

# CERN OPENLAB PHASE VIII

## Objectives, R&D Directions and Activities

To address scientific challenges at the exascale level, CERN openlab has identified two main R&D directions “**Sustainable Infrastructures**” and “**Emerging Technologies**”.

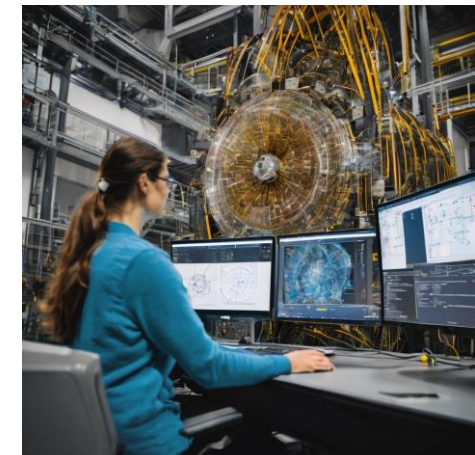
### High-level: Accelerating Computing for Science

Pioneering sustainable and emerging computing and storage solutions

Harnessing heterogeneous computing and AI for a greener future

Fostering synergies and technology transfers between industry and sciences

OBJECTIVES



### R&D DIRECTIONS

#### Sustainable Infrastructures

Heterogeneous computing platforms and infrastructures

Computer architectures and software engineering

Storage and data management

Artificial intelligence algorithms, platforms and applications

Applications for society and environment

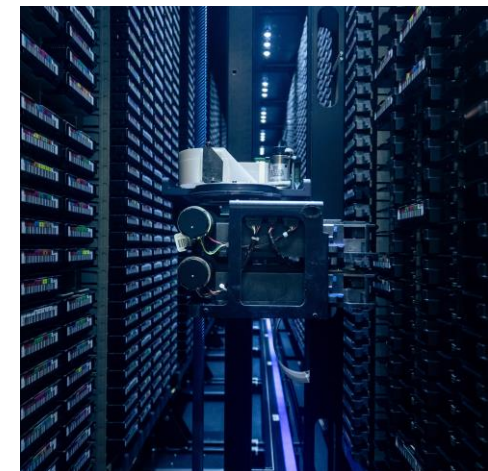
#### Emerging Technologies

New materials for long term digital storage

Digital twins

Quantum computing and networks

R&D ACTIVITIES



# R&D ACTIVITIES PLAN

Focussed, agile projects

Strategic partnership incubator

Heterogeneous architectures testbed (x86, Arm, GPUs, FPGAs, AI accelerators)

AI workflow optimization on HPC

AI applications in low latency environments

HPC resource integration

Real-time data processing on CXL architectures

Advanced storage solutions

Analysis facilities on the cloud

New materials for long-term storage

Foundation models

Low-latency interconnects

Data compression acceleration

AI on edge devices and SoCs

Digital Twins of accelerators and detectors

Hybrid HPC and QCS integration

Generative AI

**CURRENT INDUSTRY AND RESEARCH MEMBERS**

intel.

COMTRADE

E4  
COMPUTER  
ENGINEERING

INFN

ORACLE

Micron



UNIVERSITÀ  
DEGLI STUDI DI TRIESTE

SIEMENS

Fermilab

Roche

**INDUSTRY AND RESEARCH MEMBERS IN PRE-AGREEMENT STAGE**

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Johnson & Johnson

nVIDIA

PURESTORAGE

SIM NS  
FOUNDATION