C2SM
Center for Climate
Systems Modeling

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

COSMO User Workshop 2017

New COSMO User introductions

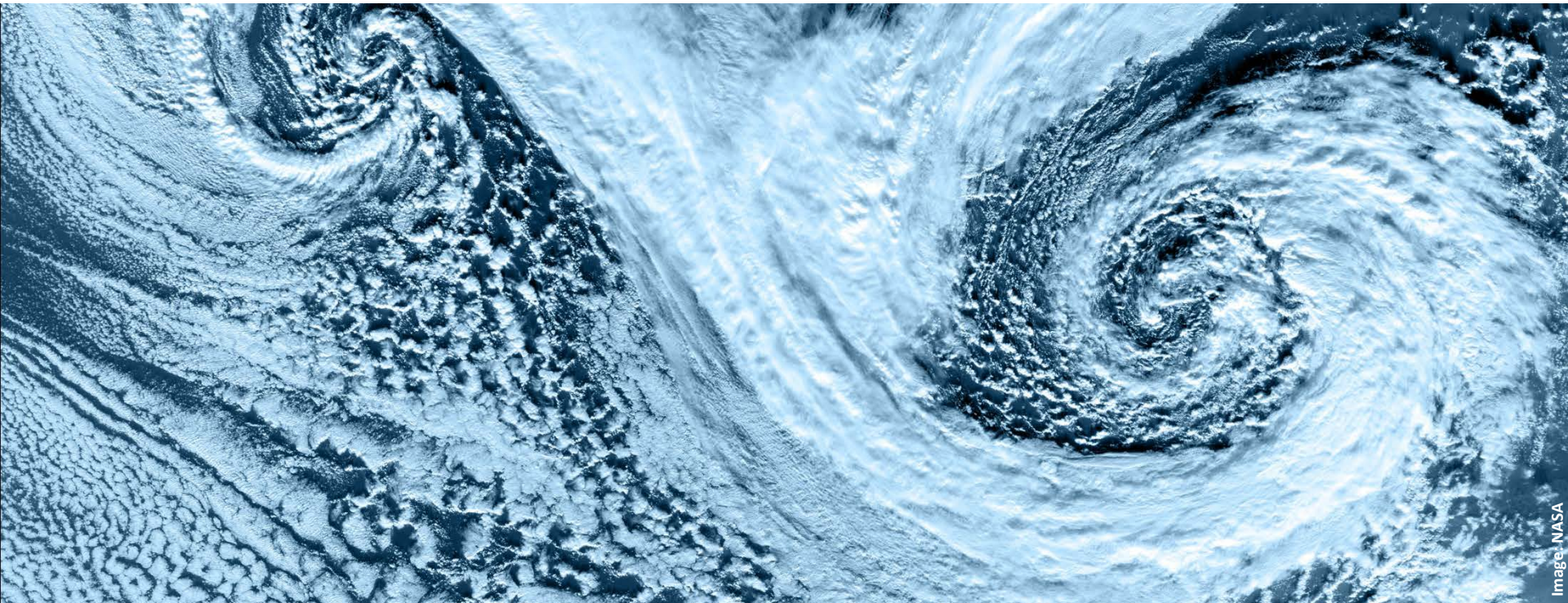
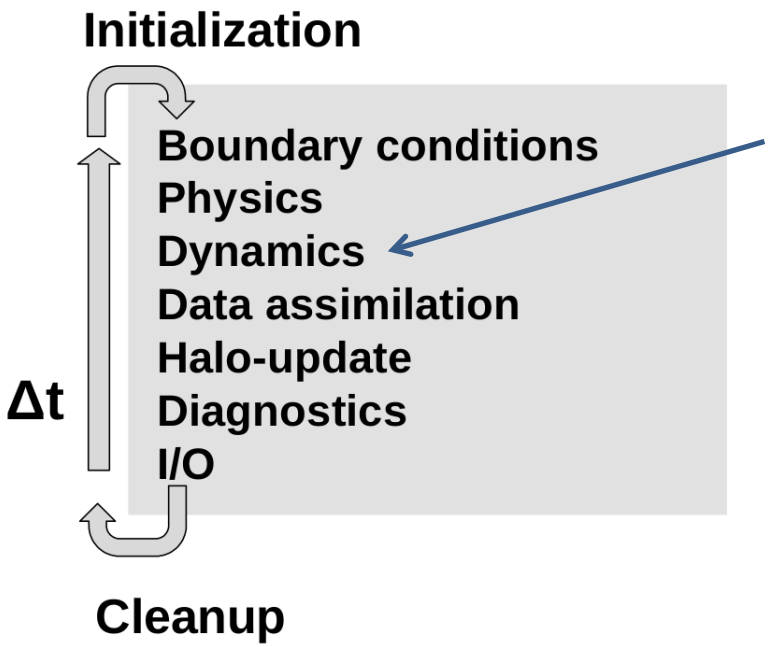


Image: NASA

Who am I

- Stefan Moosbrugger
- Computer Scientist at C2SM
  - external at MeteoSwiss
- Before C2SM:
  - Studied computer science at the University of Innsbruck
    - Special focus on high performance computing, compiler construction, parallel programming, etc.
  - Worked as research assistant at the University of Innsbruck (Distributed and Parallel Systems Group)

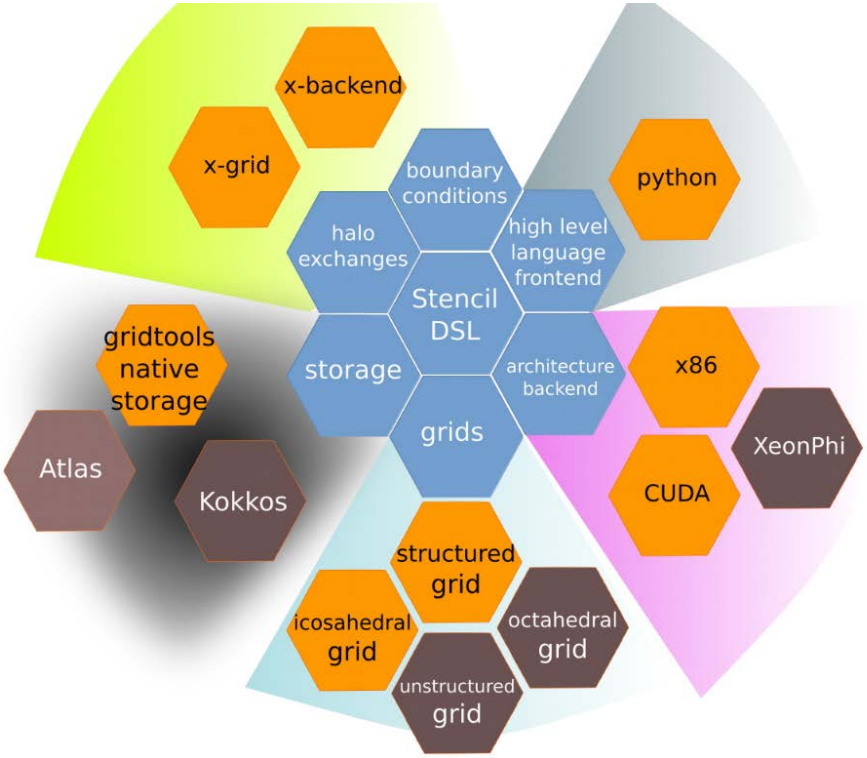
What I'm doing



COSMO timestep

- Not directly working on COSMO
- Dynamical core is written in C++ using a DSL named STELLA (STencil Loop LAnguage)
- STELLA:
  - Provides language elements to describe PDE operators in a concise and mathematical syntax.
  - Provides optimal performance for CPUs and GPUs.
  - Specialized for COSMO
    - no other architectures
    - no other grids (icosahedral, etc.)
    - no other applications

What I'm doing



- Successor: GridTools
  - Set of grid tools (including stencil DSL) for solving PDEs
  - Support other grids
  - Support more architectures
  - Usable in other models (e.g., geophysical applications, global weather models, etc.)
  - Cover a wider range of numerical methods (e.g., finite elements, Discontinuous Galerkin)

Thanks for your attention!