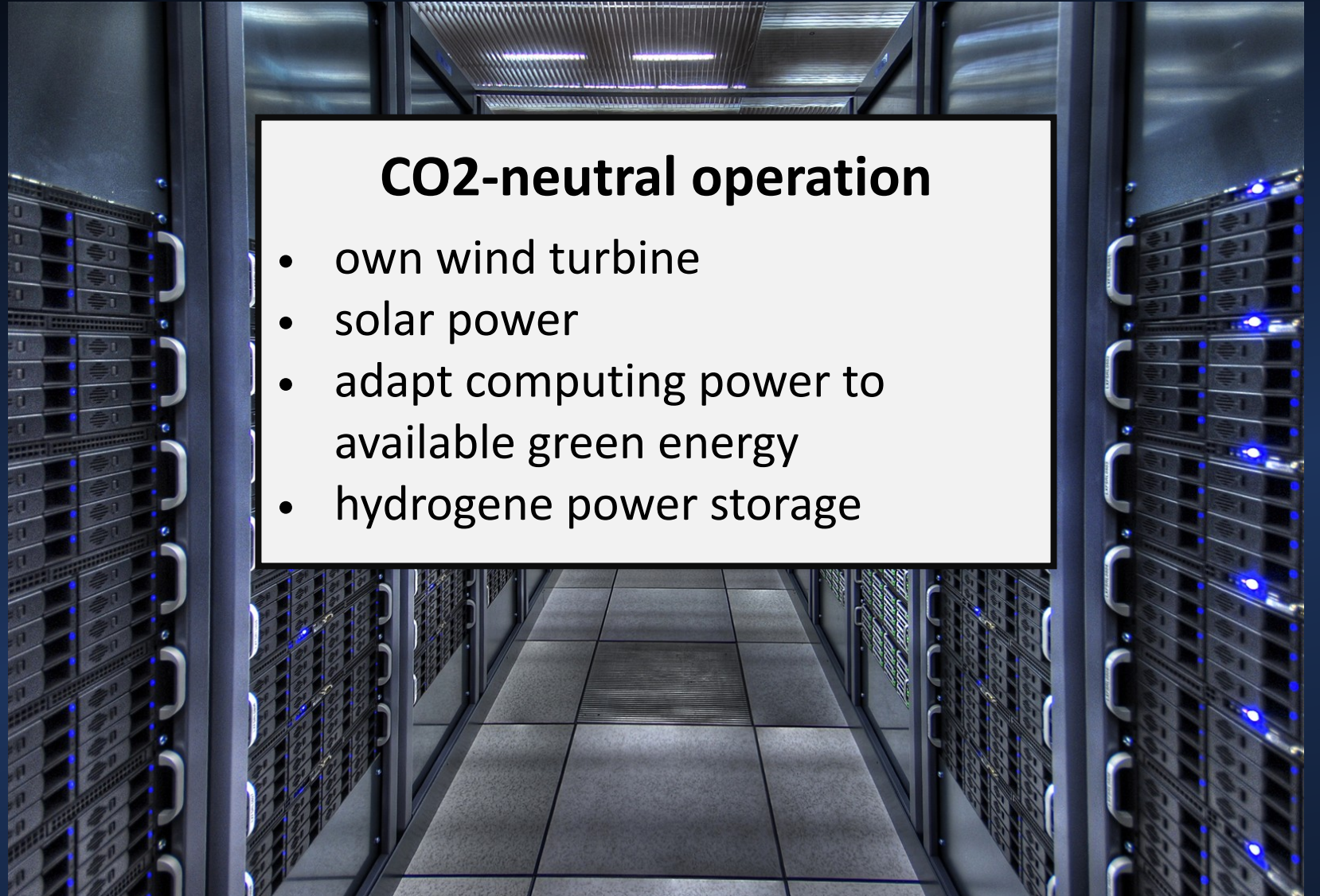
Computing dominates the power consumption of the Einstein Telescope

For reference, main lasers:

- 3x 3 kW ET-HF
- 3x 600W ET-LF

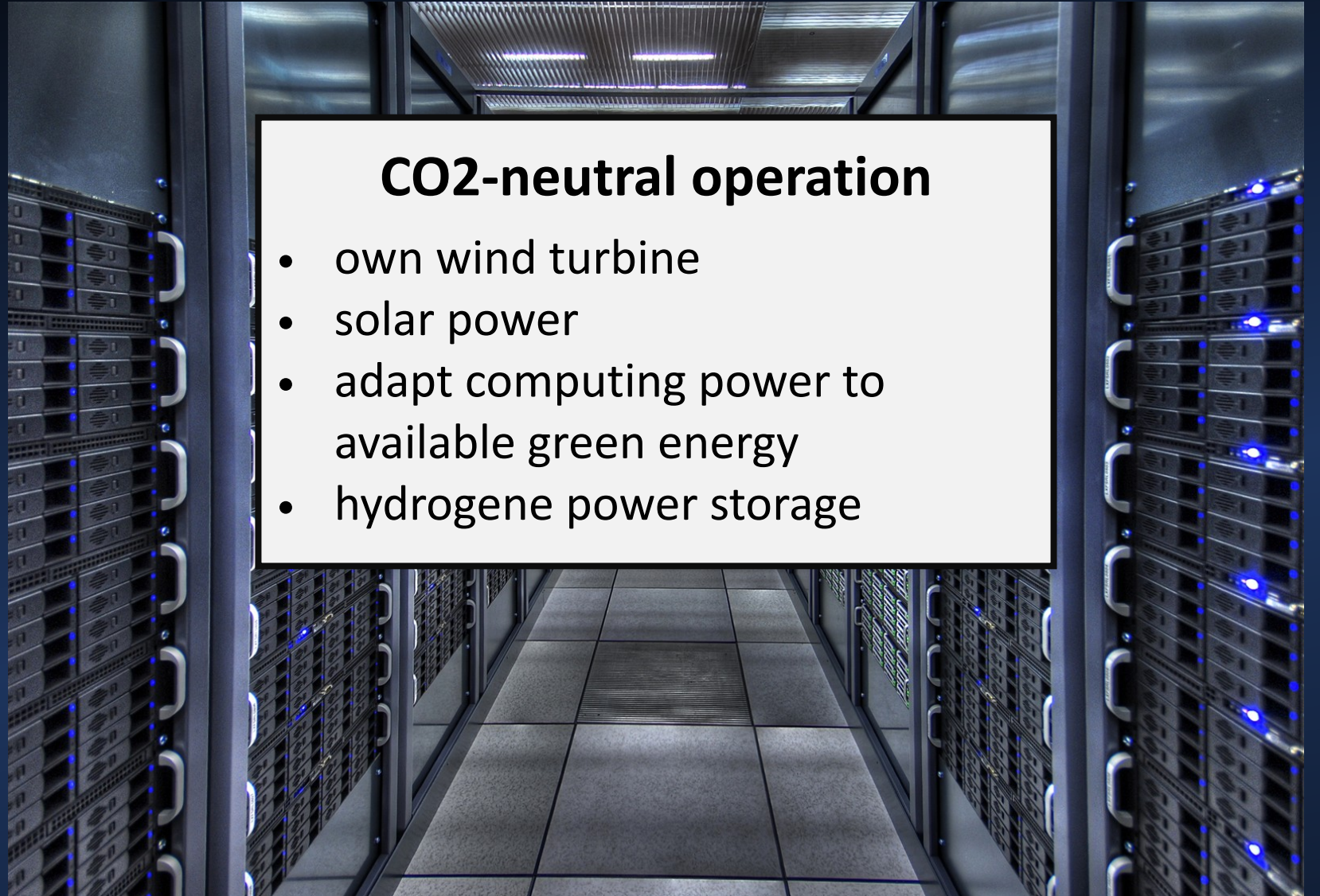
CO2-neutral operation

- own wind turbine
- solar power
- adapt computing power to available green energy
- hydrogen power storage



Other Aspects of Sustainability

- Heating of building from rest heat
- Reuse of access rest heat in district heating
- Building construction
- Centre connected to local transportation
- some home-office to reduce local travel
- main problem: computing hardware (run hardware longer)
- sustainable software



CO2-neutral operation

- own wind turbine
- solar power
- adapt computing power to available green energy
- hydrogen power storage

Einstein Telescope

Summary

- ET offers an opportunity to develop a CO₂-neutral computing centre
- All aspects of sustainability will be taken into account.
- One person (full-time) will be available from May 2025.
- Build and operate a test installation?

