# 6th ENES HPC Workshop 2020

Session 1: Very high resolution modeling and challenges
Session 2: Performance portability
Session 3: Machine learning for parametrization schemes
Session 4: Data / high volume data analysis

**Monday, 25 May 2020**

| | | | | | | | time lag + / - [hrs] | local time speaker |
|---|---|---|---|---|---|---|---|---|
| 16:00 | | Welcome & introduction | Joachim Biercamp (DKRZ) | | 00:15 | | | |
| | Session | Very high-resolution modeling | Florian Ziemen + Daniel Klocke | | | | | |
| 16:15 | talk | Sam | Hatfield | ECMWF | 00:20 | Mixed-precision ocean modelling at ECMWF | 01:00 - | 15:15 |
| 16:35 | talk | Nikolay | Koldunov | MARUM/AWI | 00:20 | Very high resolution modelling with unstructured mesh global ocean model (FESOM2) | 00:00 + | 16:35 |
| 16:55 | talk | Gijs | van den Oord | Netherlands eScience Center | 00:20 | Regional Superparametrization of OpenIFS by 3D LES | 00:00 + | 16:55 |
| 17:15 | talk | Miguel | Castrillo | BSC | 00:20 | The NEMO ORCA36 configuration and approaches to increase NEMO4 efficiency | 00:00 + | 17:15 |
| 17:35 | | Coffee break | | | 00:15 | | | |
| 17:50 | talk | Bjorn | Stevens | MPI-M | 00:20 | Next Generation Earth System Models: Lessons learned and looming challenges | 00:00 + | 17:50 |
| 18:10 | talk | Clément | Bricaud | Mercator Ocean International | 00:20 | Overview of the first year of the NEMO global 1/36° configuration (ORCA36) development | 00:00 + | 18:10 |
| 18:30 | talk | Jacqueline | Nugent | University of Washington | 00:20 | Evaluating Convection and Tropical Tropopause Layer Cirrus in the DYAMOND Simulations | 09:00 - | 09:30 |
| 18:50 | End | | | | 02:50 | | | |

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**Tuesday, 26 May 2020**

| Time | Type | | | Affiliation | Dur. | Title | time lag [hrs] | + / - | local time speaker |
|---|---|---|---|---|---|---|---|---|---|
| 09:00 | | Welcome & introduction | | Joachim Biercamp (DKRZ) | 00:10 | | | | |
| | Session | Very high-resolution modeling | | Florian Ziemen + Daniel Klocke | | | time lag [hrs] | + / - | local time speaker |
| 09:10 | talk | Puxi | Li | Chinese Academy of Meteorological Sciences, China | 00:20 | Model performance of storm resolving models in simulating mesoscale convective systems | 06:00 | + | 15:10 |
| | Session | Performance portability | | Reinhard Budich + Mario Acosta | | | time lag [hrs] | '+ / - | local time speaker |
| 09:30 | talk | Satoshi | Matsuoka | Riken | 00:20 | Fugaku:: the First Exascale Machine | 07:00 | + | 16:30 |
| 09:50 | talk | Xiaomeng | Huang | Tsinghua University | 00:20 | OpenArray v1.0: a simple operator library for the decoupling of ocean modeling and parallel computing | 06:00 | + | 15:50 |
| 10:10 | talk | Christian | Guzman | BSC | 00:20 | Accelerating Chemistry Modules in Atmospheric Models using GPUs | 00:00 | + | 10:10 |
| 10:30 | talk | Piotr | Bartman | Jagiellonian University in Kraków, Poland | 00:20 | Bridging performance and pythonicity with Numba, Pythran and ThrustRTC | 00:00 | + | 10:30 |
| 10:50 | | Coffee break | | | 00:15 | | | | |
| 11:05 | talk | Matthias | Röthlin | MeteoSwiss | 00:20 | Preparing dawn for Weather and Climate Models on Triangular Grids | 00:00 | + | 11:05 |
| 11:25 | talk | Harald | Koestler | Friedrich-Alexander- Universität Erlangen-Nürnberg | 00:20 | Code Generation Technology for Climate Models | 00:00 | + | 11:25 |
| 11:45 | talk | Rupert | Ford | STFC Hartree Centre | 00:20 | Recent Advances in PSyclone | 01:00 | - | 10:45 |
| 12:05 | talk | Iva | Kavcic | MetOffice | 00:20 | LFRic approach to performance portability | 01:00 | - | 11:05 |
| 12:25 | End | | | | 02:55 | | | | |

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**Thursday, 28 May 2020**

| | | | | | | | | time lag [hrs] | '+ / - local time speaker |
|---|---|---|---|---|---|---|---|---|---|
| 16:30 | | Welcome & introduction | | Joachim Biercamp (DKRZ) | | 00:10 | | | |
| | Session | Performance portability | | Sophie Valcke + Kim Serradell | | | | time lag [hrs] | '+ / - local time speaker |
| 16:40 | talk | Robert | Jacob | Argonne National Laboratory | | 00:20 | Software development for performance in the Energy Exascale Earth System Model | 07:00 - | 09:40 |
| 17:00 | talk | Peter | Bauer | ECMWF | | 00:20 | ECMWF's roadmap towards extreme-scale computing | 01:00 - | 16:00 |
| 17:20 | talk | Daniel | Arevalo | US NRL | | 00:20 | Computational Evaluation of Commercial Cloud HPC with a Global Atmospheric Model | 09:00 - | 08:20 |
| 17:40 | talk | Dom | Heinzeller | CU/CIRES & NOAA/ESRL/GSD | | 00:20 | The Common Community Physics Package (CCPP): a shared infrastructure for model physics for operations and research | 08:00 - | 09:40 |
| 18:00 | talk | Johann | Dahm | Vulcan Inc. | | 00:20 | Compiler toolchain for scalable weather and climate simulation using FV3 on GPUs | 09:00 - | 09:00 |
| 18:20 | | Coffee break | | | | 00:15 | | | |
| | Session | Machine learning for parameterization schemes | | Jean-Claude Andre + Peter Dueben | | | | time lag [hrs] | '+ / - local time speaker |
| 18:35 | talk | Richard | Loft | University Corporation for Atmospheric Research | | 00:20 | Exascale Climate: Can OpenACC and Machine Learning Deliver the Goods? | 08:00 - | 10:35 |
| 18:55 | talk | Chris | Bretherton | University of Washington | | 00:20 | Deep learning for cloud parameterization schemes | 09:00 - | 09:55 |
| 19:15 | talk | Stan | Posey | NVIDIA | | 00:20 | GPU Developments for Applications in Climate and Weather | 09:00 - | 10:15 |
| 19:35 | talk | Peter | Dueben | ECMWF | | 00:20 | Machine learning at ECMWF | 01:00 - | 18:35 |
| 19:55 | End | | | | | 03:15 | | | |

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**Friday, 29 May 2020**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15:00 | | Welcome & introduction | Joachim Biercamp (DKRZ) | 00:10 | | | |
| | Session | Machine learning for parameterization schemes | Jean-Claude Andre + Peter Dueben | | | time lag [hrs] | '+ / - local time speaker |
| 15:10 | talk | Matthew Chantry | U. Oxford | 00:20 | Emulation of the gravity wave drag | 01:00 - | 14:10 |
| 15:30 | talk | Maria Moreno de Castro | DKRZ | 00:20 | Interpretable Machine Learning | 00:00 + | 15:30 |
| 15:50 | talk | Carlos Gomez | BSC | 00:20 | Learning to simulate precipitation with Deep Neural Networks | 00:00 + | 15:50 |
| 16:10 | talk | Fredrik Jansson | CWI | 00:20 | Uncertainty quantification of atmospheric models - applying the EasyVVUQ framework on the DALES model | 00:00 + | 16:10 |
| | Session | Challenges in exascale data processing and visualization | Niklas Röber + Sandro Fiore | | | time lag [hrs] | '+ / - local time speaker |
| 16:30 | talk | Niklas Röber | DKRZ | 00:20 | Large Data Visualization | 00:00 + | 16:30 |
| 16:50 | | Coffee break | | 00:15 | | | |
| 17:05 | talk | Donatello Elia | CMCC | 00:20 | A HPDA-enabled environment for scalable climate data analysis | 00:00 + | 17:05 |
| 17:25 | talk | Julian Kunkel | University of Reading | 00:20 | Data-Centric IO: Potential for Climate/Weather | 01:00 - | 16:25 |
| 17:45 | talk | Jeff Durachta | NOAA GFDL | 00:20 | Initial Experiences with a Cluster Mounted Flash File System | 06:00 - | 11:45 |
| 18:05 | talk | Aparna Radhakrishnan | Princeton University/NOAA GFDL | 00:20 | Building blocks for exascale computing at GFDL | 06:00 - | 12:05 |
| 18:25 | talk | Valerio Pascucci | Univ. of Utah | 00:20 | Data Analytics and Visualization of Massive Climate and Weather Data | 08:00 - | 10:25 |
| 18:45 | End | | | 03:35 | | | |