

OPTIMISE

Innovative Optical Tools for Proximal Sensing of Ecophysiological Processes



Poznan University of Life Sciences



SWAMP Training Course
6 – 16 July 2015
Obrzycko-Rzecin (POLWET), Poland

EUFAR-Education and Training Opportunities

Ils REUSEN

VITO

Ils.reusen@vito.be



EUFAR-European Facility for Airborne Research



EUFAR

Integrating Activity of the EC FP7

Budget 6 M€

Duration 4 years (2014-2018)

24 Partners

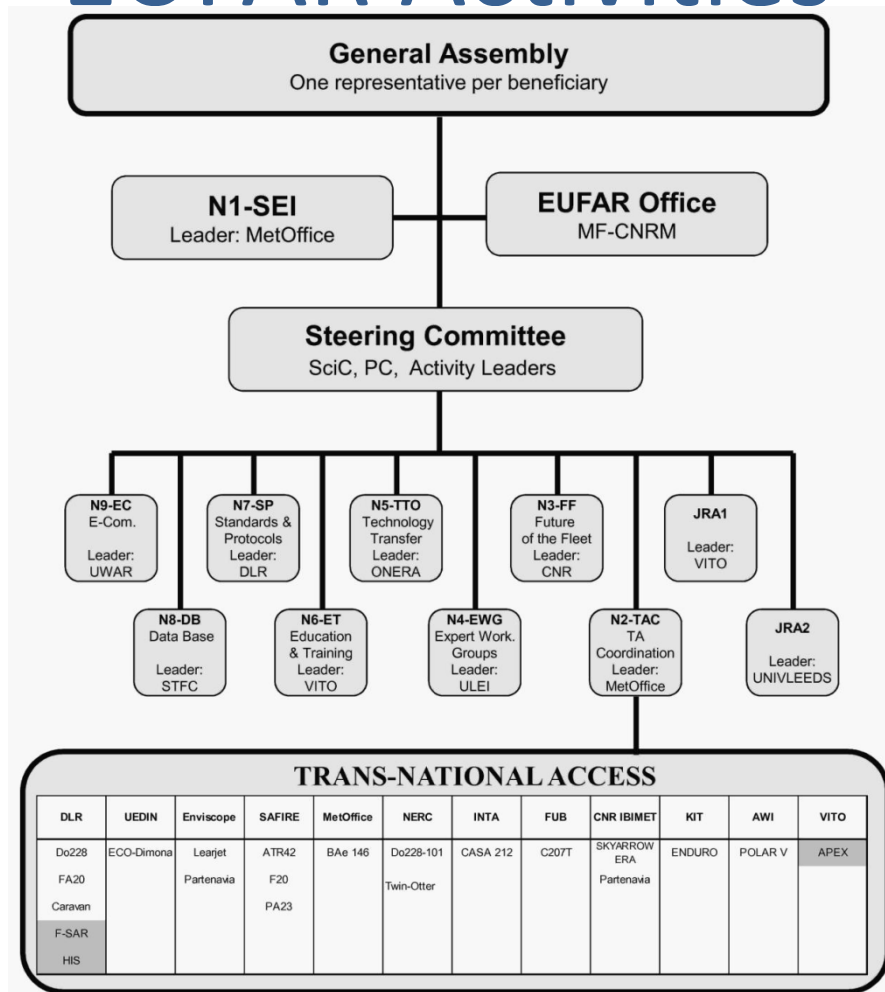
3 instruments and 18 instrumented aircraft open to Transnational Access



www.eufar.net



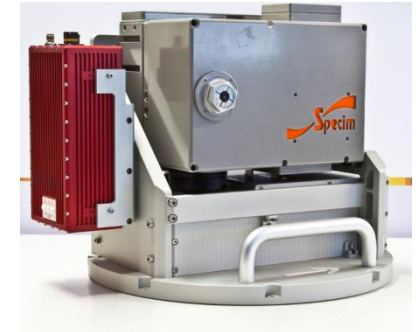
EUFAR Activities



HyperSpectral Imaging sensors open to TA



| Operator | Instrument |
|----------|-----------------------|
| VITO+RSL | APEX |
| DLR | HYSPEX VNIR+SWIR |
| NERC | aisaFenix+aisa Owl |
| INTA | AHS+CASI1500 |
| CNR | TASI |



EUFAR Activities

Networking Activities

- N1.** Strategy and European Integration (N1SEI-CNRM)
- N2.** TA and Open Access coordination (N2TAC-MetOffice)
- N3.** Future of the Fleet (N3FF-CNR)
- N4.** Expert Working Groups (N4EWG-Uni-Leipzig)
- N5.** Technology Transfer Office (N5TTO-ONERA)
- N6.** Education and Training (N6ET-VITO)
- N7.** Standards and Protocols (N7SP-DLR)
- N8.** Airborne Data Base (N8DB-STFC)
- N9.** E-Communication (N9EC-CNRM)

Transnational Activities (TA)

Joint Research Activities (JRA)

- JRA1.** HYLIGHT Improved Hyperspectral Image (HSI) processing using ALS and improved ALS processing using HSI (VITO)
- JRA2.** TGOE Development of robust calibration systems for core gas-phase chemical measurements made on-board research aircraft (UNIVLEEDS)


Objectives


- ▶ To attract early-stage researchers to airborne research
- ▶ To educate and train (theoretically and practically) early-stage researchers and trainers (e.g. university lecturers) in airborne atmospheric research and airborne remote sensing of the Earth surface
- ▶ To define an optimized (fixed) EUFAR training course concept
- ▶ To develop/consolidate EUFAR training course educational material




EUFAR N6ET supports

- ▶ ET-TA: The mentoring of young scientists by experienced researchers. Participate in the design of a new campaign

- ▶  ET-EC: An aircraft operator encouraging their scientific users to open their experiment to young scientists from all over Europe. Inexperienced users can “Join an Existing Campaign” (target 15)

- ▶  ET-VO: To stimulate the exchange of know-how and knowledge between aircraft/instrument operators (target 5)

- ▶  ET-TC: Training courses for early-stage researcher and trainers (target 4 training courses, each 20 participants)

EU-FAR supports

- ▲ EU-FAR provides 100% support for:
 - Training
 - Flight costs of research aircraft and airborne instruments through TA
 - Travel and Subsistence (T&S) expenses of participants and keynote lecturers



ET-TC Training courses

4 training courses for early-stage researchers and lecturers **including EUFAR flight (funded through EUFAR Transnational Access-TA)**

- Target=2 on airborne atmospheric research and 2 on airborne remote sensing of the Earth surface
- During 1 week to 11 days
- Equal emphasis on **theory** and **practical training/demonstration** (i.e. demo, hands-on exercises, design an experiment, definition of sampling strategy, flight plan, flight, ...)
- Keynote speakers cover **complete chain** from acquisition to interpretation of airborne data
 - Upstream topics (e.g. sensor development)
 - Downstream topics (e.g. corrections, analysis, interpretation)
- Hand-outs (or ev. syllabi) + airborne data provided through N9DB-Database
- Evaluation
- Scientific working group reports prepared by participants

REFLEX EUFAR-EUROSPEC-ESA training course, July 2012, Albacete-Barrax, Spain



Training Courses (1/5)

- **ADDRESSS** training course, 19-28 August 2010, Tihany, Hungary (**72 registrations received, 20 selected for EUFAR funding**)

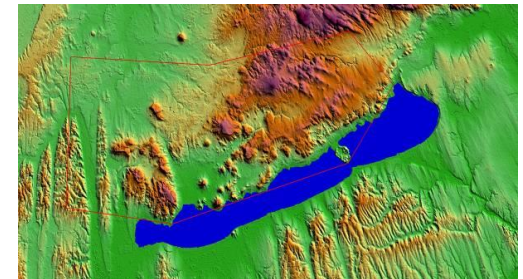
Topic: Ecology and Earth sciences

Aircraft: DO228 D-CALM
operated by NERC ARSF (UK)

Sensor: AISA Eagle/Hawk
LEICA ALS50-II LIDAR
LEICA RCD 105 digital camera
operated by NERC ARSF (UK)

Host: Balaton Limnological Research Institute

Working area: Including lakes and wetlands, drainage basins, plains, hill and mountain regions, grasslands, forests, cultivated areas, conservation, sanctuary sites and areas under high anthropogenic impact



Training Courses (2/5)

- **TETRAD (Training & Education for Turbulence Research via Airborne Data)** training course, 10-18 September 2010, Hyeres, France (**23 registrations received, 20 selected for EUFAR funding**)

Topic: Turbulence research

Aircraft: ATR42 operated by SAFIRE (FR)

Sensor: Wind vector, turbulence probes, scattering spectrometer, imaging spectrometer for cloud droplet spectra, ... operated by SAFIRE (FR)

Host: CNR ISAC Institute for Atmospheric Sciences and Climate

Working area: Flights, within external constraints, consist of over-sea patterns, as well as patterns towards French Alps (Provence-Alpes- Cote d'Azur Region)

Training Courses (3/5)

- **QAD (Quality on Airborne Data)** training course, 26 October-5 November 2010, Toulouse, France (**36 registrations received, 20 selected for EUFAR funding**)

Topic: Inter-comparison experiments (meteorological parameters, aerosols, clouds, trace gases and radiation)

Aircraft: various from EUFAR fleet

Sensor: various from EUFAR fleet

Host: University of Stockholm

Working area: South of Toulouse airport

During ICARE International Conference on Airborne Research for the Environment, 25-31 October 2010, Toulouse, France

To celebrate the 10th anniversary of EUFAR

Training Courses (4/5)

- **SONATA (School ON Aircraft Techniques for the studies of Atmospheric chemistry)** training course, 17-28 August 2011, Pescara, Italy (**54 registrations received, 20 selected for EUFAR funding**)

Topic: Atmospheric chemistry

Aircraft: BAe146 - FAAM

Sensors: various

Host: CETEMPS-University of L'Aquila

Working area: Pescara, Rome

Training Courses (5/5)

- **REFLEX (Regional Experiments For Land-atmosphere EXchanges)** training course, 18-28 July 2012, Albacete, Spain (102! registrations received, 10 selected for EUFAR funding and 10 selected for EUROSPEC funding)

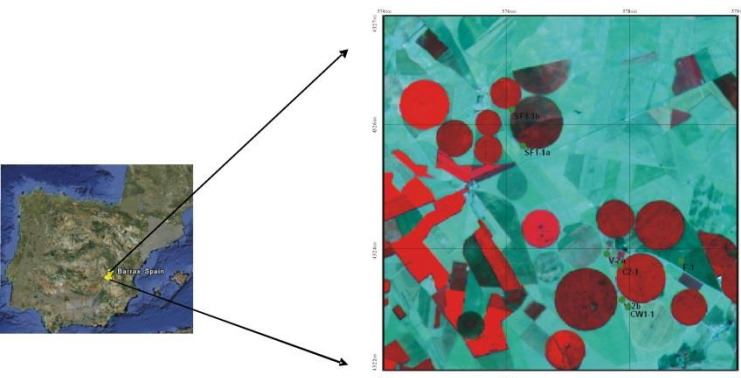
Topic: Multi-scale land-atmosphere exchanges

Aircraft+sensors: C-212-200 RS + CASI1500i and AHS operated by INTA, Spain

Principal Investigator: Prof. Dr. Bob Su, University of Twente-ITC, Enschede, The Netherlands

Host: Instituto Tecnico Agronomico Provincial (ITAP)

Working area: Las Tiesas Experimental Farm, Barrax



ET-EC Join an existing field campaign

- ▶ The list of research campaigns open to students is available in the **planning of the EUFAR fleet** at the EUFAR website



ET-TA Participate in the design of a new field campaign

- ▶ In the frame of Transnational Access (TA), EUFAR offers the opportunity to join a host research group to design a field campaign (flight experiment) including
 - scientific content
 - organisation of the campaign
 - data analysis
- ▶ Selected applicants will be able to actively participate in the
 - research flights
 - data analysis
 - publications

ET-VO Visit an aircraft/instrument operator

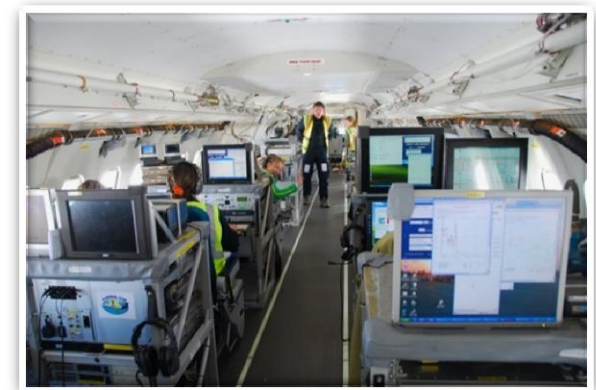
- ▶ EUFAR offers the opportunity for instrument/aircraft operators to exchange personnel
 - typically one week visit
 - to share knowledge and know-how about instrument calibration, data acquisition, etc. during field campaigns or test at a ground facility

- ▶ Eligibility criteria
 - applicants should be instrument/aircraft operator from EU member state or associated state (from list available at the EUFAR website)
 - must work in an institution established in a country other than the legal entity(ies) operating the selected aircraft/instrument
 - after the visit, the participants will be requested to write a report

N6ET

▲ EUFAR FP7 (2008-2013) Achievements:

- 5 Training Courses on airborne atmospheric research (3) and remote sensing (2): 100 trainees (from 287 received applications) including 12 university lecturers from 18 EU member states and associated states
- 15 ET-EC proposals to join an Existing Campaign supported
- 1 ET-VO proposal to visit an aircraft/instrument operator supported



EUFAR Activities

Networking Activities

- N1.** Strategy and European Integration (N1SEI-CNRM)
- N2.** TA and Open Access coordination (N2TAC-MetOffice)
- N3.** Future of the Fleet (N3FF-CNR)
- N4.** Expert Working Groups (N4EWG-Uni-Leipzig)
- N5.** Technology Transfer Office (N5TTO-ONERA)
- N6.** Education and Training (N6ET-VITO)
- N7.** Standards and Protocols (N7SP-DLR)
- N8.** Airborne Data Base (N8DB-STFC)
- N9.** E-Communication (N9EC-CNRM)

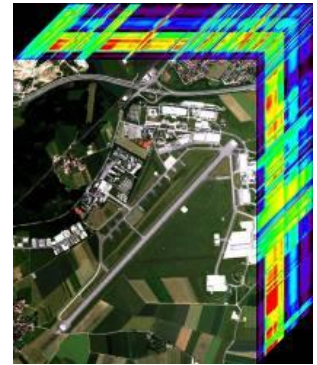
Transnational Activities (TA)

Joint Research Activities (JRA)

- JRA1.** HYLIGHT Improved Hyperspectral Image (HSI) processing using ALS and improved ALS processing using HSI (VITO)
- JRA2.** TGOE Development of robust calibration systems for core gas-phase chemical measurements made on-board research aircraft (UNIVLEEDS)

Transnational Access (TA)

- ▶ 3 instruments and 18 instrumented aircraft open to TA
- ▶ Support planned for 38 projects:
430 flight hours
- ▶ EU-FAR FP7 (2008-2013) Achievements:
 - Support allocated to 42 projects:
406 scientists and 503 flight hours



Transnational Access (TA)

- ▶ EUFAR Transnational Access call to **get 100% funded flight hours** for your experiments.
Check the EUFAR website for open calls for proposals and deadlines
- ▶ Expression of Interest
- ▶ Pre-review and evaluation process
- ▶ Eligibility criteria available at www.eufar.net

Transnational Access (TA)

▲ Three types of TA proposals can be submitted

- **Science projects**

Proposals for **scientific projects** (primary acceptance criterion is the quality and impact of the science)

- **Instrument development**

Proposals that involve the **testing or development of novel instrumentation** in any area of airborne atmospheric or geo-science research

- **Training courses**

Proposals to **host** a 1 week to 11 days **training course including flight experiment** can be submitted on any topic for which the measurement capabilities of the EUFAR fleet+instruments are relevant.
(primary acceptance criterion is the quality of the teaching)

On-line application at the EUFAR website



Transnational Access (TA)

▲ TA Eligibility criteria

- The applicants (leader and the majority of the group) must work in a institution established in a European Member State or Associated State;
- The applicants (leader and the majority of the group) must work in a country other than the country(ies) where the legal entity(ies) operating the selected aircraft and/or instrument is(are) established;
- Only groups that are entitled to disseminate the foreground that they have generated under the project are eligible to benefit from access.

EUFAR Activities

Networking Activities

- N1.** Strategy and European Integration (N1SEI-CNRM)
- N2.** TA and Open Access coordination (N2TAC-MetOffice)
- N3.** Future of the Fleet (N3FF-CNR)
- N4.** Expert Working Groups (N4EWG-Uni-Leipzig)
- N5.** Technology Transfer Office (N5TTO-ONERA)
- N6.** Education and Training (N6ET-VITO)
- N7.** Standards and Protocols (N7SP-DLR)
- N8.** Airborne Data Base (N8DB-STFC)
- N9.** E-Communication (N9EC-CNRM)

Transnational Activities (TA)

Joint Research Activities (JRA)

- JRA1.** HYLIGHT Improved Hyperspectral Image (HSI) processing using ALS and improved ALS processing using HSI (VITO)
- JRA2.** TGOE Development of robust calibration systems for core gas-phase chemical measurements made on-board research aircraft (UNIVLEEDS)

N4EWG – Expert Working

▲ Objectives:

- To improve the expertise among the specialized scientists in 12 fields of airborne research by organizing experts workshops
- To facilitate the transfer of expert knowledge to users, operators, and funding agencies

▲ EUFAR FP7 (2008-2013) Achievements:

- 20 Expert Working Groups
- 10 Expert Workshops organized
- EUFAR book on Airborne Measurements for Environmental Research, Methods and Instruments, Wiley, 2013
- ICARE conference, Nov. 2010, Toulouse



N4EWG – Expert Working Groups



▲ List of Expert Working Groups:

- **Support to airborne measurements:**
 - Certification/Operation (Gay Gratton)
 - Calibration/Validation (Tim Malthus-TBC)
 - Remotely Piloted Aircraft Systems (Joachim Reuder)
 - Quality Assurance/Control (Hans Schlager)

- **Specific measurement fields:**
 - Measurement of Aircraft State and Thermodynamic and Dynamic Parameters (Martin Zoeger)
 - In Situ Trace Gas Measurements (Jim McQuaid)
 - In Situ Measurements of Aerosol Particles (Paola Formenti)
 - In Situ Characterization of Clouds and Precipitation Particles (Christiane Voigt)
 - Aerosol and Cloud Particle Sampling (Martina Kraemer)
 - Atmospheric Radiation Measurements (Thomas Ruhtz)
 - Hyperspectral Remote Sensing (Eyal Ben-Dor and IIs Reusen)
 - Lidar and Radar Observations (Julien Delanoe)

www.eufar.net : list of expert working groups

The screenshot shows the EUFAR website interface. The top navigation bar includes 'About EUFAR', 'Aircraft & Experiments', 'EUFAR Activities' (circled in red), 'Search', and 'Members'. Below this, there are sub-links for 'Transnational Access', 'Education & Training', 'Expert Groups', and 'Overall Management'. The main content area is titled 'Description of Works' and 'Measurements:'. It features a sidebar with 'All', 'Support', and 'Specific Fields'. The main content is divided into two sections: 'Support to airborne measurements' and 'Specific measurement fields'. Each section contains a table with columns for 'Working groups designation' and 'Coordinator'.

Support to airborne measurements:

| Working groups designation | Coordinator |
|---|-----------------------------------|
| Calibration/Validation | Tim Malthus |
| Certification/Operation | Stefan Kommlaine |
| Data Processing | Daniel Schlaepfer |
| Imaging Sensors | Koen Meuleman |
| Instrument Integration | Phil Brown |

Specific measurement fields:

| Working groups designation | Coordinator |
|---|--------------------------------------|
| Active remote sensing | Jacques Pelon |
| Cloud Microphysics | Manfred Wendisch |
| Gas phase chemistry | Jim McQuaid |
| Hyperspectral Applications for Soil | Eval Ben-dor |
| Hyperspectral Applications for Vegetation | Michael Schaepman |
| Hyperspectral Applications for Water | Steve Groom |
| In-Situ Aerosols | Paola Formenti |
| Polar Research | J.Daill Kristiansson |

www.eufar.net: expert working groups details

The screenshot displays the EUFAR.net website interface. The top navigation bar includes 'About EUFAR', 'Aircraft & Experiments', 'EUFAR Activities', 'Search', and 'Members'. Below this, there are sub-links for 'Transnational Access', 'Education & Training', 'Expert Groups', 'JRA', and 'Overall Management'. The main content area is titled 'Expert Working-Groups / Certification and Operations' and features tabs for 'Description', 'Meetings', 'Documents', and 'Mailing-Lists'. A red circle highlights the 'Expert Working-Groups / Certification and Operations' breadcrumb and the 'Description' tab. The 'Description' tab shows a list of members, including 'Brenquier Jean-louis', 'Purcell Peter', 'Harbers Volkert', 'Pontaud Marc (coordinator)', 'Mathieu Eric', 'Neininger Bruno', 'Lindemann Carsten', 'Diaz de aguilar Javier', 'Vironmaki Jouko', 'Ball Steve', 'Kommallein Stefan', and 'Schell Dieter'. A red arrow points from a text box to the 'Click here to ask to the EWG coord' link. The 'Documents' tab is also highlighted with a red circle and shows a table of general documents. The 'Meetings' tab is highlighted with a red circle and shows a list of meetings. The bottom of the page features logos for 'European Facility For Airborne Research', 'esa', 'Poznan University of Life Sciences', and 'Innova'.

EUFAR.net
European Fleet for Airborne Research

home

About EUFAR Aircraft & Experiments EUFAR Activities Search Members

Transnational Access Education & Training Expert Groups JRA Overall Management

Expert Working-Groups / Certification and Operations

Description Meetings Documents Mailing-Lists

Certification and Operations

The information displayed on this website is subject to change.
Its nature is only indicative, and confirmation will only...

Members of Certification and Operations working group:

- Brenquier Jean-louis
- Purcell Peter
- Harbers Volkert
- Pontaud Marc (coordinator)
- Mathieu Eric
- Neininger Bruno
- Lindemann Carsten
- Diaz de aguilar Javier
- Vironmaki Jouko
- Ball Steve
- Kommallein Stefan
- Schell Dieter

You are interested in the activity of
Click [here](#) to ask to the EWG coord

Expert Working-Groups / Certification and Operations

Description Meetings Documents Mailing-Lists

General Documents :

| Title | Author(s) | Document type | Size (Octets) | Extension |
|---|---------------------------|-------------------------|---------------|-----------|
| NLR-CR-2003-427 Design of a fairing for a laser/scanner window in the Cessna Citation | | Technical documentation | 4,971,059 | zip |
| NLR-CR-2004-175 - Certification Flight Tests of a Fairing Mounted | W.j.a. Bonnee M. Laban | Technical documentation | 4,344,633 | pdf |

Meeting Documents :

| Title | Author(s) | Document type | Size (Octets) | Extension | Meeting |
|---|-----------|---------------|---------------|-----------|---------|
| FP6 - 1st Certification and Operational Issues EWG meeting (27/09/05): DLR presentation 2 | | | | | |
| FP6 - 1st Certification and Operational Issues EWG meeting (27/09/05): FUB presentation | | | | | |
| FP6 - 1st Certification and Operational Issues EWG meeting (27/09/05): GTK presentation | | | | | |
| FP6 - 1st Certification and Operational Issues EWG meeting (27/09/05): MET AIR presentation | | | | | |
| FP6-1st Certification&OperationalIssues EWG meeting agenda | | | | | |
| FP6: 1st Certification&Operational Issues: EWG meeting 2 agenda | | | | | |
| FP6: 1st Certification&Operational Issues: EWG meeting 2 coordinator presentation | | | | | |
| FP6: 1st Certification&Operational Issues: EWG meeting 2 DLR presentation | | | | | |

Expert Working-Groups / Certification and Operations

Description Meetings Documents Mailing-Lists

Meetings of Certification and Operations

| Meeting designation | Location |
|---|-------------------|
| FP6: EASA meeting (25/01/2006) | Cologne (Germany) |
| FP6: 1st Certif&Op. Issues EWG meeting (27/09/05) | Toulouse |

Interested in joining an Expert Working Group, click here to ask the EWG leader

European Facility For Airborne Research

esa

Poznan University of Life Sciences

Innova

EUFAR Activities

Networking Activities

- N1.** Strategy and European Integration (N1SEI-CNRM)
- N2.** TA and Open Access coordination (N2TAC-MetOffice)
- N3.** Future of the Fleet (N3FF-CNR)
- N4.** Expert Working Groups (N4EWG-Uni-Leipzig)
- N5.** Technology Transfer Office (N5TTO-ONERA)
- N6.** Education and Training (N6ET-VITO)
- N7.** Standards and Protocols (N7SP-DLR)
- N8.** Airborne Data Base (N8DB-STFC)
- N9.** E-Communication (N9EC-CNRM)

Transnational Activities (TA)

Joint Research Activities (JRA)

- JRA1.** HYLIGHT Improved Hyperspectral Image (HSI) processing using ALS and improved ALS processing using HSI (VITO)
- JRA2.** TGOE Development of robust calibration systems for core gas-phase chemical measurements made on-board research aircraft (UNIVLEEDS)

EUFAR N7SP

Objectives

- To develop, expand and implement common protocols for airborne surveys and airborne data handling in consensus with international initiatives towards standardization and harmonization.
- To support users and operators with recommendations on best practice and state-of-the-art software for airborne data pre-processing and further analysis.
- To develop, maintain and publish open source software toolboxes for higher level data products, and data analysis.
- To define and help implement standards for data transfer in real-time.



EUFAR N7SP

Achievements

- **Common protocols and metadata** conforming to existing European and American airborne science best practices were developed and disseminated to the EUFAR community.
- **Best practices** for data pre-processing have been published for users and operators on the EUFAR website ; this includes a list of existing software and a report on processing software performance, availability and adaptability.
- Development of **EGADS (EUFAR General Airborne Data-processing Software)** - a Python-based toolbox for processing airborne data ; EGADS provides a framework for researchers to apply expert-contributed algorithms to data files, and acts as a platform for data intercomparison.
- Development of the **EUFAR Metadata Creator**, to allow the production of metadata for a particular dataset to facilitate data storage and searches for Airborne Scientific Campaigns. XML files generated by this version conform to v1.3 of the INSPIRE metadata and XML Standard.
- Development of the **Airborne Science Mission Metadata Creator**, to allow the creation of a standard set of mission reports, aiding in classification and searches of data sets based on flight phenomena, mission parameters or other criteria.



EUFAR N7SP

Achievements

- Development of **EGADS (EUFAR General Airborne Data-processing Software)** - a Python-based toolbox for processing airborne data; EGADS provides a framework for researchers to apply expert-contributed algorithms to data files, and acts as a platform for data intercomparison.

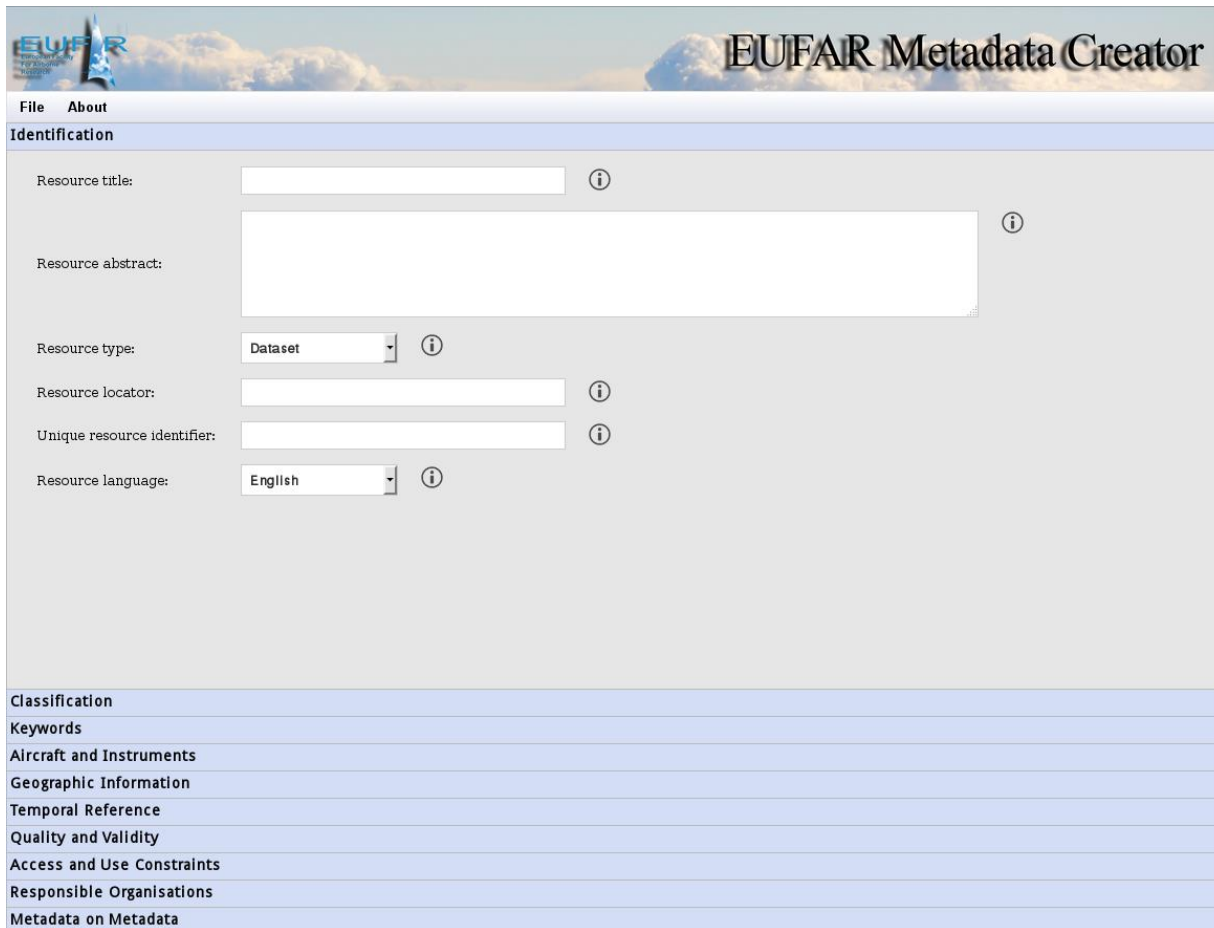
```
henryo@lxeufar2:~  
Fichier Édition Affichage Rechercher Terminal Aide  
lxeufar2:/home/henryo => python  
Python 2.7.9 (default, Dec 13 2014, 22:06:10)  
[GCC 4.8.2] on linux2  
Type "help", "copyright", "credits" or "license" for more information.  
>>> import egads  
>>> egads.  
egads.EgadsAlgorithm(      egads.__new__(          egads.core  
egads.EgadsData(          egads.__package__      egads.get_file_list(  
egads.__author__          egads.__path__         egads.input  
egads.__class__(          egads.__reduce__(      egads.os  
egads.__date__            egads.__reduce_ex__(   egads.path  
egads.__delattr__(        egads.__repr__(        egads.site  
egads.__dict__            egads.__revision__     egads.sys  
egads.__doc__             egads.__setattr__(     egads.test(  
egads.__file__            egads.__sizeof__(      egads.tests  
egads.__format__(         egads.__str__(         egads.thirdparty  
egads.__getattr__(        egads.__subclasshook__(egads.units  
egads.__hash__(           egads.__version__      egads.ver  
egads.__init__(           egads._version  
egads.__name__            egads.algorithms  
>>> egads.[]
```



EUFAR N7SP

Achievements

- Development of the **EUFAR Metadata Creator**, to allow the production of metadata for a particular dataset to facilitate data storage and searches for Airborne Scientific Campaigns. XML files generated by this version conform to v1.3 of the INSPIRE metadata and XML Standard.



The screenshot shows the 'EUFAR Metadata Creator' web application. The interface includes a header with the EUFAR logo and the title 'EUFAR Metadata Creator'. Below the header is a navigation menu with 'File' and 'About'. The main content area is titled 'Identification' and contains several input fields and dropdown menus, each with an information icon (i):

- Resource title:
- Resource abstract:
- Resource type:
- Resource locator:
- Unique resource identifier:
- Resource language:

Below the 'Identification' section are several other sections, each with a blue header:

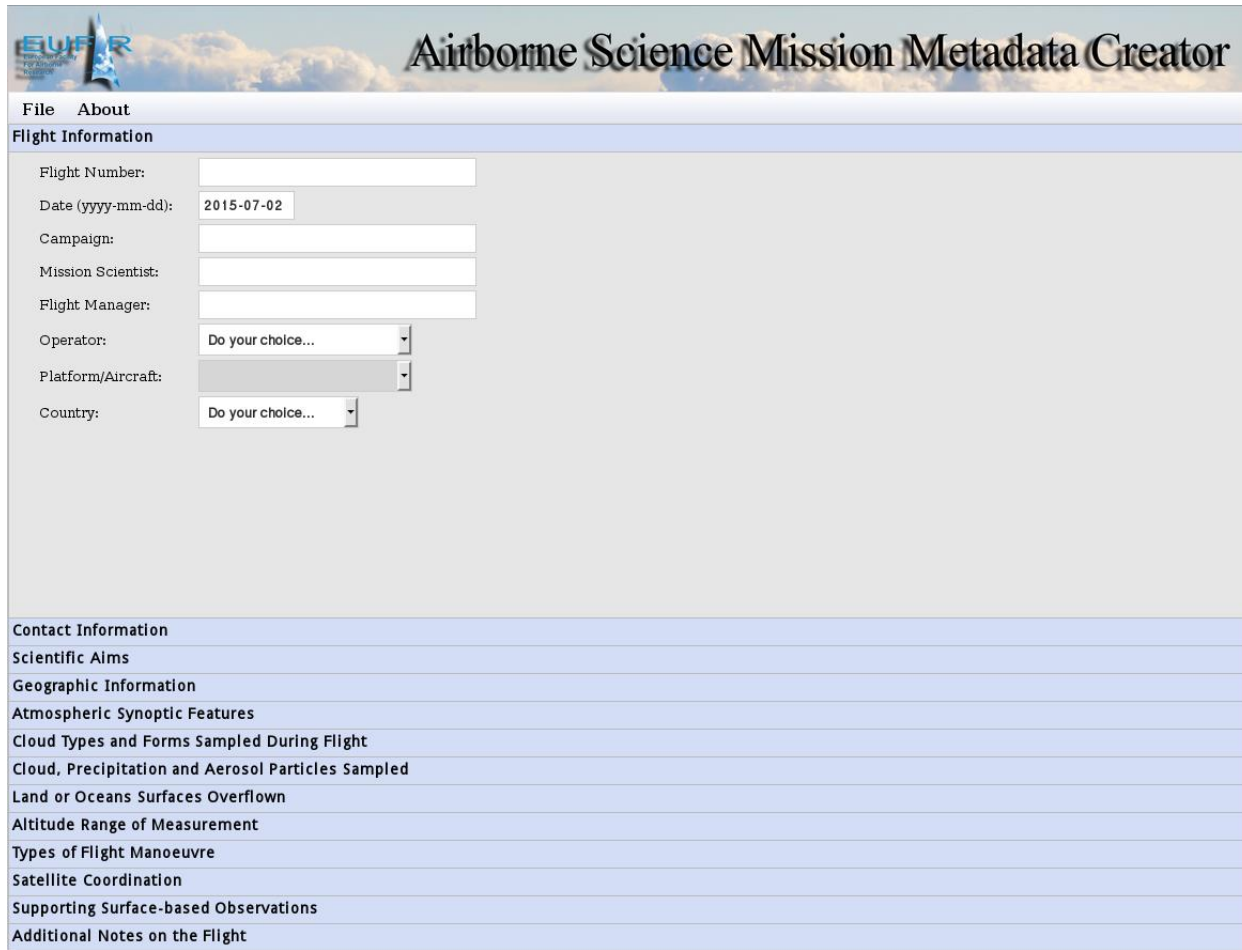
- Classification
- Keywords
- Aircraft and Instruments
- Geographic Information
- Temporal Reference
- Quality and Validity
- Access and Use Constraints
- Responsible Organisations
- Metadata on Metadata



EUFAR N7SP

Achievements

- Development of the **Airborne Science Mission Metadata Creator**, to allow the creation of a standard set of mission reports, aiding in classification and searches of data sets based on flight phenomena, mission parameters or other criteria.



The screenshot displays the 'Airborne Science Mission Metadata Creator' web application. The interface features a header with the EUFAR logo and the application title. Below the header is a navigation menu with 'File' and 'About' options. The main content area is divided into several sections, each with a blue header bar:

- Flight Information**: This section contains several input fields and dropdown menus:
 - Flight Number:
 - Date (yyyy-mm-dd):
 - Campaign:
 - Mission Scientist:
 - Flight Manager:
 - Operator:
 - Platform/Aircraft:
 - Country:
- Contact Information**
- Scientific Aims**
- Geographic Information**
- Atmospheric Synoptic Features**
- Cloud Types and Forms Sampled During Flight**
- Cloud, Precipitation and Aerosol Particles Sampled**
- Land or Oceans Surfaces Overflown**
- Altitude Range of Measurement**
- Types of Flight Manoeuvre**
- Satellite Coordination**
- Supporting Surface-based Observations**
- Additional Notes on the Flight**



ophysiological Processes

EUFAR Activities

Networking Activities

- N1.** Strategy and European Integration (N1SEI-CNRM)
- N2.** TA and Open Access coordination (N2TAC-MetOffice)
- N3.** Future of the Fleet (N3FF-CNR)
- N4.** Expert Working Groups (N4EWG-Uni-Leipzig)
- N5.** Technology Transfer Office (N5TTO-ONERA)
- N6.** Education and Training (N6ET-VITO)
- N7.** Standards and Protocols (N7SP-DLR)
- N8.** Airborne Data Base (N8DB-STFC)
- N9.** E-Communication (N9EC-CNRM)

Transnational Activities (TA)

Joint Research Activities (JRA)

- JRA1.** HYLIGHT Improved Hyperspectral Image (HSI) processing using ALS and improved ALS processing using HSI (VITO)
- JRA2.** TGOE Development of robust calibration systems for core gas-phase chemical measurements made on-board research aircraft (UNIVLEEDS)

EUFAR N8DB – Database

Objectives

- To provide online access to data collected by EUFAR funded projects (mainly under TA), by
 - ❑ Linking to existing aircraft data archives
 - ❑ Providing secure, accessible, online storage for data not in an archive
- Data are stored in standard formats with well-documented metadata
- EUFAR data are publicly available but you need to register

The screenshot shows the EUFAR website interface. At the top, there is a navigation bar with links: 'About EUFAR', 'Aircraft & Experiments', 'EUFAR Activities', 'Search', and 'Members'. Below this is a secondary navigation bar with links: 'EUFAR Presentation', 'Members Directory', 'Contact', 'Links', 'FAQ', and 'Help'. The main content area starts with a 'Welcome to EUFAR' message, followed by a paragraph describing EUFAR as an Integrating Activity funded by the European Commission under FP5/FP6/FP7. Below this is a row of six buttons: 'Operators', 'Transnational Access', 'Education & Training', 'Expert Working Groups', 'Standards & Protocols', and 'EUFAR Data Archive'. The 'EUFAR Data Archive' button is circled in red. Below the buttons is a 'What's new? Get the EUFAR network news!' section with several news items, including information about funding bids, training courses, and measurement flights.

For details and to access data use link from
EUFAR web page
or
badc.nerc.ac.uk/data/eufar/

SWAMP reporting!

- ▲ Evaluation forms
 - to be completed on last day of training course
- ▲ Student reports
 - to be submitted on-line
 - due **15/08/2015**
- ▲ Working group scientific reports
 - to be sent to bureau@eufar.net
 - examples and **template** available at www.eufar.net
 - due **15/12/2015**

Student reports

Reusen IIs as reuseri Thu 26 Aug 2010 10:09:55 | [Disconnect](#)

EUFAR
European Facility
For Airborne
Research

About EUFAR Aircraft & Experiments EUFAR Activities Search **Members**

Data Manag. / Back-Office Subscribe Unsubscribe

To Do

◀ Use left menus to access your records

Data Management
(EUFAR Back-Office)


Add (or update) your aircraft, instruments, addresses, publications, documents, ...

Management:

- To Do
- ▣ Personal Data
- ▣ Aircraft & Experiment
- Expert groups
- Meetings
- Documents/Publications
- Mailing lists
- ▣ Transnational Access
- Education & Training**
- Back-Office Help

Student reports

Reusen IIs as reusen Thu 26 Aug 2010 10:09:55 | [Disconnect](#)



[About EUFAR](#)
[Aircraft & Experiments](#)
[EUFAR Activities](#)
[Search](#)
[Members](#)

[Data Manag. / Back-Office](#)

[Subscribe](#)

[Unsubscribe](#)

| | | | | |
|----------------------|-------------------------|-------------------------------------|------------------------|----------------------------|
| SACHSPERGER Johannes | i-WAKE2 | ET-EC - 264 summary | Accepted | Assessment |
| LONITZ Katrin | TETRAD | ET-TC - 263 summary | Accepted | Assessment |
| CHANDRA Arunchandra | TETRAD | ET-TC - 262 summary | Accepted | Assessment |
| BORDAS Arpad | TETRAD | ET-TC - 261 summary | Accepted | Assessment |
| GORSKA Anna | TETRAD | ET-TC - 260 summary | Accepted | Assessment |
| FIORI Elisabetta | TETRAD | ET-TC - 259 summary | Accepted | Assessment |
| RISIUS Steffen | TETRAD | ET-TC - 258 summary | Accepted | Assessment |
| RADULESCU Razvan | TETRAD | ET-TC - 257 summary | Accepted | Assessment |
| BOSCORNEA Andreea | TETRAD | ET-TC - 256 summary | Accepted | Assessment |
| BEITZEL Tamara | TETRAD | ET-TC - 255 summary | Accepted | Assessment |
| MOMFERRATOS Giorgos | TETRAD | ET-TC - 254 summary | Accepted | Assessment |
| DIWAN Sourabh | TETRAD | ET-TC - 253 summary | Accepted | Assessment |
| BOLBASOVA Lidia | TETRAD | ET-TC - 252 summary | Accepted | Assessment |
| SOUAMI Damya | TETRAD | ET-TC - 251 summary | Accepted | Assessment |
| KATZWINKEL Jeannine | TETRAD | ET-TC - 250 summary | Accepted | Assessment |
| HACHELAF Rabah | TETRAD | ET-TC - 249 summary | Accepted | Assessment |
| SAHOO Ganapati | TETRAD | ET-TC - 248 summary | Accepted | Assessment |
| AMPE Eva | TETRAD | ET-TC - 247 summary | Waiting for Evaluation | Validation |
| DL GENOVA Nicoletta | MORE | ET-EC - 246 summary | Accepted | Assessment |

Management:

- To Do
- ▣ Personal Data
- ▣ Aircraft & Experiment
- Expert groups
- Meetings
- Documents/Publications
- Mailing lists
- ▣ Transnational Access
- Education & Training

Back-Office Help

[Report bugs](#)
[Contact](#)
[Website Terms of Use Eufar ©](#)

Student reports

Reusen IIs as reusen Thu 26 Aug 2010 10:09:55 | [Disconnect](#)

EUFR
European Facility
For Airborne
Research

About EUFR Aircraft & Experiments EUFR Activities Search **Members**

[Data Manag. / Back-Office](#) [Subscribe](#) [Unsubscribe](#)

Management:

- To Do
- ▣ Personal Data
- ▣ Aircraft & Experiment
- Expert groups
- Meetings
- Documents/Publications
- Mailing lists
- ▣ Transnational Access
- Education & Training

Back-Office Help

Decision: Accepted
Background OK.

Evaluation from the Research Project coordinator (Alessandra Sabina LANOTTE):
Decision: Accepted
OK. very young, but involved in experimental measurement of warm clouds. Interest for the school is evident and well described.

Final Decision:
Accepted

Final Report:
Main achievements / difficulties encountered:

Comments / evaluation from Research Project coordinator:
Soon available

Report due 15/08/2012

Working group scientific report – template



Reusen IIs as reusen/ Tue 19 Jul 2011 11:43:41 | [Disconnect](#)

[About EUFAR](#) [Aircraft & Experiment](#) [EUFAR Activities](#) [Search](#) [Members](#)

[Transnational Access](#) [Education & Training](#) [Expert Groups](#) [JRA](#) [Overall Management](#)

visit to aircraft/instrument operators for exchange of knowledge and know-how. (ET-VO)

EUFAR provides 100% support for:

- ▶ Training
- ▶ Flight costs of research aircraft and instruments
- ▶ Travel and Subsistence (T&S) expenses (reimbursement rules available [here](#))

- [Register to a Training Course on airborne research! \(ET-TC\)](#)

EUFAR organizes training courses for promoting airborne research in the European academic community. The courses provide a theoretical background on Earth Sciences and associated physical processes, as well as training on airborne instrumentation, measurement, data processing and analysis. The participants are also trained by aircraft operators on issues specific to airborne operation. Depending on operators restrictions, participants might have the opportunity to design a flight plan and participate to a flight experiment. The data are then processed and analyzed with the support of tutors, who are experienced users of airborne facilities. The selection of the participants is performed by the EUFAR Education and Training evaluation committee. After the training course, the participants will be requested to write a scientific report.

[Details of Training Courses and how to apply](#)

- [Join an existing field campaign! \(ET-EC\)](#)

EUFAR gives the opportunity for students/teachers to join an existing research campaign and work with the researchers and the aircraft operator. The list of research

[Report bugs](#) [Contact](#) [Website Terms of Use Eufar ©](#)

Working group scientific report - template

The image shows a screenshot of the EUFAR website. The top navigation bar includes 'About EUFAR', 'Aircraft & Experiments', 'EUFAR Activities', 'Search', and 'Members'. Below this, there are sub-navigation links: 'Transnational Access', 'Education & Training', 'Expert Groups', 'JRA', and 'Overall Management'. The main content area is divided into two sections. The left section, titled 'Education & Training', lists 'Upcoming EUFAR Training Courses' and 'Next Training Courses in environmental sciences'. A red circle highlights a link to download the training course flyer. The right section, titled 'Working Group', lists 'Programme' and 'Scientific Working Group reports'. A red circle highlights a link to download the Scientific Working Group report template. The bottom of the image features logos for EUFAR, ESA, and Poznan University of Life Sciences, along with a banner for the 'OPTIMISE' project.

Reusable as reuser/ Thu 2 Jul 2015 16:13:04 | Disconnect

About EUFAR Aircraft & Experiments **EUFAR Activities** Search Members

Transnational Access Education & Training Expert Groups JRA Overall Management

Education & Training:

- Upcoming EUFAR Training Courses:

6th EUFAR – OPTIMISE Training Course on "Spectrometry of a Wetland"

This training course is hosted by the Poznan University of Life Sciences by the FP7 European Facility for Airborne Research (EUFAR) and CO

- To download the training course flyer, click [here](#).
- For more information, click [here](#).

- Next Training Courses in environmental sciences:

None

- Previous courses

Information on previous EUFAR and non-EUFAR training courses can be

Back to EUFAR - Summer School (Alt+Left)

About EUFAR Aircraft & Experiments **EUFAR Activities** Search Members

Transnational Access Education & Training Expert Groups JRA Overall Management

Education & Training:

- Programme:

From July 6-16 2015, self introduction of students, lectures (theory and case studies), tutorials, demonstration and training in ground equipment and UAVs, and -if the aircraft flight planning and APEX imaging spectroradiometer are planned. Participants with the assistance of Scientific Working Group leaders and the APEX flight campaign manager and operator will be able to sampling strategies and APEX flight plans for acquiring data of the POLWET wetland study site. If the weather conditions allow, scientific flights over the POLWET study site will be performed July 2015. In parallel with the flight campaign, (near-)ground measurements will be performed by the Scientific Working Groups at the POLWET site. Archived and acquired data will be provided by experienced tutors.

On 16 July 2015, the Scientific Working Groups will present their experiment and preliminary results based on data acquired during the training course or archived data.

A final programme is available [here](#).

The programme is subject to changes caused by weather conditions.

- Presentations:

Not available yet.

- Scientific Working Group reports:

Not available yet.

- Venue:

To download the Scientific Working Group report template, click [here](#)

Report bugs Contact

EUFAR European Facility For Airborne Research

esa

Poznan University of Life Sciences

OPTIMISE Innovative Optical Tools for Proximal Sensing of Ecophysiological Processes

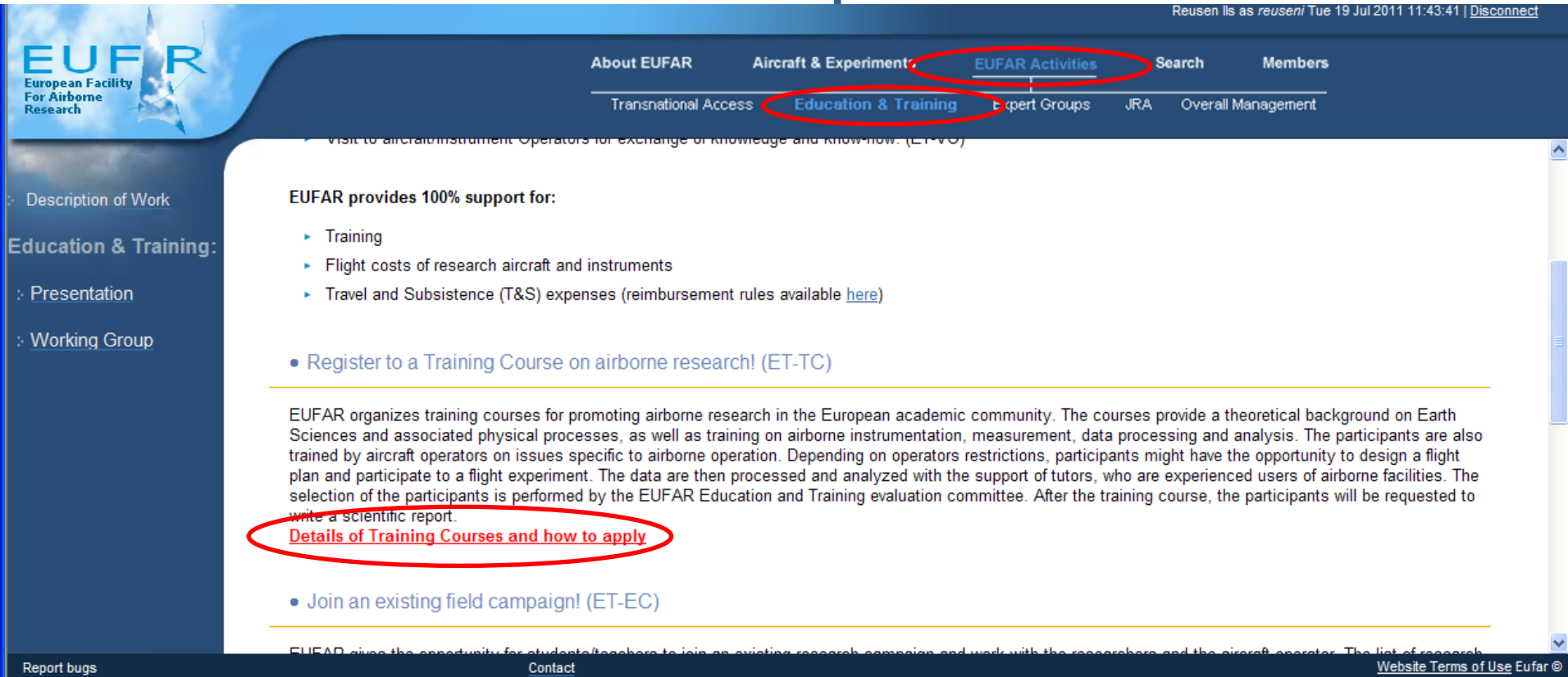
Reports due 15/12/2015!



Poznan University of Life Sciences



Working group scientific report – example



Reusen IIs as reusen/ Tue 19 Jul 2011 11:43:41 | [Disconnect](#)

[About EUFAR](#) [Aircraft & Experiment](#) [EUFAR Activities](#) [Search](#) [Members](#)

[Transnational Access](#) [Education & Training](#) [Expert Groups](#) [JRA](#) [Overall Management](#)

visit to aircraft/instrument operators for exchange of knowledge and know-how. (ET-VO)

EUFAR provides 100% support for:

- ▶ Training
- ▶ Flight costs of research aircraft and instruments
- ▶ Travel and Subsistence (T&S) expenses (reimbursement rules available [here](#))

- [Register to a Training Course on airborne research! \(ET-TC\)](#)

EUFAR organizes training courses for promoting airborne research in the European academic community. The courses provide a theoretical background on Earth Sciences and associated physical processes, as well as training on airborne instrumentation, measurement, data processing and analysis. The participants are also trained by aircraft operators on issues specific to airborne operation. Depending on operators restrictions, participants might have the opportunity to design a flight plan and participate to a flight experiment. The data are then processed and analyzed with the support of tutors, who are experienced users of airborne facilities. The selection of the participants is performed by the EUFAR Education and Training evaluation committee. After the training course, the participants will be requested to write a scientific report.

[Details of Training Courses and how to apply](#)

- [Join an existing field campaign! \(ET-EC\)](#)

EUFAR gives the opportunity for students/teachers to join an existing research campaign and work with the researchers and the aircraft operator. The list of research

[Report bugs](#) [Contact](#) [Website Terms of Use Eufar ©](#)

Working group scientific report - example

Reusen lis as reusen/ Tue 19 Jul 2011 12:12:20 | Disconnect



About EUFAR

Aircraft & Experiments

EUFAR Activities

Search

Members

Transnational Access

Education & Training

Expert Groups

JRA

Overall Management

Working Group Scientific Report template is available [here](#). Deadline for submission of Working Group Scientific Reports to bureau@eufar.net is **15/12/2010**.

1st EUFAR FP7 Training Course On "Advanced Digital Remote sensing in Ecology and earth Sciences Summer School (ADDRESS)

This training course has been organized by the Balaton Limnological Research Institute (BLRI) from August 19th to 28th 2010, at Tihany, Hungary.

Flyer [here](#).

More information is available [here](#).

Working Group Scientific Report template is available [here](#). Deadline for submission of Working Group Scientific Reports to bureau@eufar.net is **15/12/2010**.

• Past EUFAR FP6 Training Courses:

2nd EUFAR FP6 Training Course On Airborne Cloud and Aerosol Science (ACAS)

This training course took place on April 17-25th 2008 in Utrecht, The Netherlands.

Registrations closed on January 10th 2008 and selection process ended on February 1st 2008.

More information is available [here](#).

1st EUFAR FP6 Training Course on Boundary Layer Research with Instrumented aircraft (SERAI)

This training course took place on July 10-20th 2007 in Iasi, Romania.

Registrations closed on May 11th 2007 and selection process ended on May 29th 2007.

More information is available [here](#).



Print

Report bugs

Contact

[Website Terms of Use Eufar](#) ©



Working group scientific report - example

Reusen IIs as reusen Thu 26 Aug 2010 10:09:55 | Disconnect

EUFR
European Facility
For Airborne
Research

About EUFR Aircraft & Experiments **EUFR Activities** Search Members

Transnational Access **Education & Training** Expert Groups JRA Overall Management

Description of Work

Education & Training:

Presentation

Working Group

The three flights of 2h20min each with students on board (6 students per flight) were performed on April 22nd, 23rd and 24th in the morning.

- Students Scientific reports

- ▶ [Report Group 1: T.Hamburger, K.Ardon, D.Perez, B.Aouizerats, H.Macintyre, L.Belegante](#)

Flight B358 22/04/08, 08:32-10:59 UTC

The main aim of the flight is to investigate the atmospheric and aerosol properties of two different air masses, and look at the variation within them. In order to achieve this, runs will be planned in two different locations (which will depend heavily on the meteorology). We also wish to examine these properties within the boundary layer and above it (in the free troposphere). We therefore plan to make observations at different heights in our two locations (i.e. a 'stacked profile').

- ▶ [Report Group 2: W.Frey, K.Markakis, M.Blackett, C.Chou, B.Takacs, A.Calvo](#)

Flight B359 23/04/08, 08:21-10:45 UTC

Our flight had two main objectives which were based on a number of observations including weather and air quality forecasts. The first was to examine the response of polluted plumes from central Europe to changes in boundary layer stability. Based on the weather forecast it was expected that a south easterly airflow would carry polluted air masses from the industrialised central Europe to the region of the North Sea where the flight would take place. Thus, measurements of horizontal and vertical profiles within the boundary layer were necessary in the area where high concentrations were expected. The second objective was to examine the relationship between aerosol and cloud particle concentrations in cirrus clouds. The cirrus clouds were forecasted to come in front of a frontal system approaching from the west and this seemed an ideal opportunity to examine this relationship.

Report bugs Contact [Website Terms of Use Eufar ©](#)

Contact person

For more info on
EUFAR Education and Training opportunities

Contact

Dr. Ils Reusen

VITO

Boeretang 200

2400 Mol

Belgium

+32 14 33 68 62

ils.reusen@vito.be



Contact person

For more info on
EUFAR Transnational and Open Access

Contact

bureau@eufar.net

or

Phil Brown

phil.brown@metoffice.gov.uk



Contact person

For more info on
EUFAR Expert Working Groups

Contact

Manfred Wendish

m.wendisch@uni-leipzig.de



Contact person

For more info on
EUFAR DB

Contact

Dr. Wendy Garland

BADC-STFC, UK

wendy.garland@stfc.ac.uk



Contact person

For more info on
EUFAR SP

Contact

Stefanie Holzwarth

DLR, DE

Stefanie.holzwarth@dlr.de



TETRAD

ADDRESS



I wish you
all an
interesting
SWAMP training
course!

Spread
the
knowledge!



Looking forward to meeting you at one of the next EUFAR activities!



To apply:
www.eufar.net

