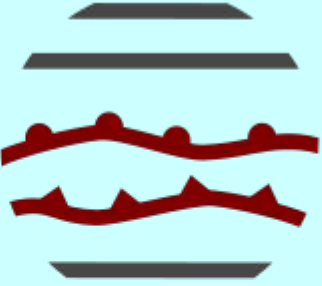


# ACCORD

The logo for ACCORD features the letters 'A', 'C', 'C', 'R', and 'D' in a dark red, sans-serif font. The letter 'O' is replaced by a stylized icon of a hamburger with three layers: a top bun, a middle layer with red dots, and a bottom bun.

A Consortium for COnvection-scale modelling  
Research and Development

**Area Leader Session, chaired by Anne-Lise  
Dhoms**

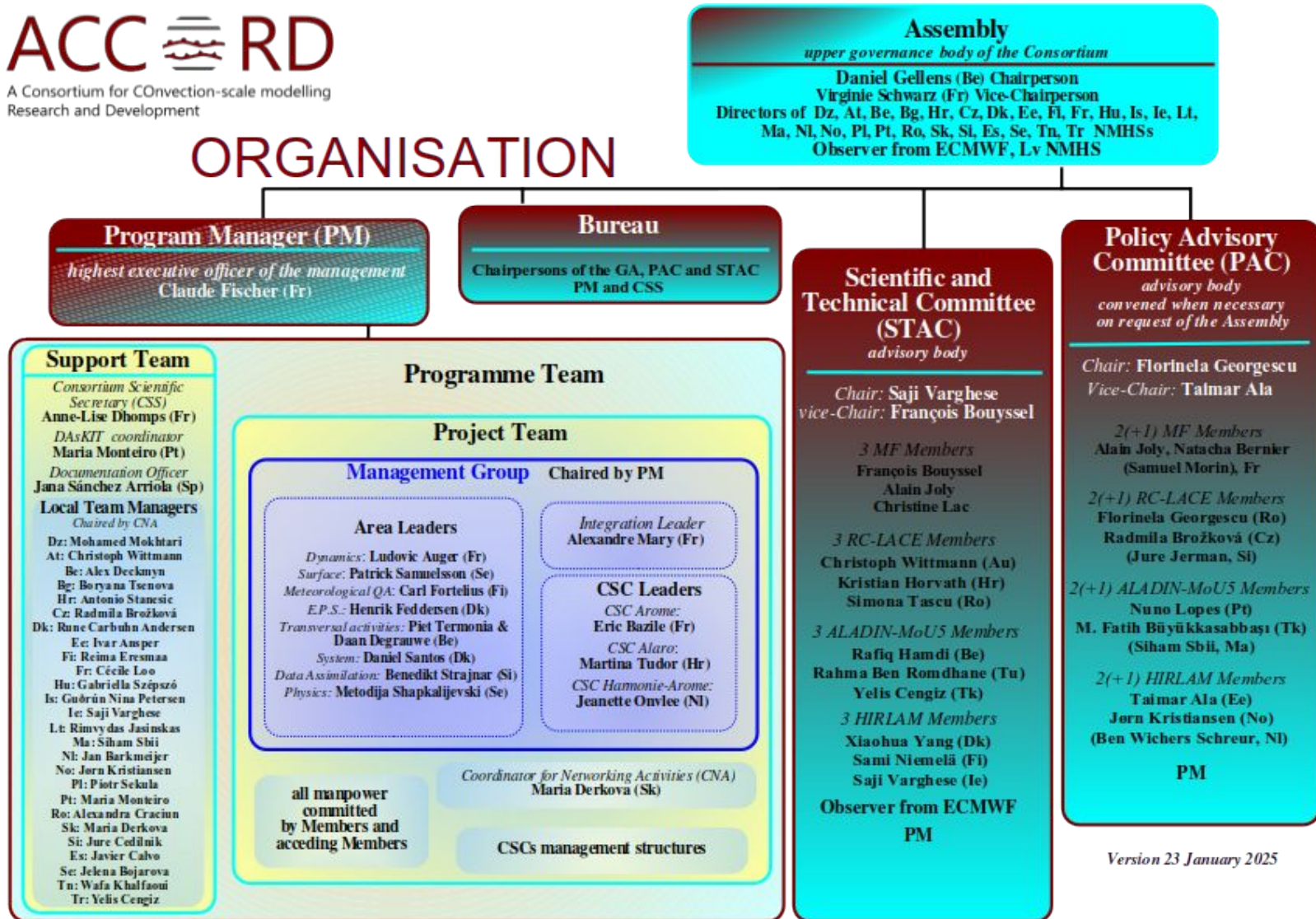
All Staff Workshop 2025

# General organisation



A Consortium for CONvection-scale modelling  
Research and Development

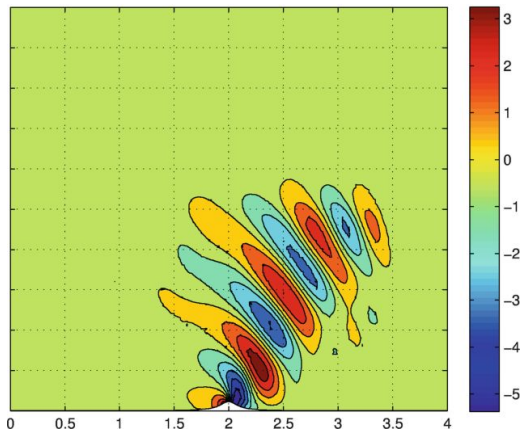
## ORGANISATION



# Dynamics Area Leader



Ludovic Auger  
Météo-France, Toulouse  
[ludovic.auger@meteo.fr](mailto:ludovic.auger@meteo.fr)



## Research and Development on dynamical core :

- **Maintenance and continuous modernization of current dynamical core** : semi-implicit, semi-lagrangian, implementing new vertical variables, more conservative schemes,...
- Anticipating operational **hectometric resolutions** for future configurations.
- **Exploring new solutions** to face stability issues linked with steep slopes : gridpoint dynamics, new dynamical core with modern DSL-based code.

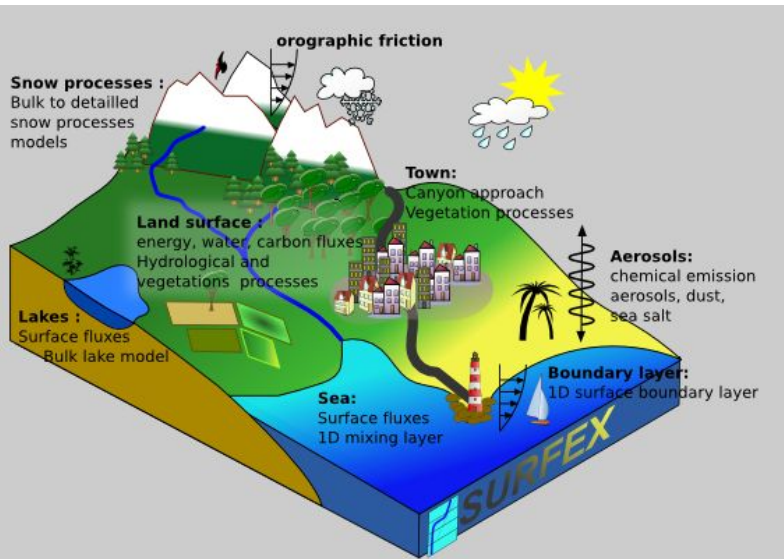
# Surface Area Leader



**Patrick Samuelsson**  
SMHI, Sweden  
[patrick.samuelsson@smhi.se](mailto:patrick.samuelsson@smhi.se)

## Sub-areas of surface:

- **Physiography**
  - How to describe properly the surface characteristics, e.g. land cover, albedo, LAI. [Different version of databases are used within ACCORD](#). Efforts towards higher resolution versions will be presented on Wednesday.
- **Physical processes**
  - Combinations and development of SURFEX physical parameterizations components. Different levels of complexity is used and explored in ACCORD, especially how we can introduce a multi-layer alternative to the current operational setups.
- **Observations and data assimilation**
  - Work to activate surface assimilation in all ACCORD setups is ongoing. We move towards more satellite-based observations for surface data assimilation. In parallel the algorithms are developed, e.g. EKF and EnKF, and a move towards OOPS is going on.



<https://www.umr-cnrm.fr/surfex/>

# Meteorological Quality Assurance Area Leader



**Carl Fortelius**  
FMI, Finland  
[carl.fortelius@fmi.fi](mailto:carl.fortelius@fmi.fi)

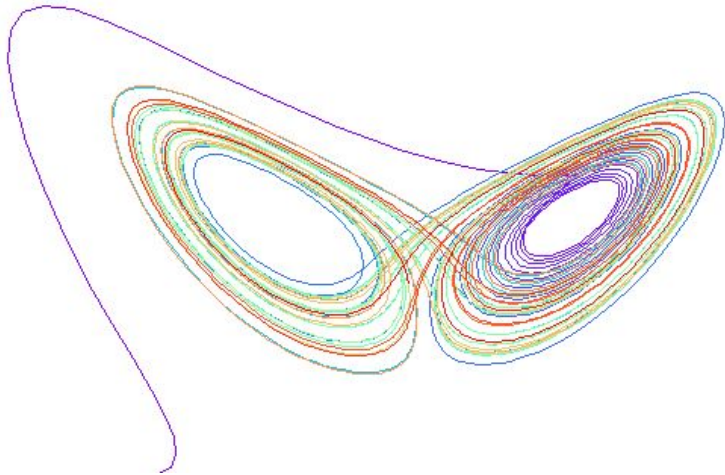
		Observed		Total
		yes	no	
Forecast	yes	<i>hits</i>	<i>false alarms</i>	<i>forecast yes</i>
	no	<i>misses</i>	<i>correct negatives</i>	<i>forecast no</i>
Total		<i>observed yes</i>	<i>observed no</i>	<i>total</i>

- **Verification of forecasts:** How much can I trust the forecast? Are we getting better? Am I getting a return on my investments? To properly answer these questions we need:
  - **Metrics**
  - **Observations**
  - **Software**
- **Validation and development of forecasting systems:** Is my system working properly? Is my system replicating the climate system? How can I make it better? To properly answer these questions we need:
  - **Methods**
  - **Data**
- **Communication with users:** Do I know what my users need? Do my users know what my system can do? To properly answer these questions we need to:
  - **Dialogue**

# EPS Area Leader



Henrik Feddersen  
DMI, Denmark  
[hf@DMI.dk](mailto:hf@DMI.dk)



## Ensemble prediction and probabilistic forecasting

- **Quantify forecast uncertainty**
  - Capture, e.g., low probability, high impact events
- **Represent uncertainties by perturbations of**
  - initial conditions
  - boundary conditions
  - model physics
- **Ensemble postprocessing to facilitate use of ensembles**
  - Calibration to improve reliability
  - Develop user-oriented ensemble products
- **Challenge in the next few years**
  - How to utilise ML in ensemble prediction

# Code refactoring and adaptation Area Leader



Daan Degrauwe  
RMI, Belgium  
[daan.degrauwe@meteo.be](mailto:daan.degrauwe@meteo.be)

## Porting ACCORD NWP model to new architectures (e.g. GPUs)

- Refactoring of code to increase flexibility
- Hardware-specific adaptation
  - source-to-source translation
  - use of optimized libraries
- Targeting GPU-powered EuroHPC machines (link with Destination Earth)
- Exploration of using domain-specific languages



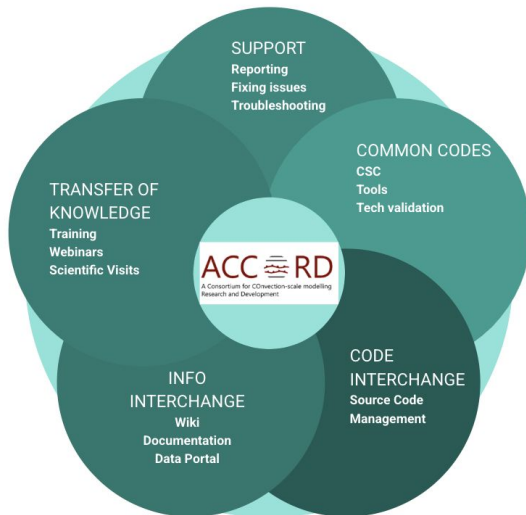
# System Area Leader



**Daniel Santos Muñoz**  
DMI, Denmark  
[dsm@dm.dk](mailto:dsm@dm.dk)

## System Area leader

- **Code generation and maintenance**
  - ACCORD Github forge management
  - Transfer of knowledge
- **Computational efficiency**
  - 4Dvar
  - Single precision
- **New working practices**
  - All CSC export version
  - CI/CD
  - Documentation management support
  - Integrated development environment
  - Common scripting system
  -



# Data Assimilation Area Leader



**Benedikt Strajnar**  
ARSO, Slovenia  
[benedikt.strajnar@gov.si](mailto:benedikt.strajnar@gov.si)

**RD1:** In-situ observations

**RD2:** Ground-based remote sensing

**RD3:** Satellite observations

**RD4:** Observation pre-processing, quality control and bias correction

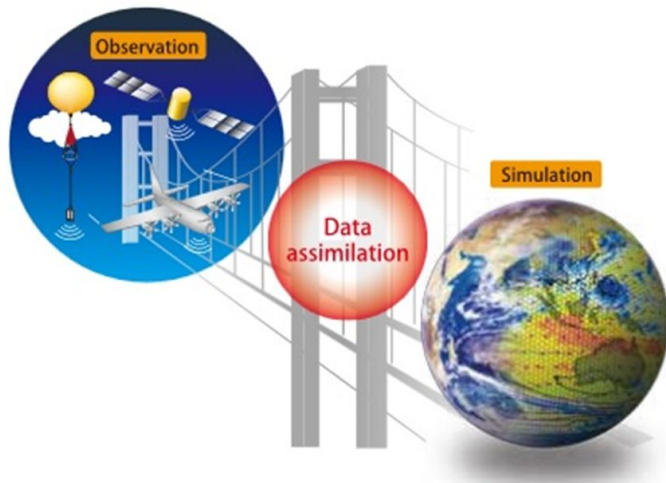
**RD5:** Variational systems (3D-Var or 4D-Var)

**RD6:** EnVar, EDA and variants

**RD7:** Initialization methods and nowcast

**RD8:** Diagnostic methods, optimization of assimilation cycles

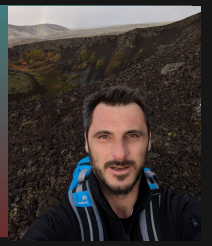
**RD9:** AI/ML methods for data assimilation



Current outstanding challenges: **modernization of algorithms** via OOPS and benefiting from **new satellite observations**.

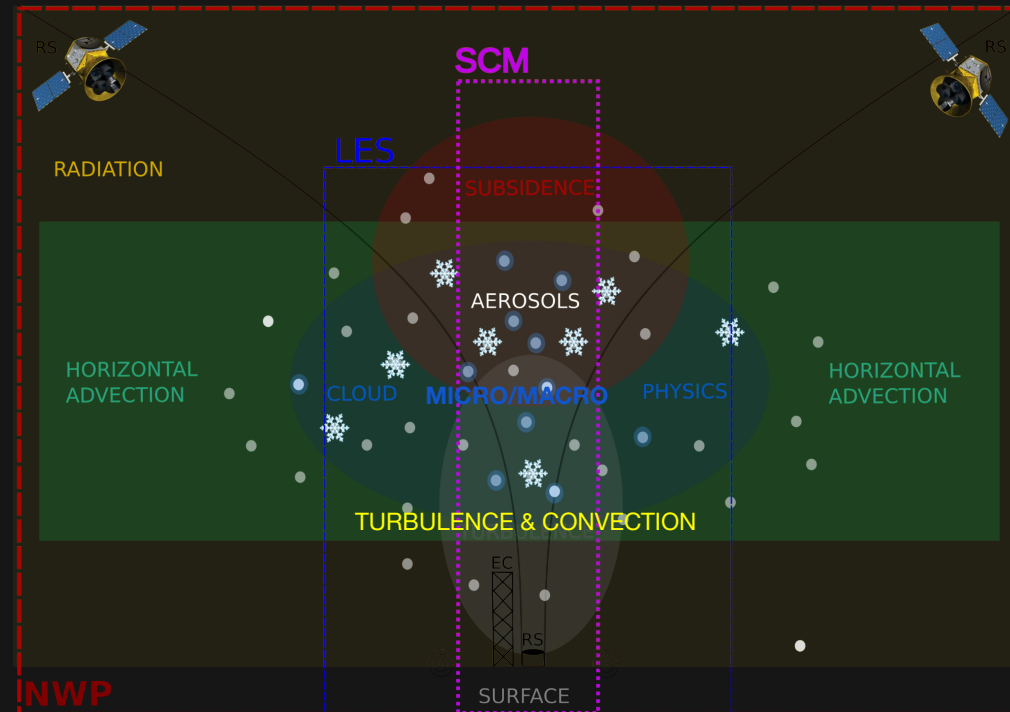
# Physics Area Leader

Metodija (Meto) Shapkalijevski  
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+46764957790



Focus on the representation of non-resolved processes across scales in our NWP systems to account for the changing needs of the operational meteo services:

[https://opensource.umr-cnrm.fr/projects/accord/wiki/ACCORD\\_Physics\\_WW\\_2024](https://opensource.umr-cnrm.fr/projects/accord/wiki/ACCORD_Physics_WW_2024)



... by sophisticated process-oriented validation framework, which integrates specialized observations and tools.