21st ECMWF workshop on high performance computing in meteorology

Programme

Monday
Agenda

All times are shown in the selected time zone.

Location: DAMA - Tecnopolo 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)

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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**	Florent Duguet (NVIDIA)
16:10 to 16:30	**Scaling IFS to 1km and beyond**	Ioan Hadade (ECMWF)
16:30 to 16:50	**Good ideas are persistent - pick them up!** Presentation slides Video recording	Luis Kornblueh (Max Planck Institute forMeteorology)

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	**Forecast users and HPC shaping the future together - a panel discussion** Chairs: Chris Kitchen and Becky Hemingway Panel members: • Franck Cappello (Argonne National Laboratory) • Dan Suri (Met Office) • Katherine Yelick • Linus Magnusson (ECMWF) Video recording	
11:30 to 13:00	**Lunch break**	
	Session 4 Session chair: Christine Kitchen (ECMWF}	
13:00 to 13:20	**The DTN AI Weather Revolution: Turning complex data into decision-grade insights using machine learning**	Satheesh Maheswaran (AWS) Stefan Weissenberger (NVIDIA) Sam Lillo (DTN)
13:20 to 13:40	**Optimizing Large-Scale Graph Neural Networks for the NVIDIA Grace Hopper Architecture**	Maximilian Stadler (NVIDIA)
13:40 to 14:10	**Improving the scalability and I/O of AIFS**	Jan Polster (ECMWF) Cathal O Brien (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	**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)	
17:10 to 18:30	**Buffet and drinks**	

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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?**	Katherine Yelick (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**	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)**	Ulrich Schättler (Deutscher Wetterdienst)
10:10 to 10:30	**An Update on High-Performance Computing at Météo-France**	François Bouyssel (Météo-France)
10:30 to 10:50	**From LEO to Azure: The UK Met Office HPC Journey**	Paul Selwood (Met Office)
10:50 to 11:10	**An Update on High-Performance Computing at the Japan Meteorological Agency**	Katsuhiko Ganzu (Numerical Prediction Division, JMA)
11:10 to 11:30	**Past, present and future of HPC at the Australian Bureau of Meteorology**	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**	Vincent Fortier (Environnement et Changements Climatiques Canada)
13:20 to 13:40	**Past, present, and future of HPC at the CMA**	Shuai Deng (National Meteorological Information Centre)
13:40 to 14:00	**Past, present, and future of HPC at the National Weather Service**	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**	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**	Thomas Hauser (NCAR)
14:40 to 15:10	**Coffee break**	
15:10 to 15:30	**FORGE: Re-generating a forecast system for sustainability**	Michael Lange (ECMWF)
15:30 to 15:50	**A Python Dynamical Core for Operational Numerical Weather Prediction**	Daniel Hupp (MeteoSwiss)
15:50 to 16:10	**Bringing Performance Portability to ICON**	Magdalena Luz (ETH Zurich)
16:10 to 16:30	**Developing ECMWF's next-generation performance-portable atmospheric dynamical core**	Sara Faghih-Naini (ECMWF)
16:30 to 16:50	**GPU Porting of ECMWF Physical Parametrizations using a High-Level Programming Model**	Stefano Ubbiali (ETH Zurich)

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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**	Jan Frederik Engels (German Climate Computing Center)
08:20 to 08:40	**Enhancing Tape Library Access Efficiency through Load Balancing at ECMWF**	Sebastien Denvil (ECMWF)
08:40 to 09:00	**High performance data**	Tom Gale (Bureau of Meteorology)
09:00 to 09:20	**I/O in LFRic: Collaborative Complexity**	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**	Massimo Gisonni (CINECA)
10:10 to 10:30	**Cross-Domain Insights on Federated Computing for Weather Workflows**	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**	Tommaso Benacchio (Danish Meteorological Institute)

10:50 to 11:10	**Data-awareness with Maestro middleware in Climate Digital Twin workflows**	Ali Mohammed (HPE HPC/AI EMEA RESEARCH LAB (ERL))
11:10 to 11:30	**A modern Data Platform to improve Workflows and Pipelines**	Giuseppe Trotta (Cineca) Sven Breuner (VAST Data)
11:30 to 11:45	**Closing remarks**	Martin Palkovic (ECMWF)