ChEESE in a nutshell

ChEESE-2P is a cutting-edge initiative aimed at tackling some of the most pressing **challenges in geoscience through exascale computing.**

Funded by Horizon EuroHPC, ChEESE-2P continues its legacy by preparing and optimizing flagship computational codes for exascale systems.

Now, the project expands to new disciplines and enhanced performance metrics, enabling the scientific community to **harness HPC for geohazards**.

11 FLAGSHIP CODES

At the heart of ChEESE-2P are 11 community flagship codes designed to address 12 domain-specific Exascale Computational Challenges.

CHALLENGES 12

The codes span **various geoscience domains**, including computational seismology, magnetohydrodynamics, physical volcanology, and tsunamis, with new additions in geodynamics and glacier hazard modeling.

The project focuses on **optimizing these codes for performance, scalability, and portability** across diverse hardware architectures emerging from the EuroHPC Pilots.

This involves **co-designing with mini-apps**, enhancing single-node and multi-node efficiency, and continuous performance monitoring .

PILOT DEMONSTRATORS

To showcase the real-world applications of these flagship codes, ChEESE is developing nine Pilot Demonstrators that will be tested in 15 Simulation Cases

Key Challenges Addressed

- Earthquake Simulations
- Tsunami Simulations
- Volcanic Eruption Forecasting
- Glacier Hazard Assessments

Outcomes and Contributions

- Valuable datasets via European Open Science Cloud (EOSC)
- Services for urgent computing
- Early warning systems
- Comprehensive hazard assessments