National Czech Programme | eosc

Tomáš Kozubek

Scientific Director

IT4Innovations, VSB – Technical University of Ostrava

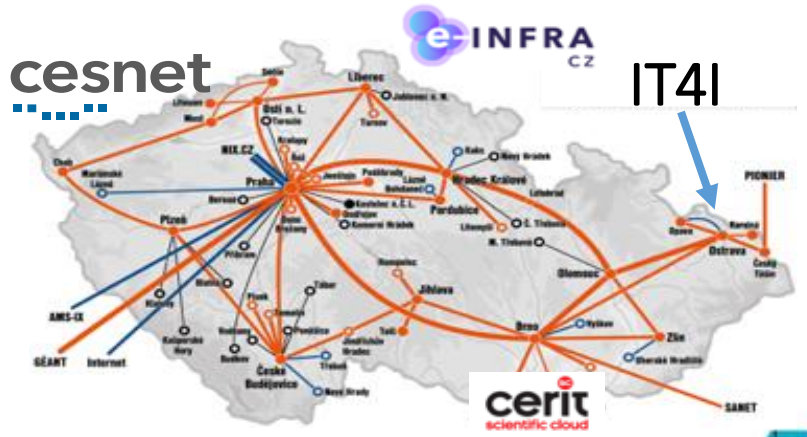
National EOSC CZ Conference 2025
Long Live Research Data

Co-funded by the European Union

MINISTRY OF EDUCATION, YOUTH AND SPORTS

ABOUT IT4INNOVATIONS

- Established in 2011 in Ostrava, Czechia
- Unit of the VSB – Technical University of Ostrava
- Member of e-INFRA CZ
  - a strategic research infrastructure of Czechia
  - HPC / Cloud / data / EOSC technologies and services
- 5 research laboratories
  - more than 100 FTE in HPC, HPDA, AI, QC
- Strong international collaboration
  - part of EU initiatives: EuroHPC JU, PRACE, EUDAT, ETP4HPC, BDVA, QUIC, EOSC, I4MS, iRODS, VI-HPS, WHPC
  - 25+ HE/DEP ongoing projects
- Operating
  - 2 supercomputers Barbora & Karolina, 1 quantum computer VLQ
  - co-operating LUMI supercomputer (TOP #9 in the world)
- Cooperation with industry and public institutions
  - NCC in HPC, EDIH OVA, LUMI and Czech AI Factories
- Training and educational activities
  - 50+ trainings per year in HPC, HPDA, AI, QC, and Open Science



EUROHPC JOINT UNDERTAKING

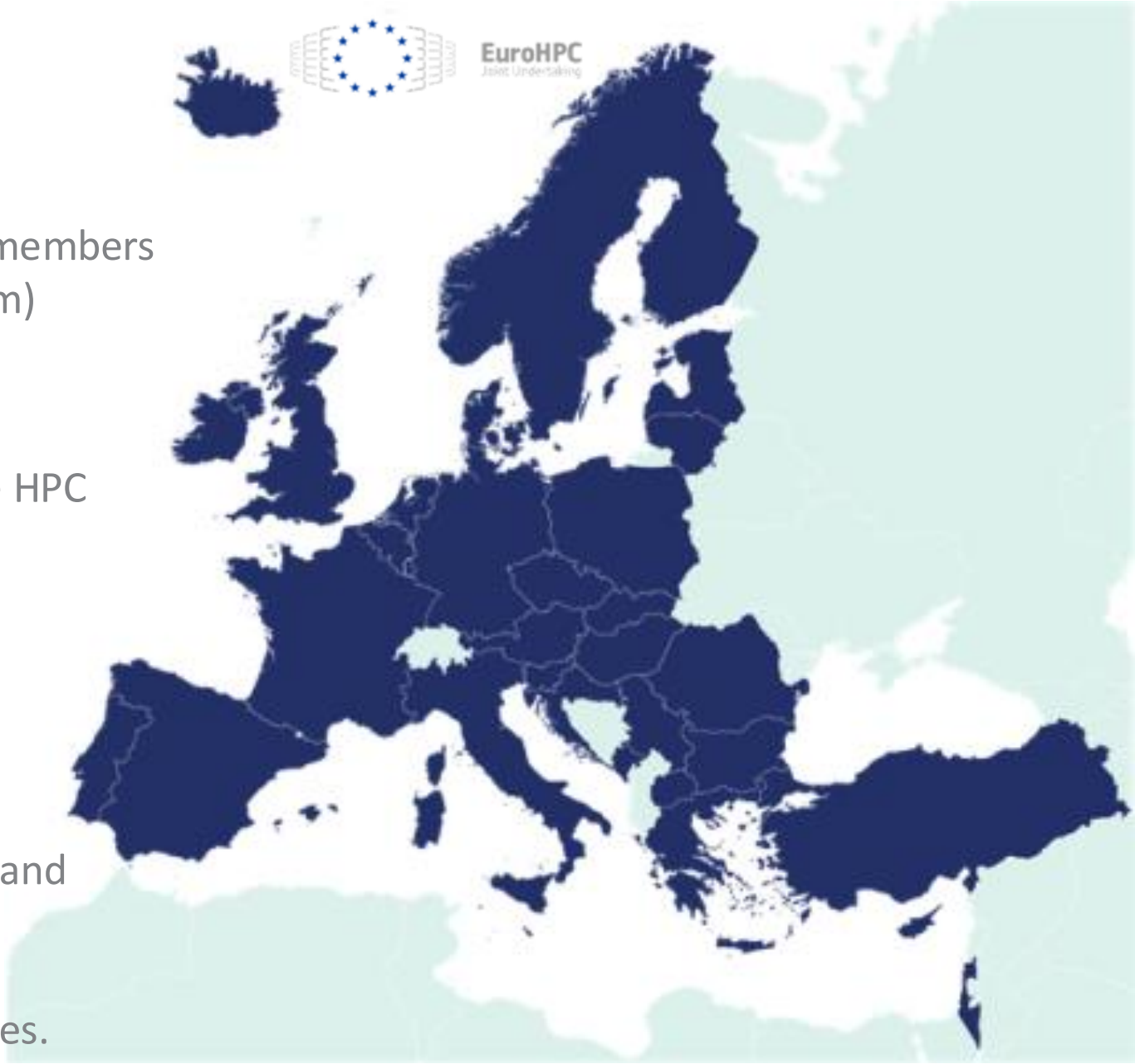
- Established in 2018
- Composed of 37 member states and 3 private members (ETP4HPC, BDVA, Quantum Industry Consortium)

EuroHPC goals

1. A federated HPC/QC/AI infrastructure
2. European Technologies & Applications for the HPC ecosystem
3. Leadership in HPC use and skills

Financial scheme

1. EUR 1,9 billion from DEP to support infrastructures;
2. EUR 900 million from HE to support research and innovation activities;
3. EUR 200 million from CEF to improve the interconnection of HPC, QC, and data resources.



SUPERCOMPUTERS OF EUROHPC JU

www.top500.org, 2x a year ranking

EuroHPC JU access: Regular, Extreme Scale, Benchmark, and Development Access

LUMI (Finland, #9)

Karolina (Czechia)

Discoverer (Bulgaria)

Vega (Slovenia)

Leonardo (Italy, #10)

Meluxina (Luxemburg)

Deucalion (Portugal)

MareNostrum 5 (Spain)

Jupiter (Germany, #4)

Daedalus (Greece) *2026

Arrhenius (Sweden) *2026

Alice Recoque (France) *2026

LUMI: ONE OF THE MOST POWERFUL IN EUROPE

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

- Manufactured by **Hewlett Packard Enterprise**
- Total budget: 207.1M€ **(50 % EuroHPC JU)**
- #3 in TOP500 and GREEN500 in 2022
- Period of operation: 2021–2026
- Consortium: **FI (CSC in Kajani)**, SE, NO, DK, BE, PL, CH, **CZ**, EE, IS, NL
- Ca **2,5% of the resources available to the Czech users** through IT4I Open Access calls

EuroHPC Joint Undertaking

454784 AMD EPYC CPU cores,
11912x GPU AMD Instinct MI250X, 128GB HBM2e

1 system

531.5

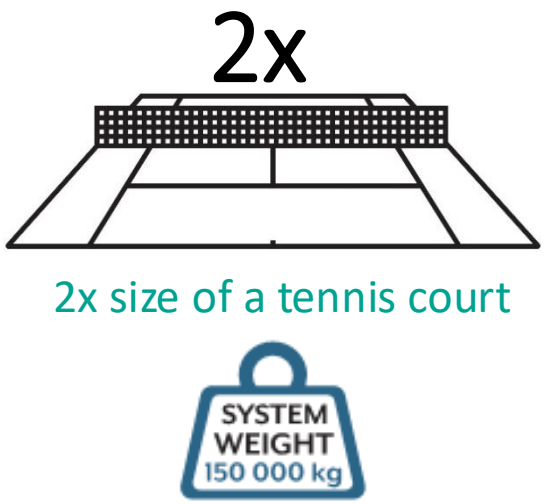
PFlop/s

peak performance

Computing power equivalent to

1 500 000

modern laptop computers



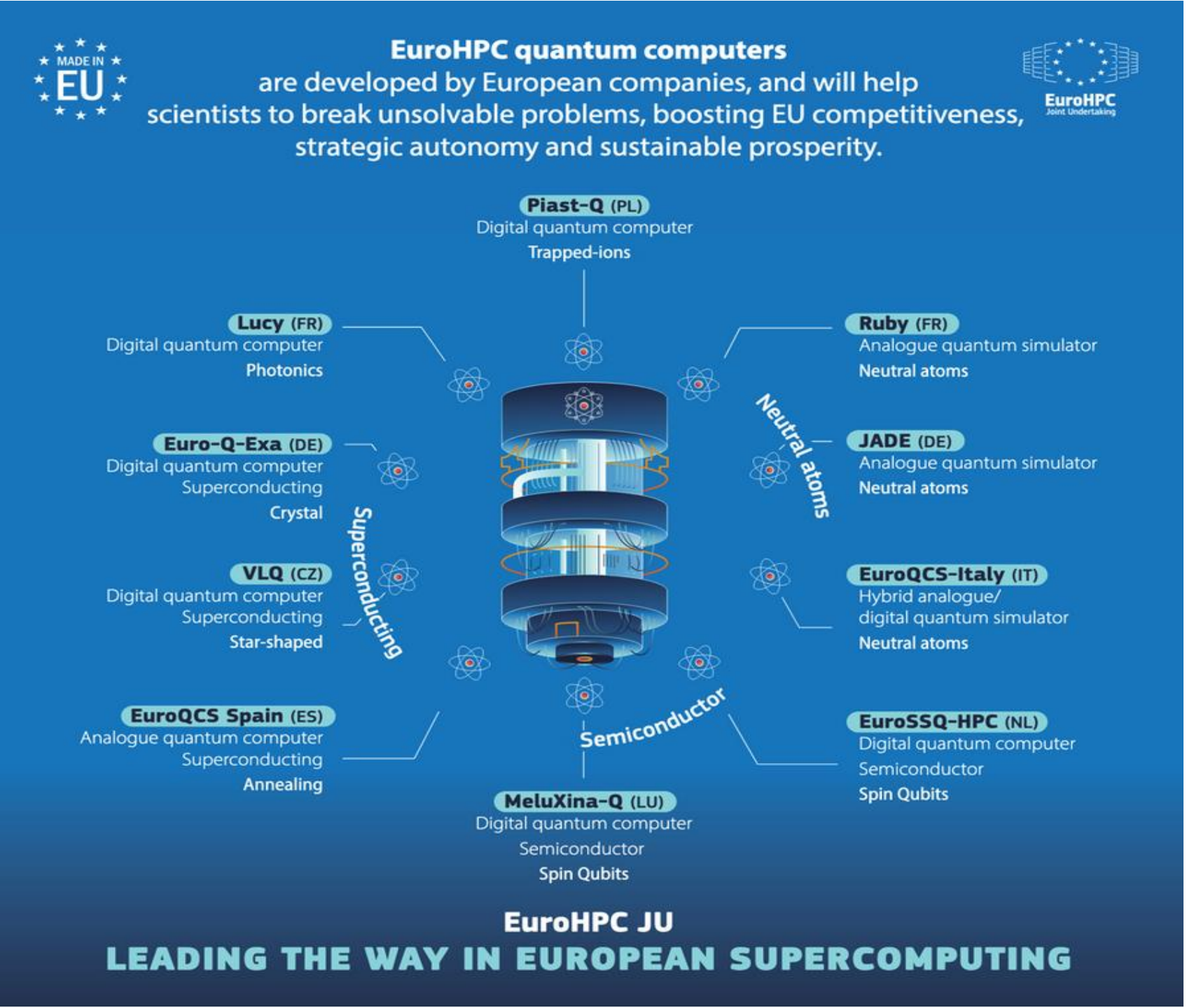
2x size of a tennis court

Modern platform for:

High-performance computing,
Artificial intelligence,
Data analytics

Based on GPU technology

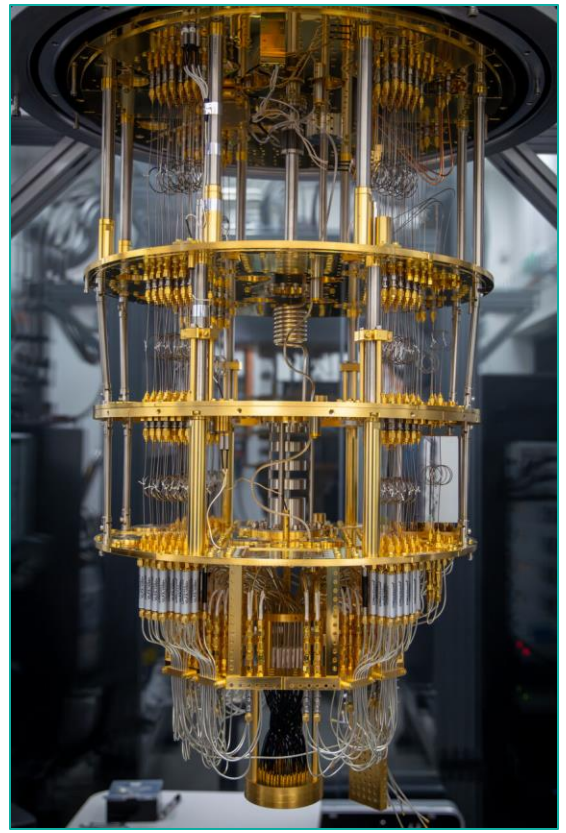
EUROHPC QUANTUM COMPUTERS

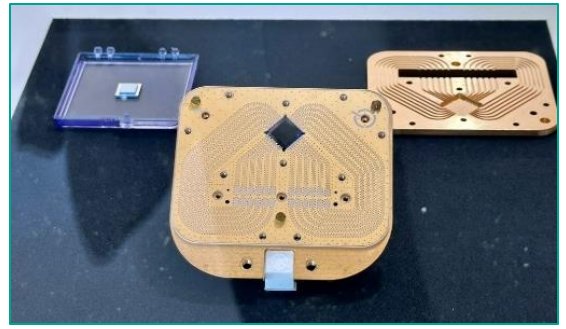


VLQ QUANTUM COMPUTER

VLQ LUMI-Q

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER





Superconducting technology, 24 qubits in a star-shaped topology

ATLAS OF QUANTUM COMPUTING APPLICATIONS

VLQ

LUMI-Q

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

www.it4i.cz

01 Finance

02 Pharmaceutical Industry

03 Energy

04 Automotive Industry

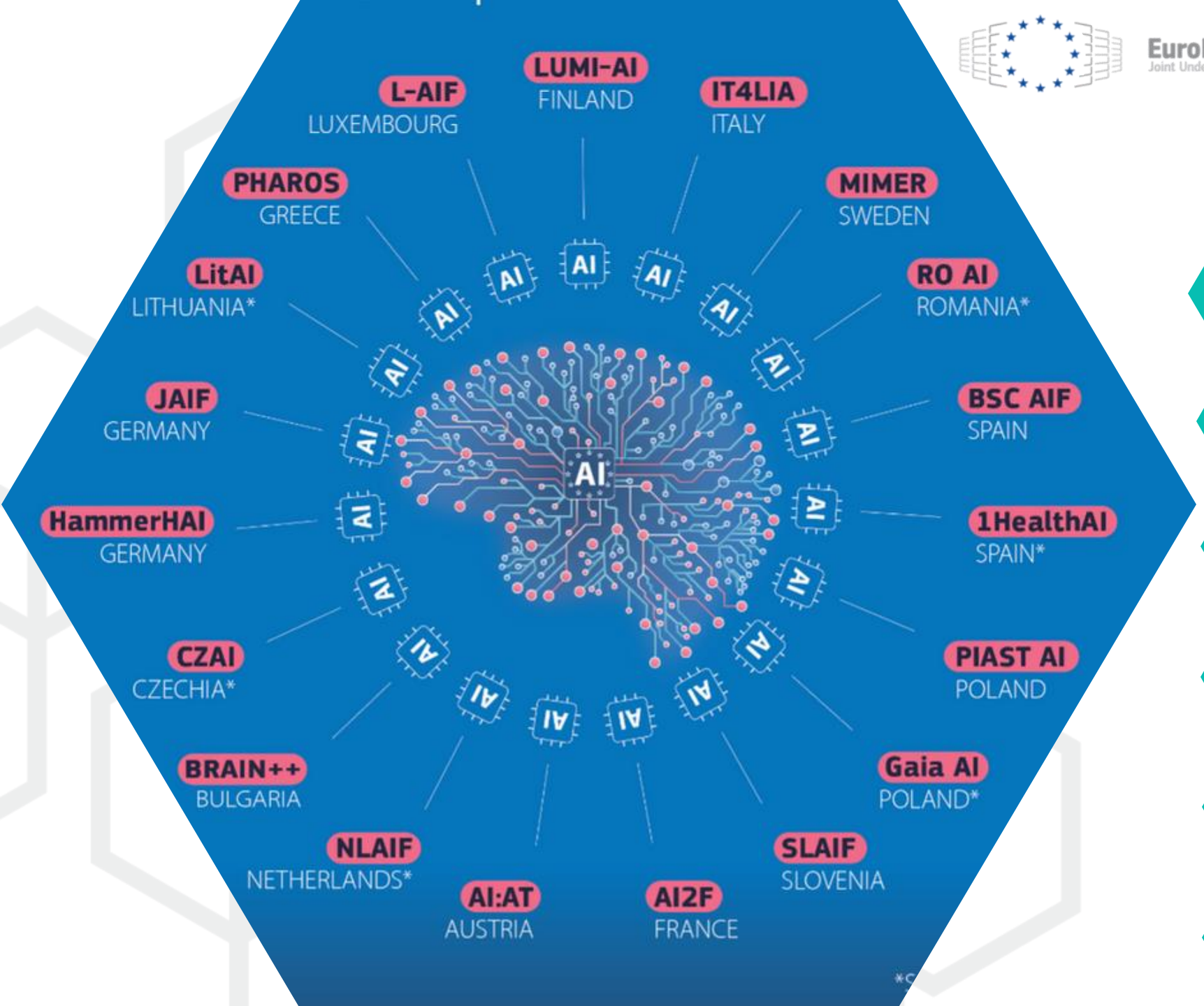
05 Telecommunications

06 Logistics

07 Chemical Industry

08 Manufacturing Industry

09 Healthcare



EuroHPC Joint Undertaking

VSB TECHNICAL UNIVERSITY OF OSTRAVA | IT4INNOVATIONS NATIONAL SUPERCOMPUTING CENTER

AI FACTORIES

- Expert support for development and deployment AI models to HPC
- State-of-the-art computing capacity in Europe
- Mass data storage and secure data services
- Efficient software Tools and environments
- Support for new AI talents
- Professional training and consulting

AI FACTORIES

LUMI AI Factory

Three pillars

- AI-optimised supercomputer LUMI-AI
- AI Factory Service Center
- Experimental quantum-computing platform LUMI-IQ

Consortium: **Finland**, Czechia, Denmark, Estonia, Norway and Poland

Total budget over 612 M€

- EU: 306.4 M€, FI: 250 M€, **CZ: 11 M€**, DK: 10 M€, EE: 5 M€, NO: 20.4 M€, PL: 10 M€

CZECH AI FACTORY

Two pillars

- AI-optimised supercomputer KarolAIna 340 GPU, 850 PFlop/s (TF32)
- AI Factory Service Center for SMEs, startups, and institutions from the public and research sectors

Consortium: **VSB-TUO**, CTU in Prague, CUNI, BUT, IOCB, INDRC

Total budget 40 M€

- EU: 20 M€, CZ: 20 M€

Tomáš Kozubek
tomas.kozubek@vsb.cz

IT4Innovations National Supercomputing Center
VSB – Technical University of Ostrava
17. listopadu 2172/15
708 00 Ostrava-Poruba, Czech Republic
www.it4i.cz