



21st ECMWF workshop on high performance computing in meteorology

Programme

Monday Agenda

All times are shown in the selected time zone.

Location: DAMA - Tecnopolis di Bologna, Via Stalingrado 84/3, 40128 Bologna

The selected timezone is Europe/London

Arrival		
12:30 to 13:45	Registration and coffee	
	Opening session	
13:45 to 13:55	Practical arrangements	
13:55 to 14:00	Welcome to Bologna and opening remarks Video recording	Morena Diazzi (Emilia-Romagna Region)
14:00 to 14:15	ECMWF at 50 Video recording	Florence Rabier (ECMWF) Andy Brown (ECMWF)
14:15 to 14:30	Meeting the needs of users Video recording	Roar Skålin (Norwegian Meteorological Institute) Florian Pappenberger (ECMWF)
14:30 to 14:45	Supercomputing Video recording	Martin Palkovic (ECMWF) Christine Kitchen (ECMWF)
14:45 to 15:00	Destination Earth Video recording	Grazyna Piesiewicz (European Commission) Irina Sandu (ECMWF)
15:00 to 15:30	Coffee break	
	Keynote address and panel discussion	
15:30 to 15:50	Machine Learning in today's meteorology Video recording	Mariana Clare (ECMWF)

15:50 to 16:30

Panel discussion on the role of machine learning

Moderator: Morena Diazzi

Panellists:

- Mariana Clare (ECMWF)
- Grazyna Piesiewicz (European Commission)
- Florence Rabier (ECMWF)
- Roar Skålin (Norwegian Meteorological Institute)

[Video recording](#)

Optional seminar

Live from Bologna!

16:45 to 17:45

Cycle 50r1

Andy Brown (ECMWF)

Tuesday Agenda

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Arrival		
07:30 to 08:00	Registration and coffee	
	Session 1: Joint with Destination Earth Annual Meeting Session chair: Martin Palkovic (ECMWF)	
08:00 to 08:15	Introduction to the Destination Earth Initiative Video recording	Grazyna Piesiewicz (European Commission)
08:15 to 08:30	A strategic partnership with EuroHPC Presentation slides Video recording	Josephine Wood (EuroHPC JU)
08:30 to 09:00	Implementing Digital Twin technology Keynote presentation Presentation slides Video recording	Nils Wedi (ECMWF)
09:00 to 09:30	Coffee break	
09:30 to 09:55	The CINECA HPC and AI infrastructure for Science and Innovation integrated into the EuroHPC ecosystem Presentation slides Video recording	Sanzio Bassini (CINECA)
09:55 to 10:20	Towards AI supercomputing with LUMI-AI Presentation slides Video recording	Pekka Manninen (CSC)
10:20 to 10:45	European Exascale Era: JUPITER and Its Applications Presentation slides Video recording	Mathis Bode (Jülich Supercomputing Centre, Forschungszentrum Jülich)

10:45 to 11:10	Alice Recoque and AI Factory France : beyond Exascale toward the convergence of HPC, AI and Quantum Presentation slides Video recording	Éric Boyer (Genci)
11:10 to 11:35	Convergence of exascale AI and HPC for societal benefit at the BSC Presentation slides Video recording	Miguel Castrillo (BSC-CNS)
11:35 to 13:00	Lunch break	
	Session 2 Session Chair: Samuel Hatfield (ECMWF)	
13:00 to 13:20	GPU-adaptation of the IFS Presentation slides Video recording	Michael Lange (ECMWF)
13:20 to 13:40	Cross-platform optimisation for GPUs of various flavours (the low-level tech overview) Presentation slides Video recording	Ahmad Nawab (ECMWF)
13:40 to 14:00	Flexible GPU offloading strategies with the Atlas library using Pluto Presentation slides Video recording	Willem Deconinck (ECMWF)
14:00 to 14:20	Efficient spectral transformations on NVIDIA hardware Presentation slides Video recording	Lukas Mosimann (NVIDIA)
14:20 to 14:40	Adapting Destination Earth's Digital Twins to EuroHPC supercomputers Presentation slides Video recording	Balthasar Reuter (ECMWF)
14:40 to 15:10	Group photo and coffee break	
15:10 to 15:30	Profiling and GPU Porting of RAPS and ecWAM Models for EuroHPC Architectures Presentation slides Video recording	Fabio Di Sante (Cineca)

15:30 to 15:50	Porting and benchmarking GRAF on AWS Presentation slides	Tim Brown (AWS)
15:50 to 16:10	On the use of different arithmetic precisions and its impact on dynamic systems Presentation slides Video recording	Florent Duguet (NVIDIA)
16:10 to 16:30	Scaling IFS to 1km and beyond Presentation slides	Ioan Hadade (ECMWF)
16:30 to 16:50	Good ideas are persistent - pick them up! Presentation slides Video recording	Luis Kornblueh (MPI Meteorologie)

Wednesday

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Arrival		
07:30 to 08:00	Registration and coffee	
	Keynote presentation Session chair: Christine Kitchen (ECMWF)	
08:00 to 09:00	EAIRA: Establishing a Methodology for Evaluating AI Models as Scientific Research Assistants Presentation slides Video recording	Franck Cappello (Argonne National Laboratory)
	Session 3: Joint with UEF2025 Chairs: Christine Kitchen (ECMWF) and Becky Hemingway (ECMWF)	
09:00 to 09:30	Coffee break	
09:30 to 09:50	AICON - Introducing ML-based weather forecasting at DWD Presentation slides Video recording	Florian Prill (German Weather Service DWD)
09:50 to 10:10	Community AI at NSF NCAR Presentation slides Video recording	John Clyne (National Center for Atmospheric Research (NCAR))
10:10 to 10:30	AIFS case studies Presentation slides Video recording	Linus Magnusson (ECMWF)

10:30 to 11:30	<p>Forecast users and HPC shaping the future together - a panel discussion Chairs: Chris Kitchen and Becky Hemingway Panel members:</p> <ul style="list-style-type: none"> • Franck Cappello (Argonne National Laboratory) • Dan Suri (Met Office) • Katherine Yelick • Linus Magnusson (ECMWF) 	
	Video recording	
11:30 to 13:00	Lunch break	
	<p>Session 4 Session chair: Christine Kitchen (ECMWF}</p>	
13:00 to 13:20	<p>The DTN AI Weather Revolution: Turning complex data into decision-grade insights using machine learning Presentation slides Video recording</p>	Satheesh Maheswaran (AWS) Stefan Weissenberger (NVIDIA) Sam Lillo (DTN)
13:20 to 13:40	<p>Optimizing Large-Scale Graph Neural Networks for the NVIDIA Grace Hopper Architecture Presentation slides Video recording</p>	Maximilian Stadler (NVIDIA)
13:40 to 14:10	<p>Improving the scalability and I/O of AIFS Presentation slides Video recording</p>	Cathal O Brien (ECMWF) Jan Polster (ECMWF)
14:10 to 14:30	Coffee break	
14:30 to 15:30	Tour of the Computer Hall	
15:00 to 16:30	Joint HPC and UEF Poster Session	
	Evening reception	
16:30 to 17:00	Welcome drinks	
17:00 to 17:10	<p>Welcome speeches Dr Florence Rabier (Director General of ECMWF) Vincenzo Colla (Vice-Presidente Regione Emilia-Romagna) Anna Lisa Boni (Comune di Bologna) General Giuseppe Addesa (Aeronautica Italia)</p>	

17:10 to 18:30

Buffet and drinks

Thursday Agenda

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Arrival		
07:30 to 08:00	Registration and coffee	
	Keynote presentation Session chair: Ioan Hadade (ECMWF)	
08:00 to 09:00	Can Climate Science Win the Hardware Lottery? Presentation slides Video recording	Katherine Yellick (UC Berkeley)
	Session 5 Session Chair: Ioan Hadade (ECMWF)	
09:00 to 09:30	Coffee break	
09:30 to 09:50	Past, present, and future of HPC at ECMWF Presentation slides Video recording	Michael Hawkins (ECMWF)
09:50 to 10:10	Paving the way for AI? - Development of HPC and NWP in the last Decades (The DWD Perspective) Presentation slides Video recording	Ulrich Schättler (Deutscher Wetterdienst)
10:10 to 10:30	An Update on High-Performance Computing at Météo-France Presentation slides Video recording	François Bouyssel (Météo-France)
10:30 to 10:50	From LEO to Azure: The UK Met Office HPC Journey Presentation slides Video recording	Paul Selwood (Met Office)

10:50 to 11:10	An Update on High-Performance Computing at the Japan Meteorological Agency Presentation slides Video recording	Katsuhiko Ganzu (Numerical Prediction Division, JMA)
11:10 to 11:30	Past, present and future of HPC at the Australian Bureau of Meteorology Presentation slides Video recording	Tom Gale (Bureau of Meteorology)
11:30 to 13:00	Lunch break	
13:00 to 13:20	From Past to Future: ECCC's HPC and the Transformation of Weather Services Presentation slides Video recording	Vincent Fortier (Environnement et Changements Climatiques Canada)
13:20 to 13:40	Past, present, and future of HPC at the CMA Presentation slides Video recording	Shuai Deng (National Meteorological Information Centre)
13:40 to 14:00	Past, present, and future of HPC at the National Weather Service Presentation slides Video recording	David Michaud (NOAA/National Weather Service)
14:00 to 14:20	Perspectives on High-Performance Computing in Meteorology in the Era of Heterogeneous Processor Architecture-Based Supercomputers Presentation slides Video recording	Ji-Sun Kang (Korea Institute of Science and Technology Information)
	Session 6 Session chair: Balthasar Reuter (ECMWF)	
14:20 to 14:40	The NSF NCARCommunity Software Facility: Transforming Software Engineering for Earth System Models Presentation slides Video recording	Thomas Hauser (NCAR)
14:40 to 15:10	Coffee break	

15:10 to 15:30	FORGE: Re-generating a forecast system for sustainability Presentation slides Video recording	Michael Lange (ECMWF)
15:30 to 15:50	A Python Dynamical Core for Operational Numerical Weather Prediction Presentation slides Video recording	Daniel Hupp (MeteoSwiss)
15:50 to 16:10	Bringing Performance Portability to ICON Presentation slides Video recording	Magdalena Luz (ETH Zurich)
16:10 to 16:30	Developing ECMWF's next-generation performance-portable atmospheric dynamical core Presentation slides Video recording	Sara Faghih-Naini (ECMWF)
16:30 to 16:50	GPU Porting of ECMWF Physical Parametrizations using a High-Level Programming Model Presentation slides Video recording	Stefano Ubbiali (ETH Zurich)

Friday Agenda

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Arrival		
07:30 to 08:00	Registration and coffee	
	Session 7 Session chair: Tiago Quintino (ECMWF)	
08:00 to 08:20	Mapping Earth System Components to compute architectures for Optimized Throughput, Hardware Utilization and Energy Efficiency Video recording	Jan Frederik Engels (German Climate Computing Center)
08:20 to 08:40	Enhancing Tape Library Access Efficiency through Load Balancing at ECMWF Presentation slides Video recording	Sebastien Denvil (ECMWF)
08:40 to 09:00	High performance data Presentation slides Video recording	Tom Gale (Bureau of Meteorology)
09:00 to 09:20	I/O in LFRic: Collaborative Complexity Presentation slides Video recording	Iva Kavčič (Met Office)
09:20 to 09:50	Coffee break	
09:50 to 10:10	Containerization and deployment of weather models on EuroHPC JU infrastructures Presentation slides Video recording	Massimo Gisonni (CINECA)
10:10 to 10:30	Cross-Domain Insights on Federated Computing for Weather Workflows Presentation slides Video recording	Layla Loffredo (SURF B.V.)

10:30 to 10:50	Building multi-platform end-to-end capability in the Destination Earth On-demand Extremes digital twins: an integrated NWP-air quality workflow Presentation slides Video recording	Tommaso Benacchio (Danish Meteorological Institute)
10:50 to 11:10	Data-awareness with Maestro middleware in Climate Digital Twin workflows Presentation slides Video recording	Ali Mohammed (HPE HPC/AI EMEA RESEARCH LAB (ERL))
11:10 to 11:30	A modern Data Platform to improve Workflows and Pipelines Presentation slides Video recording	Giuseppe Trotta (Cineca) Sven Breuner (VAST Data)
11:30 to 11:45	Closing remarks Video recording	Martin Palkovic (ECMWF)