



**Toward
EUropean Facilities for Airborne and Balloonborne Research
EUFABAR
(a project proposal in response to INFRA-DEV-2022-01-01)**

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A proposal in response to the Call:

Developing the European research infrastructures landscape, maintaining global leadership (2022)
(HORIZON-INFRA-2022-DEV-01)

Type of action

HORIZON-RIA HORIZON Research and Innovation

Actions

Type of MGA

HORIZON Action Grant Budget-Based [HORIZON-AG]

Deadline model

single-stage

Opening and closing dates

19 January 2022 - 20 April 2022

Expected amount of funding: 3 ME



The next call is planned for 2024 (with preliminary opening [6/12/2023](#) and closing date [12/3/2024](#)):

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of between EUR 1.00 and 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 12.00 million.
Type of Action	Research and Innovation Actions
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). 11 .



HORIZON-INFRA-2022-DEV-01-01: Research
infrastructure concept development

Expected outcomes are:

- **sound science cases** for new research infrastructures, including expected scientific breakthrough, gap analysis and feasibility/design studies to support planning and decision making at the national level (e.g. funding bodies, governments) and at European level (e.g. ESFRI);
- a better alignment of the development of the research infrastructure landscape with the advancement of excellent science and frontier research;
- **new services and access opportunities** available to the research community, allowing to better tackle scientific and societal challenges.

proposals should address all following aspects:

- demonstrate relevance in relation to ERA, including to the existing landscape, and the **advancement with respect to the state-of-art** of the new infrastructure (or networks of national facilities);
- highlight the **research challenges** the new research infrastructures will make possible to address, including at global level;
- indicate the **gaps in the research infrastructure landscape** the new infrastructure will cover and the synergies with existing infrastructures at European and global level, including those co-financed from other EU instruments (e.g.: Cohesion policy);
- indicate, when relevant, **the potential impact of the new research infrastructure at regional level.**

Proposal should provide evidence that the project will effectively:

- **identify technologies** and develop research infrastructure architecture (e.g. single site or distributed, ...);
- **identify scientific user communities** (and their related needs) that will benefit from access to RI services, including scientific data and instrumentation, and develop the planning of research services to users;
- **identify governance options** and strategic approaches for institutional/stakeholders' commitment and engagement;
- **develop initial financial plans for the RI construction** (or major upgrades) and operation as well as preliminary ideas for long-term sustainability, including synergies with other funds and programmes (e.g.: ERDF);
- develop plans for an **efficient data curation and preservation and for the provision of access** to data collected or produced by the future infrastructure, in line with the FAIR principles.



The project aimed at **defining the frame of a Research Infrastructure (RI) that could act as a single point of contact for all users interested in airborne(manned/remotely piloted)/balloonborne exploratory, mobile, deployable observing systems across all areas of the Earth system - atmosphere, hydrosphere, biosphere, solid Earth, surface.** Proposed project duration was 36 months.

Existing consortia interested in joining the proposal were:

EUFAR AISBL (<https://www.eufar.net/>)

HEMERA (<https://www.hemera-h2020.eu/>)

Harmonious COST Action (<https://www.costharmonious.eu/>)

HARMONIOUS

UAS for environmental monitoring

Working groups

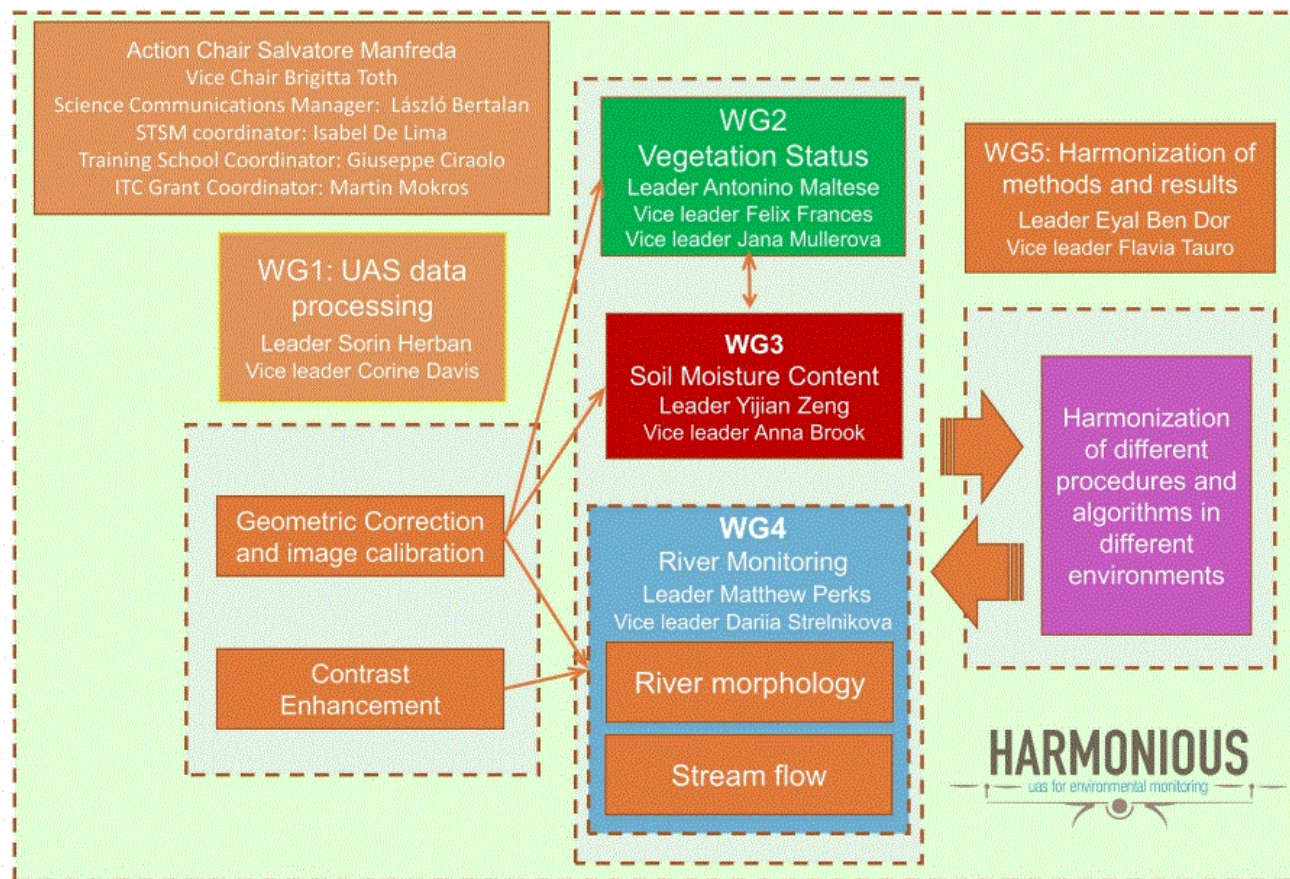
WG1 - Data Preparation and Calibration

WG2 - Vegetation

WG3 - SM

WG4 - River

WG5 - Harmonize



UAS FOR ENVIRONMENTAL MONITORING

On the Use of Unmanned Aerial Systems for Environmental Monitoring

Our review manuscript “On the Use of Unmanned Aerial Systems for Environmental Monitoring” has been just published on MDPI Remote Sensing

[Read more](#)

ACCURACY OF UAS-BASED DSMS

Assessing the Accuracy of Digital Surface Models Derived from Optical Imagery Acquired with Unmanned Aerial Systems

Some useful recommendations for UAS-surveys aimed at the derivation of 3D surface models can be found in our recent manuscript published on Drones MDPI. The results [...]

[Read more](#)

IMAGE VELOCIMETRY REPOSITORY

Repository of videos for image velocimetry: Towards harmonization of image velocimetry techniques for river surface velocity observations

Since the turn of the 21st Century, image based velocimetry techniques have become an increasingly popular approach for determining open-channel flow in a range of hydrological [...]

[Read more](#)

UAS GUIDELINES

Current Practices in UAS-based Environmental Monitoring

With the increasing role that unmanned aerial systems (UAS) are playing in data collection for environmental studies, two key challenges relate to harmonizing and providing standardized [...]

[Read more](#)



EUFAR

European Facility
for Airborne Research

EUFAR BECAME AN AISBL!

After a lengthy negotiation period of about 2 years, 8 European institutions representing 6 different countries involved in airborne environmental research have signed the necessary Statutes to constitute EUFAR as an AISBL – an international non-profit association under Belgian law. These documents were deposited with the Belgian courts on 30 August 2017. The formal constitution of the EUFAR AISBL was officially publicised in the Moniteur belge on 23 January 2018 (search by N° Entrepriise: 687.812.944 or Dénomination: EUFAR).

[Welcome to EUFAR](#)[EUFAR Facilities](#)[EUFAR Activities](#)

THE UNIQUE EUROPEAN RESEARCH INFRASTRUCTURE
DEDICATED TO AIRBORNE RESEARCH IN THE ENVIRONMENTAL
AND GEO-SCIENCES



Upcoming events

[Upcoming events](#)[Archive](#)

Dec. 8
2021 **EUFAR Presents - a webinar series on airborne science topics**
EUFAR presents a new series of...

Jan. 13
2022 **EUFAR Airborne Science Webinar #2**
Two talks on the use of airborne...

Jan. 14
2022 **GSIS TC webinar - History of Methane and CO2 Mapping with AVIRIS**
History of Methane and CO2...



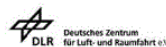
Consiglio Nazionale delle Ricerche
Roma, Italy
Contact: Francesco CAIRO, f.cairo@isac.cnr.it
Website: <http://www.cnr.it/>



Centre National de la Recherche Scientifique
Paris, France
Contact: Aurelien BOURDON, aurelien.bourdon@safire.fr
Website: <http://www.safire.fr/>



Ústav výzkumu globální změny AV ČR
Brno, Czech Republic
Contact: Jan HANUS, hanus.j@czechglobe.cz
Website: <http://www.czechglobe.cz/>



Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)
Wessling-Oberpfaffenhofen, Germany
Contact: Andreas MINIKIN, Andreas.Minikin@dlr.de
Website: <http://www.dlr.de/FB>



Freie Universität Berlin
Berlin, Germany
Contact: Thomas RUHTZ, Thomas.Ruhtz@fu-berlin.de
Website: <http://www.fu-berlin.de/>



National Institute for Aerospace Research "Elie Carafoli"
220 Iuliu Maniu str. District 6
Bucharest, Romania
Contact: Andreea CALCAN, calcan.andreea@incas.ro
Website: <http://www.incas.ro/>



Vlaamse Instelling voor Technologisch Onderzoek
Mol, Belgium
Contact: Ils REUSEN, ils.reusen@vito.be
Website: <http://www.vito.be/>



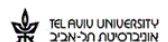
Météo-France / Centre National de Recherches Météorologiques
Toulouse, France
Contact: Elisabeth GERARD, bureau@eufar.net
Website: <http://www.umr-cnrm.fr/?lang=en>



Met Office
Exeter, United Kingdom
Contact: Philip BROWN, phil.brown@metoffice.gov.uk
Website: <http://www.metoffice.com/>



Office National d'Etudes et de Recherches Aéropatiales
Toulouse, France
Contact: Xavier BRIOTTET, xavier.briottet@onera.fr
Website: <http://www.onera.fr/>



Tel Aviv University
Tel Aviv, Israel
Contact: Eyal BEN DOR, bendor@post.tau.ac.il
Website: <http://www.tau.ac.il/index-eng.html>



University 'G. d'Annunzio' of Chieti-Pescara, Italy
Chieti - Pescara, Italy
Contact: Piero DI CARLO, piero.dicarlo@unich.it
Website: <http://www.unich.it/>



University of Warsaw
Warsaw, Poland
Contact: Hanna PAWLOWSKA, hanna.pawlowska@igf.fuw.edu.pl
Website: <http://en.uw.edu.pl/>



HEMERA H2020 V2

Integrated access to balloon-borne platforms for innovative research and technology



HEMERA WORKSHOP



BALLOON LAUNCHES



SCIENTIFIC RESULTS



FUTURE PROSPECTIVE



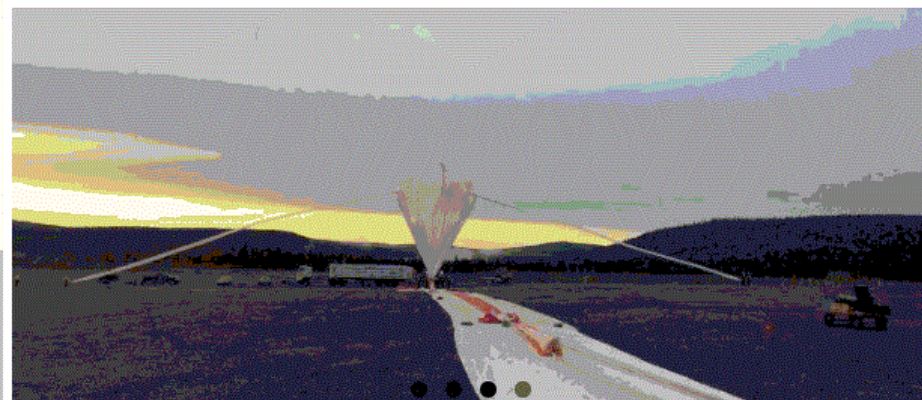
RESULTS OF CFP



OUTREACH



PAYLOADS LIST



HEMERA is a Research Infrastructure funded by the Horizon 2020 framework Programme of the European Union which integrates a large starting community in the field of tropospheric and stratospheric balloon-borne research, to make existing balloon facilities available to all scientific teams in the European Union, Canada and associated countries. The complementary of the HEMERA members' capabilities in the field of balloon systems and operations will offer an easy and enhanced service to the scientific community. A wide range of scientific and technical themes are addressed, such as astronomy, atmospheric physics and chemistry, climate research, fundamental physics, biology, space research and technology.

Objectives we defined were:

O1 : **Offer single Access**. The added value of this new RI is to be able to investigate the interaction between the different compartments of the Earth System (Atmosphere-surface interactions) through a single hub for platforms and knowhows.

O2 : **Research challenges** for roadmap definition of needs in term of combination of existing instruments, platform, common instrumentations, new instrumentation, new platforms.

O3 : **data** availability and unique virtual access portal, good practices, FAIR Data.

O4 : **New services** with definition and development of products for climate services, meteorological forecast, satellite CAL/VAL.

O5 : define **combine Access**, common platforms and common campaign management and operational good practices during campaigns



The possible Consortium:

CYI(CY): <https://www.cyi.ac.cy/>

VITO(BE): <https://remotesensing.vito.be/>

KIT(GE): <https://www.kit.edu/>

SKYDWELLER (SP) : <https://skydweller.aero/>

CNR(IT): <https://www.cnr.it>

UNIFE2(IT) : <https://www.unife.it/>

UNICH(IT) : <https://www.unich.it/>

CIRA(IT): <https://www.cira.it/it>

NEOVIA(FR): <https://neovia-innovation.eu>

CNRS(FR) : <https://www.cnrs.fr/>

INCAS(RO): <https://www.incas.ro/>

ONERA(FR): <https://www.onera.fr/>

CNES(FR) : <https://www.cnes.fr/>

UNORL(FR): <https://www.univ-orleans.fr>

POLY(FR)

SAFIRE(FR)

CZECHGLOBE(CS)

UNIWA(PL)

FUB(GE)

KING, WOOD & MALLESTON (SP)

WP1 : Management, IT

WP5 : RI Governance & Sustainability FR? IT?

WP7:
Networking
GE TBD ()
-1 synergie
EUFABAR
2- capability
for
- ACTRIS,ICOS,
IAGOS,
EUROPFLEET

WP2 : Research Challenges
300 k€
White book for roadmap

WP3 : Capabilities and Synergy
GE TBD
Good practices for :
- Combine access
- Common platform
- New instrumentation

WP8
Outreach
RO
Newsletter
Promotion
of services
and
products :
Workshop
conference
Summer
school

WP4 : 400 k€
FR New Services
-climate services
- Meteorological services
- CAL/VAL for satellite
- Scientific services

WP 6 : FR virtual access
Database
FAIR DATA



WP	Topic	Proposed Leader	Tasks	Estimated budget k€	Participants	Contacts
1	Management	CNR(IT)Cairo/CNRS(FR)Huret	Financial and technical management of the consortium; Handle all ethical and legal issues; Monitor the results and implement corrective measures if necessary; Liaise of the consortium between the EC and the wider community.	300	CNR(IT) CNRS(FR) NEOVIA(FR)	f.cairo@isac.cnr.it n.huret@opgc.fr
2	Research Challenges	CYI(CY)Marenco?/CNRS(FR)Formenti/ ONERA(FR)Doublet? /UNORL(FR)Catoire/ (POLY)Crevoisier/	Define the science needs that justify a new airborne RI Identify capabilities and gaps to meet the H2020 Grand Challenges Identify new instrumental and platform development (new stratospheric platform, long endurance UAVs, new experimental approach i.e. dropsondes for aircraft and balloons) to fill the gaps Identify critical issues in the exchange of tools and instruments between different platforms and propose solutions to overcome them	300	CYI(CY) CNRS(FR) KIT(GE) UNIFE2(IT) CIRA(IT) INCAS(RO) ONERA(FR) UNICH(IT) UNORL(FR) POLY(FR) ?	f.marenco@cyi.ac.cy paola.formenti@lisa.ipsl.fr felix.friedl-vallon@kit.edu salvatore.manfreda@unina.it V.Baraniello@cira.it vajaiac.sorin@incas.ro Philippe.Doublet@onera.fr piero.dicarlo@unich.it valery.catoire@cnsr-orleans.fr cyril.crevoisier@lmd.polytechnique.fr coultris?
3	survey of the EC airborne/ balloonborne/ UAVs lasdcape	UNIFE2(IT)Manfreda /CNES(Vacher)/ ONERA(FR)Doublet? /(CNRS)Coultris	Survey what is available and where Define what is missing (non existing or with low TRL) and needs in terms of Research Challenges	200	CYI(CY) VITO(BE) KIT(GE) ONERA(FR) UNIFE2(IT) UNICH(IT) CNES(FR) CIRA(IT) FUB(GE)?	f.marenco@cyi.ac.cy ils.reusen@vito.be felix.friedl-vallon@kit.edu Philippe.Doublet@onera.fr salvatore.manfreda@unina.it piero.dicarlo@unich.it Francois.Vacher@cnes.fr V.Baraniello@cira.it ruhtz@zedat.fu-berlin.de
4	contours and scope of the new RI	UNIFE2(IT)Manfreda / CZECHGLOBE(CS)Hanus/ CNRS(FR)Huret	<ul style="list-style-type: none"> definition of new services development of open access: transnational Access; Virtual access,... 	400	VITO(BE) UNIFE2(IT) CZECHGLOBE(CS) E(CS) CIRA(IT) CNRS(FR)	ils.reusen@vito.be salvatore.manfreda@unina.it hanus.j@czechglobe.cz V.Baraniello@cira.it n.huret@opgc.fr
5	Infrastructure Governance	Marie-Pierre Lefevre(CNRS) Brown(MetOffice)	Definition of Infrastructure Legal form, Business model, regulatory rules; <ul style="list-style-type: none"> Transnational policy Future costs and sustainability of IS on the long term 	200		
6	Infrastructure Database	Holzwarth(DLR) Payan(CNRS-AERIS)	Define a common portal for platform, instruments and data <ul style="list-style-type: none"> Study and provide guidelines for shared data formats 	400	UNICH(IT) INCAS(RO) CNRS-AERIS(FR)	piero.dicarlo@unich.it vajaiac.sorin@incas.ro sebastien.payan@latmos.ipsl.fr
7	Networking	REUBEN(VITO)	<ul style="list-style-type: none"> Establish cross links with ACTRIS, ICOS, IAGOS,EUROFLEETS... Establish Advisory group with Space Agencies representatives Survey on users needs: Cross contamination between scientific communities: platform based (Aircraft/balloon/UAVs) and topic based (Atmosphere/Surface/Ocean) Intercomparison campaign with other RIs 	900	CYI(CY) UNICH(IT) VITO(BE) INCAS(RO) SAFIRE(FR)?	f.marenco@cyi.ac.cy piero.dicarlo@unich.it ils.reusen@vito.be vajaiac.sorin@incas.ro aurelien.bourdon@safire.fr
8	Outreach	Pawlowska(UNIWA)	<ul style="list-style-type: none"> Newsletter, website, workshops, Conferences Promotion of the IS to Climate services; Space Agencies for satellite products Cal/Val activities; etc. Definition of strategies for training of new generations of professionals in airborne science 	200	CYI(CY) UNIWA(PL)? INCAS(RO)	f.marenco@cyi.ac.cy hanna.pawlowska@igf.fuw.edu.pl vajaiac.sorin@incas.ro



WP1: Project Management (CNR(IT), CNRS(FR), NEOVIA(FR))

Objectives

- Financial and technical management of the consortium;
- Handle all ethical and legal issues;
- Monitor the results and implement corrective measures if necessary;
- Liaise of the consortium between the EC and the wider community.

WP2: Research Challenges (CYI(CY), CNRS(FR), KIT(GE), UNIFE2(IT), CIRA(IT), INCAS(RO), ONERA(FR), UNICH(IT), UNORL(FR), POLY(FR))

Objectives

- **Define the science needs** that justify a new airborne RI
- Identify **capabilities and gaps** to meet the H2020 Grand Challenges
- Identify new **instrumental and platform development** (new stratospheric platform, long endurance UAVs, new experimental approach i.e. dropsondes for aircraft and balloons) to fill the gaps
- identify **critical issues in the exchange of tools and instruments between different platforms** and propose solutions to overcome them

Tasks:

- Six **Expert Working Groups** corresponding to the H2020 Grand Challenges (health and wellbeing, food security, transport, energy, climate action, society and security) should be set up
- A **White Book identifying experimental approaches to tackle the Challenges**, with particular emphasis on synergies and complementarities between research platforms (Balloons, UAVs, Aircraft) and with other existing research infrastructures should be issued



WP3: Capabilities and new synergies (CYI(CY), VITO(BE), KIT(GE), ONERA(FR), UNIFE2(IT), UNICH(IT), CNES(FR), CIRA(IT), FUB(GE)?, SKYDWELLER(SP)?)

Objectives

- Find **what is available and where**
- Define **what is missing** (non existing or with low TRL) and needs in terms of Research Challenges

Tasks:

- Define **strategy for enhancing and combining different capabilities**

WP4: New services (VITO(BE), UNIFE2(IT), CZECHGLOBE(CS), CIRA(IT))

Objectives:

- definition of **new services**
- development of **open access**: transnational Access; Virtual access,...

Tasks:

- define and develop relevant services based on data obtained during campaign for climate services, meteorological weather model, satellite measurements.
- define climate services products for Copernicus, Meteorological products for weather forecast model, CAL/VAL products for satellite
- - Implement a framework for Open Access and Virtual access to the platforms
- Implementation of new algorithms

WP5: Infrastructure Governance (King & Wood Mallesons, with operators)

Objectives

- Definition of **Infrastructure Legal form**, Business model, regulatory rules;
- Transnational policy
- Future costs and sustainability of IS on the long term

Tasks:

- Survey of existing Research infrastructure legal forms; MOU between Institutes and Agencies on developing an IS. Guidelines for a Transnational access policy.
- define a legal form that could group together the existing EUFAR AISBL with associations or single agencies involving aircraft, balloon or UAVs operators.
- Define its sustainability and propose internal regulation.

WP6: Infrastructure Database (UNICH(IT), INCAS(RO), CNRS-AERIS(FR))

Objectives

- Define a **common portal for platform, instruments and data**
- Study and provide guidelines for shared data formats

Tasks

- Survey of existing platforms and instrumentation;
- Web portal setup;
- Guidelines for common data format.

WP7: Networking (CYI(CY), UNICH(IT), VITO(BE), INCAS(RO), SAFIRE(FR)?)

Objectives

- Establish cross links with **ACTRIS, ICOS, IAGOS, EUROFLEETS...**
- Establish Advisory group with **Space Agencies** representatives
- **Survey on users needs**; Cross contamination between scientific communities: platform based (Aircraft/balloon/UAVs) and topic based (Atmosphere/Surface/Ocean)
- Planning of future joint activities with other Ris

Tasks

- links to other RIs (also beyond atmosphere), links to space agencies, ESA, etc etc.
- Produce **one white book per IR, with science rationale and detailed planning of future common activities** (i.e detail flight plans, balloon launching, UAV deployment and so on, if a campaign was about to happen). (examples): validation of ground based vertical measurements of aerosol/trace gases and multi-instrumental balloon/airborne in situ measurements, on dedicated (ICOS, ACTRIS) sites; intercomparison with IAGOS on specific flights corridors, etc.
- Advisory Group



WP8: Outreach (CYI(CY), UNIWA(PL)?, INCAS(RO))

Objectives

- Maintain **effective communication with end users, stakeholders and general public.**

Tasks:

- Newsletter, website, workshops, Conferences
- Promotion of the IS to Climate services; Space Agencies for satellite products Cal/Val activities; etc.
- Definition of strategies for training of new generations of professionals in airborne science

Outlooks

- WP3 Capabilities and Sinergies had no leader
- WP7 Networking had no leader. There is still no agreement with many major research Agencies active in airborne research
- The budget has to be agreed
- Need to have more even spreading of WP leading between countries.
- WP2 split into more subWP (UTLS, Troposphere, PBL, Surface...)
- More operators should be present in WP3 and WP 5 with the latter led by an operator, and the lawyer as consultant
- Other RI possibly involved (already interest from IAGOS)



... and new platforms
yet to come...

Hybrid High Altitude Airship

A Stratospheric Platform
for Earth Observation and
Telecommunications

