

HIRLAM system concepts to facilitate phasing

Daniel Santos Muñoz, AEMET
dsantosm@aemet.es



ALADIN-HIRLAM Strategy workshop
26-28th April 2016, Toulouse, France

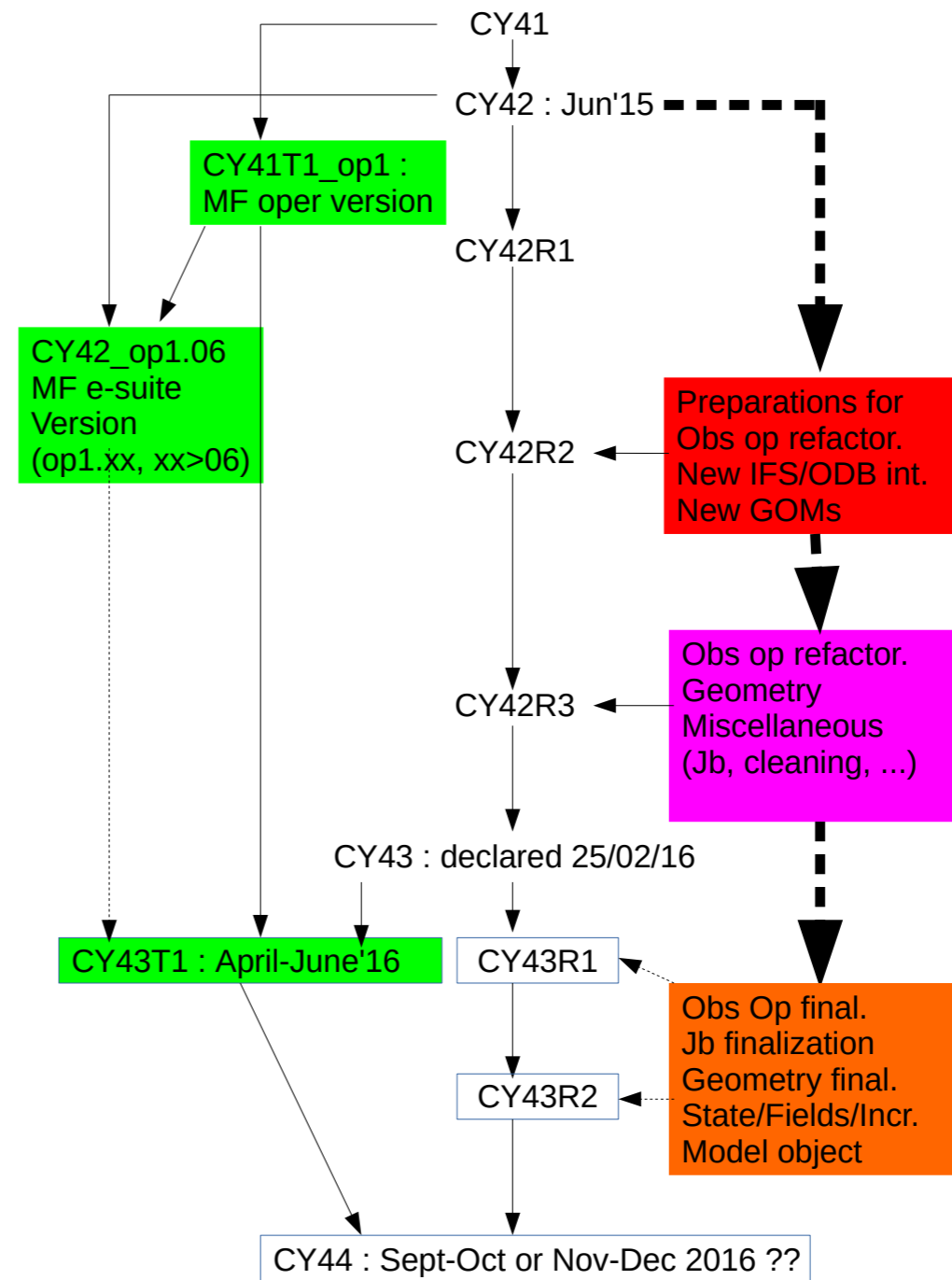
FUTURE CYCLES

ECMWF/MF	MF	HIRLAM	Declaration
CY43			February 2016
		40h1.1	April-May 2016
	CY43T1		April-June 2016
CY44			Sept-Oct 2016
		42h1	2016

- **Large structural changes expected in CY42/CY43**
- **No Harmonie-41h1 planed**

Current phasing

- We are involve on **cy43t1** phasing
- **Niko Sokka** HIRLAM Cycle Master and **Toone Moene** will be active part on MF cycling
- Potential HIRLAM contributions <https://hirlam.org/trac/wiki/Phasing/cy43t1>
- **First deadline 18th April**
- **Second deadline 9th May**



Courtesy of Claude Fischer

Current phasing

- Expert teams scientists/developers:

Dynamics

4D-Var

Magnus Lindskog
Jann Barkmeijer
Roger Radriamampianina

Alvaro Subías
Mariano Hortal

System

Ulf Andrae
Eoin Whelan
Niko Sokka
Daniel Santos

Radiation

Laura Rontu
Emily Gleeson
Lisa Bengtsson

CY43_Main

Surfex

Patrick Sammuelson
Daniel Santos

Turbulence

Wim De Rooy
Geert Lenderink

Micro-physics

Karl-Ivar Ivarsson

Ensemble Perturbations

Jelena Bojarova

Current phasing

- Expert teams scientists/developers:

18th April

4D-Var

Magnus Lindskog
Jann Barkmeijer
Roger Radriamampianina

Dynamics

Alvaro Subías
Mariano Hortal

System

Ulf Andrae
Eoin Whelan
Niko Sokka
Daniel Santos

Radiation

Laura Rontu
Emily Gleeson
Lisa Bengtsson

CY43_t1.01

Surfex

Patrick Samuelson
Daniel Santos

Turbulence

Wim De Rooy
Geert Lenderink

Micro-physics

Karl-Ivar Ivarsson

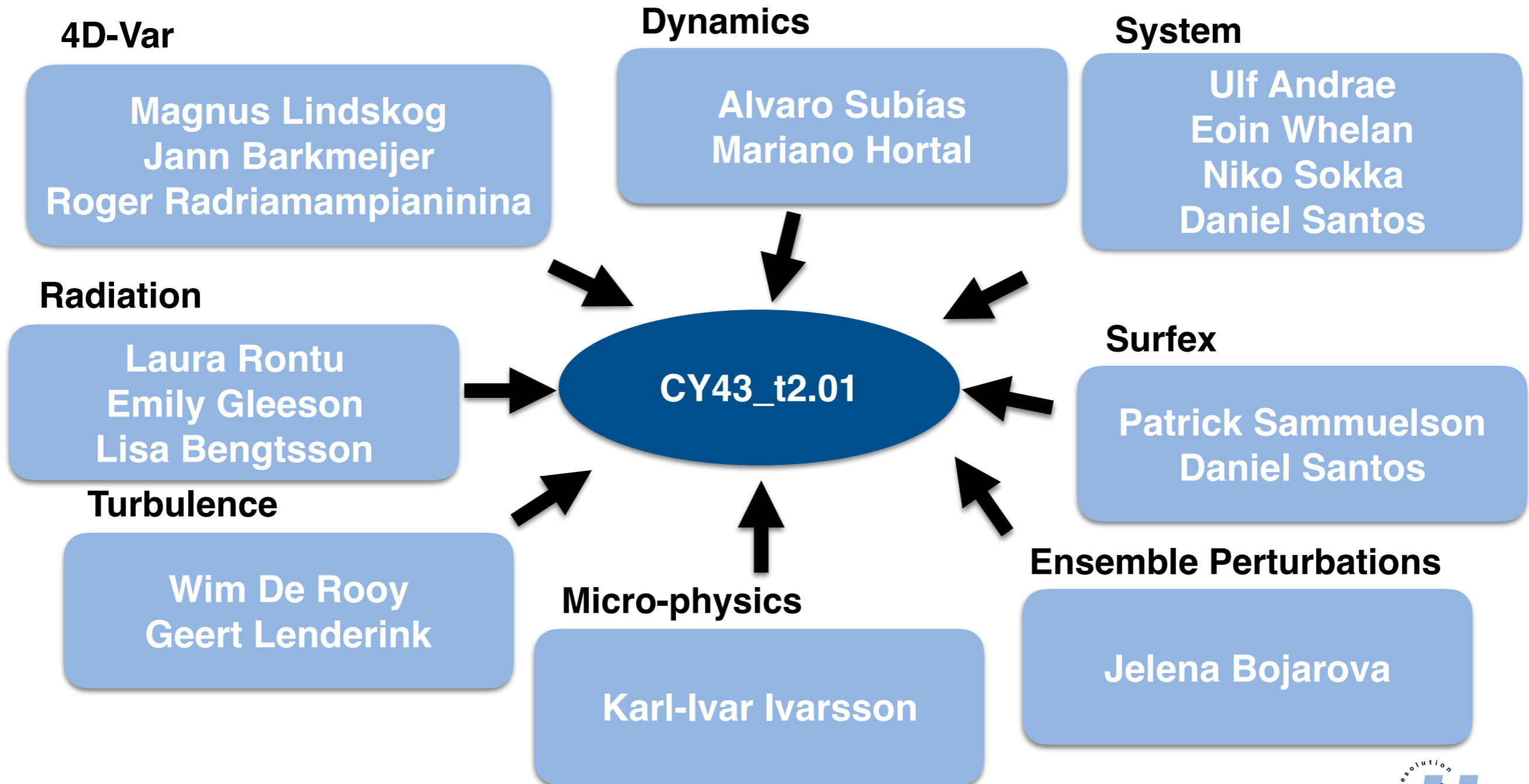
Ensemble Perturbations

Jelena Bojarova

Current phasing

- Expert teams scientists/developers:

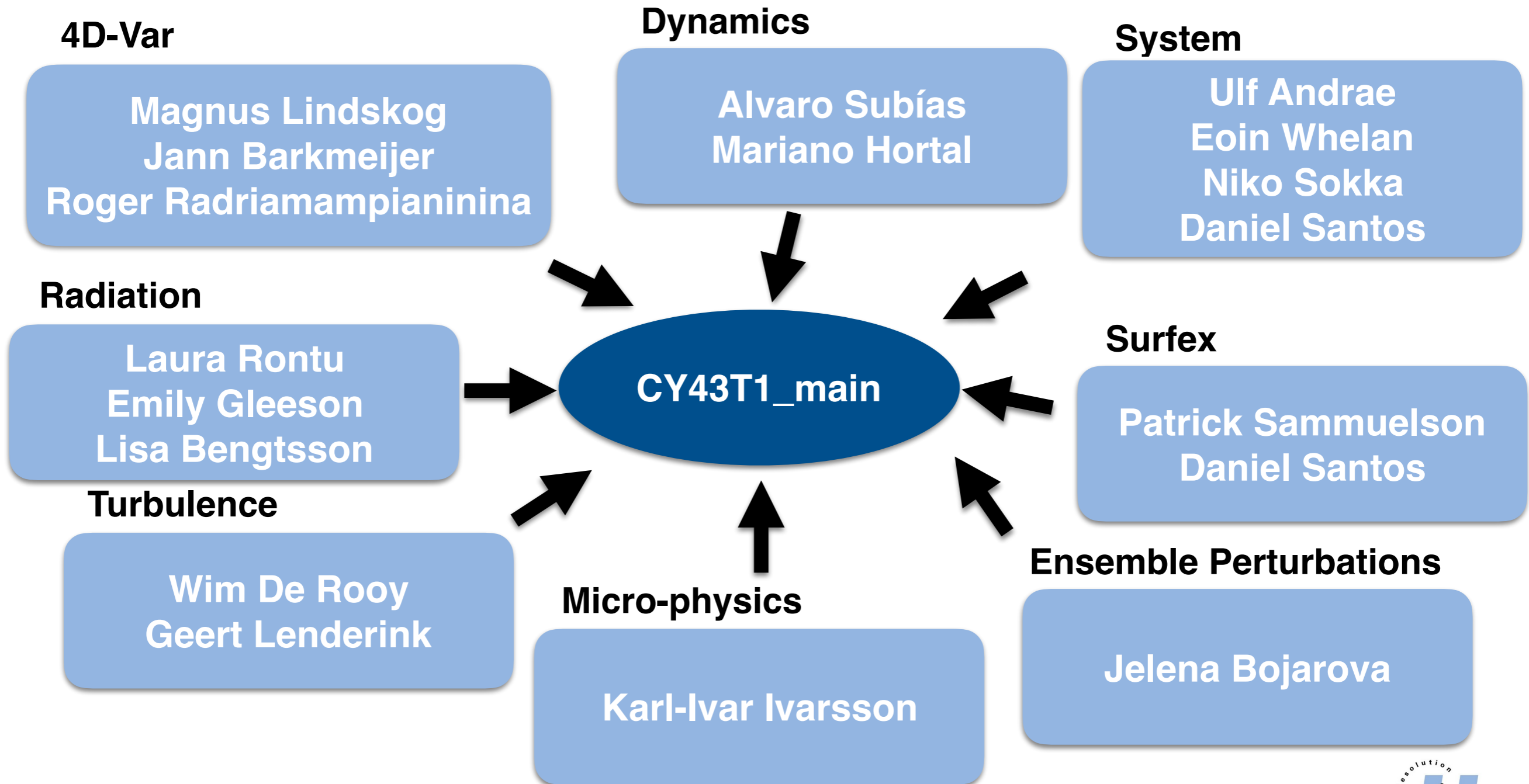
9th May



Current phasing

- Expert teams scientists/developers:

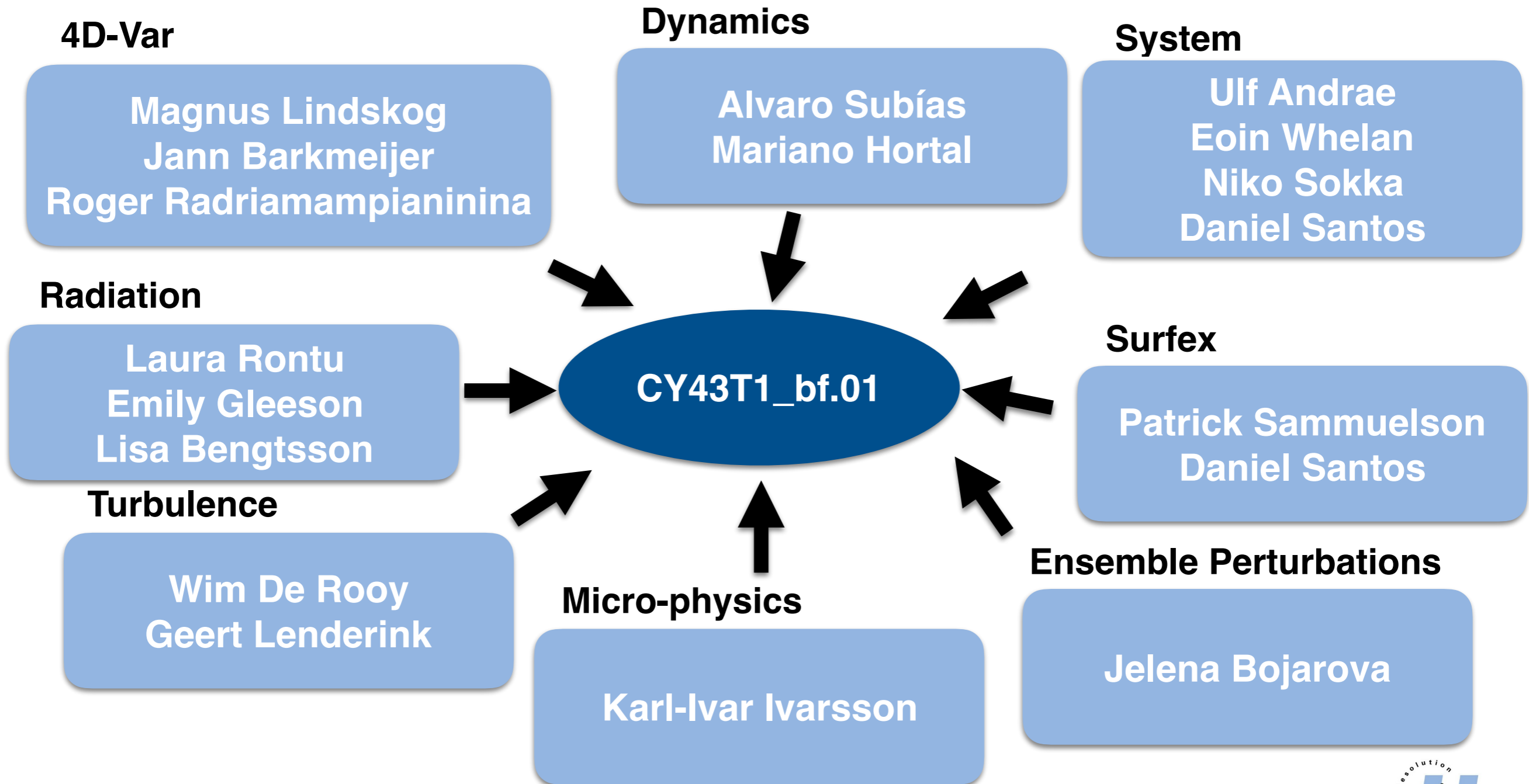
May



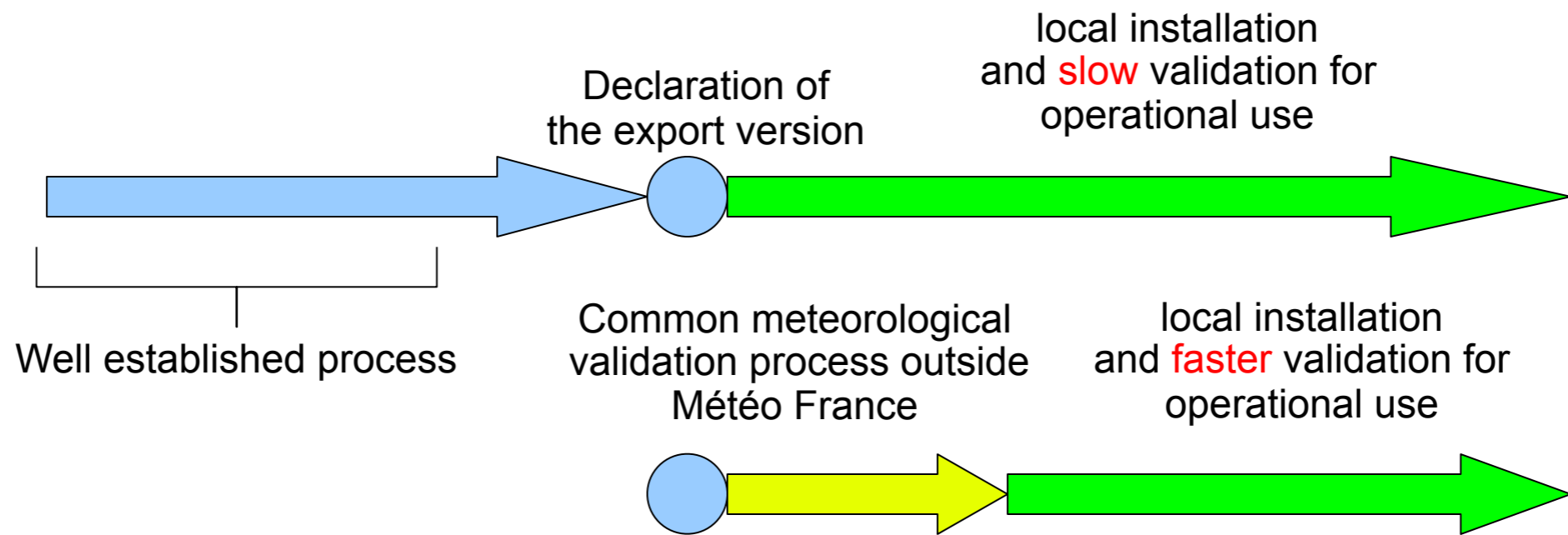
Current phasing

- Expert teams scientists/developers:

June



Development and testing



continuous porting and validation with different stages:
alfa-, beta-, release candidate, and final version



Courtesy of Roger Randriamampianina



Development and testing



logged in as dmunoz | [Logout](#) | [Preferences](#) | [Help/Guide](#) | [About Trac](#)

Wiki | Timeline | **Browse Source** | View Tickets | New Ticket | Search | Admin | Roadmap | Blog

[Last Change](#) | [Revision Log](#)

Default Repository

Visit: View revision:

Name ▲	Size	Rev	Age	Author	Last Change
▶ branches		14813	64 minutes	trygveasp	Clean up and add missing settings from prod pre-svn days
▶ tags		14653	3 months	bsa	Script changes for migration to cray-xc30
▼ trunk		14811	74 minutes	ovignes	Port from MetCoOp? branch, fixes #134
▶ contrib		14747	5 weeks	niko	Merge vendor/mitraille/current into vendor/contrib/mitraille.
▼ harmonie		14811	78 minutes	ovignes	Port from MetCoOp? branch, fixes #134
▶ config-sh		14724	7 weeks	uandrae	Andrew Singleton & Ulf Andrae: Enable usage of EPS ENS data from the ...
▶ const		14357	6 months	uandrae	Yurii Batrak & Ulf Andrae: Merge SICE from 38h1 branch to the trunk - No ...
▶ ecf		14407	6 months	ovignes	Enable log output of running jobs in ecFlow at ECMWF
▶ msms		14811	78 minutes	ovignes	Port from MetCoOp? branch, fixes #134
▶ nam		14792	5 days	dmunoz	Laura Rontu: radiation updates to introduce LHLRADUPD switch and new ...
▶ scr		14793	5 days	xiaohua	re-define ICELAND domain as the current IMO operational one and rename the ...
▶ sms		14753	5 weeks	uandrae	Ulf Andrae: Update SLAF to allow flexible setting of lag for perturbation ...
▶ src		14792	5 days	dmunoz	Laura Rontu: radiation updates to introduce LHLRADUPD switch and new ...
▶ util		14758	4 weeks	uandrae	Ulf Andrae: Only search for pressure levels in interpolation if requested
▶ hirlam		14621	4 months	toon	Toon Moene: This is what you get when you use a language ...
▼ vendor		14746	5 weeks	niko	Tag vendor/mitraille/current as vendor/mitraille/cy43t1.
▶ aladin		14722	8 weeks	niko	Tag vendor/aladin/current as vendor/aladin/cy43main.01
▶ auxlibs		12127	3 years	niko	Tag vendor/auxlibs/current as vendor/auxlibs/2.6.
▶ ecmwf		14585	5 months	eoin	Eoin: code moves/adds/changes required by Makeup in the refactor branch
▶ gmckpack		14619	4 months	eoin	Tag vendor/gmckpack/current as vendor/gmckpack/6.6.2
▶ grib_api		12130	3 years	niko	Tag vendor/grib_api/current as vendor/grib_api/1.10.4.
▶ mitraille		14746	5 weeks	niko	Tag vendor/mitraille/current as vendor/mitraille/cy43t1.
▶ oops		8047	6 years	ovignes	Import oops_20100409_0423 into vendor/oops/current
▶ scripts		8481	6 years	ovignes	Tag scripts/current as scripts/cy36
▶ surfex		9816	5 years	trygveasp	Tag surfex v7.0

- **SVN /GIT merge**

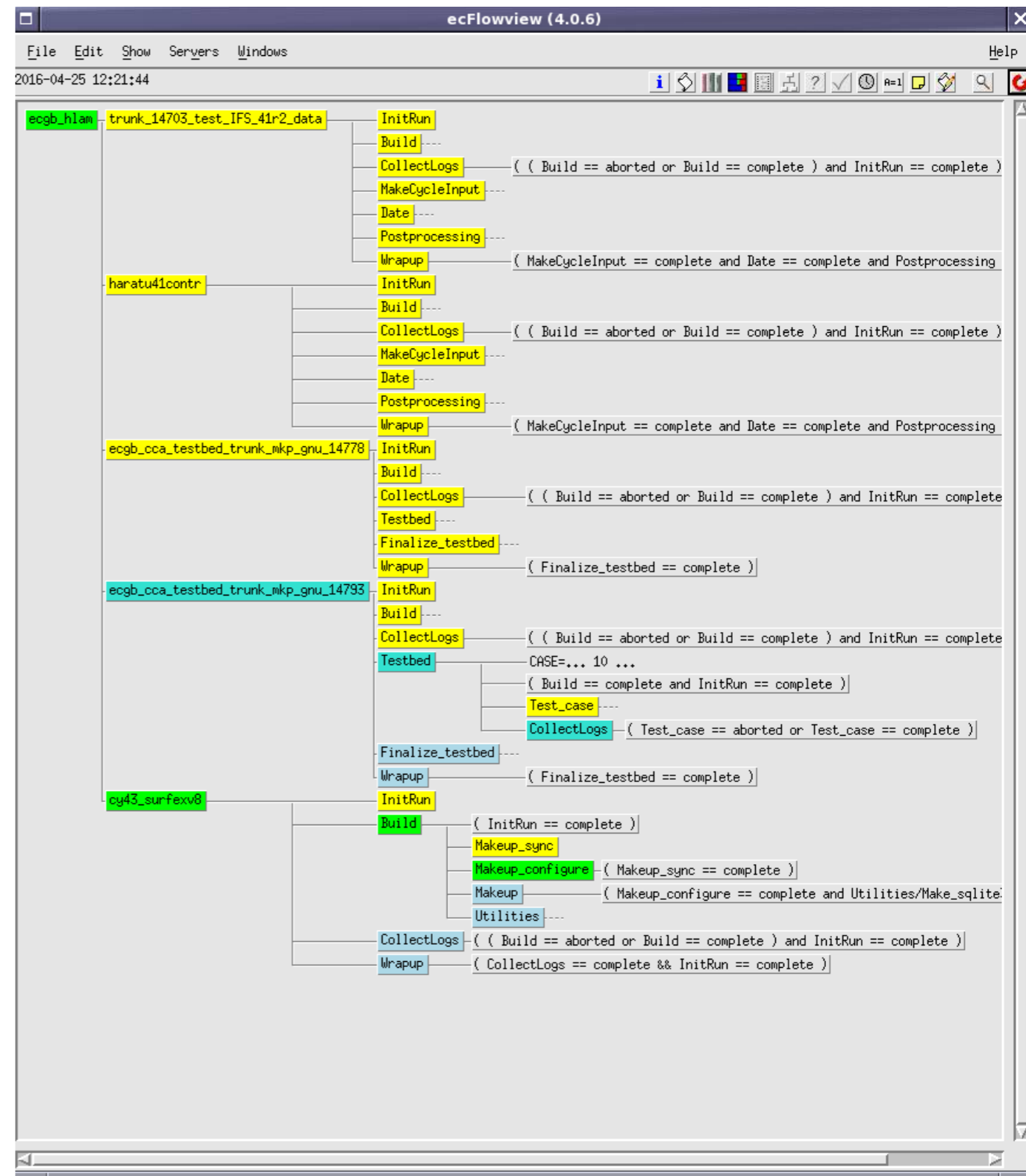
- **Kai Sattler** is close to a final solution this will facilitate collaboration and phasing



Development and testing

- **HARMONIE TESTBED**

- The HARMONIE testbed provides a facility to **run a number of well defined test cases using the existing script environment** in HARMONIE
- **Runs** if there is a **trunk update** in **ECMWF** and **MetEirean**
- **ecFlow** allows to run/monitor several model setups.
- The **namelist maker** (a Harmonie tool) to build all namelists for the known schemes and methods
- With a simple “make” command one can **create a set of namelists** compatible with the chosen model configurations.



Development and testing

- **HARMONIE TESTBED**

- **Testbed output example at MetEirean**

Configuration: redhat7.gfortran.openmpi
Build method: makeup

Compare revision trunk_gnu_14793 and trunk_gnu_14792

Check:AROME_3DVAR

Compare /data/ewhelan/hm_home/trunk_gnu_14793/
archive_AROME_3DVAR/2008/09/30/18/ICMSHHARM+0006
vs /data/ewhelan/hm_home/trunk_gnu_14792/
archive_AROME_3DVAR/2008/09/30/18/ICMSHHARM+0006
Files are equal

Compare /data/ewhelan/hm_home/trunk_gnu_14793/
archive_AROME_3DVAR/2008/09/30/21/ICMSHHARM+0006
vs /data/ewhelan/hm_home/trunk_gnu_14792/
archive_AROME_3DVAR/2008/09/30/21/ICMSHHARM+0006
Files are equal

Compare /data/ewhelan/hm_home/trunk_gnu_14793/
archive_AROME_3DVAR/2008/10/01/00/ICMSHHARM+0006
vs /data/ewhelan/hm_home/trunk_gnu_14792/
archive_AROME_3DVAR/2008/10/01/00/ICMSHHARM+0006
Files are equal

Check:AROME_1D

Check:AROME

Check:AROME_MUSC

Check:ALARO_3DVAR

Check:ALARO_1D

Check:ALARO

Check:ALARO_MUSC

Check:AROME_BD_ARO

Check:AROME_BD_ALA

Check:AROME_EKF

Check:ALARO_3DVAR_OLD

Check:ALARO_OLD_MUSC

Check:ALARO1_3DVAR_OLD

Check:HarmonEPS

Check:AROME_EPS_COMP

Check:ALARO_EPS_COMP

Check the internal consistency

**Compare HarmonEPS mbr000 with deterministic forecast from
AROME_EPS_COMP**

Compare AROME and AROME_1D

Compare ALARO and ALARO_1D

Testbed comparison complete

[Status: OK]

Improving phasing and operational model setup

- **More “horizontal communication” between scientist/developers for all communities ecosystem**
- **Common GIT repository**
- **Guarantee T-cycle reproducibility, not only for the forecast model but also for the rest.**
- **A reference and simple assimilation configurations to check all the model are necessary.**
- **Rewrite the HARMONIE model scripting system (python)**
- **Let's start building something new together!!!**

Cy38h1.2 vs Cy40h1.1.beta.5

20160218:

- validation test of **40h1** with **minimum and target scenarios for operational domains**
- **additional test** for main options on 1) **HARATU and updates**, 2) **cubic/quadratic/super linear grids**
- further tests on other options (radiation, cloud/microphysics schemes, ice scheme pi factors)

Institutes	model versions	"minimum", "targeted" configuration	upper air DA	gmted2010	cubic/quadratic/ super linear grid	haratu update test	additional options
HIRLAM-B	38h1 branch, 40h1 beta4, 40h1 beta5	minimum, target	3DVAR	gtopo30	cubic, linear		
DMI	38h1 branch, 40h1 beta 5	target	blending	gmted2010	cubic, quadratic, linear	yes	pi factors, auto rain conversion
MetCoOP	38h1.2, 40h1 beta5, 40h1-beta5-updHARATU- bf	minimum, target	3DVAR	gtopo30, gmted2010	cubic, quadratic, superlinear, linear	yes	ice scheme, llcrit, radiation, pi factor
AEMET	38h1.2, 40h1 beta5, 40h1-beta5-updHARATU- bf	minimum, target	3DVAR	gtopo30, gmted2010	cubic, linear	yes	
IMO	38h1.2, 40h1 beta5	minimum, target	blending	gtopo30			ocndt2
KNMI	40h1 beta5	target	3DVAR	gtopo30	linear	yes	
FMI	38h1.2, 40h1 beta5	target	3DVAR	gtopo30	linear	yes	llcrit
METIE	38h1.2, 40h1 beta5	minimum, target	3DVAR	gtopo30	linear		
!LHMS	38h1.2, 40h1 beta5	minimum, target		gtopo30	linear		

https://hirlam.org/trac/wiki/Harmonie_40h1/ValidationTests

RCR

- The aim of **HARMONIE RCR (Regular Cycle with the Reference)** is to **shorten the way between research and operations**
- Call for new RCR centres for every QA cycle
- First call was for **cy38h1**
- Second call for **cy40h1** and the new set of tests
- **DMI, AEMET and MetCoOp**

Cy40h1.1 will be released on April - May 2016