The ENES HPC-TF Newsletter

Issue n°4, September 2018

> ENES, the "European Network for Earth-System modelling", established a Task Force, the so-called HPC-TF, in late 2011 to help addressing issues related simulation using high-performance computing and serving ENES active projects. The HPC-TF is presently serving the ESiWACE[1] Centre of Excellence. A newsletter is being produced on a regular basis, to bring in contained way information of likely interest to a larger community. It is also available at   https://verc.enes.org/computing/hpc-collaborations/hpc-taskforce

1. ESiWACE2 and IS-ENES3: The story continues…[2]

The proposals for the centre of excellence (CoE) **ESiWACE2** and the infrastructure project **IS-ENES3**, submitted to the 2018 calls on CoE's and research infrastructures by the European Commission, have been selected for funding and are currently subject to grant preparation. While IS-ENES3 is mostly aimed at providing the infrastructure to efficiently support the European climate community in its participation in international intercomparison modelling experiments, particularly for the next IPCC report, and manyfold exploitation of their results -thus serving sciences and society, ESiWACE2 will concentrate on the many computing challenges which the next-generation climate- and weather-models have to face to fully benefit from future exascale architectures.

IS-ENES3 is the third phase of the distributed e-infrastructure of ENES, as the European climate modelling community faces the challenges of CMIP6. IS-ENES3 will develop, document and deploy new and advanced models and tools, standards and services to deal with unprecedented data volumes and model complexity; it will stimulate collaboration, disseminate software and data, and further integrate the community. IS-ENES3 will support climate research, climate impact science, and climate services; it will ease access and exploitation of data and knowledge produced by state-of-the-art models. In doing so, the project will find innovative ways of working with the Copernicus programme, with other parts of the European data infrastructure, and with the HPC and data analytics industries in synergy with ESiWACE2. IS-ENES3 comprises 22 partners from 11 countries and is planned to start on 1 December 2018.

ESiWACE2 brings together 20 partners from 9 European countries and plans to further push Earth System Model technology towards execution on upcoming pre-exascale and exascale systems, focusing on the preparation of production-ready, community model-based ESM simulation systems. These developments will be complemented by the establishment of new technologies such as domain-specific languages, tools to minimise data output for ensemble runs, and services to the community in terms of performance optimisation support. Co-design between model developers, HPC manufacturers and HPC centres is to be fostered, in particular through the design and employment of High-Performance Climate and Weather benchmarks, with a first version of these

---

[1] Centre of Excellence in Simulation of Weather and Climate in Europe (https://www.esiwace.eu/)
[2] This item has been written in common between IS-ENES3 and ESiWACE2 projects and is published in the same format in the ENES HPC-TF and ESiWACE newsletters

benchmarks feeding into ESiWACE2 through the research project ESCAPE-2. Anticipated start date for ESiWACE2 is 1 January 2019.

2. 5th ENES HPC Workshop[2]

The 5th ENES HPC workshop was held on 17-18 May in Lecce, Italy with 49 participants. The main focus of the workshop, organised and supported through ESiWACE and building on the previous ENES HPC workshops (Lecce, 2011; Toulouse, 2013; Hamburg, 2014 and Toulouse, 2016), was on high-resolution modelling. It also addressed other issues such as domain-specific languages, coupling & I/O tools and involved discussions about European and international HPC eco-systems and data centre support, as well as the relationship with the EC strategy on HPC, featuring invited speakers from EXDCI, PoP, EoCoE, EuroEXA.
More details on the workshop can be found in ESiWACE deliverable D1.5 and on the ESiWACE website: https://www.esiwace.eu/events/5th-enes-hpc-workshop/presentations

3. EuroHPC[2]

EuroHPC is the European exascale programme. It is aiming to acquire large pre-exascale machines in 2020 with exascale machines in 2022/23 including substantial European technology contributions. The EuroHPC programme is supported by 22 European countries (see http://eurohpc.eu/).

EuroHPC launched three working groups last spring, to prepare reports and propositions on (i) Architectures, (ii) Benchmarking, and (iii) Users requirements. The CoEs were invited to represent their communities in all three working groups, and to potentially provide relevant benchmarks. For the weather and climate community, the CoE ESiWACE involved the ENES HPC-Task Force to actively contribute to these three reports.

4. ENES and data-driven research (EOSC-Hub)

EOSC-hub is a 3-year European programme (2018-2020) bringing together multiple service providers to create the Hub: a single contact point for European researchers and innovators to discover, access, use and reuse a broad spectrum of resources for advanced data-driven research (see https://www.eosc-hub.eu/). ENES is contributing to this programme and offered through S. Fiore (CMCC[3], Italy) an interview which appeared in the first issue (June 2018) of EOSC-Hub magazine This interview focuses on tools available for climate date analysis, mostly ECAS, The European Climate Analytics Service, offered by DKRZ[4] and CMCC (see https://www.eosc-hub.eu/sites/default/files/EOSC-hub_Magazine_Issue1.pdf).

5. PRACE allocations

Four projects are presently being funded by PRACE and run on PRACE computers. Two were selected under Call 15:

---

[3] Euro-Mediterranean Center on Climate Change (Italy)
[4] Deutsche KlimaRechenZentrum (Hamburg)

- **ROMEO**, "Understanding the role of mesoscale eddies in the global ocean", led by Doroteaciro Iovino (CMCC) and being awarded 67.7 million core hours on Marconi – KNL;
- **Glob15km**, "Global 15km coupled climate simulations", led by Virginie Guemas (BSC[5]) and being awaded 24 million core hours on MareNostrum,

while two others were selected under Call 16:

- **HiResNTCP**, "High-resolution near-term climate predictions", lead by Francisco Doblas-Reyes (BSC) and being awarded 33 million core hours on Marenostrum;
- **ReSuMPTiOn**, "Revealing SubMesoscale Processes and Turbulence in the Ocean", led by Laurent Brodeau (IGE[6]) and being awarded 40 million core hours on MareNostrum.

---

[5] Barcelona Supercomputing Center
[6] Institut des Géosciences de l'Environnement (Grenoble)