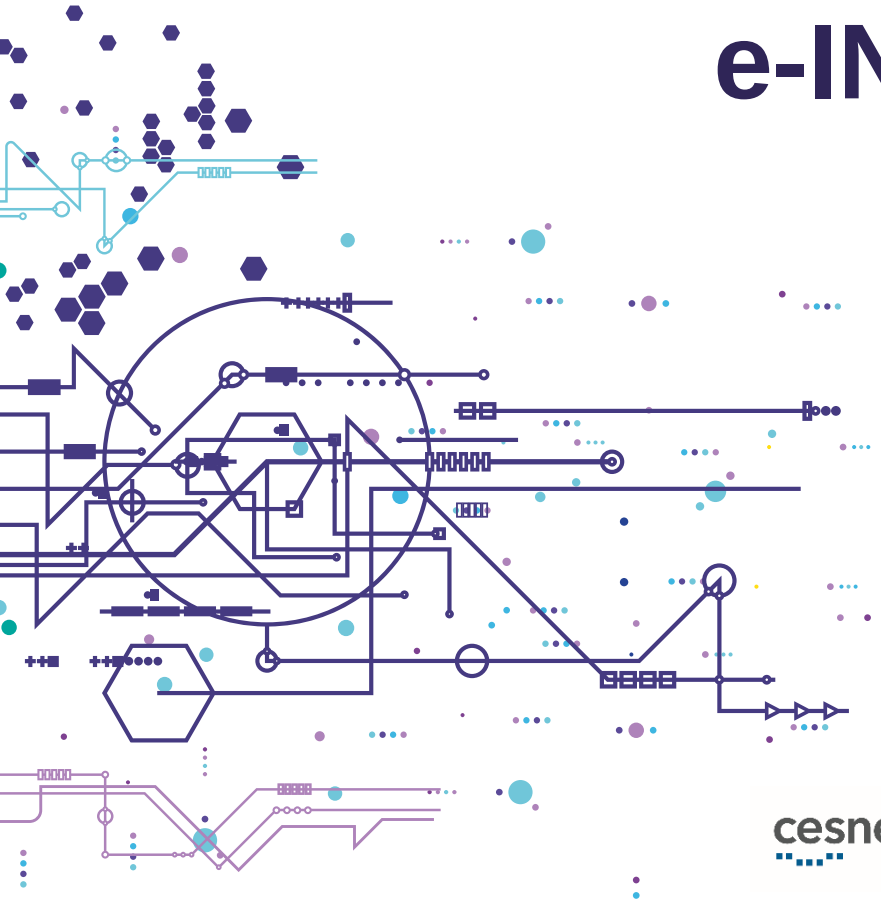
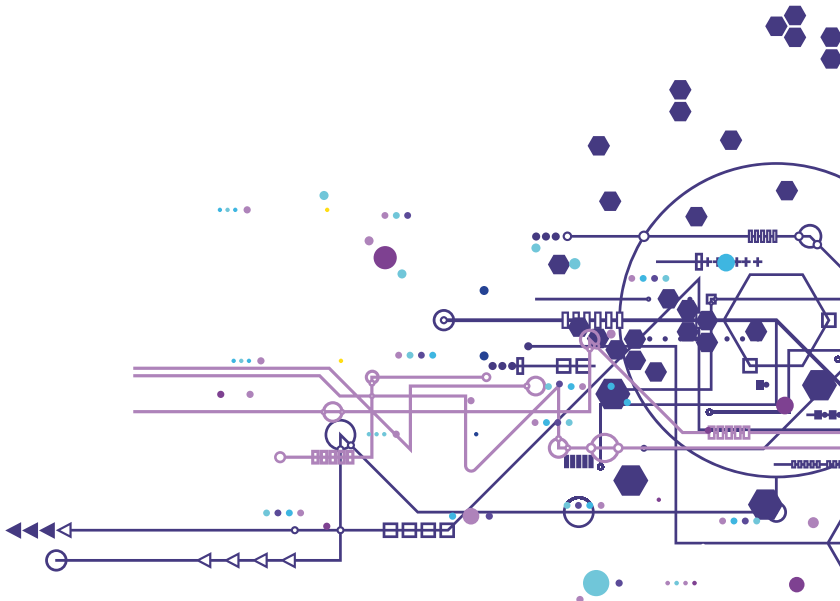
e-INFRA CZ Roadmap





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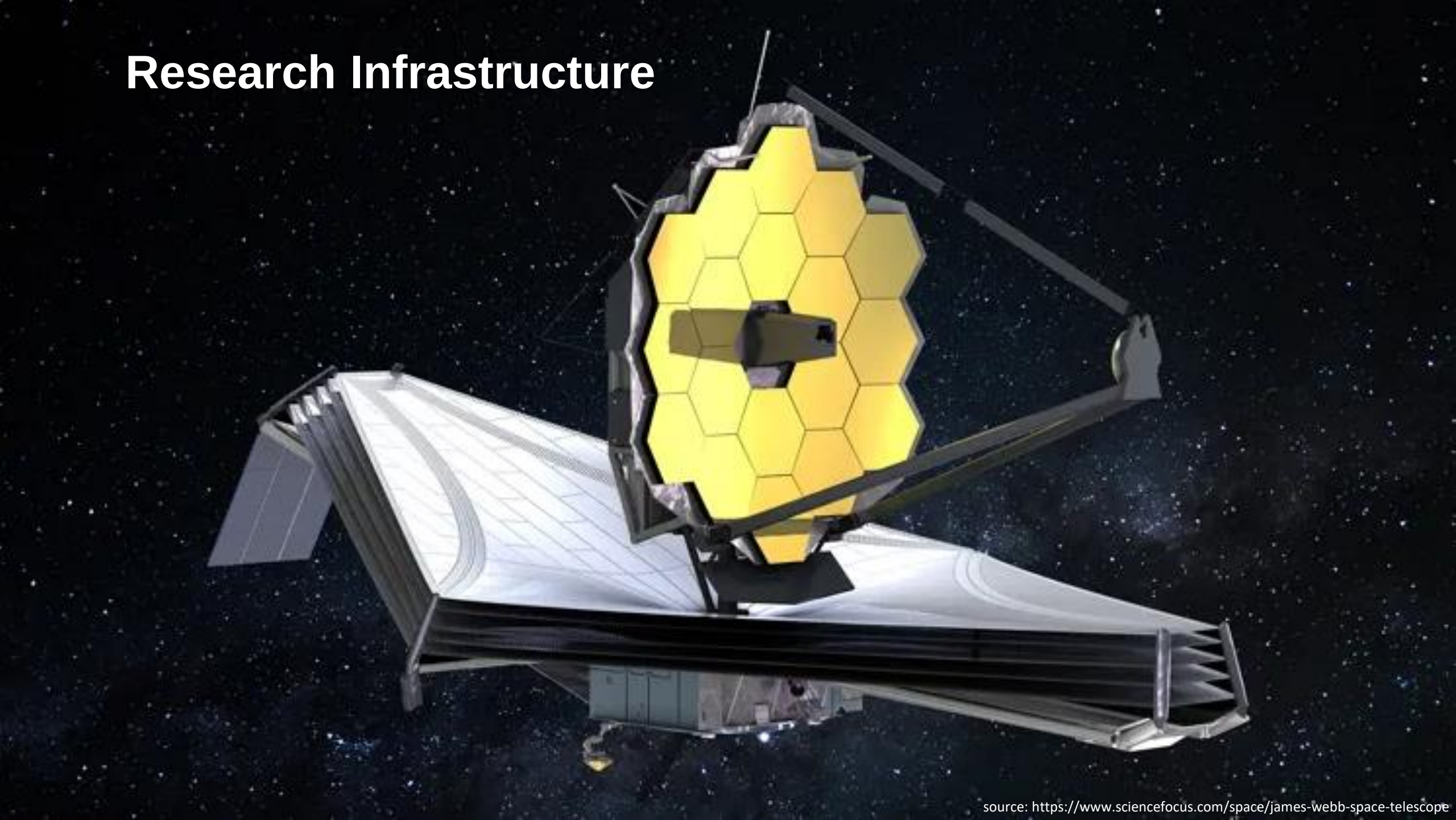
source: https://www.biography.com/scientists/galileo-discoveries-theories-modern-physics-astronomy

Putting resources together

source: https://www.cloudynights.com/articles/cat/articles/a-visit-to-the-museum-of-astronomical-telescope-r3040

Research Infrastructure



source: https://www.sciencefocus.com/space/james-webb-space-telescope

Bit More CLOUDy with e-infrastructures

On research infrastructures

Research Infrastructures are facilities that provide resources and services for research communities to conduct research and foster [encourage] innovation. They can be used beyond research e.g. for education or public services and they may be single-sited, distributed, or virtual.

European commission

research communities

provide resources and services

foster [encourage] innovation

Part I – Resources and Services

e-INFRA CZ major service areas

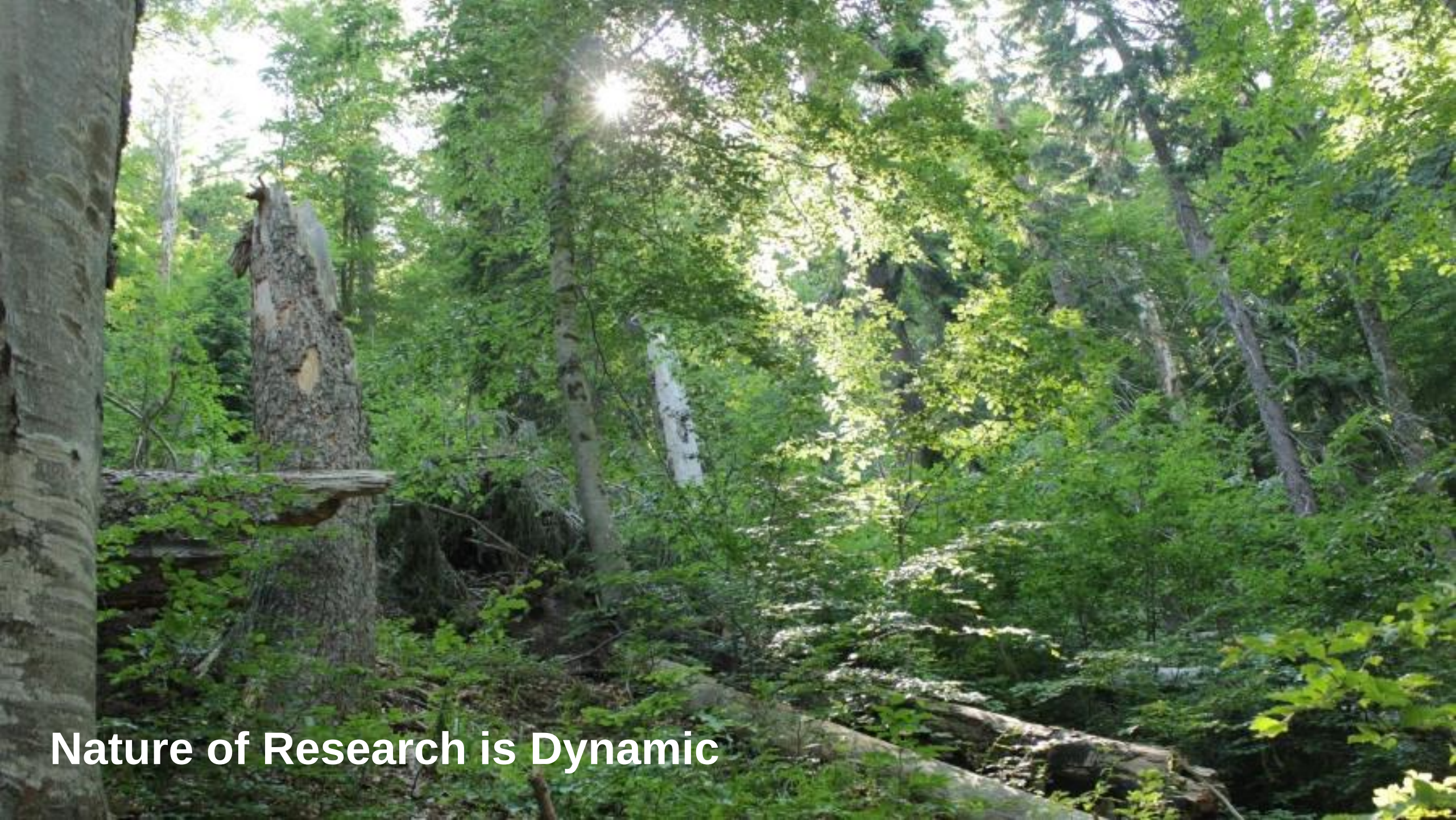
Data transfer

Data processing

Data storage

… and more

Perfection by Isolation


Nature of Research is Dynamic

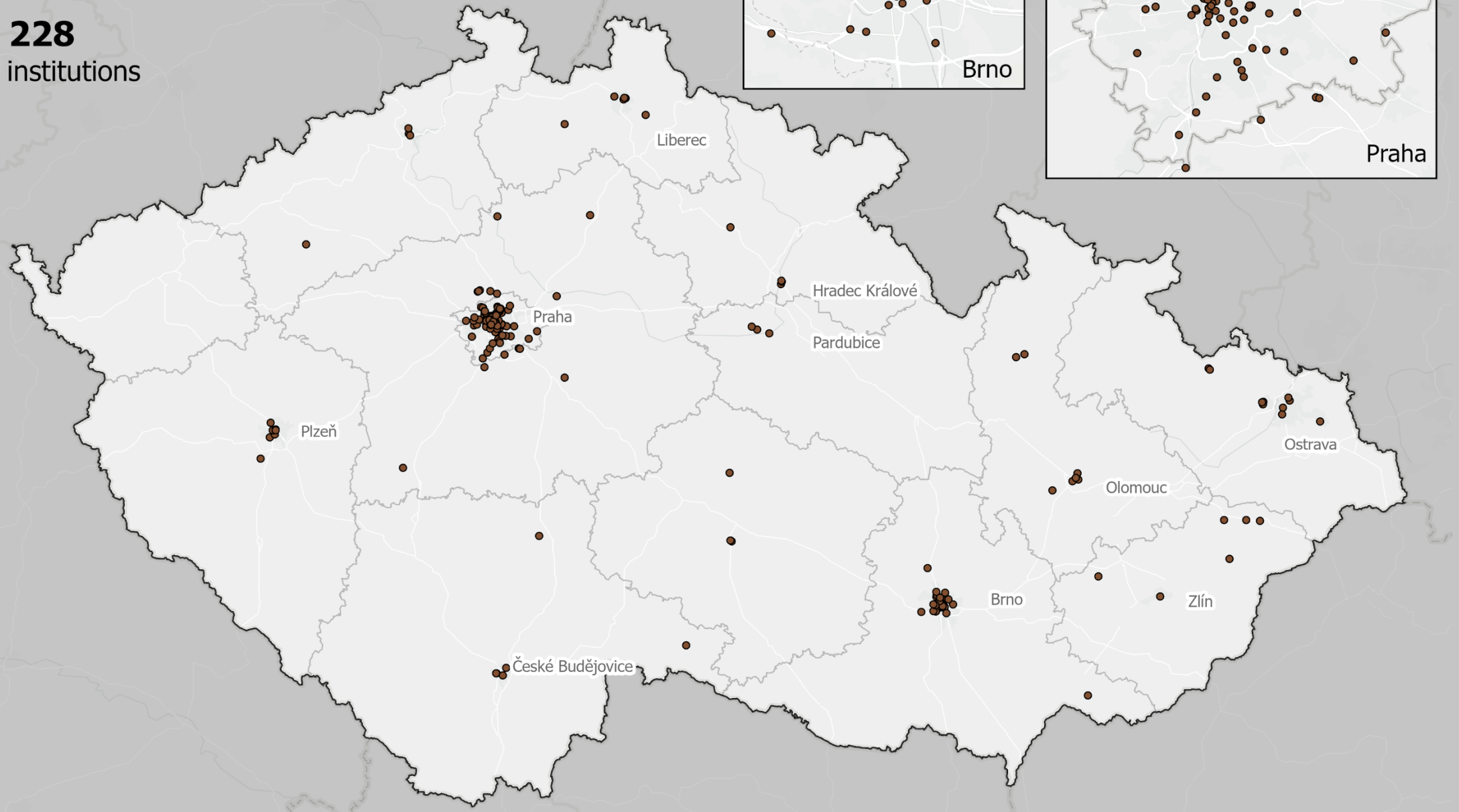
PART II - Research communities

source: https://skylum.com/cs/blog/fire-photography-101-how-to-master-fire-background-shots

Research organisations in Czechia

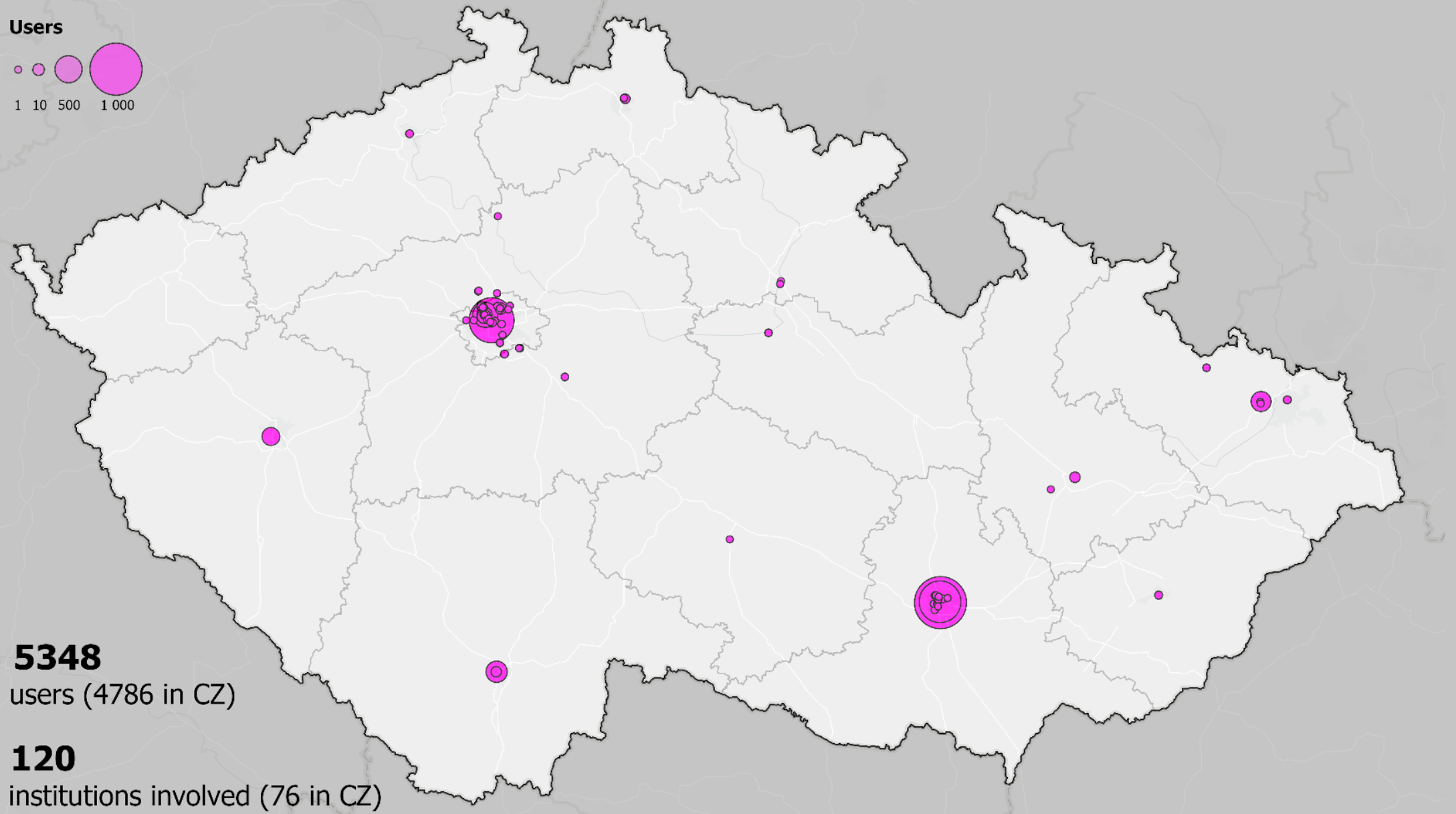
provided by Ministry of Education, Youth and Sports

228
institutions



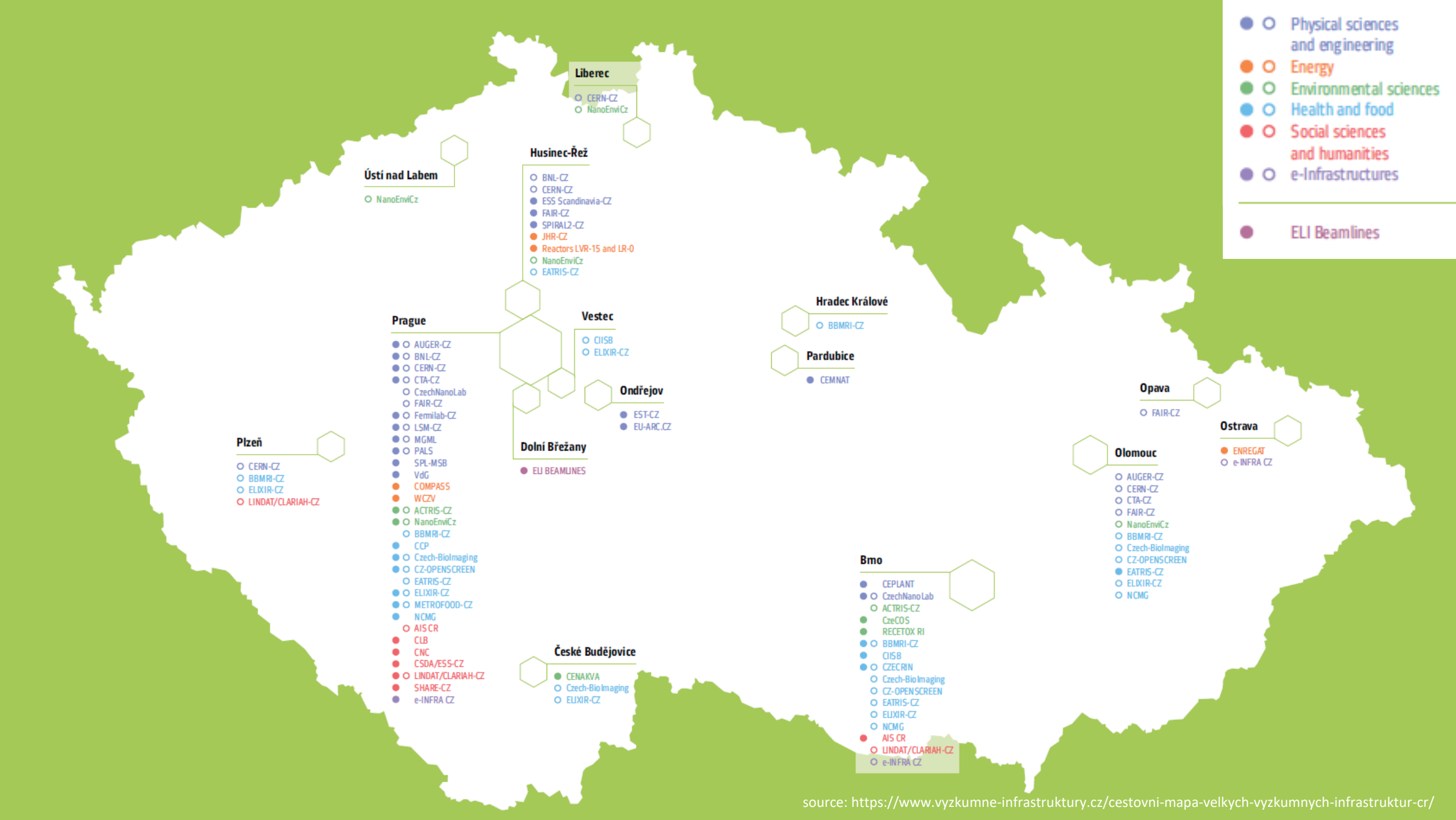
Users of e-INFRA CZ

affiliated to CZ institutions



5348
users (4786 in CZ)

120
institutions involved (76 in CZ)



source: https://www.vyzkumne-infrastruktury.cz/cestovni-mapa-velkych-vyzkumnych-infrastruktur-cr/

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CESNET / e-INFRA CZ
| National Data Infrastructure Architecture |

PETRA ČERNOHLÁVKOVÁ
National Library of Technology
| Metadata |

RADKA ŘÍMANOVÁ
Central Library of Charles University
| Education and Human Resources |

MICHAL RŮŽIČKA
ICS Masaryk University / e-INFRA CZ
| Core Services |

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Institute of Organic Chemistry and Biochemistry of the CAS / ELIXIR - CZ
| Bio/Health/Food|

JINDŘICH KREJČÍ
Institute of Sociology of the CAS
| Social Sciences |

JIŘÍ CHUDOBA
FZU (Institute of Physics of the Czech Academy of Sciences)
| Physical Sciences |

JAN HAJIČ
Charles University / LINDAT / CLARIAH-CZ
| Humanities and the Arts |

MAREK CEBECAUER
J. Heyrovský Institute of Physical Chemistry of the CAS
| Materials Sciences and Engineering |

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IT4Innovations National Supercomputing Center VŠB - TUO
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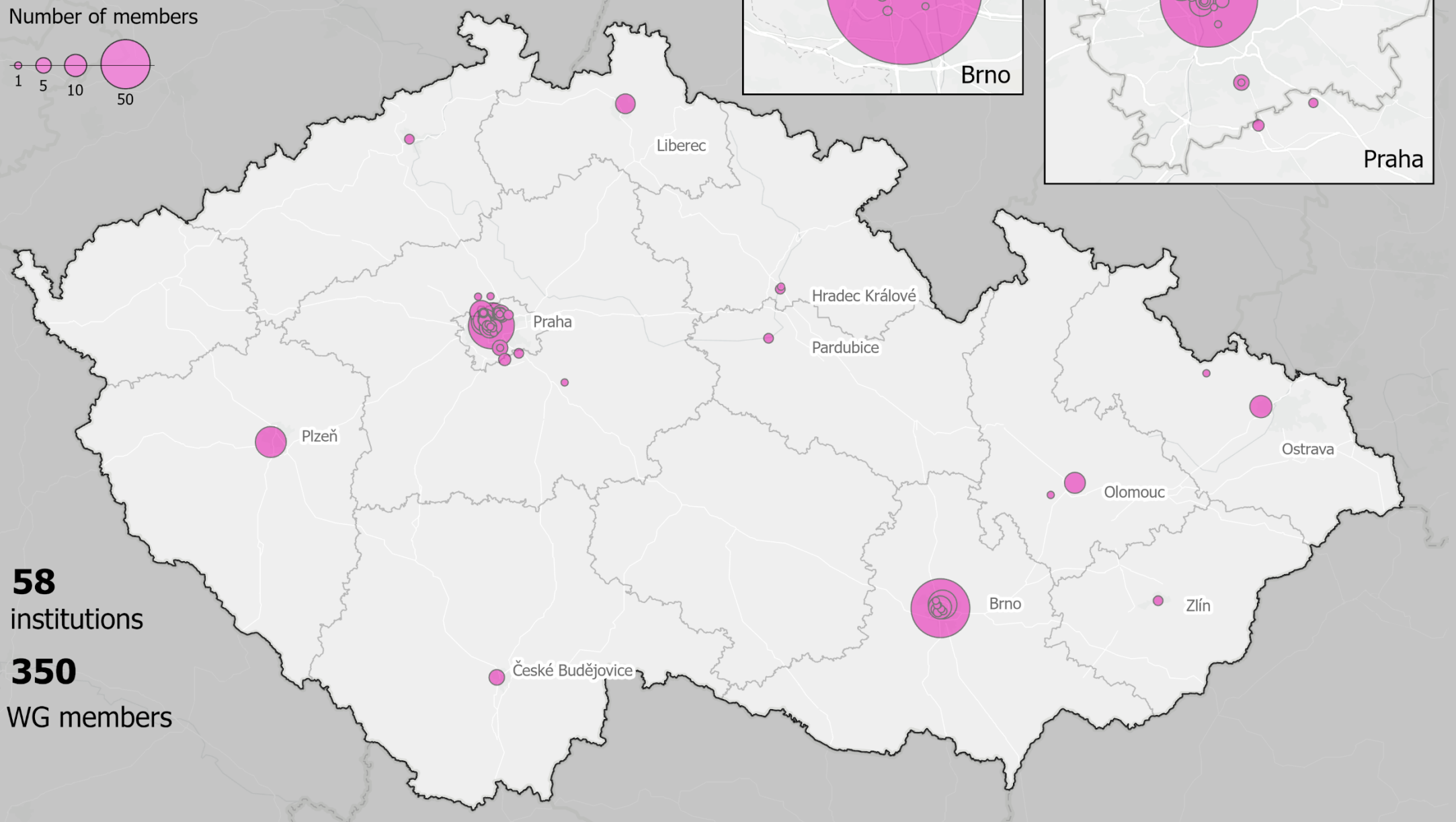
Masaryk University / RECETOX
| Environmental Sciences |

ZDENKA DUDOVÁ
BBMRI.cz, Masaryk Memorial Cancer Institute
| Sensitive Data |

EOSC CZ Working Group members

at institutions



58
institutions

350
WG members

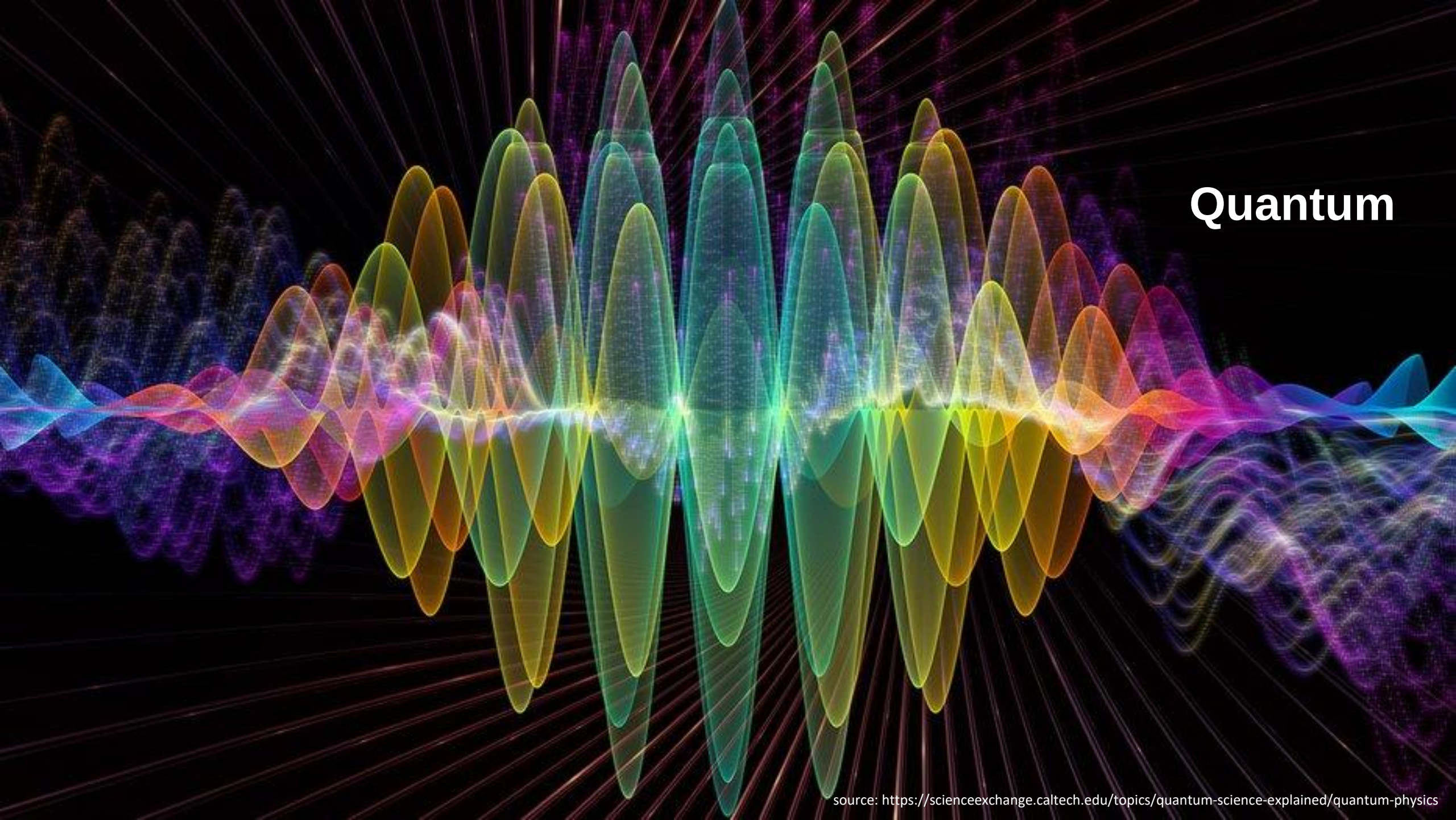
PART III – Fostering Innovation

source: https://www.space.com/saturn-v-rocket-guide-apollo

Secondary Use of Data

source: https://www.uptekk.com/

source: https://anundergroundminer.com/blog/the-four-main-types-of-mining

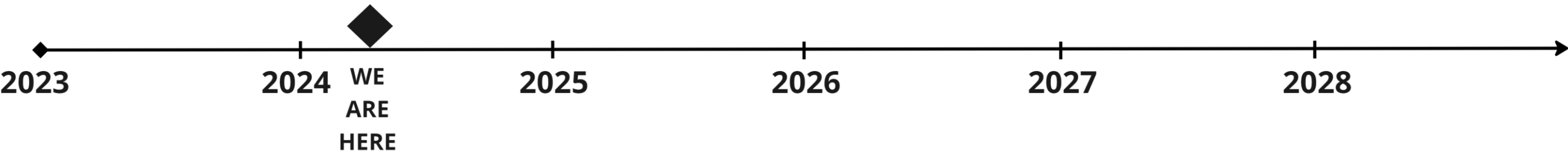


source: https://scienceexchange.caltech.edu/topics/quantum-science-explained/quantum-physics

THE ROADMAP

Disclaimer: in 2011, Elon Musk estimated he would put a man on Mars by 2020.

source: https://hrfibreglass.co.uk/grp/why-you-need-a-business-roadmap/



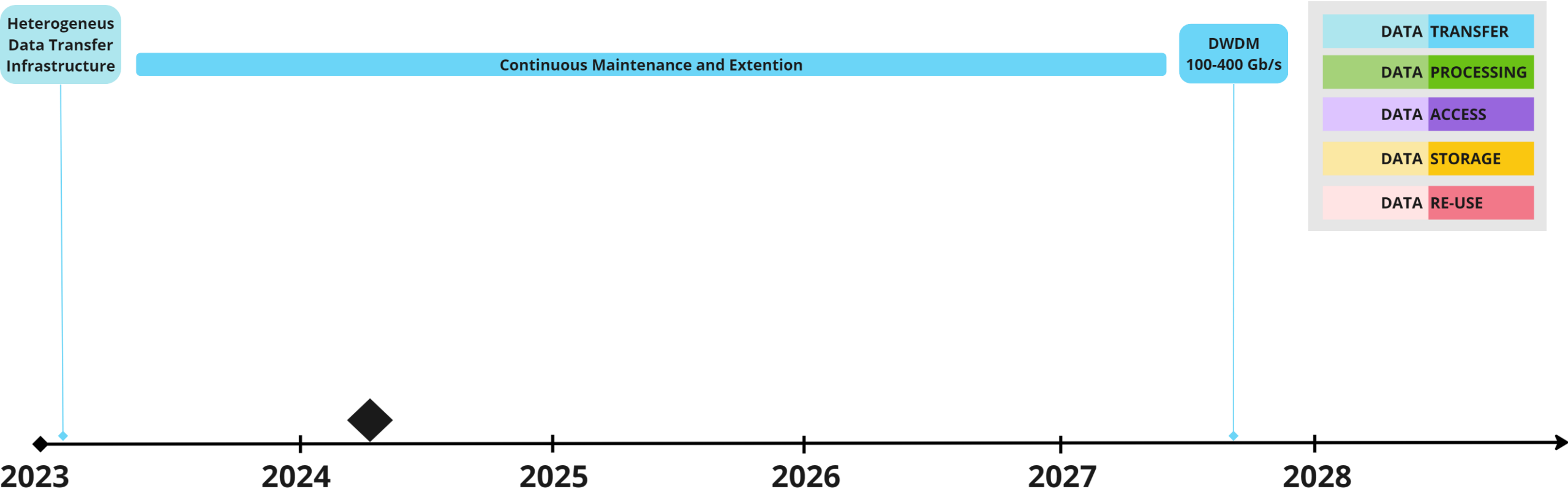
DATA TRANSFER

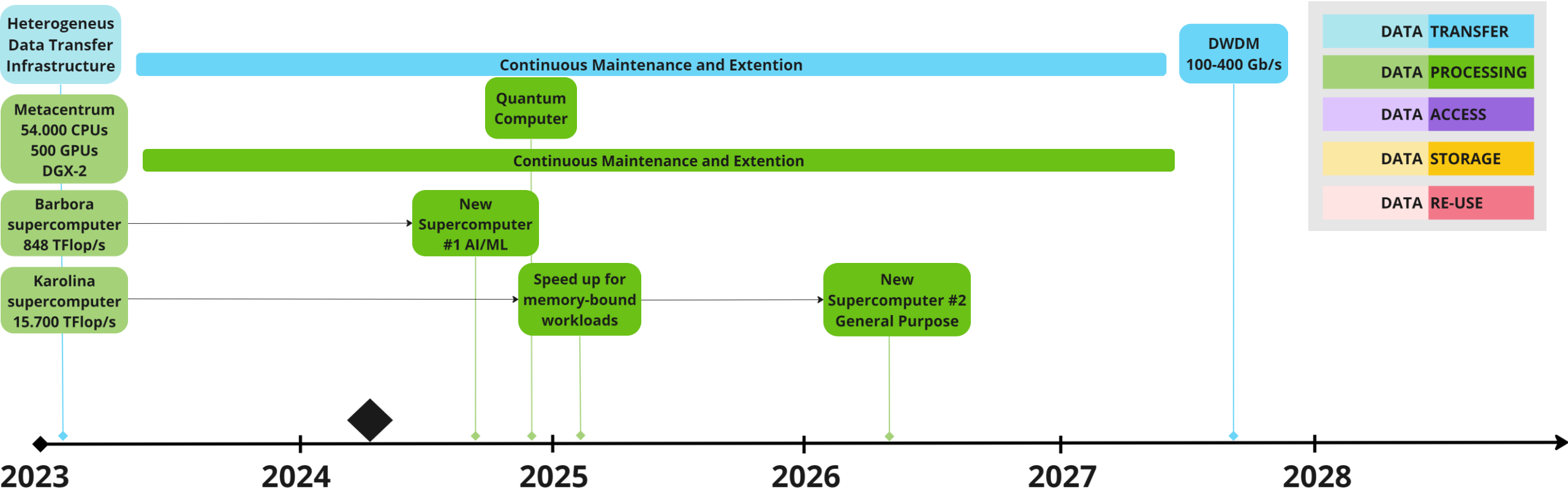
DATA PROCESSING

DATA ACCESS

DATA STORAGE

DATA RE-USE


Heterogeneus Data Transfer Infrastructure
Continuous Maintenance and Extention
DWDM 100-400 Gb/s
DATA TRANSFER
DATA PROCESSING
DATA ACCESS
DATA STORAGE
DATA RE-USE
2023
2024
2025
2026
2027
2028


Heterogeneus Data Transfer Infrastructure
Continuous Maintenance and Extention
DWDM 100-400 Gb/s
Metacentrum 54.000 CPUs 500 GPUs DGX-2
Quantum Computer
Continuous Maintenance and Extention
Barbora supercomputer 848 TFlop/s
New Supercomputer #1 AI/ML
Karolina supercomputer 15.700 TFlop/s
Speed up for memory-bound workloads
New Supercomputer #2 General Purpose
DATA TRANSFER
DATA PROCESSING
DATA ACCESS
DATA STORAGE
DATA RE-USE
2023
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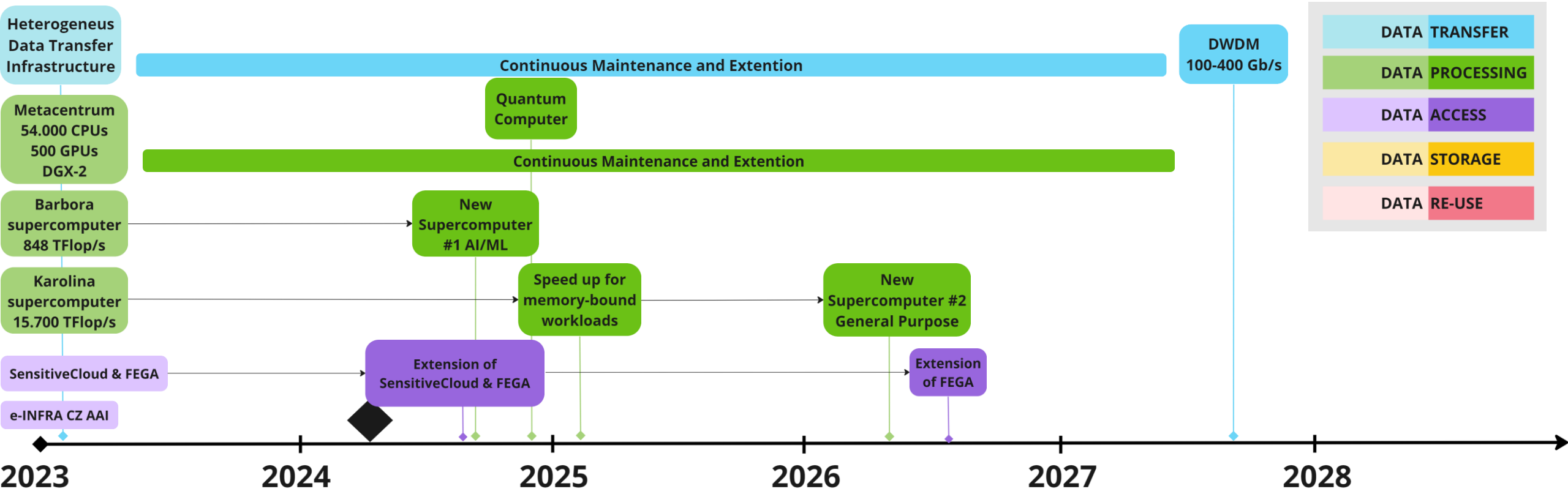
2028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Karolina supercomputer 15.700 TFlop/s
Speed up for memory-bound workloads
New Supercomputer #2 General Purpose
SensitiveCloud & FEGA
Extension of SensitiveCloud & FEGA
Extension of FEGA
e-INFRA CZ AAI
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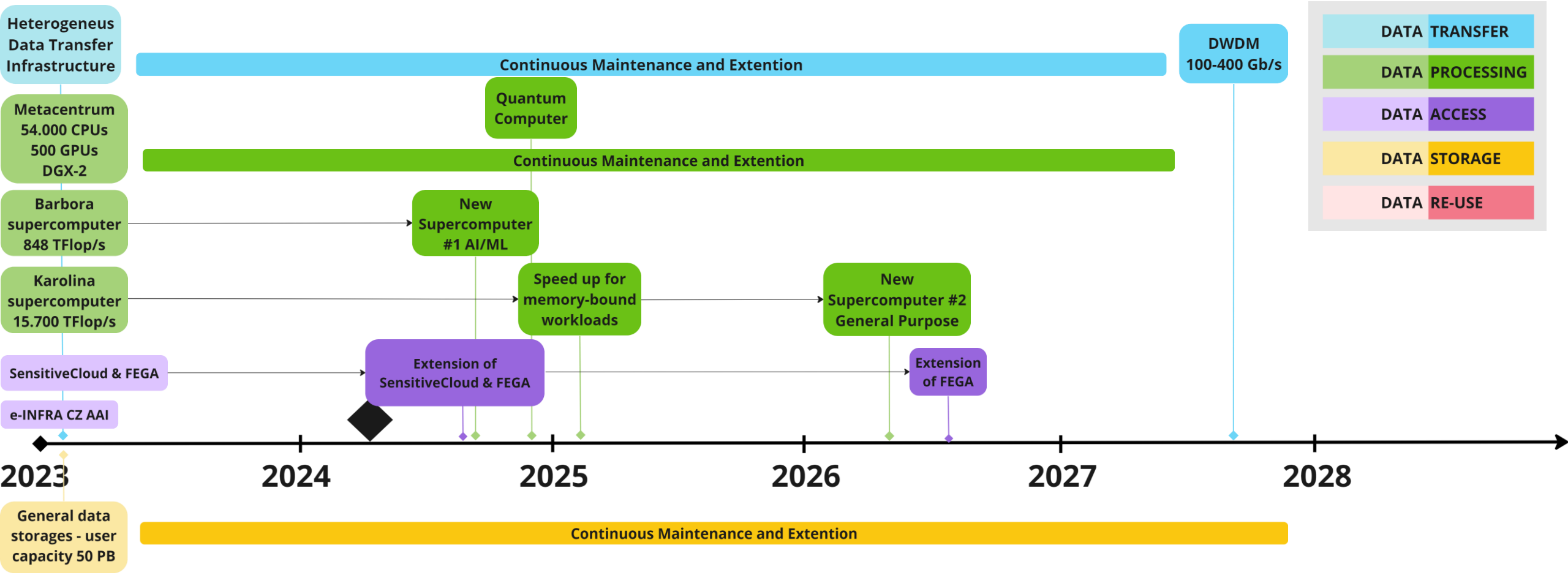
DATA TRANSFER
DATA PROCESSING
DATA ACCESS
DATA STORAGE
DATA RE-USE


Heterogeneus Data Transfer Infrastructure
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DWDM 100-400 Gb/s
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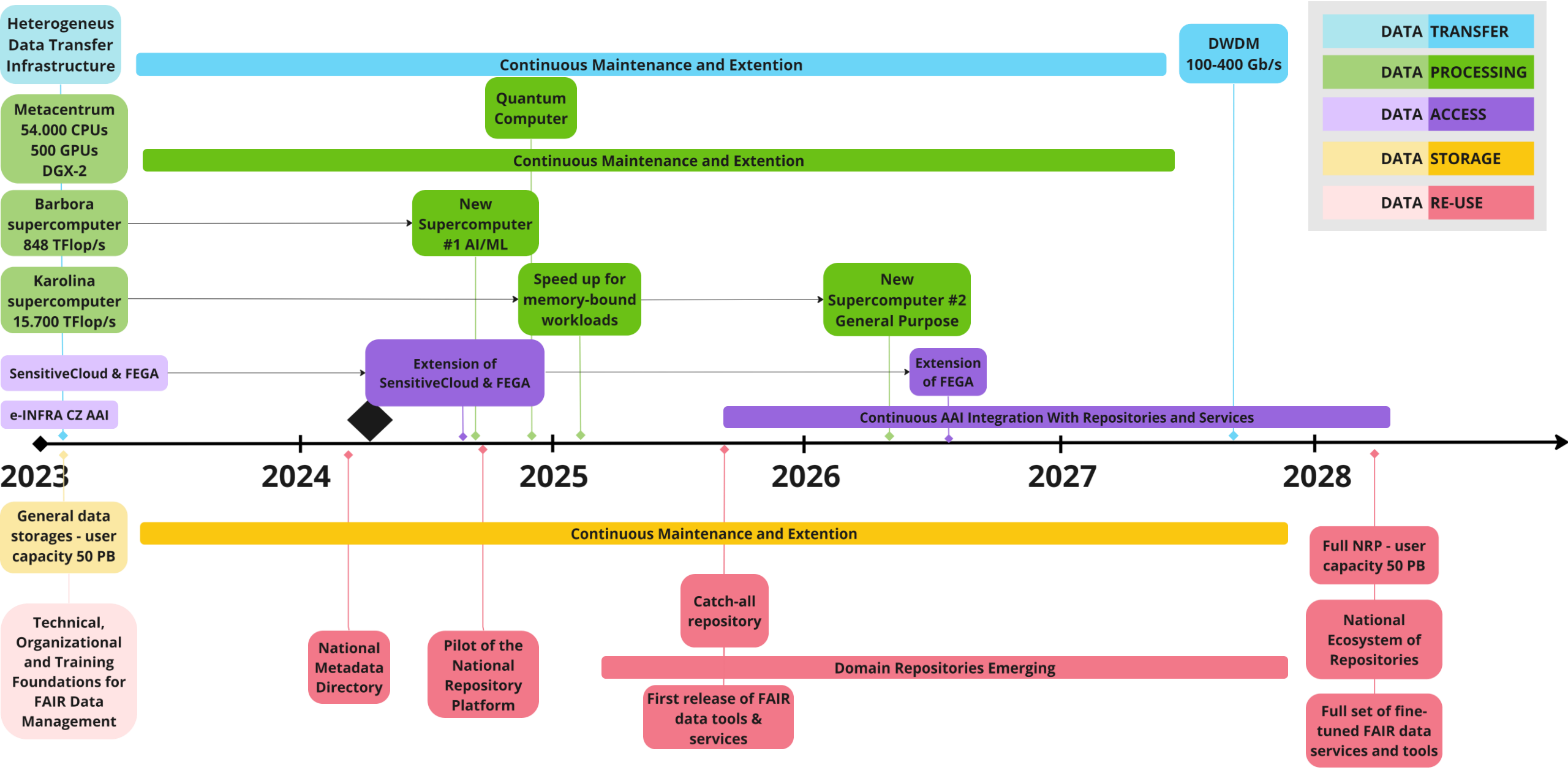
SensitiveCloud & FEGA
Extension of SensitiveCloud & FEGA
Extension of FEGA
e-INFRA CZ AAI
2023
2024
2025
2026
2027
2028
General data storages - user capacity 50 PB
Continuous Maintenance and Extention
DATA TRANSFER
DATA PROCESSING
DATA ACCESS
DATA STORAGE
DATA RE-USE


DATA TRANSFER
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Speed up for memory-bound workloads
New Supercomputer #2 General Purpose
SensitiveCloud & FEGA
Extension of SensitiveCloud & FEGA
Extension of FEGA
e-INFRA CZ AAI
Continuous AAI Integration With Repositories and Services
2023
2024
2025
2026
2027
2028
General data storages - user capacity 50 PB
Continuous Maintenance and Extention
Full NRP - user capacity 50 PB
Technical, Organizational and Training Foundations for FAIR Data Management
National Metadata Directory
Pilot of the National Repository Platform
Catch-all repository
Domain Repositories Emerging
National Ecosystem of Repositories
First release of FAIR data tools & services
Full set of fine-tuned FAIR data services and tools

e-INFRA CZ – together for science

To **engage research communities** …

… and **to foster science** …

… by **smart and robust solutions** to

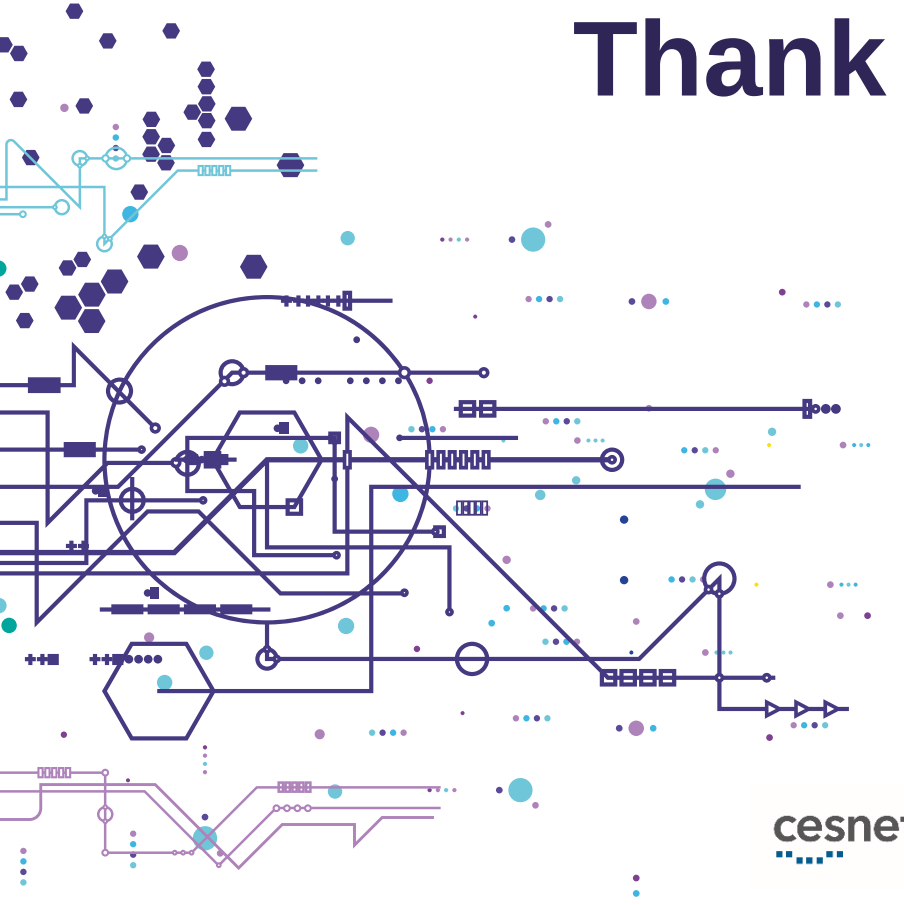
PROCESS
TRANSFER
STORE
ACCESS and
RE-USE

research data in Czechia

e-INFRA CZ
together for science

On behalf of the whole e-INFRA CZ:

Thank you for your attention



Matej Antol

CERIT-SC Executive Director
e-INFRA CZ Integration Manager

cesnet

MUNI CERIT-SC

VŠB TECHNICKÁ UNIVERZITA OSTRAVA | IT4INNOVATIONS NÁRODNÍ SUPERPOČÍTAČOVÉ CENTRUM

Presentation was created in collaboration with Kseniya Bobryshava, Martin Dvořák and Michaela Capandová, EOSC CZ Secretariat.