Riding the wave of the future in supercomputing: Center of Excellence for Exascale in Solid Earth (ChEESE) will share Exascale-compatible codes on EPOS repository

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Many parts of Europe are exposed to geohazards such as earthquakes, landslides, tsunamis and volcanic eruptions. With civil protection as a primary objective, the HPC Center of Excellence (CoE) ChEESE - Center of Excellence for Exascale in Solid Earth - has been created to become a hub for High-Performance Computing (HPC) software within the solid Earth community. It will enable services such as urgent computing, hazard assessment and early warning using flagship simulation codes that will run efficiently on future European Exascale HPC systems.

ChEESE will enable HPC-based codes and related services for hazard, early warning and earth sub-surface characterization on the EPOS repository. This will allow the solid Earth community, including civil protection agencies and other stakeholders, to access these codes and toolkits easily. The CoE also aims at providing specialist training on services and capacity building measures.

Coordinated by Barcelona Supercomputing Center (BSC), the ChEESE main objective is to address 15 scientific, technical and socio-economic Exascale computational challenges in the domain of solid Earth. To accomplish this task, it has been awarded with €7.7 million from European Commission funding over three years.

Currently, ChEESE is preparing 10 community flagship European codes to run efficiently on upcoming pre-Exascale and Exascale supercomputers. It is also developing 12 pilot demonstrators requiring of Exascale computing on near real-time seismic simulations and full-wave inversion, ensemble-based volcanic ash dispersal, faster-than-real-time tsunami simulations, and physics-based hazard assessments for earthquakes, volcanoes and tsunamis. These demonstrators will serve as proofs of concept
towards enabling future services on urgent computing, early warning forecasts of geohazards, hazard assessment and data analytics.

“EPOS is the most important and most widely-used solid Earth science infrastructure in Europe so we wanted to make sure to include ChEESE codes and services in its repository. I believe that ChEESE outcomes will be useful to solid Earth researchers and companies because our codes will run on the next wave of supercomputing-pre-exascale and exascale supercomputers, opening the possibility to solve challenging problems unfeasible at present” said ChEESE coordinator Arnau Folch.

For more information, please see the ChEESE promotional video or visit www.cheese-coe.eu.

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