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

13:00 to 17:00	**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:** • 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: • 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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08:00 to 11:50	**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
09:30 to 09:55	**Technical Challenges of deploying and running future Destination Earth Twins** Presentation slides Video recording	Utz-Uwe Haus (HPE HPC EMEA Research Lab) 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**	
13:10 to 17:10	**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 (NCAR)
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)

Wednesday
Agenda

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07:45 to 11:50	**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 (Deutscher Wetterdienst)
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**	
13:10 to 17:10	**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 Mullowney (AMD, Inc)
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 (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 Platfoms** Presentation slides Video recording	Camilo Moreno (Intel Corporation)
17:30 to 20:00		
	Dinner at Cantina Bentivoglio Starting at 18:30 at Via Mascarella 4/b 40126 Bologna	

Thursday
Agenda

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08:00 to 13:05	**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	Tim Brown (AWS)
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**	
13:10 to 17:10	**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 Ehrengruber (CSCS)
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

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08:00 to 13:00	**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)