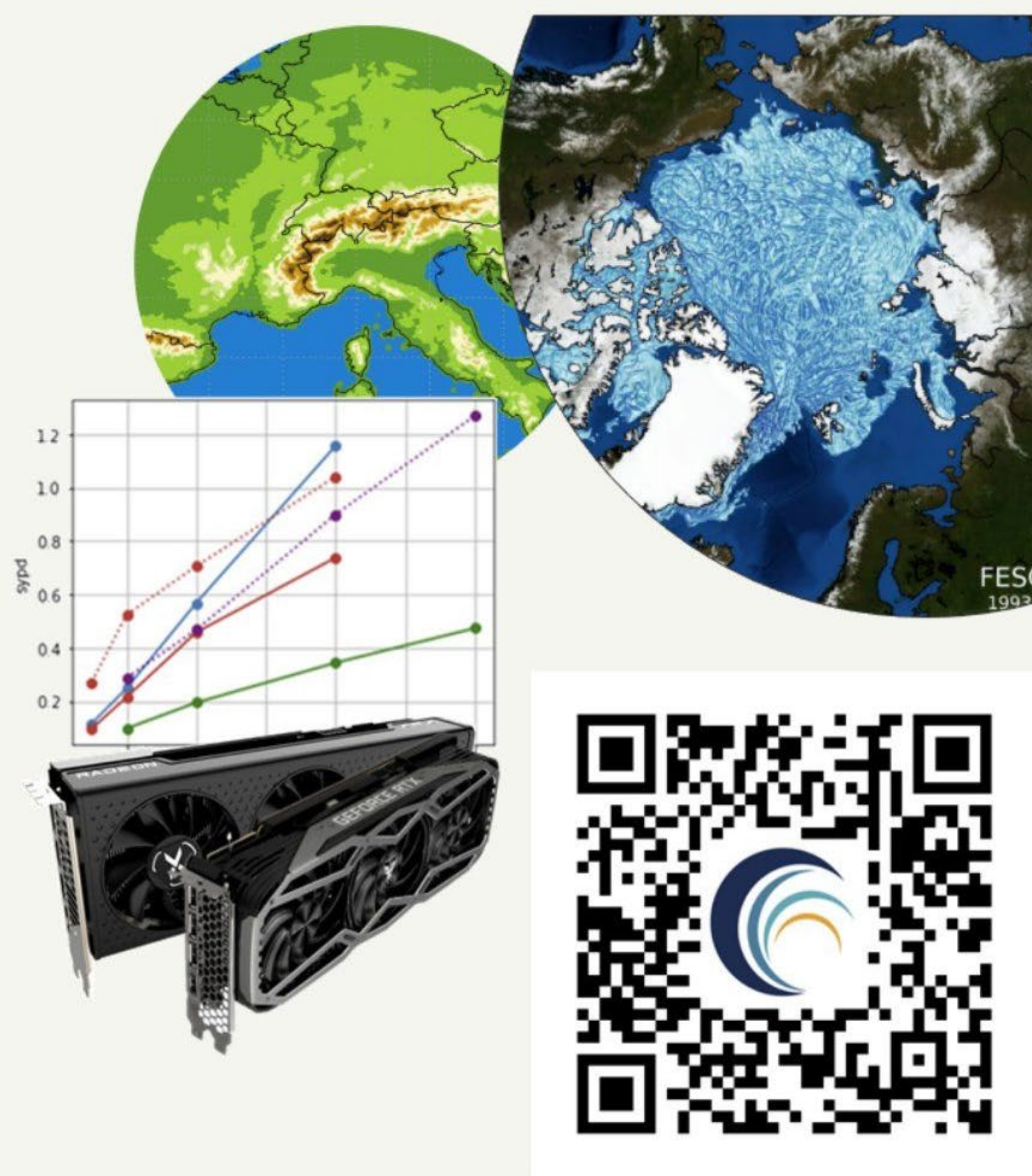


Joachim Biercamp, Nicola Brown, Rosa Rodríguez Gasén & the ESIWACE3 Consortium

We offer free support to optimise and port **YOUR** code

Call For Proposals 2023-2024



#CfPESIWACE3
#CallForProposalsESIWACE3



Who? can apply: Weather and Climate model developers

What? Support, guidance, and advice from ESIWACE3 experts in optimising and porting source code to modern HPC systems

Where? Remotely

When? Anytime, it is a rolling call

Deadline to enter next round of reviews, 1 November 2023, 14:00 CET

Specialist expertise available from ESIWACE3 partners includes:

- developing and implementing numerical climate and weather models;
- porting and programming for heterogeneous architectures;
- containerisation techniques;
- optimisation and tuning code for accelerators;
- dealing with I/O bottlenecks and accelerating algorithms using GPUs;
- access to an extensive portfolio of state-of-the-art tools & applications.

EXAMPLES of successfully completed service projects:

The tracer transport module of the FESOM2 ocean circulation and sea ice model was ported to GPUs using OpenACC, benchmarked, and optimised. Additionally, kernel CPU optimisations resulted in 15 – 30% performance gains. This project paved the way for efficient deployment of FESOM2 on an exascale CPU- and GPU-based system.

The computational efficiency of the ECHAM/MESy Atmospheric Chemistry (EMAC) model was improved by reducing the memory footprint of the code, as well as optimising performance for current and future GPU technologies. This project extended computational capability to be able to handle chemistry mechanisms an order of magnitude more complex.

The performance of RTE+RRTMGP-CPP, the C++ interface and CUDA port of the Rapid Radiative Transfer Model for GCM applications was improved by removing the overhead from repeated GPU memory management operations, optimising the current CUDA kernel to improve the memory bandwidth utilisation and parallelism, and tuning the compute kernels and their parallel layout in a systematic and automated way.

Who we are and what we do

ESIWACE3, the third phase of the Centre of Excellence (CoE) in Simulations of Weather and Climate in Europe will provide support for the wider community of weather and climate modelling in the use of state-of-the-art supercomputers and new architectures. The project will run from January 2023 until December 2027.

Towards exascale weather and climate simulations

Supporting the community of weather and climate modelling in Europe



01 Increase efficiency of simulations on state-of-the-art supercomputers



02 Design tools to close technology gaps for HPC



03 Develop tools to tackle the data challenge of high-resolution models



04 Support the community in the use of supercomputers via targeted services

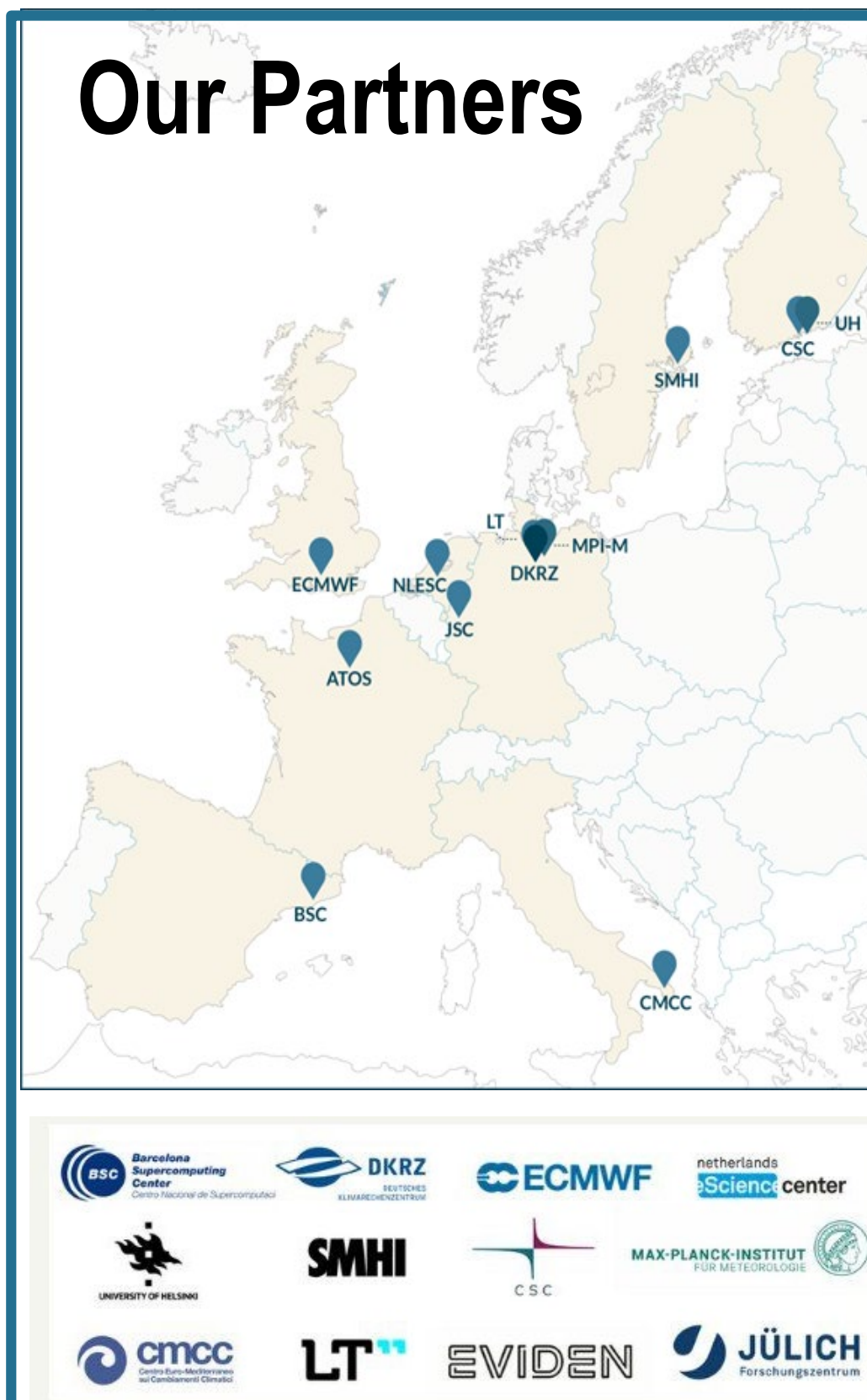


05 Support the community in the use of supercomputers via training and capacity building



06 Build a well-connected & inclusive community, and transfer knowledge between European initiatives

Our Partners



Our Objectives

The transfer and establishment of knowledge and technology for efficient and scalable simulations of weather and climate across the Earth system modelling community in Europe;

Closing common technology gaps in the knowledge and toolbox for high-resolution Earth system modelling via joint developments across the European community;

Serving as a sustainable community hub for training, communication, and dissemination of high-performance computing for weather and climate modelling in Europe.

NEWSLETTER



[ESiWACE3@LinkedIn](#)

[ESiWACE@Twitter](#)

[ESiWACE880@YouTube](#)

W
E
B
S
I
T
E



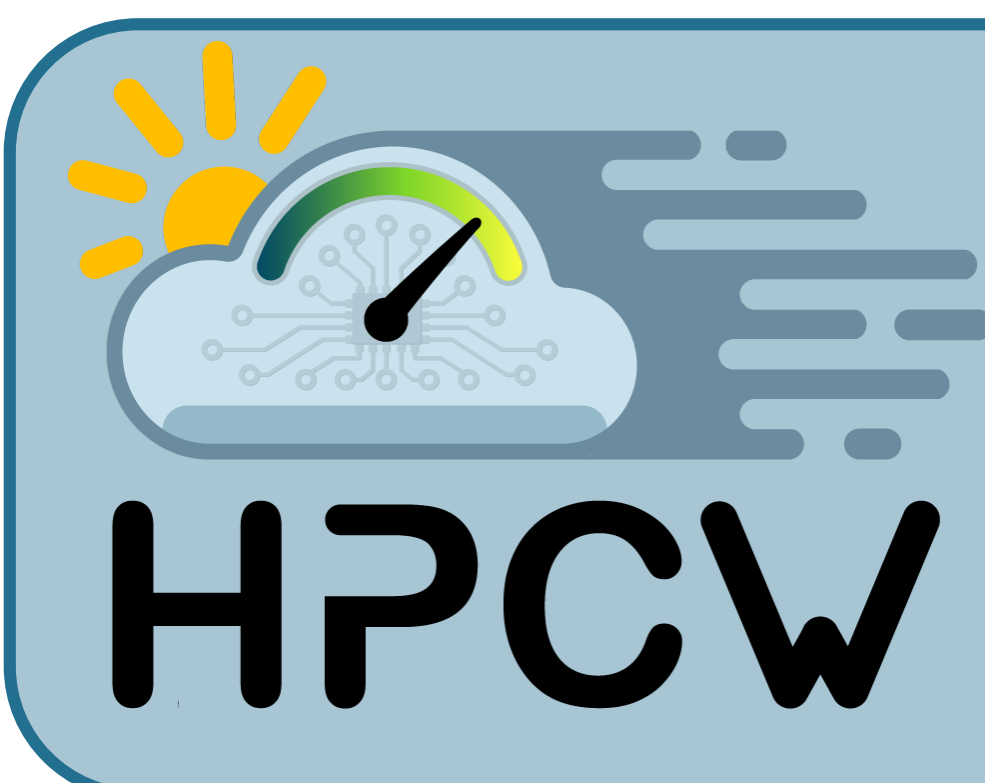
W
E
B
S
I
T
E

Training opportunities

ESIWACE3 offers a range of free training opportunities aimed at everyone in the European modelling community. Particular emphasis is placed on attracting female participants and those from the inclusiveness target countries.

- First hackathon, offering practical help in adapting weather and climate models to run on LUMI, runs at CSC (Finland) on 18 – 20 October. Further hackathons will follow.
- Summer schools in 2024 and 2025 will help students and postdocs build networks and develop their skills in HPC and modelling.
- Online training courses will be easily accessible to all.

See: <https://www.esiwace.eu/training>



High performance climate and weather benchmark

A Domain-Specific Benchmark targeting exascale application of climate and weather codes

Complete codes:

ICON - Ocean and Atmosphere
IFS (RAPS)
NEMO

Dwarfs & mini-applications:

IFS atmosphere FV dwarf IFS-FVM
Radiation dwarf ACRANEB2
ICON ocean advection dwarf
ecRad, ecTrans, Dwarf-P-CloudSC

Contact: esiwace3-communication@bsc.es