

ESiWACE3 Newsletter

Issue #5 / August 2024

News

8th ENES HPC workshop

From 22 to 24 May 2024, about 40 scientists met at the Foundation Euro-Mediterranean Centre on Climate Change (CMCC) premises in Lecce (Italy) for the [“8th ENES workshop in High Performance Computing for Climate and Weather”](#). Further participants joined online.



During these biennial workshops, members of the European Network for Earth System Modelling (ENES) exchange ideas with international experts on current topics related to high-performance computing for climate and weather simulations.

The workshop was structured in 4 sessions, covering the most relevant aspects of HPC and today's technologies:

- Session 1: European and International Landscape; conveners: Joachim Biercamp (DKRZ) and Erwan Raffin (Eviden/ATOS);
- Session 2: Performance and accelerators; conveners: Mario Acosta (BSC) and Sophie Valcke (CERFACS);
- Session 3: Data; conveners: Uwe Fladrich (SMHI) and Sandro Fiore (UNITrento);
- Session 4: Machine learning; conveners: Peter Dueben (ECMWF) and Giovanni Aloisio (CMCC).

The next event in this series will be organised in 2026 by the Swedish Meteorological and Hydrological Institute (SMHI).

2nd ESIWACE3 hackathon

On 24-26 June 2024, Amsterdam (Netherlands) held the 2nd ESIWACE3 Hackathon. Entitled "[Optimisation and Tuning of Earth-System Models](#)", the event targeted weather and climate modellers at all career stages, aiming to assist climate scientists with optimising earth-system models (ESMs).

The hackathon was designed so that participants could bring their codes and work in teams, together with HPC experts, to improve their code performance. In the context of the optimisation and tuning of ESMs, the focus of this hackathon was on (but not limited to) porting of code to Graphics Processing Units (GPUs), performance portability on different architectures, use of auto-tuning for performance optimisation or energy-efficiency, and application of mixed-precision programming techniques.

In the end, only one team participated in the hackathon. It came from Delft University of Technology, and the team worked on the OpenACC port of DALES, the Dutch Atmospheric Large Eddy Simulation, in collaboration with ESIWACE3 experts. After profiling DALES on the GPU, the team used Kernel Tuner to improve the performance of the most compute-intensive sections of the model.



Online training event "GPU optimisation with Kernel Tuner"

ESIWACE3 and the [National Competence Center for HPC in Austria](#) are organising the training event "[GPU Optimization with Kernel Tuner](#)" as part of the CASTIEL2 Training Sprint. This event will occur on the mornings (10 am - 1 pm CEST) of **12 and 13 September 2024**. It is a 2 half-day training course which aims to introduce the tool to new users and enable them to optimise GPU-bound code.

[Kernel Tuner](#) is a tool for automatic optimisation of GPU code, which has been developed by a team from CoE ESIWACE3. Kernel Tuner is an external tool to benchmark and optimise GPU kernels in isolation. It can be used directly on existing kernel code without extensive code changes in any host programming language. Currently, the tool offers more than 20 optimisation algorithms and makes energy-efficient GPU programming a reality.

The event is free, but registration is required through this [link](#).

We hope you enjoy this online training event!



GPU optimization with **Kernel Tuner**

12-13 September 2024
ONLINE



ESiWACE3 @ EMS2024

ESiWACE3 will be present at the [European Meteorological Society Annual Meeting 2024](#) (EMS24) under the booth that the Earth Sciences Department of the Barcelona Supercomputing Center-Centro Nacional de Supercomputación (BSC-CNS) will have at the event as an exhibitor. The 2024 Annual Meeting will take place as a hybrid event at the Historical University of Barcelona (Barcelona, Spain) & online from 2 to 6 September 2024. The exhibitor area will be located in the main entrance room, and the BSC/ESiWACE3 booth will be number 4, just next to the stairs that go to the lecture rooms.

The annual meetings of the EMS aim to foster the cross-fertilisation of ideas, feedback between science and applications, and the involvement of all the diverse actors in the fields of weather, climate, water, and the environment. This year's conference focus topic aims to explore the critical role of weather and climate research in shaping policies, strategies, and technologies that will pave the way towards a climate-neutral Europe.

Some brand-new ESiWACE3 audiovisual and printed material will be displayed at the booth, presenting the project and the services offered within it.

Looking forward to seeing you all at EMS24!!!



Come to visit us!

Booth #4

Events

External events

External events in which ESIWACE3 has participated since the last issue of the ESIWACE Newsletter:

- [Parallel IO NHR Workshop](#), Hamburg (Germany), 7-8 May 2024. [Presentation](#).
- [HPCKP Annual Meeting 2024](#), Barcelona (Spain), 8-9 May 2024. [Presentation](#).
- [ISC High Performance Computing 2024](#), Hamburg (Germany, 12-16 May, 2024. [Poster](#) & Presentation.
- [1st Industry sector of the month workshop: "Environment, climate and weather"](#) organised by CASTIEL2, Online, 12 June 2024. [Presentation](#).

Updates

During the period M17-M19 (May, June and July 2024), three further ESIWACE3 Deliverables and three Milestones have been published:

Deliverables

- **Deliverable 1.5: Report on the containerization of ECEarth4**
D1.5 should have been delivered by the end of June 2024, but a delay has been requested and granted, and this Deliverable will be delivered by September 2024.
- **Deliverable 6.2: Report of activities and first update of the CDEP**
D6.2 comprises the first updated version of the Communication, Dissemination and Exploitation Plan (CDEP) for the ESIWACE3 project. It describes the goals and target audiences for communicating and disseminating the project's outcomes, the channels to be used, and the actions to be taken. The document also reports on actions already taken in line with the CDEP since Deliverable 6.1 was submitted.
Read D6.2 [here](#).
- **Deliverable 7.6: First update of Collaboration plan**
D7.6 describes synergies and collaboration with the Coordination and Support Action (CSA) CASTIEL 2 and the EuroHPC JU Centers of Excellence (CoE) complementary to ESIWACE3. This deliverable is an update of the information recollected in Deliverable 7.5 - "Collaboration plan with definition of common objectives and activities, including milestones" (D7.5) that can be found [here](#). The activities reported here include identifying common objectives, defining and implementing a collaboration plan, and defining related project-specific milestones.

Read D7.6 [here](#).

Milestones

- **Milestone 2.3: Performance assessment of PSyclone with regional configuration**

M2.3 reports the achievement of porting two high-resolution CMCC configurations based on the Nucleus for European Modelling of the Ocean (NEMO) model to GPUs using PSyclone.

Read M2.3 [here](#).

- **Milestone 3.2: Strategies for enhanced HPDA solutions designed**

M3.2 aims to describe a set of enhancements that will be explored in the context of the WP3 of the ESIWACE3 project to support High Performance Data Analytics (HPDA).

Read M3.2 [here](#).

- **Milestone 4.3: Service assessment 1**

M4.3 describes the calls for Services (three calls for Service 1 projects and one call for Service 2) done within the project in the first 18 months of ESIWACE. After some staffing shortages in the first year, the full set of granted Service 1 projects is currently up and running.

Read M4.3 [here](#).

News from the neighbours

Upcoming conferences and events

- [1st ESIWACE3-WarmWorld Summer School](#), 27 August-2 September 2024, Helsinki (Finland).
- [POP3 Profiling and Optimisation Tools - 46th VI-HPS Tuning Workshop](#), 4-6 September 2024, Ostrava (Czech Republic) and online.
- [Workshop on Advancements of Global Challenges Applications \(PPAM2024\)](#), 8-11 September 2024, Ostrava (Czech Republic).
- [European Meteorology Society annual meeting](#), 2-6 September 2024, Barcelona (Spain).
- [Supercomputing 2024](#), 17-19 November 2024, Atlanta (USA).

Training events

Find collected information on upcoming and past training events from all consortium partners and projects we are involved with [here](#).

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To receive the latest news about ESIWACE3 in your email inbox, subscribe to the [ESIWACE3 Community](#).

You can also look at the [previous issues](#) of the ESIWACE newsletter.