Call for applications to the management positions of the ALADIN-LACE-HIRLAM Consortium Area Leaders (AL) and Coordinator for Network Activities (CNA)

After some 30 years of cooperation, the ALADIN, LACE and HIRLAM Numerical Weather Prediction Consortia have decided to reinforce their collaboration. At the end of 2020, twenty-six European National Meteorological Services will become Members of a new single Consortium, under this **Memorandum of Understanding – MoU - (**http://www.umr-cnrm.fr/aladin/IMG/pdf/mou_alh_for_signature.pdf **)** covering the period 2021-2025.

The Members have adopted an ambitious **2021-2025 Strategy (**https://www.umr-cnrm.fr/aladin/spip.php?article363 **– Strategy document)** outlining their objectives in meteorological and computer science for this time period. The outcome of this Strategy has been reflected in the **Rolling Work Plan - RWP2021 (**http://www.umr-cnrm.fr/aladin/IMG/pdf/rwp2021.pdf **)** describing the work packages for 2021.

The development of all codes will continue, in order to support **world-leading operational NWP suites** operated by the Members, **with a priority on high resolution (from kilometric to hectometric grid size) and short-range (including nowcasting suites)**. Another priority of the Strategy is to **further increase the interoperability and portability of the codes**. The codes are currently grouped in three "Canonical System Configurations" (CSC AROME, ALARO and HARMONIE-AROME), and full interoperability is only achieved inside the CSCs. The Consortium will strive to increase interoperability across the CSCs while fostering more and more scientific innovation transversal to the CSC definition, in order to achieve its long term goals. It will also work to make the codes portable on various computer architectures, in order to cope with the rapid evolution of HPC systems and encourage maximum competition in procurements of the Members.

To coordinate the work and deliver the objectives of the Strategy, the Consortium has defined a Management Group composed of:

- the Programme Manager (the "PM")
- the 3 CSC Leaders
- the Integration Leader: this specific position will be held by a staff of Météo-France
- **8 Area Leaders ("AL")**
- Supporting functions:
    - the Scientific Secretary: Météo-France defines its own procedure for the Consortium Scientific Secretary
    - **the Coordinator of Network Activities ("CNA")**

In a specific Call for Applications issued in the summer 2020, four management positions have been already appointed:

- Claude Fischer from Météo-France as PM,
- Jeanette Onvlee from KNMI (Netherlands) as Harmonie-Arome CSC Leader,
- Martina Tudor from DHMZ (Croatia) as Alaro CSC Leader,
- Eric Bazile from Météo-France as Arome CSC Leader.

The present Call concerns the Area Leader and Coordinator for Network Activities positions.

Call for applications for the 8 positions of the Area Leaders of the new Consortium

The Area Leaders work under the leadership of the PM on the implementation of the Strategy. In accordance with items 106-108-109-112 of the MoU, the Area Leaders are responsible for the modernization of the code and working methods, which should lead to increased modularity and interoperability across CSCs. The list of the 8 Area Leader positions and the terms of reference of each position are presented below.

In their activity, the Area Leaders will respect the continuity of the CSCs especially in the initial phase of the MoU. However, Area Leaders are not responsible for the specific implementation of the scientific developments in each CSC, that remains the responsibility of the CSC leaders.

Each Area Leader function is corresponding to a minimum commitment of 0.5 FTE and is delivered by one Consortium Member. Applications are required to be sent as personal application by one staff (the Applicant), with backing from the Member institute employing the staff. The MoU foresees the possibility that the whole Area Leader commitment can be split among the Applicant and one supporting person from the same employer. In the case where the personal manpower commitment of the Applicant remains lower than 0.5 FTE, an explanation about how the function is proposed to be fully occupied must be provided (name of additional staff, total manpower commitment reaching 0.5 FTE, organization of the tasks within the function). However, a single personal application fulfilling the whole function will receive a higher priority in the ranking and selection process (see below).

Applications are invited according to the following calendar:

- Issue Call for Applications: 10 November 2020
- Deadline for Applications: 15 January 2021 (incl.)

Conditions to be eligible to these positions are the following:

- You must be already employed by your Institute or show a commitment that you will be employed if selected.
- Your application must be supported by your Institute.
- Good knowledge of English.

How to apply:

Send your application to Patricia Pottier from Météo-France: patricia.pottier@meteo.fr

Your application should consist of:

- a letter of motivation
- a CV
- a letter of support by your Institute
- if the function is proposed to be fulfilled with the support of additional staff, then the letter of support should contain information about how the responsibility and tasks are proposed to be shared. The names of the additional staff should be listed with CV

Selection process:

The applicants will be interviewed by a selection panel composed of the PM, the 3 CSC Leaders, the chairs of STAC and PAC, and an external adviser on human resources (the Head of Personnel of ECMWF). The selection panel will rank the applications per Area, taking into account the way the function is proposed to be fulfilled (eg. single versus multiple staff proposal), the level of expertise, the interpersonal skills of candidates, the coherence of the vision and motivation of the Applicant with respect to the strategical goals and ToRs of each Area Leader function.

The final definition and the attribution of the Area Leader functions will be done by the Assembly. The Assembly will attribute all Area Leader functions simultaneously, taking care of geographical balance.

The general and specific Terms of Reference for the 8 Area Leaders are provided hereafter.

The Area Leaders

The Area Leaders are responsible of implementing item 31 of the MoU:

- either lead the corresponding area, that is define a long term scientific and architectural vision for the modernization of the code, including normative aspects, increased modularity and interoperability and take full responsibility of the delivery or the corresponding developments,
- or conduct specific actions on CSC interoperability, as decided by the Assembly and for a limited duration.

Area Leaders are not responsible for the specific implementation of the scientific developments in each CSC, that remains the responsibility of the CSC leaders.

The Area Leaders provide input for all documents prepared under the responsibility of the PM for the governance bodies.

The Area Leaders also contribute to the preparation of the Strategy.

The Area Leaders may be called by the PM to make presentations to the governance bodies in their area of expertise.

The Area Leaders attend meetings of the MG when their area of expertise is needed. For their evaluation of scientific novelty and implementation in the common codes, they will take into account the desired synergies between the three CSCs, their interoperability and ultimately reduction of number.

Personal skills:

- Excellent knowledge of the state-of-the-art scientific issues in their field of responsibility. Recent scientific publications, technical notes or participation in the coordination of activity in their field would be an advantage
- Good knowledge of cross-cutting scientific issues in other fields of activities of R&D in the Consortium
- Good knowledge of the code modernization and interoperability aspects in their field, or a firm intention of concern and participation in these aspects
- Good knowledge of the Aladin-LACE-Hirlam NWP codes, including the process of building new code versions and the related challenges (or a firm will to be in touch with these issues)
- Good communication in an international context
- Ability for team work

The specific Terms of Reference of each Area Leader are listed hereafter.

Area Leader for the Transversal activities on addressing future evolution of software infrastructure (Length of mandate: 5 years)

This Area Leader will conduct specific actions in order to address the uncertainties in the future evolution of the software infrastructures. These efforts are transversal to all CSCs.

- In the short term, he/she will be responsible for planning and executing the SPTR1 work package. In the short term (2020-2021) this includes:
  - finalizing the work on the LAM configuration for Atlas;
  - deciding on an approach to introduce flexibility in the 1D components, namely physical parameterizations and surface models;
  - train people to build know how on Atlas, the IO server and the chosen software for the flexibility of the 1D components;
  - analyze and document the existing DSL solutions.
- He/she will coordinate and plan contributions of the ALH consortium to the development of the DSL for the LAM version.
- At a longer term he/she will implement these approaches in the other area's dynamics, physics, surface, data assimilation and system.

Area Leader of Dynamics (Length of mandate: 5 years)

- The Dynamics Area Leader will lead the Dynamics Area during the period of the MoU.
- He/she will be responsible for the execution of the DY* work packages of the RWP.
- He/she will be responsible for the developments of the necessary improvements of the present dynamical core to ensure the models will be able to progress towards the hectometric scales, as specified in work package DY1.
- He/she will be responsible for the developments to ensure the long-term (of the time scale of 10 years) evolution of an Atlas based dynamical core. This includes:
  - the development of a LAM solution based on a finite-volume approach following the FVM developments of ECMWF, as planned in work package DY2;
  - the finalization a gridpoint dynamics solver as a scientific testbed, as a backup solution and as an alternative to the spectral dynamics, as described in work package DY3.

Area Leader of Physics (Length of mandate 2 years, to be redefined after the first tasks are complete)

- The Physics Area Leader will execute a number of specific actions on topics that are transversal to the three CSCs:
  - coordinate the creation of an inventory of the blocking points for convergence between the CSCs and analyze and define by 2023 a road map for convergence (PH9),
  - coordinate actions to increase the interoperability at the level of the exchange of parameterizations schemes between the different CSCs,

    - analyze and coordinate the development of the code restructuring needed for the implementation of 3D physics.
- The leadership of the physics of the CSCs will remain in the hands of the CSC Leaders, as described in work packages PH1, PH2, PH3 and PH5 in the RWP.

- The PM will in principle be responsible for all transversal issues between the three CSCs (specifically, PH6-PH10 and HR1 in the RWP). He/she may appoint additional experts to address specific transversal issues, in particular concerning the redaction and execution of the related work packages in the RWP.

Interoperability issues are situated in the physics packages of the different CSCs. In order to ensure that clear and concrete convergence steps will be made, the mandate of the Area Leader for physics will be, in the first years, deliberately limited to a few very specific technical and scientific tasks, while keeping the scientific progress of the physics parameterizations of the CSC's still under the responsibility of the CSC Leaders. In practice he/she will take responsibility for the first strategic physics goal *to work towards a greater level of interoperability (enabling exchange of individual parameterizations across CSCs)*. Additionally he/she will be responsible for the interoperability aspects of the new 3D code solutions needed for the second strategic physics goal, i.e. *to develop the model physics to be fit to represent the hectometric scales*. This will allow the Physics AL to work in the first two years with a clear deliverable in mind and guarantee that *by 2023 a roadmap for further convergence can be delivered*. The expectation is that the content of the roadmap will take into account the relative ambition (difficulty) of the interoperability tasks, leveraged by their expected benefit for collaboration and new ambitions across the future Consortium.
The roadmap will be scrutinized and approved by the various governance bodies of the Consortium. The Assembly will then decide whether the Physics AL position will be extended or redefined, and possibly reopen the position. The Terms of Reference of the Physics AL will be reviewed, in accordance with the decisions in the Governance bodies, by 2023. The Physics AL will then implement it and lead the area in more general terms with joint scientific and technical goals in mind.

Area Leader in Data Assimilation (Length of mandate: 5 years)

- The Data Assimilation Area Leader will execute a number of specific actions on topics that are transversal to the three CSCs.
- He/she will be responsible for developing a long term solution for data assimilation and for the redaction and the execution of the work packages that are transversal to all CSCs. This includes:
    - the implementation of OOPS and its corresponding interoperability aspects (DA6);
    - the development of data assimilation algorithmic solutions based on an ensemble variational approach (DA2.3 and DA2.4);
    - the optimization of data assimilation for nowcasting (DA5);
    - an assessment of the possibility for a common preprocessing approach based on a tool like SAPP (DA7.1-7.4);
    - the definition of the testing environment for the data assimilation components in concertation with the System Area Leader and Integration Leader;
    - consider the consequences of growing data volumes and of new quality control mechanisms for an increasing variety of observations, in close collaboration with the CSC leaders;

- guaranteeing the liaison with EUMETNET and EUMETSAT, in concertation with the CSC leaders;

The aim of the DasKIT program is to develop and maintain a basic data assimilation kit that allows newcomers or starting members to organize their local data stream and to help them to easily set up a basic data assimilation cycle. This program will be coordinated by a specific Project Team member, the DasKIT coordinator, who will assist the DA Area Leader and the PM therein. The DasKIT program tasks are described in the DA8 work package of the RWP. The DasKIT coordinator position is not part of this Call for applications.

Area Leader on Surface (Length of mandate: 5 years)

- The Surface Area Leader will lead the Surface Area during the period of the MoU.
- He/she will be responsible for the redaction and the execution of the SU work package of the RWP.
- He/she will define a long term scientific and architectural vision for the modernisation of the Surface code.
- Specifically, he/she will
  - for the surface model (SU3, SU4),
    - coordinate, in concertation with the ALARO CSC Leader, the switch to SURFEX
    - explore and develop more advanced options (with emphasis on soil, snow, urban) are possible
    - streamline the code for phasing and coupling with other parts of the NWP system
  - for the physiography (SU5):
    - continue to update physiographic databases as the model resolution is increasing
    - assess the forecast impact of the new databases and perform the required tuning of surface modules
  - for Surface Data Assimilation (SU1, SU2):
    - work on the assimilation of satellite and crowd-sourced surface data,
    - work on the interoperability and modernization of the code for the spatialization and the adaptation to the OOPS framework
    - progressively move to a coupled surface-atmosphere data assimilation system.

Area Leader on EPS (length of mandate: 5 years)

- The EPS Area Leader will take the scientific leadership of the EPS Area during the period of the MoU. He/she will define a long-term vision to progress to provide seamless, well-calibrated high-resolution ensemble prediction systems from the nowcasting range to 2-3 days ahead.
- Specific attention will be paid to the following aspects:
  - the development of user oriented approaches (E7) that facilitate the use of ensemble output;
  - the development of more physically based EPS perturbations in concertation with the Physics Area Leader (PH10) and the Surface Area Leader;

- acting in concertation with the System Area Leader concerning the development of the EPS collaboration and working environment.
- He/she will be responsible for the redaction of the EPS work packages in the RWP, and coordinate with the CSC leaders on the execution of these packages.
- The CSC leaders will be responsible for the implementation of the scientific developments in their respective CSC's.

Area Leader on Meteorological Quality Assurance (Length of mandate: 5 years)

- The Meteorological Quality Assurance Area Leader will lead the Meteorological Quality Assurance Area during the period of the MoU.
- He/she will be responsible for the redaction and the execution of the MQA work package and of the RWP. He/she will
  - coordinate an iterative consultation process to collect requirements and assess what needs to be done to make HARP more attractive as a common tool; (MQA1)
  - coordinate the developments of common methods/metrics with focus on methods for spatial-temporal verification and high impact weather; (MQA2)
  - carry out verification of physical processes to aid model development, including the necessary observations and their quality. (MQA3)
- He/she will strengthen the synergy with DA team on observation format and quality control.
- He/she will strive to enhance the user-developer interaction: both R2O (didactic) and O2R (model weaknesses, cases).

Area Leader for System (Length of mandate 5 years)

- He/she will be responsible for the redaction and the execution of the SY1 and SY4 work package and of the RWP.
- The System Area Leader will be responsible for the following specific tasks:
  - The development of a more distributed, efficient and continuous process for the integration and validation of new developments for the T-codes, in concertation with the Integration Leader (COM2.2). Ensure that this process abides to evolving ECMWF and MF integration constraints.
  - Develop the testing environment for DA, in concertation with the DA Area Leader (who is responsible for the definition of the tests) and the Integration Leader (who needs to approve the functionality of the tests).
- In the first two years of the MoU period, he/she will:
  - Collect information from Members to map their current scripting systems, their functionalities and their dependencies on IT elements that may constitute barriers to convergence on the scripting system. (SY4)
  - Assess Vortex potential as a basis for a future common system. (SY4)
  - Collect views on, and then define, a more common collaboration and development environment for EPS, in concertation with the EPS Area Leader. This can then be developed during the remainder of the MoU period.

Call for applications for the position of Coordinator for Network Activities in the new consortium

Following item 113 of the MoU, the position of Coordinator for Network Activities (CNA) is defined in the Project Team. The CNA role represents a 0.2 FTE position.

The Terms of Reference for the CNA are provided hereafter.

The Coordinator for Network Activities

The Project team also includes the positions of Coordinator for Network Activities (CNA).

The CNA role represents a 0.2FTE position.

The Coordinator for Network Activities shall assist the PM and the Integration and System leaders in the following tasks:

- Preparation of the Local Team Managers ("LTM") meeting and the coordination of actions to be taken by the LTMs
- Supervise changes in the preparation of input files necessary for the Members, in order to run local versions of the System (for example: coupling files, climatological files)
- Coordinate the tests of new versions of the System: help on the local installation, distribute the needed technical tasks among the Members, ensure relevant technical information is made available among Members
- Participate in MG meeting when needed

Personal skills:

- Excellent communication in an international context
- Great sense of human contacts
- Ability to chair large meetings involving more than 20 or 30 participants
- Good knowledge of the technical definitions and contents involved by the Consortium NWP activities:
  - the general aspects and challenges for building new code versions, from the initial R&D version in the MF Central Repository of the T-codes, to the exportable versions (for the Members)
  - how to install and locally run any, or at least one, version of a CSC. Practical experience with local installation and testing would be an advantage for this position
  - the definition and build process of so-called climatological files, as well as PGD files.
  - the definition and build process of coupling files for surface and lateral boundary conditions (so-called LBC files), both when the coupling data originate from MF's Arpege global model and from ECMWF's IFS model
- A certain sense and affinity for the details in technical results or code changes, and ensuring communication of these details