

7th ENES HPC Workshop

Monday, May 9 2022 - Wednesday, May 11 2022

Barcelona Supercomputing Center (BSC), Spain

Sala de Junes, Rectorat UPC

Monday 9 May

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|-------|--|---|--|
| 13:00 | Welcome & Introduction | | |
| 13:10 | Session 1: European and International Landscape | Joachim Biercamp & Jenni Kontkanen | |
| 13:10 | Strengthening the European HPC communities by addressing the skills and competence level | Bastian Koller | HLRS, CASTIEL, EuroCC, |
| 13:35 | Lumi - the first EuroHPC pre-exa system | Jenni Kontkanen | CSC |
| 14:00 | ARMing the IFS: Experiments and experiences from porting the ECMWF model to Fugaku | Samuel Hatfield | ECMWF |
| 14:25 | <i>Break</i> | | |
| 14:45 | Numerical Climate and Weather Modeling on the China Earth System Simulator | Yongqiang Yu | LASG, Institute of Atmospheric Physics |
| 15:10 | DestinE: opportunities & challenges for digital twins of the Earth System | Nils Wedi | ECMWF |
| 15:35 | HPC Challenges for CMIP: lessons from CMIP6 and potential next steps | Jean François Lamarque | NCAR |
| 16:00 | <i>Coffee break</i> | | |
| 16:30 | Session 2: Mix traditional modeling with ML | Jean-Claude André & V. Balaji | |
| 16:30 | Machine learning for weather and climate predictions | Peter Dueben | ECMWF |
| 17:00 | High-Tune Explorer: a tool to accelerate model calibration based on process-oriented metrics | Fleur Couvreur | Météo-France |
| 17:25 | Skilful precipitation nowcasting using deep generative models of radar | Suman Ravuri | Google Deep Mind |
| 17:50 | Fourier Neural Operators for Fast Weather Modeling | Anima Anandkumar | CalTech & NVIDIA |
| 18:15 | Building digital twins of the Earth for NVIDIA's Earth-2 initiative | Karthik Kashinath | NVIDIA |
| 18:40 | Discussion | V. Balaji & J.C. André | Princeton & CERFACS |
| 19:30 | <i>End of session</i> | | |



Tuesday 10 May

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| 09:15 | Welcome coffee | | |
| 09:45 | Session 3: Performance | Sophie Valcke & Mario Acosta | |
| 09:45 | CPMIP performance metrics for CMIP6: Lessons, recommendations and next steps | Mario Acosta | BSC |
| 10:10 | Performance optimization in NEMO ocean model | Italo Epicoco | CMCC |
| 10:35 | The new load balancing tool in OASIS3-MCT_5.0 | Eric Maisonnave | CERFACS |
| 11:00 | <i>Break</i> | | |
| 11:20 | The Potential of Functional Concurrency in W&C models | Reinhard Budich | MPI |
| 11:45 | PoP Studies of Earth Sciences Codes | Jesus Labarta | BSC |
| 12:10 | Recent Atlas library developments for Earth system modelling | Willem Deconinck | ECMWF |
| 12:35 | On the energy costs of data production, data transfer and data storing | Jean-Claude André | CERFACS |
| 13:00 | Discussion | | |
| 13:15 | <i>Lunch</i> | | |
| 14:30 | Session 4 : Heterogeneous architectures (accelerators) | Sylvie Jousaume & Italo Epicoco | |
| 14:30 | Preparing ICON for heterogeneous architectures - Experiences and the way forward | Claudia Frauen | DKRZ |
| 14:55 | PSyclone in Met Office: Evolution and revolution | Iva Kavcic | UK Met |
| 15:20 | Accelerating tracer transport in FESOM-2 with GPU's | Gijs van den Oord | NLeSC |
| 15:45 | CAMP First GPU Solver: A Solution to Accelerate Chemistry in Atmospheric Models | Christian Guzman | BSC |
| 16:10 | <i>Break</i> | | |
| 16:35 | Preparing IFS for HPC accelerators via source-to-source translation | Michael Lange | ECMWF |
| 17:00 | Enabling large scale modeling on GPU accelerated nodes for NCAR's next supercomputer Derecho | Thomas Hauser | NCAR |
| 17:25 | E3SM's C++ based GPU strategy and latest performance | Mark Taylor | PNL |
| 17:50 | Discussion | | |
| 18:15 | <i>End of session</i> | | |
| 20:30 | <i>Social dinner</i> | | |



Wednesday 11 May

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| 08:30 | Welcome coffee | | |
| 09:00 | Session 5: Data Workflow | Kim Serradell & Jean Christophe Rioual | |
| 09:00 | Nobody needed all those bits anyway: compressing atmospheric data into its real information content | Milan Klöwer | Oxford |
| 09:25 | Fostering lossy compression in the European Earth System Modelling community: SZ compressor and XIOS I/O server as a case study | Xavier Yepes | BSC |
| 09:50 | Data-Centric workflows in Exascale Weather Forecasting | Tiago Quintino | ECMWF |
| 10:15 | <i>Break</i> | | |
| 10:30 | ExCALIData: Exascale I/O & Storage and Workflow | Grenville Lister | NCAS |
| 10:55 | Semantic access to gridded weather data based on zarr | Gabriela Aznar | MSwiss |
| 11:20 | Towards HPC and Big Data convergence for climate analysis at scale | Donatello Elia | CMCC |
| 11:45 | Discussion | | |
| 13:00 | <i>Lunch</i> | | |

Organising committee : Kim Serradell, Sylvie Joussaume, Sophie Valcke, Jean-Christophe Rioual, Jenni Kontkanen, Joachim Biercamp, Italo Epicoco, Mario Acosta, Jean-Claude André, V. Balaji

