Overview of C2SM ICON activities
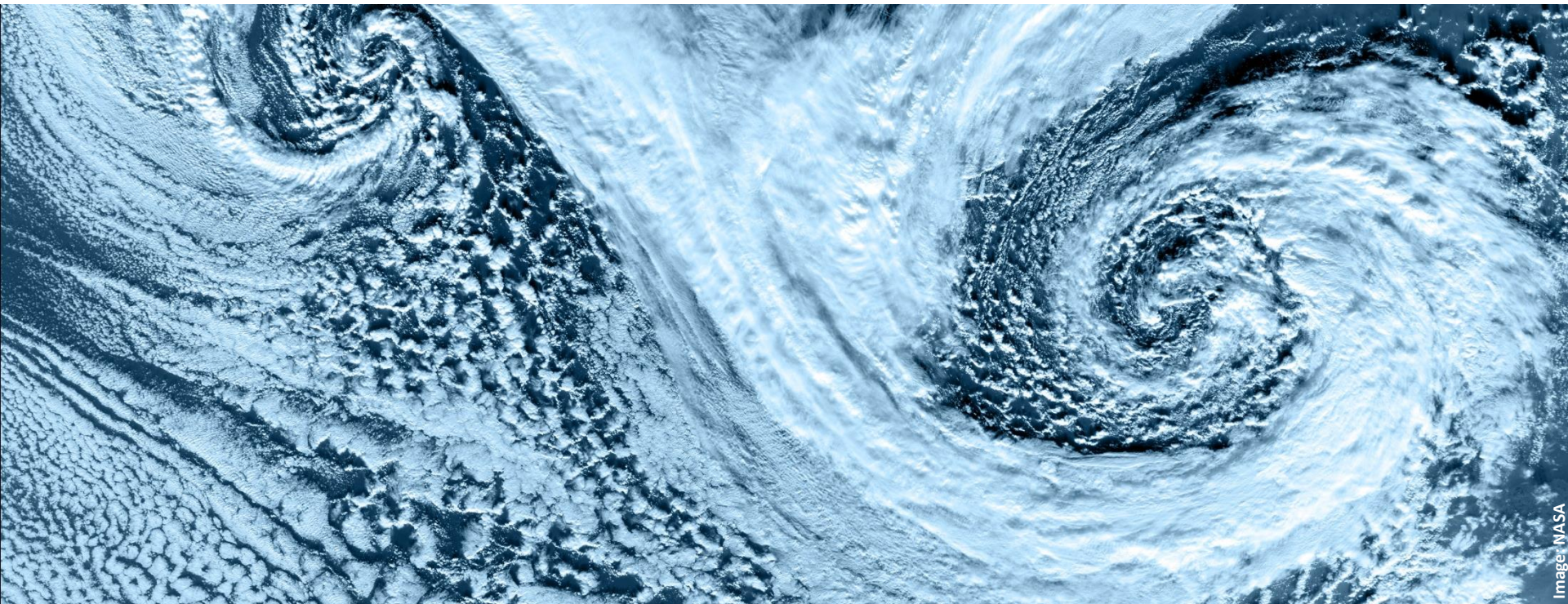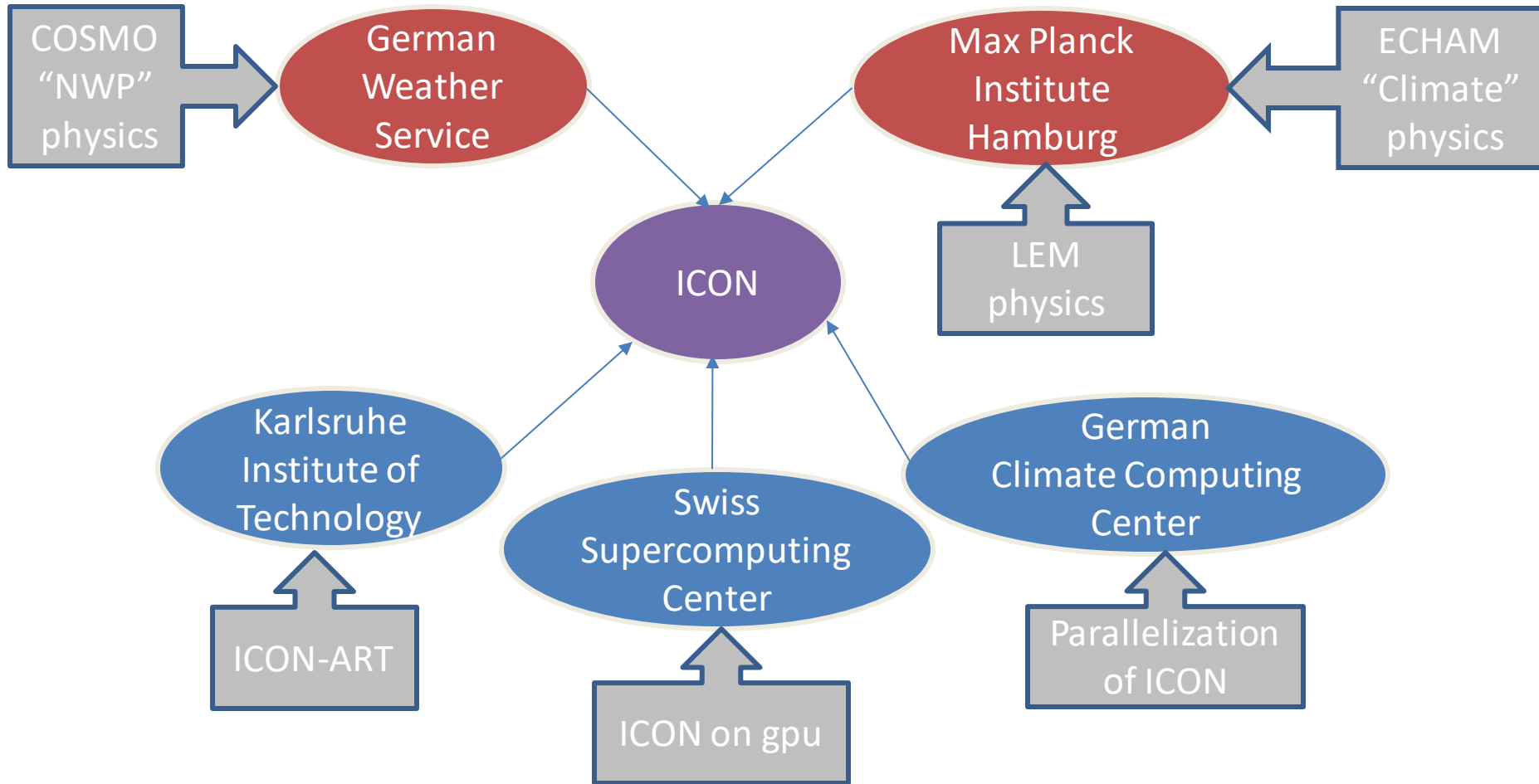
Katie Osterried

COSMO User Workshop 2019

ICON Introduction

ICON development partners

C2SM

ICON current usage

NWP physics

DWD :

- Running ICON on global scale and European scale (13 km, 6.5 km, operational)
- Running ICON-ART for mineral dust forecasts (pre-operational)
- Plans to switch off COSMO and run ICON for German scale (2 km): during 2020

Various research groups in Germany producing papers with ICON-NWP and ICON-ART

Climate physics

MPI plan to participate in CMIP6 with ICON-ESM and MPI-ESM

AMIP case is already published

ICON official activities

- ICON training course, April 8-12, 2019 Langen

Organized by German Weather Service, Karlsruhe Institute of Technology, and COSMO-CLM community

- ICON infrastructure meetings

Every 3-4 months, invitation only ("gatekeepers")

- ICON developer meetings, Feb. 11-15, 2019, Hamburg

Twice a year, all welcome, technical and science topics

- ICCARUS (ICON COSMO CLM ART User Seminar), March 18-22, 2019, Offenbach

Science presentations and working group meetings

COSMO to ICON transition projects

Replacing COSMO by ICON-NWP

Priority Project "C2I": Transition of COSMO to ICON-LAM

- Project leader: Daniel Rieger (DWD)

- Goal: Transition all COSMO partners to ICON-LAM by March 2022

- ICON-LAM = limited area ICON run with NWP physics

Tasks for each COSMO member include:

Installing ICON, defining forecast setup, assessing performance against COSMO, verification, feedback from forecasters, data assimilation, and technical framework

Replacing COSMO-CLM by ICON-CLM

ICON-CLM: ICON Climate Limited area Mode

- Project at DWD to adapt ICON-LAM for climate runs using "COSMO" physics

- Add time dependent SST, sea-ice, fix restarts

- Adapt CLM tools (chaining scripts, climatological testsuite)

PG ICON

- Project group in the CLM community

- Aim to share experiences installing and running ICON-CLM

C2SM ICON activities

Activities in Ulrike Lohmann's group

Coupling of ICON to HAMMOZ aerosol chemistry model (ICON-HAM)

- Coding finished

- Testing and debugging underway by HAMMOZ consortium

PhD project of Bernhard Enz

- Use ICON-LAM to model hurricanes in the North Atlantic

- Comparison with NICAM

- Running on Piz Daint at CSCS

Porting ICON to gpu

Dynamics:

- Will Sawyer (CSCS) ported dynamical core to gpu with OpenACC (compiler directives)

Physics:

ENIAC project

- Porting of Climate (ECHAM) physics packages to gpu using OpenACC

- Development of tool to do automatic porting to different architectures

IMPACT project

- Porting of NWP (COSMO) physics packages to gpu using OpenACC

C2SM ICON activities

Source Code Administration of Extpar

- Extpar = software to generate external parameter fields for COSMO and ICON

- Latest release (November 2018) is fully tested and supported for ICON

Technical testsuite for ICON

- Adaptation of COSMO technical testsuite for ICON

- Allows comparison of model results between machines, compilers, cpu/gpu, etc.

Technical support

- Help with compiling and running ICON

- Contact Colombe Siegenthaler

C2SM ICON services

C2SM ICON meetings (~ 3 month intervals)

- Forum for discussion of issues, progress, running ICON on CSCS machines

- Suggestion of issues to be brought to the ICON infrastructure meetings

- Contact Colombe Siegenthaler or me to join mailing list

C2SM ICON license

- As with COSMO, C2SM plans to obtain an ICON license and distribute the code to C2SM members