



20th ECMWF workshop on high performance computing in meteorology

Programme

Monday Agenda

Location: Tecnopolo di Bologna

Agenda time displays according to the selected time zone.

The selected timezone is Europe/London

	Today's programme is not being livestreamed.	
13:30 to 14:00	Arrival and registration	
14:00 to 14:30	Opening remarks by Dr Florence Rabier, ECMWF Director-General and invited guests: <ul style="list-style-type: none">• Presidente Stefano Bonaccini (President of the Regione)• Magnificent Rector, prof. Giovanni Molari (Rector of University of Bologna)• Professor Francesco Ubertini (President of Cineca)	
14:30 to 14:50	Presentation and discussion around the ECMWF High-Performance Computing System and the European Weather Cloud: The ECMWF High Performance Computing Facility Presentation slides	Oliver Treiber (ECMWF)
15:10 to 16:10	Tour of the computer hall	
14:50 to 15:10	Presentation and discussion around the ECMWF High-Performance Computing System and the European Weather Cloud: Implementation of the Production European Weather Cloud Presentation slides	Xavier Abellan (ECMWF) Stig Telfer (StackHPC Ltd)
16:20 to 17:20	Panel discussion on the topic of “Diversifying HPC” chaired by Antonio Navarra Invited speakers will debate the various challenges and opportunities facing the HPC community. Panellists: <ul style="list-style-type: none">• Katherine Evans (Oak Ridge National Laboratory)• Utz-Uwe Haus (HPE HPC EMEA Research Lab)• Peter Messmer (NVIDIA)• Sheri Mickelson (NCAR)	
17:20 to 17:30	Group photo	

17:30 to 19:30

Aperitif and buffet dinner

Transport to town centre

Tuesday Agenda

Location: San Domenico

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	Morning session Chair: Balthasar Reuter	
08:00 to 09:00	Keynote: Modular Supercomputing: enabling application diversity in HPC Presentation slides Video recording	Estela Suarez (Forschungszentrum Juelich, Juelich Supercomputing Centre)
09:00 to 09:15	Coffee break	
09:15 to 09:30	Digital Twins of the Earth system Presentation slides Video recording	Thomas Geenen (ECMWF)
09:30 to 09:55	Technical Challenges of deploying and running future Destination Earth Twins Presentation slides Video recording	Utz-Uwe Haus (HPE) Craig Prunty (SiPearl)
09:55 to 10:20	Destination Earth, Data Spaces and a European Cloud Federation: opportunities and challenges Presentation slides Video recording	Charalampos Tsitlakidis (European Commission - DG CONNECT)
10:20 to 10:45	The Earth-2 Service Architecture Presentation slides Video recording	Peter Messmer (NVIDIA)
10:45 to 11:00	Comfort break	
11:00 to 11:25	Machine learning at ECMWF Presentation slides Video recording	Matthew Chantry (ECMWF)

11:25 to 11:50	AI for Simulation: Accelerating HPC with AI and IPUs Presentation slides Video recording	Alexander Titterton (Graphcore)
11:50 to 13:10	Lunch break	
	Afternoon session Chair: Martin Palkovic	
13:10 to 13:35	Met Office HPC Update Presentation slides Video recording	Paul Selwood (Met Office)
13:35 to 14:00	IFShub - An integrated web interface to IFS developer workflow Presentation slides Video recording	Paul Burton (ECMWF)
14:00 to 14:25	Earth system modeling on Modular Supercomputing Architectures: coupled atmosphere-ocean simulations with ICON Presentation slides Video recording	Olaf Stein (Research Centre Juelich)
14:25 to 14:50	Coffee break	
14:50 to 15:15	The concept of NCAR's community software facility Presentation slides Video recording	Thomas Hauser (National Center for Atmospheric Research)
15:15 to 15:40	LFRic and NGMS: Meeting challenges of exascale through diversifying HP Presentation slides Video recording	Iva Kavčič (Met Office)
15:40 to 16:05	Exascale Computing for Meteorology Presentation slides Video recording	Ilene Carpenter (HPE)
16:05 to 16:20	Comfort break	
16:20 to 16:45	Towards Diversified Exascale Numerical Weather Prediction Workflows Presentation slides Video recording	Christopher Harrop (CIRES, University of Colorado and NOAA Global Systemes Laboratory)

16:45 to 17:10

**ICON on its Way to Exascale - Status
and Next Steps**

[Presentation slides](#)

[Video recording](#)

Claudia Frauen (German Climate
Computing Center (DKRZ))

Wednesday

Agenda

Location: San Domenico

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	Morning session Chair: Chris Kitchen	
07:45 to 08:45	Keynote: Leveraging diversity in all dimensions to predict multiscale meteorology and its impacts Presentation slides Video recording	Katherine Evans (Oak Ridge National Laboratory)
08:45 to 09:30	Coffee break	
09:30 to 09:55	HPC update for Australian Bureau of Meteorology Presentation slides Video recording	Adam Smith (Bureau of Meteorology)
09:55 to 10:20	Diverse Aspects of Computing at DWD Presentation slides Video recording	Ulrich Schättler (DWD)
10:20 to 10:45	Embracing Diversity and Democratizing High-Performance Computing: Cultivating Inclusion and Driving Innovation Presentation slides Video recording	Mthetho Sovara (Centre for High Performance Computing)
10:45 to 11:00	Comfort break	
11:00 to 11:25	A Deep Dive into DPU Computing - Addressing HPC Performance Bottlenecks Presentation slides Video recording	Richard Graham (NVIDIA)
11:25 to 11:50	Numerical Weather prediction at MeteoSwiss using ICON on GPUs Presentation slides Video recording	Xavier Lapillonne (MeteoSwiss)

11:50 to 13:10	Lunch break	
	Afternoon session Chair: Ioan Hadade	
13:10 to 13:35	Foundation Model in Earth Science: Towards Atmospheric Prediction and Analysis Presentation slides Video recording	Sujit Roy (University of Alabama in Huntsville; NASA MSFC)
13:35 to 14:00	Code refactoring patterns targeting bandwidth optimized architectures and heterogeneous architectures Presentation slides Video recording	Jacob Poulsen (Intel)
14:00 to 14:25	Performance Optimization of ECTrans on AMD GPUs Presentation slides Video recording	Paul Mullaney (AMD)
14:25 to 14:50	Coffee break	
14:50 to 15:10	Hybrid 2024: Adapting IFS for a hybrid CPU-GPU architectures Presentation slides Video recording	Michael Lange (ECMWF)
15:10 to 15:30	GPU adaptation of NWP single column algorithms Presentation slides Video recording	Michael Staneker (ECMWF)
15:30 to 15:50	Automating GPU adaptation of NWP single column physics using Loki Presentation slides Video recording	Ahmad Nawab (ECMWF)
15:50 to 16:10	Heterogeneous HPC to the rescue? Ways to improve the energy efficiency of climate simulations today and tomorrow Presentation slides Video recording	Jan Frederik Engels (German Climate Computing Center (DKRZ))
16:10 to 16:35	Integrated Forecasting System Performance Optimisation Presentation slides Video recording	Richard Graham (NVIDIA)

16:35 to 17:00

**Performance Portability and
Programmability in the Evolution of Weather
Codes Towards Heterogeneous Platforms**

Camilo Moreno (Intel
Corporation)

[Presentation slides](#)

[Video recording](#)

Dinner at Cantina Bentivoglio

Starting at 18:30 at

Via Mascarella 4/b

40126 Bologna

Thursday Agenda

Location: San Domenico

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	Morning session Chair: Cristina Duma	
07:45 to 08:45	Keynote: ML for High-Performance Climate: Massive Data Post Processing, Extreme Compression, and Earth Virtualization Engines Presentation slides Video recording	Torsten Hoefler (ETH Zurich)
08:45 to 09:30	Coffee break	
09:30 to 09:55	Best Practices for NWP in the cloud Presentation slides Video recording	Timothy Brown (Amazon Web Services)
09:55 to 10:20	Exploration of public cloud computing by an operational site running the Unified Model Presentation slides Video recording	Jeff Zais (NIWA)
10:20 to 10:45	Weather forecasting on the cloud: an evaluation of IFS performance on Azure HPC instances Presentation slides Video recording	Cathal O'Brien (ECMWF)
10:45 to 11:00	Comfort break	
11:00 to 11:25	Enabling Elastic Cloud Integration with Kubernetes Presentation slides Video recording	Timothy Whitcomb (US Naval Research Laboratory)
11:25 to 11:50	Designing sustainable buildings globally with Hybrid-cloud Presentation slides Video recording	Niall Kennedy (YellowDog)

11:50 to 13:05	Lunch break	
	Afternoon session Chair: Thomas Geenen	
13:10 to 13:35	Diversifying Your HPC Technology with Azure: A New Era of Scientific Computing Presentation slides Video recording	Mike Kiernan (Microsoft)
13:35 to 14:00	New Generation HPC for CMA Presentation slides Video recording	Shuai Deng (National Meteorological Information Centre)
14:00 to 14:25	Optimization of the Digital Twins for Weather and Climate Predictions: an exciting battleground Presentation slides Video recording	Stella Paronuzzi Ticco (BSC)
14:25 to 14:50	Coffee break	
14:50 to 15:10	Project Rajin and UXarray: community tools for the analysis of kilometer scale climate and weather model output Presentation slides Video recording	John Clyne (National Center for Atmospheric Research (NCAR))
15:10 to 15:30	Seeking portability and productivity for future NWP code with GT4Py Presentation slides Video recording	Christian Kühnlein (ECMWF)
15:30 to 15:50	GT4Py: A Python framework for weather and climate applications Presentation slides Video recording	Till Ehrenguber (CSCS / ETH Zurich)
15:50 to 16:10	Pace: A GPU-enabled implementation of FV3GFS using GT4Py Presentation slides Video recording	Oliver Elbert (NOAA)
16:10 to 16:20	Comfort break	
16:20 to 17:10	Poster session	

Friday Agenda

Location: San Domenico

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	Morning session Chair 1 (9:00-11:45): Sam Hatfield Chair 2 (12:00-14:00) Patrick Gillies	
07:45 to 08:10	Updates of HPC in Japan Meteorological Agency Presentation slides Video recording	Eizi Toyoda (Japan Meteorological Agency)
08:10 to 08:30	Domain Specific Language Adoption into NASA's Goddard Earth Observing System code Presentation slides Video recording	Christopher Kung (NASA / SAIC)
08:30 to 08:50	Transforming Weather and Climate Code with Psyclone Presentation slides Video recording	Sergi Siso (STFC Hartree Centre)
08:50 to 09:10	Parallel Software Framework of MCV Model Presentation slides Video recording	Qingu Jiang (CMA Earth System Modeling and Prediction Centre)
09:10 to 09:55	Coffee break	
09:55 to 10:20	Computation Storage as seen from the Excalidata project Presentation slides Video recording	Jean-Thomas Acquaviva (DDN Storage)
10:20 to 10:45	Save Up to 260 CO2e per PB with the WEKA Data Platform Presentation slides Video recording	Derek Burke (WEKA)
10:45 to 11:00	Comfort break	

11:00 to 11:25	I/O management at NCEP. Problems and Progress Presentation slides Video recording	George Vandenberghe (NOAA/NCEP)
11:25 to 11:50	MME REP: Climate Data Records and EO data processing in a server-less computing paradigm Presentation slides Video recording	Salvatore Pinto (EUMETSAT)
11:50 to 12:00	Comfort break	
12:00 to 12:25	MultIO: A framework for message-driven data routing in high-resolution weather and climate modelling Presentation slides Video recording	Domokos Sarmany (ECMWF)
12:25 to 12:50	EarthWorks: The computational and engineering challenges faced when building a global storm-resolving resolution modeling system Presentation slides Video recording	Sheri Mickelson (NCAR)
12:50 to 13:00	Closing remarks Video recording	Martin Palkovic (ECMWF)