



LAST CALL FOR EUFAR TRAINING COURSE APPLICATIONS!

EASI - Exploring Air Sea Interaction via airborne data

Shannon, Ireland, 25 June - 4 July 2017

Funded by EUFAR and jointly organised with CNR-ISAC, the primary goal of the EASI summer school is to teach and train participants on the use of a research aircraft, and on the experimental possibilities it opens for atmospheric sciences research. This implies providing participants with a complete overview of airborne and remote sensing experimental techniques, and of specific features of collection and analysis of airborne measurements. In addition, EASI aims to transfer consolidated knowledge on and recent advancements in specific topics related to air-sea interaction, and near coastal boundary layer structure and dynamics. 4 flights with the instrumented ATR42 aircraft (operated by SAFIRE) from the Shannon airport and a visit to the **Mace Head Atmospheric Research Station** are planned. Click [here](#), to download the flyer.

RS4forestEBV - Airborne remote sensing for monitoring essential biodiversity variables in forest ecosystems

Bavarian Forest National Park, Germany (3 - 9 July 2017)

DLR Oberpfaffenhofen, Germany (10 - 14 July 2017)

Organised by EUFAR, the University of Twente and DLR, the training course will present special skills required for processing the new generation of airborne hyperspectral, thermal, and LiDAR data for retrieving essential biodiversity variables in forest ecosystems. The ground data collection that will be performed during the first week of the training course at the Bavarian Forest National Park aims to provide participants with know-how on tools (field spectroscopy, thermal spectrometry and terrestrial LiDAR) and measurement techniques to collect different vegetation variables.

In addition, an airborne campaign with a NERC Twin Otter will be organised (if weather conditions allow) for the concurrent acquisitions of hyperspectral imaging data in visible, near-infrared, shortwave infrared and longwave-infrared wavelengths as well as LiDAR data. Furthermore, during the second week, participants will be able to attend certain sessions of the **ICARE 2017 conference** that will be held simultaneously at DLR (10 - 13 July). Click [here](#), to download the RS4forestEBV flyer.

STANCO - School and Training on Aircraft New and well-established techniques for Atmospheric Composition Observation

University of Cambridge & Cranfield airport (UK)

26 June - July 2017

The STANCO training course, financed by EUFAR and jointly organised with **DiSPUTER** of the University "G. d'Annunzio" of Chieti-Pescara, aims to provide an overview of measurement techniques, data analysis and specifics of airborne measurements of species relevant in the atmosphere. Emphasis will be on new instruments and emerging techniques for aircraft observations. During the course, a visit to the **Facility for Airborne Atmospheric Measurements** at Cranfield airport will be organised to provide a first overview of the BAe-146 and of the instruments installed on board the aircraft. The lectures will be integrated with three mission flights using the BAe-146 aircraft where students will have the opportunity to have hands-on training on conducting airborne measurements. To download the STANCO flyer, click [here](#).



3 to 4 flights are planned during the STANCO training course with instrumented aircraft BAe-146 (operated by FAAM) from Cranfield airport

APPLICATION PROCEDURE

Applicants: PhD students, post-docs & university lecturers (up to 20 participants will be accepted for each course)

Travel & subsistence: 100% funded by EUFAR for selected applicants working in an institution established in a European Member State or Associated State. There is NO registration fee to participate.

TO APPLY, CLICK ON THE LINK BELOW:

www.eufar.net/projects/education-and-training/

Deadline: 3 April 2017 (Selected participants will be notified by 30 April 2017).

For information, contact: bureau@eufar.net





ICARE 2017 CONFERENCE “Developing the infrastructure to meet future scientific challenges”

REGISTRATIONS NOW OPEN, [CLICK HERE.](#)

The 2nd International Conference on Airborne Research for the Environment (ICARE 2017) will be held at the **German Aerospace Research Centre - DLR**, in Oberpfaffenhofen from 10 to 13 July 2017. Mainly funded by EUFAR (under the EC's FP7 framework programme), the conference will also receive significant in-kind and cash contributions from DLR and ESA respectively.

The conference will bring together both operators and users of research aircraft working in support of a broad range of environmental research interests together with representatives of relevant funding agencies and equipment suppliers. Airborne research has significantly contributed to our understanding of important environmental processes in the atmosphere, ocean and on the land surface. The ability to continue and develop this role will depend on the airborne research community adapting to the challenges of a world of increasingly restricted financial resources.

The conference will review the scientific drivers for future airborne measurements across a broad range of topics in environmental science. There will also be sessions devoted to a range of technical and support issues that are concerned with developing aircraft operators' ability to address these science drivers.



Aerial shot of DLR premises, Oberpfaffenhofen. Photo credit: DLR (CC-BY 3.0)



DLR research aircraft parked at Oberpfaffenhofen. Photo credit: DLR (CC-BY 3.0)

It is expected that the programme will include sessions on the following topics:

1) Science drivers for future airborne science missions

- o Airborne support to future satellite missions
- o Polar research
- o Atmospheric science
 - > Clouds and precipitation
 - > Atmospheric composition – trace gases and aerosols
 - > Atmospheric dynamics
 - > Air-sea interaction
- o Oceans, lakes and inshore waters
 - > Primary productivity
 - > Water quality
 - > Mesoscale ocean dynamics
- o Land surface studies
 - > Land-atmosphere interaction
 - > Vegetation and forest studies
 - > Agriculture
 - > Soils and minerals

2) Organisation of future field campaigns

- o Access to airspace for measurement flights
- o Diplomatic and security restrictions
- o Coordination of multi-aircraft campaigns through separate funding streams

3) Developing future airborne science capabilities & platforms

- o Maintenance of capability range
- o Developing open access to airborne facilities
- o Broadening the scientific user base
- o Synergy of manned aircraft and UAVs

4) New developments in instrumentation and data

- o Exploitation of lightweight / low-power instruments
- o Unattended operation
- o Exploitation of real-time data for science planning, education and public engagement
- o Transferability between aircraft
- o Data formats and exchange – facilitating collaboration
- o Development of protocols for the conduct of airborne intercomparisons

The conference will consist of both plenary and parallel sessions with invited keynote speakers. We expect that a number of research aircraft will be exhibited during the conference. The Call for Abstracts inviting both oral and poster submissions for the conference programme is currently open, click [here](#) for more information.

CALL FOR ABSTRACTS AND REGISTRATION FOR ICARE 2017 CONFERENCE ARE NOW OPEN:

For more information, click on the following link:

<http://icare2017.besl-eventservice.de/front/conference.php>

EUFAR MANAGEMENT

EUFAR's annual General Assembly 2017 marks the start of another promising year

EUFAR's annual General Assembly took place in Warsaw from 14 to 17 February 2017. Hosted and organised by EUFAR partner, University of Warsaw, the meeting was held on the beautiful main campus of the university in the heart of the city. Apart from the usual presentations dedicated to each activity, the meeting also included a session dedicated to EUFAR's technology transfer activity and a special session dedicated to the "Future strategy of EUFAR" with invited members from EUFAR's Strategic Advisory Committee (SAC). 36 participants attended the meeting including invited guests and SAC members, representing 18 of the 24 EUFAR's partners. A special thanks goes out to the **University of Warsaw/ Faculty of Physics/ Institute of Geophysics** for its hard work in the local organisation and in ensuring the smooth running of the meeting.

The gathering served as an important occasion to review the past three years of activity in the current EUFAR project (2014-2018), and present each activity's objectives for the remaining life time of the project, which is set to end in January 2018. There have been a number of remarkable achievements since the start of the project which have only been made possible by the continued commitment and hard work of the EUFAR steering committee and activity leaders.

Some achievements include the successful clustering of EUFAR funded flight campaigns with multinational campaigns (e.g. **DACCIWA**, **ICE-D**), the launch of the new EUFAR website end of 2015, the **EUFAR SWAMP training course** in July 2015, development and launch of 13 **software tools** serving to improve processing and interpretation of airborne hyperspectral imagery and laser scanning data by the joint research activity **HYLIGHT**, advances in the calibration of airborne trace gas measurements from the joint research activity **TGOE**, tools developed by EUFAR's standard and protocols' team (**EUFAR General Airborne Data-Processing Software**, **Airborne Science Mission Metadata** and **EUFAR Metadata Creator**), the **EUFAR Flight Finder tool** to locate flight data within the EUFAR data archive, various expert working group workshops which have resulted in publications such as contribution to a book on "**Ice formation and evolution in clouds and precipitation: Measurement and modelling challenges**" and a **paper** on atmospheric correction of remote-sensing data. A full list of these achievements can be found [here](#).

One area in which EUFAR continues to face significant obstacles concerns the technology transfer activity; a new and challenging task taken up at the start of this contract, seeking to support the transfer of technology between EUFAR experts in airborne measurements and industry partners, and further support their partnership by providing expertise on issues related to exchange of knowledge.

Currently, a number of promising technologies developed by EUFAR partners have been identified through this activity, resulting in the publication of a technology booklet, however, a number of setbacks have been experienced such as the delay in presenting these technologies to potential industry partners and failure to bring on board technology transfer offices of EUFAR partners. The strategy of the activity was discussed in detail during the meeting along with some new ideas to push this activity forward. With one year left to go, the activity will aim to commercially exploit two to three technologies developed within EUFAR before the end of the project.

Exciting activities coming up include the three **EUFAR training courses** set to take place over this summer (EASI (Ireland), STANCO (UK) and RS4forestEBV (Germany)) as well as EUFAR's 2nd International Conference on Airborne Research for the Environment (**ICARE 2017**) to be held at the German Aerospace Research Centre (DLR) in mid-July this year. Furthermore, three expert workshops on stratospheric remote-sensing aircraft, processing of cloud particle measurements and aerosol chemical compositions will be held in the course of the year.

After three full days of presentations and intense discussions, the general assembly adjourned with the promise of another packed and stimulating year ahead.

For more information on the event and to access the meeting presentations and report, click [here](#).



Group photo outside the Auditorium Minus at the University of Warsaw's main campus, EUFAR General Assembly, February 2017



Above left: General Assembly in session
Above right: Hanna Pawlowska & Krzysztof Dudek from the Uni. of Warsaw, the meeting hosts and also responsible for EUFAR's website development and maintenance



Right: Auditorium Minus at the University of Warsaw's main campus

PUBLICATIONS

Great article on EUFAR and the future of airborne research in the EU Research magazine

Following [EU Research](#)'s interview with EUFAR scientific coordinator, Philip Brown (Met Office, UK), a 3-page article on EUFAR's support to the airborne research community features in the magazine's 2017 Spring edition.

"Instrumented aircraft are an important scientific tool, allowing researchers to gather data on the Earth's surface and atmosphere, yet such facilities are not always available in some countries. The EUFAR2 project helps widen access to airborne research facilities and supports the growth of the environmental science research community, as Philip Brown explains."

Click [here](#), to access the full online article (pages 54 – 56).



AMS Meteorological Monographs - Ice Formation and Evolution in Clouds and Precipitation: Measurement and Modelling Challenges

Two [expert workshops](#) jointly organised by EUFAR and the [ICCP/IAMAS](#) on data processing, analysis and presentation software of cloud probes have contributed significantly to the AMS meteorological monograph edition on ["Ice formation and evolution in clouds and precipitation: Measurement and modelling challenges"](#), and have set the stage for a third workshop on processing of cloud particle measurements to take place in July. For more information on this next workshop, click [here](#).

Join a EUFAR-funded flight campaign

EUFAR provides the opportunity for early-stage researchers and university lecturers to join an existing research campaign. The access offered includes general training by the research team and aircraft operator (on instruments, organisation of the campaign, data analysis, etc.) To view opportunities to join an existing research campaign, please visit the [ET-EC page](#).

Currently the MASOMED flight campaign is open for participation by interested early-stage researchers. MASOMED, dealing with mapping soil variability within rainfed Mediterranean agroecosystems, is a flight experiment to be performed in Spain in early May. For more information, click [here](#) or contact Sabine Chabrilat (chabri@gfz-potsdam.de).

Three stratospheric airborne research platforms are currently available to the European science community, click [here](#) for more information.



EGRETT aircraft, operated by GROB Aircraft (previously GROB Aerospace), and used by Airborne Research Australia (ARA) for scientific field experiments.

Geophysica M55 aircraft; operated by Myasishchev Design Bureau



EUFAR TOOLS & SOFTWARE

The EUFAR Flight Finder (EFF)

The EFF is a geospatial-temporal search interface to locate flight data within the EUFAR data archive at BADG and can be found at <http://flight-finder.ceda.ac.uk/>. Flights from FAAM, NERC-ARSF and SAFIRE aircraft are currently included - more will be added shortly.

All comments and feedback are welcome, by emailing: support@ceda.ac.uk.

ASMM & EMC

Check out the new versions of the ASMM (Airborne Science Mission Metadata) and EMC (EUFAR Metadata Creator) tools developed by EUFAR's standards & protocols team, available via the following links:

- emc.eufar.net
- asmm.eufar.net

For more information, click [here](#).

HYLIGHT tools

Under EUFAR's Joint Research Activity - HYLIGHT dedicated to the integration of airborne hyperspectral imagery and laser scanning data to improve image processing and interpretation, a number of tools have been developed by the working group. Most of the tools are available together with their installation guides and user manuals on the [EUFAR website](#).

Contact – ils.reusen@vito.be, for more information.

EXPERT WORKSHOPS

EUFAR Workshop on Hyperspectral Imaging from UAVs – Applications in Precision Farming

University of Milano-Bicocca, Milan, Italy, 14 December 2016

EUFAR together with VITO organised an expert workshop on hyperspectral imaging from UAVs with applications in precision farming. Hosted by the University of Milano-Bicocca, this workshop brought together 18 experts in UAV hyperspectral image processing and sensor developers with the aim of presenting the state-of-the art in high spatial, high spectral remote sensing and in miniaturised hyperspectral sensors and technology. The EUFAR technology transfer officer leader from ONERA also participated in the workshop to give a presentation on the commercial application of technologies. Furthermore, the workshop served to identify gaps in bringing the knowledge to an operational system, i.e. bridge the gap between research and farmers/ industry.

Workshop abstract

Increasing food production in a sustainable way is one of the major challenges to meet the needs of the world's growing population. Since the area of land suitable for agriculture is limited, optimisation of crop quality from existing agricultural land becomes of utmost importance. Precision farming, through the optimal use of inputs, e.g., water, fertilizers, and pesticides, enables farmers a more effective and efficient use of their existing land to increase crop size and quality. However, to determine the optimal use of inputs, and allow a time- and site-specific treatment against production limiting factors with the goal of optimising yield, a continuous monitoring and proper understanding of plant physiological processes in relation to the environment is essential. Remote sensing has proven to be a powerful tool for the monitoring of the Earth's surface on a global, regional and even local scale as current agricultural management decisions require insight on within field variability. Recent developments in sensor and information technologies have led to a huge improvement of the perception of our surroundings. Hyperspectral imaging from Unmanned Aerial Vehicles (UAV) is able to capture the desired high spectral and spatial information, furthermore providing temporal flexibility to bridge the gap between information needs and data availability for precision farming.

For more information, contact stephanie.delalieux@vito.be, or visit the [event page](#) on the EUFAR website.



Group photo from EUFAR expert workshop, Milan, 14 December 2016

EUFAR/ ICCP/ IUGG/ IAMAS Expert Workshop on Processing of Cloud Particle Measurements

DLR, Oberpfaffenhofen, Germany, 7 - 9 July 2017

Recent analysis showed differences in cloud data sets from airborne instruments caused by different data analysis methods. Thus it is the scope of the workshop to discuss, optimise and harmonise cloud data analysis and correction methods from cloud imagers operated on research aircraft within the international cloud community. The workshop will also focus on knowledge transfer and training for students and early career scientists who will be working with cloud measurements carried out using a broad array of sensors.

This workshop is a follow-up of the 2014 Data Analysis Workshop that was convened in Boston prior to the American Meteorological Society (AMS) cloud physics conference and the 2016 software workshop that met prior to the International Conference on Clouds and Precipitation (ICCP) held in Manchester in July (sponsored by **ICCP**, EUFAR and **IAMAS/IUGG**). These two workshops have set the stage for the 2017 workshop, which will have a strong component of knowledge transfer. The workshop seeks to provide hands-on training on the software packages that are most widely used by the scientific community to analyse ground-based, airborne, and in situ cloud measurements. By the end of the workshop, participants will be expected to be moderately proficient in manipulating, analysing and graphing data.

The **2016 EUFAR/ ICCP workshop** on cloud measurements confirmed that there is a lack of consistency in correction/analysis algorithms applied to cloud measurements and their implementation. There is a need to bring consensus among the community, in order to discuss “best practices” in processing data and reporting results. This is the overarching motivation for this workshop. Best practices will be discussed based on the evaluation of new observations in liquid, mixed phase and ice clouds.

The objectives of this meeting are the following:

- Hands-on training on software packages from cloud probes
- Reach consensus on optimum practices for cloud probe data algorithms, including aspects of their implementation and documentation, whenever possible
- Identify aspects of algorithms that cannot be optimised in general and that must be set for individual probes or individual datasets
- Monitor the progress in cloud data evaluation and inter-comparison

The workshop is planned in connection with EUFAR's 2nd International Conference on Airborne Research for the Environment (**ICARE 2017**) to be held at DLR in Oberpfaffenhofen, from 10 to 13 July 2017.

Please send applications to participate in this workshop to darrel.baumgardner@gmail.com.

UPCOMING EVENTS

EUFAR Stratospheric Research Workshop

CNR-ISAC, Rome, Italy, 4 - 5 May 2017

A priority for the development of the European airborne research fleet is to maintain the capability of a **stratospheric research aircraft**. To this aim, various solutions should be explored, either investigating gaining access to existing stratospheric aircraft outside Europe or on ensuring the long-term availability of a fully European platform.

At the moment, there are 3 stratospheric platforms available to the science community, advertised on the EUFAR website: the Geophysica M55 aircraft (operated by Myasishchev Design) Bureau, the EGRETT (operated by GROB Aerospace), and the WB-57 aircraft (operated by NASA). For more information on these aircraft, click [here](#).

A 2-day EUFAR workshop will be held in early May at CNR's Institute of Atmospheric Sciences and Climate (CNR-ISAC) offices, in Rome, to define future research topics that may be tackled by a stratospheric research aircraft, and to provide suggestions on how to secure the availability of such an aircraft in Europe in the coming decade.

If you are interested in this topic and you wish to attend the workshop, you are invited to fill the registration form, which you can access [here](#).

A limited number of attendees is foreseen. If your application to attend this workshop is accepted, your expenses will be fully covered by EUFAR.

For more information, please contact the workshop organiser - Francesco Cairo (f.cairo@isac.cnr.it).

European Geosciences Union General Assembly

Vienna, Austria, 23 - 28 April 2017

The EGU General Assembly 2017 will bring together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary and space sciences. The EGU aims to provide a forum where scientists, especially early career researchers, can present their work and discuss their ideas with experts in all fields of geoscience.

EUFAR will hold a stand in the main exhibition hall to disseminate information on EUFAR and draw interest on EUFAR's activities. The project coordinator, Elisabeth Gerard will present a poster on "EUFAR, the key portal and network for airborne research in Europe" during the session dedicated to aircraft-based observation of the atmosphere and atmosphere-surface exchange processes.

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To publish airborne research related publications, job opportunities, events, etc., contact bureau@eufar.net.



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EUFAR Handbook

Reference: Manfred Wendisch & Jean-Louis Brenguier (Eds.)
Airborne Measurements for Environmental Research: Methods and Instruments, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2013
ISBN: 978-3-527-40996-9, 655pp.

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