Poznan University of Life Sciences

METEOROLOGY DEPARTMENT · 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

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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 Trans-national Access

www.eufar.net

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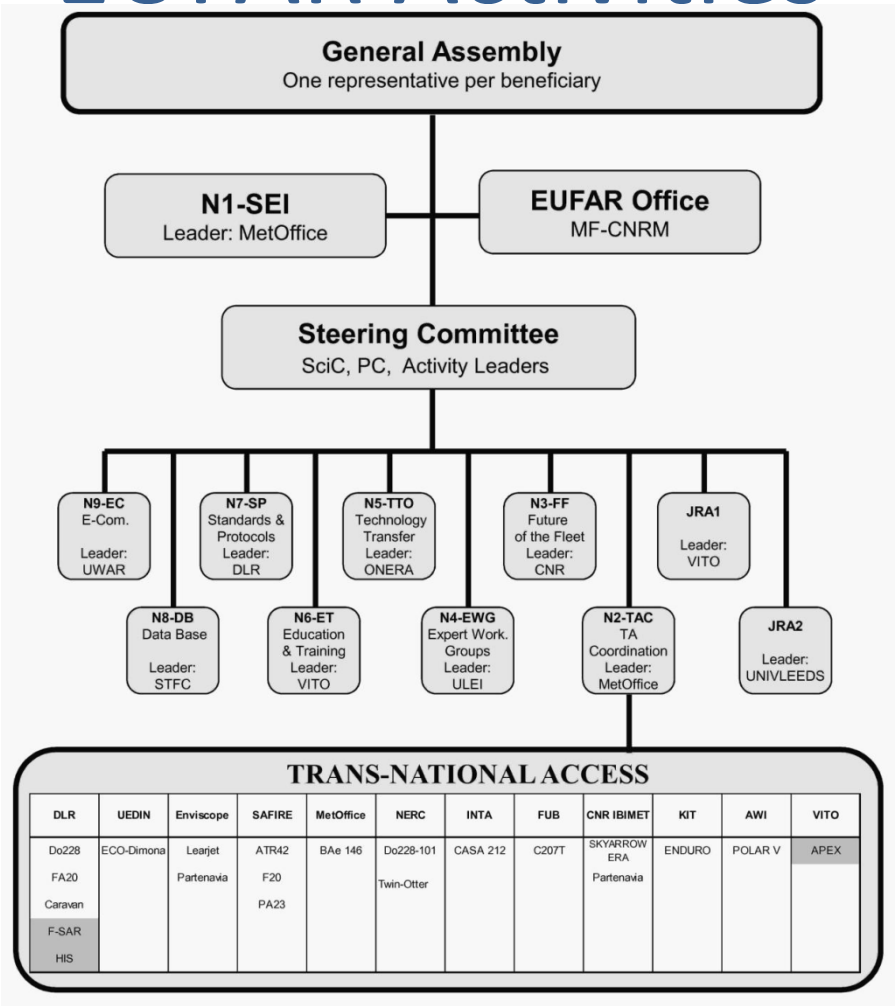
OPTIMISE

Innovative Optical Tools for Proximal Sensing of Ecophysiological Processes

EUFAR Activities



DLR	UEDIN	Enviscope	SAFIRE	MetOffice	NERC	INTA	FUB	CNR IBIMET	KIT	AWI	VITO
Do228 FA20 Caravan F-SAR HIS	ECO-Dimona	Learjet Partenavia	ATR42 F20 PA23	BAe 146	Do228-101 Twin-Otter	CASA 212	C207T	SKYARROW ERA Partenavia	ENDURO	POLAR V	APEX

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Innovative Optical Tools for Proximal Sensing of Ecophysiological Processes

HyperSpectral Imaging sensors open to TA

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

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Joint Research Activities (JRA)

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JRA2. TGOE Development of robust calibration systems for core gas-phase chemical measurements made on-board research aircraft (UNIVLEEDS)

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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)

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EUFAR supports

- EUFAR 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

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Training Courses (1/5)

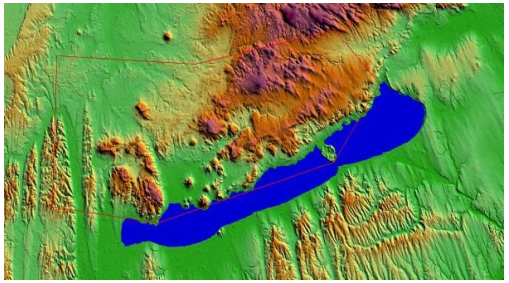
- **ADDRESSS** training course, 19-28 August 2010, Tihany, Hungary (72 registrations received, 20 selected for EUFAR funding)

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

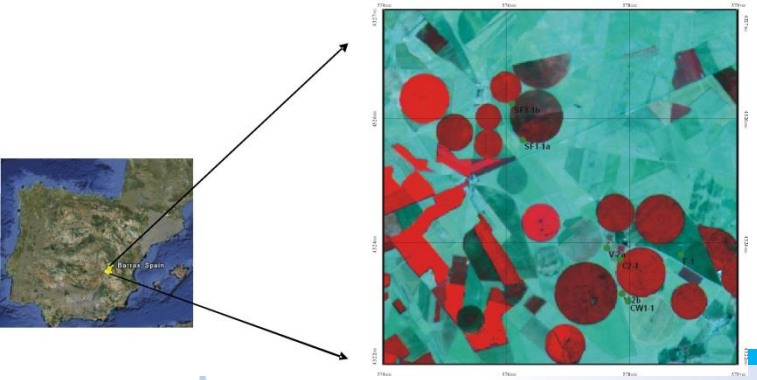
  Sensors: various

  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



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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

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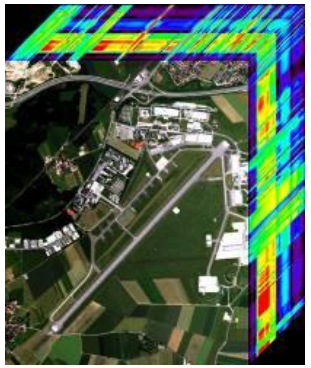
Transnational Access (TA)

- 3 instruments and 18 instrumented aircraft open to TA
- Support planned for 38 projects:

  430 flight hours

- <u>EUFAR FP7 (2008-2013) Achievements:</u>
  - Support allocated to 42 projects:

  406 scientists and 503 flight hours



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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.

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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

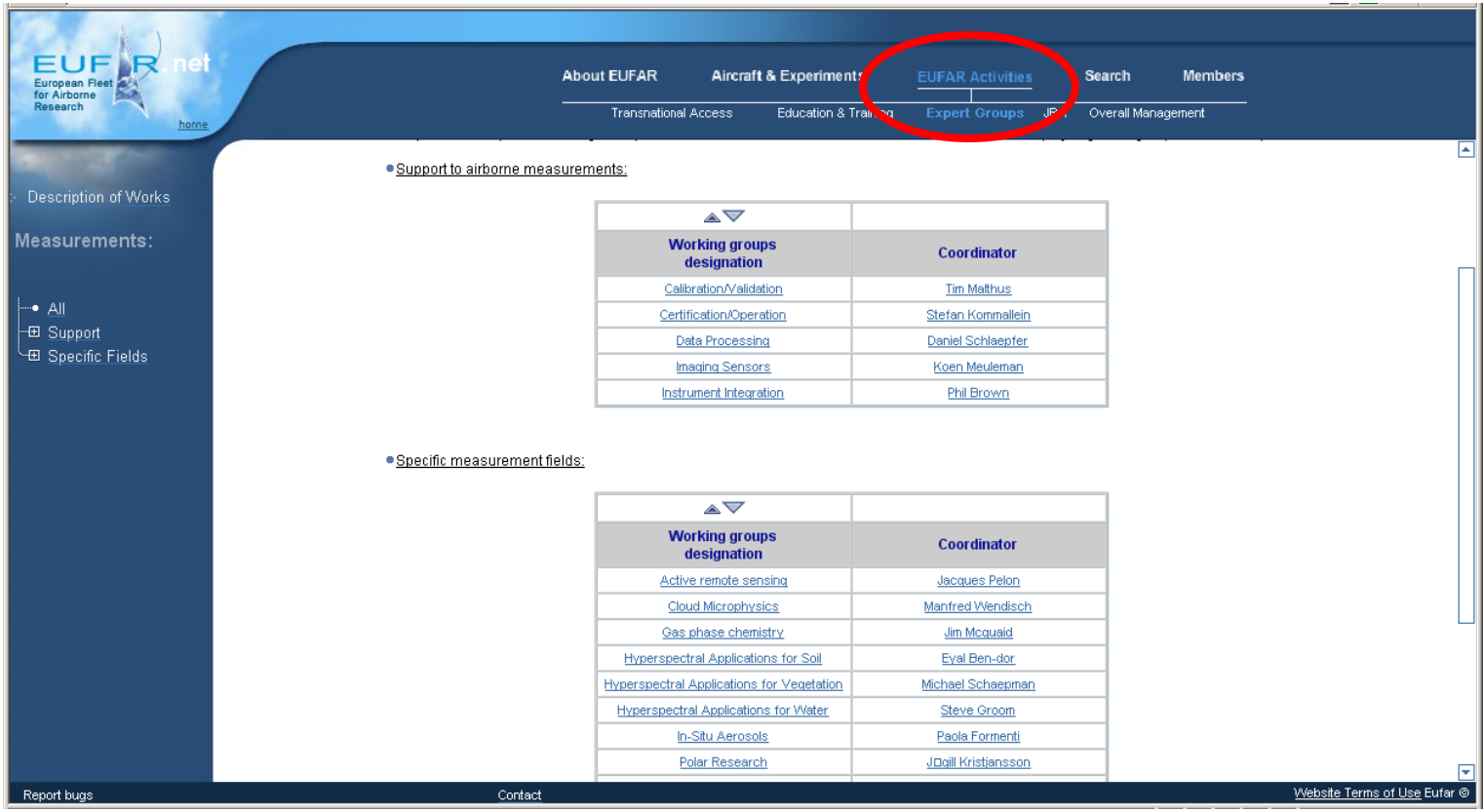
N4EWG – Expert Working Groups

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 Ils Reusen)
  - ❑ Lidar and Radar Observations (Julien Delanoe)

www.eufar.net : list of expert working groups



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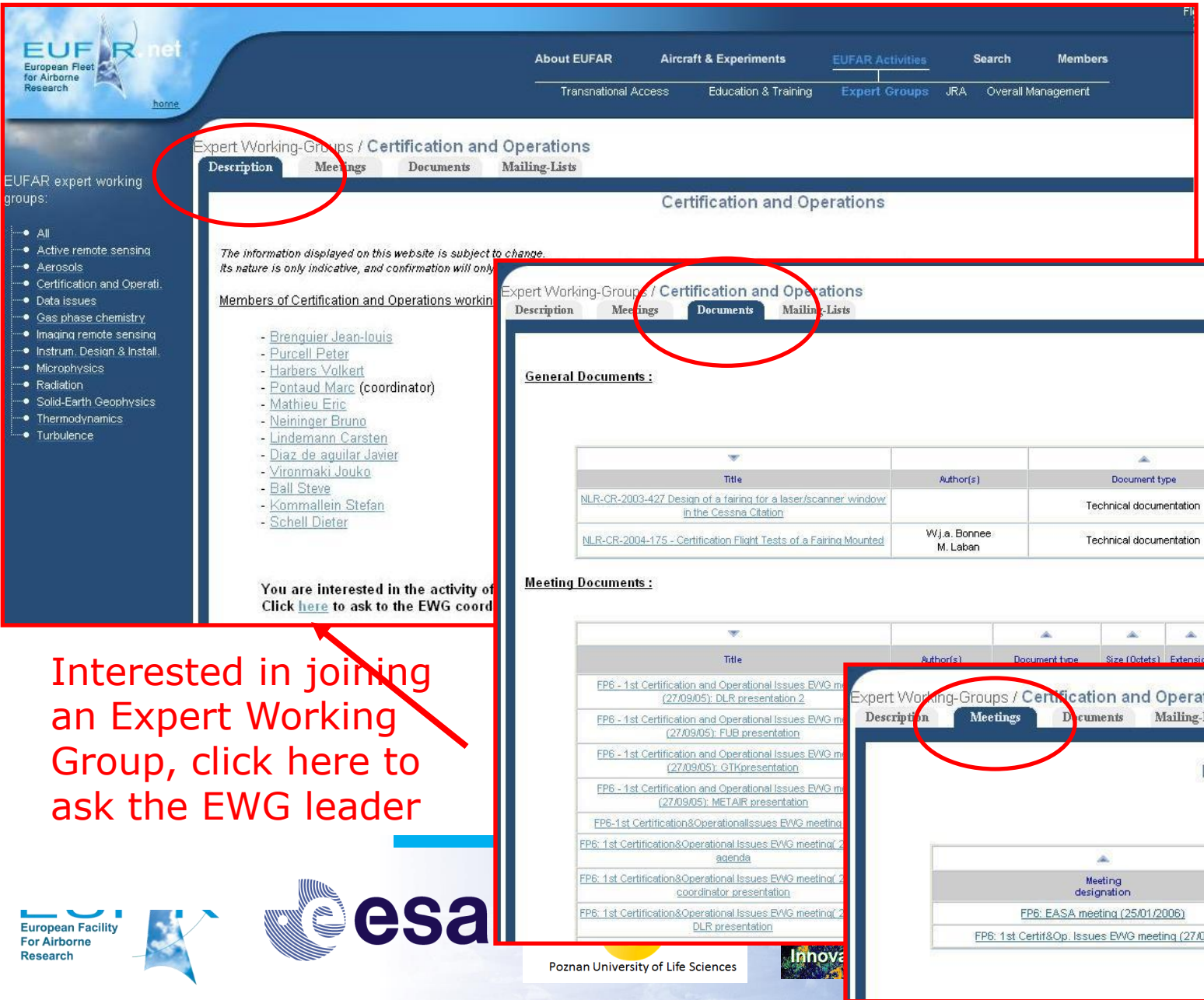
www.eufar.net: expert working groups details



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

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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.

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Achievements

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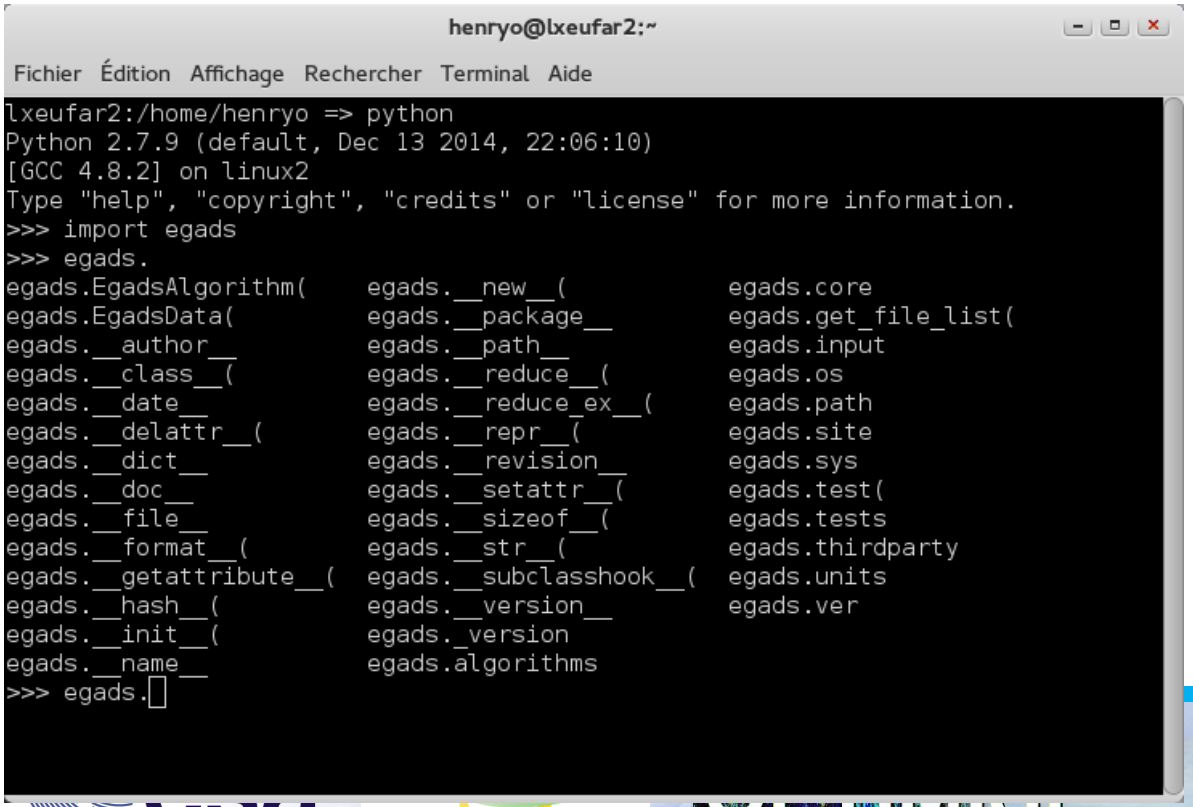

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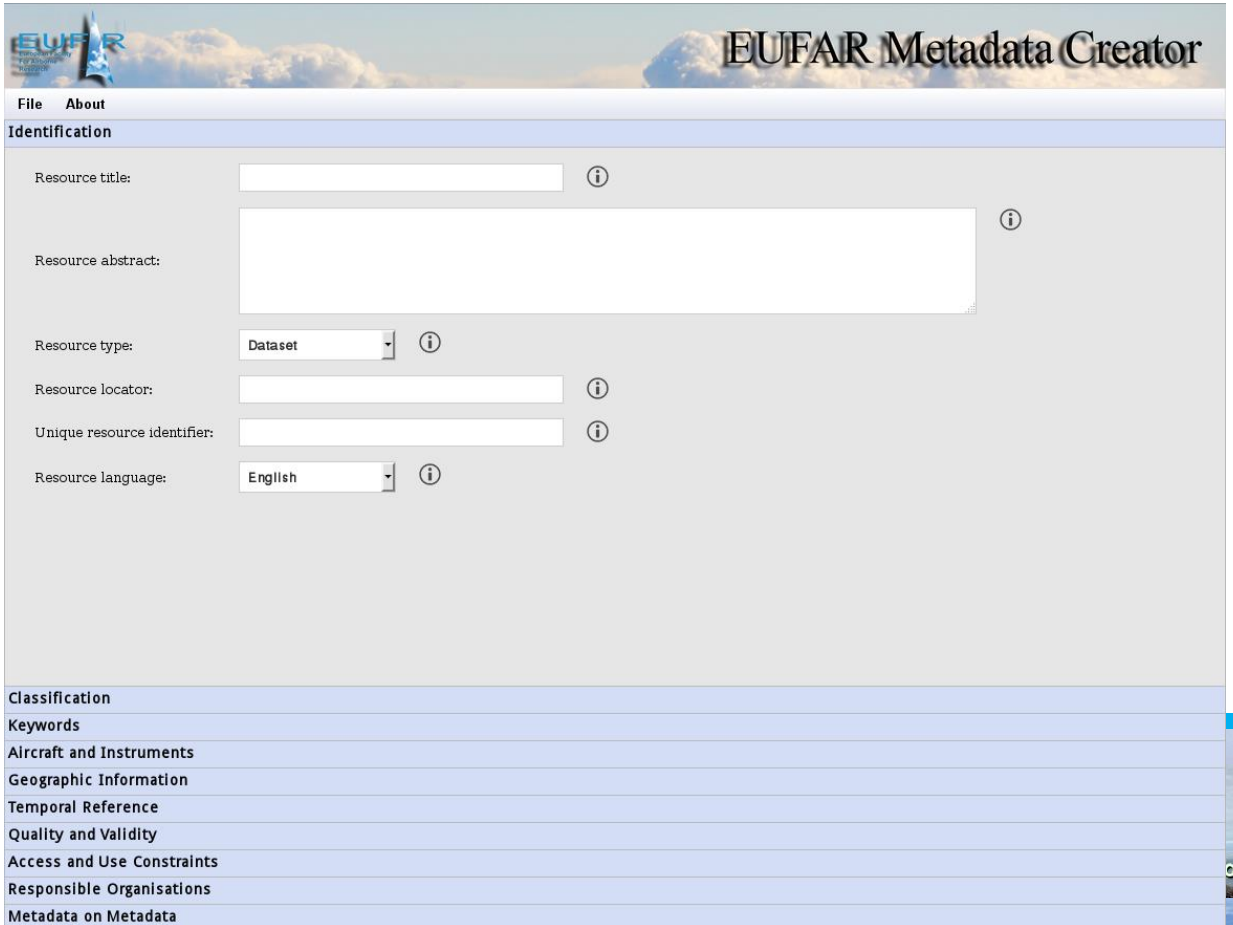

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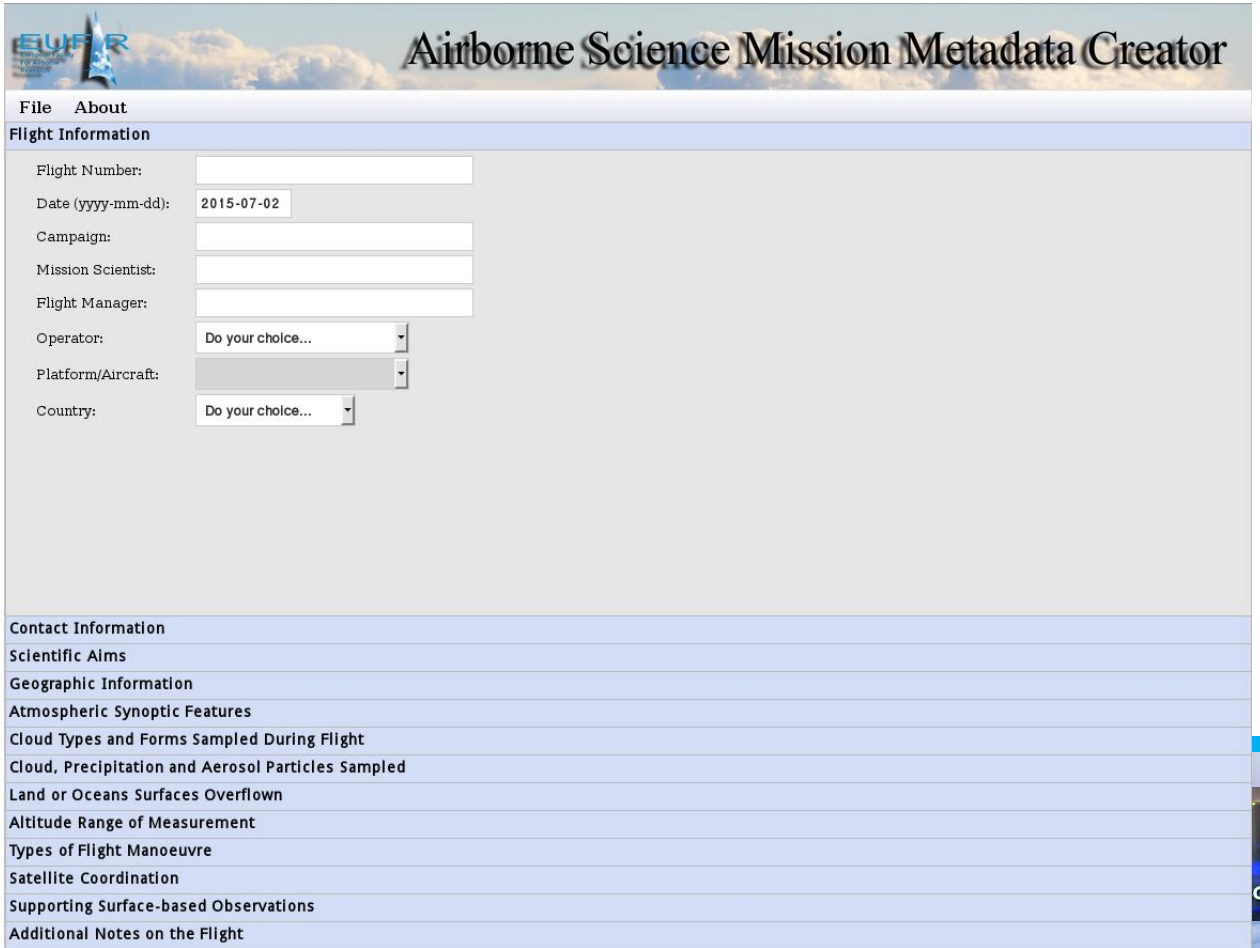

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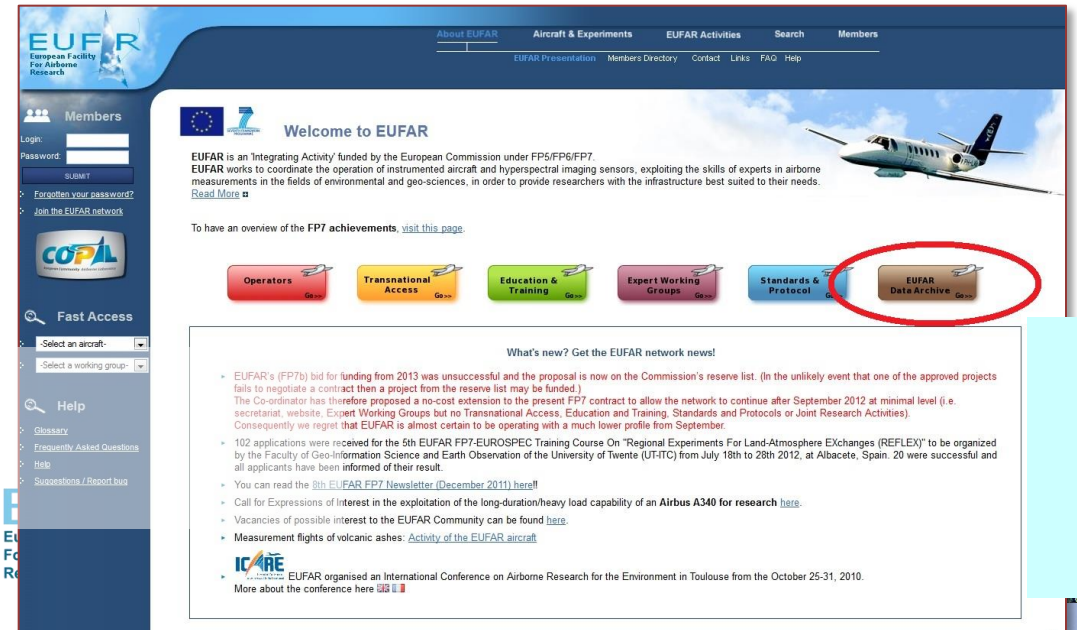
EUFAR N8DB – Database

- 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



For details and to access data use link from

EUFAR web page

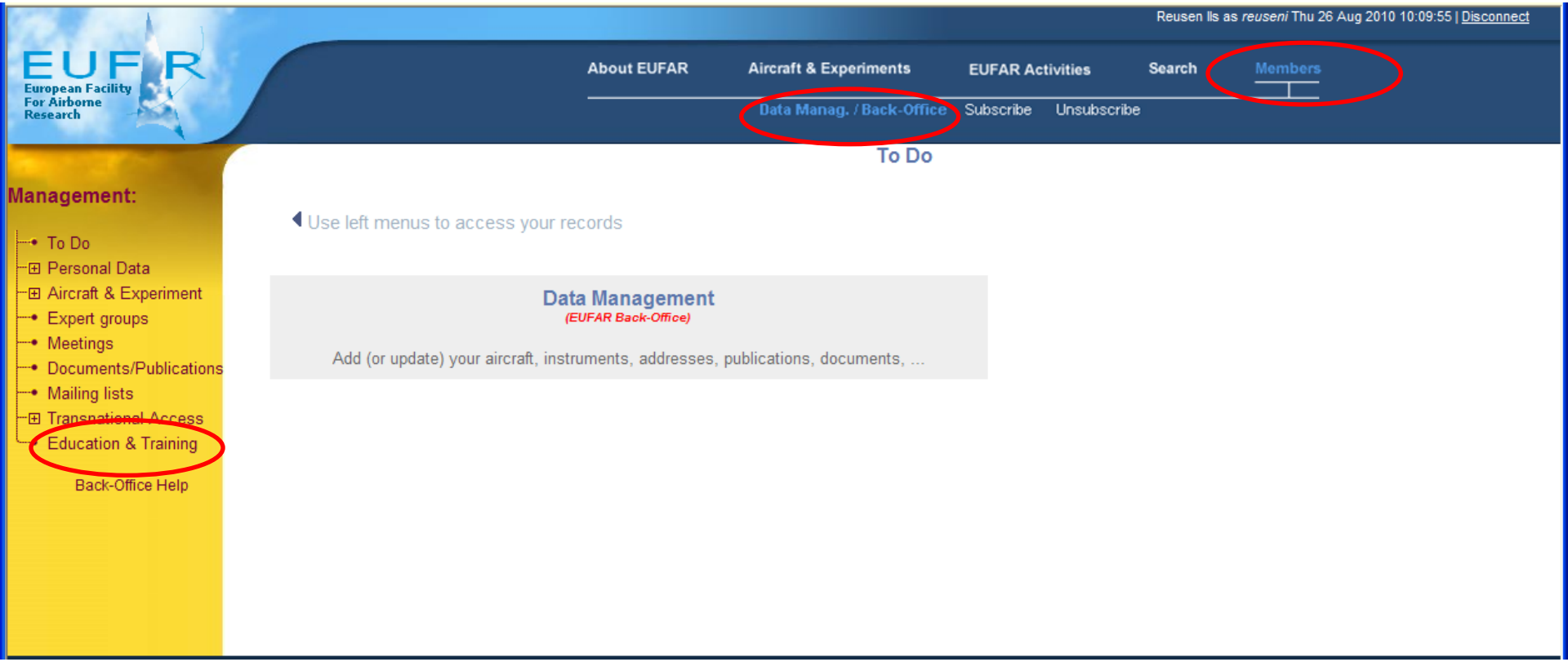
or

badc.nerc.ac.uk/data/eufar/

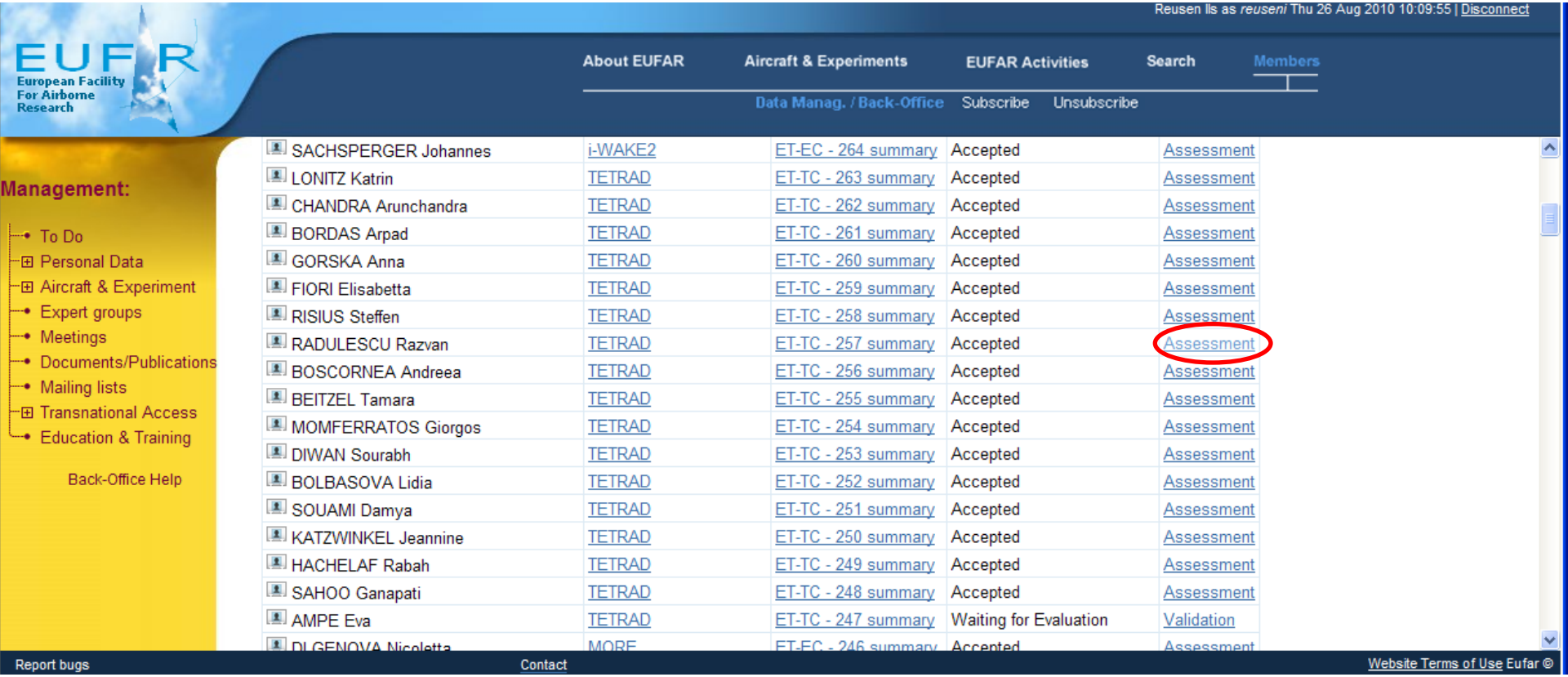
SWAMP reporting!

- 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



Student reports



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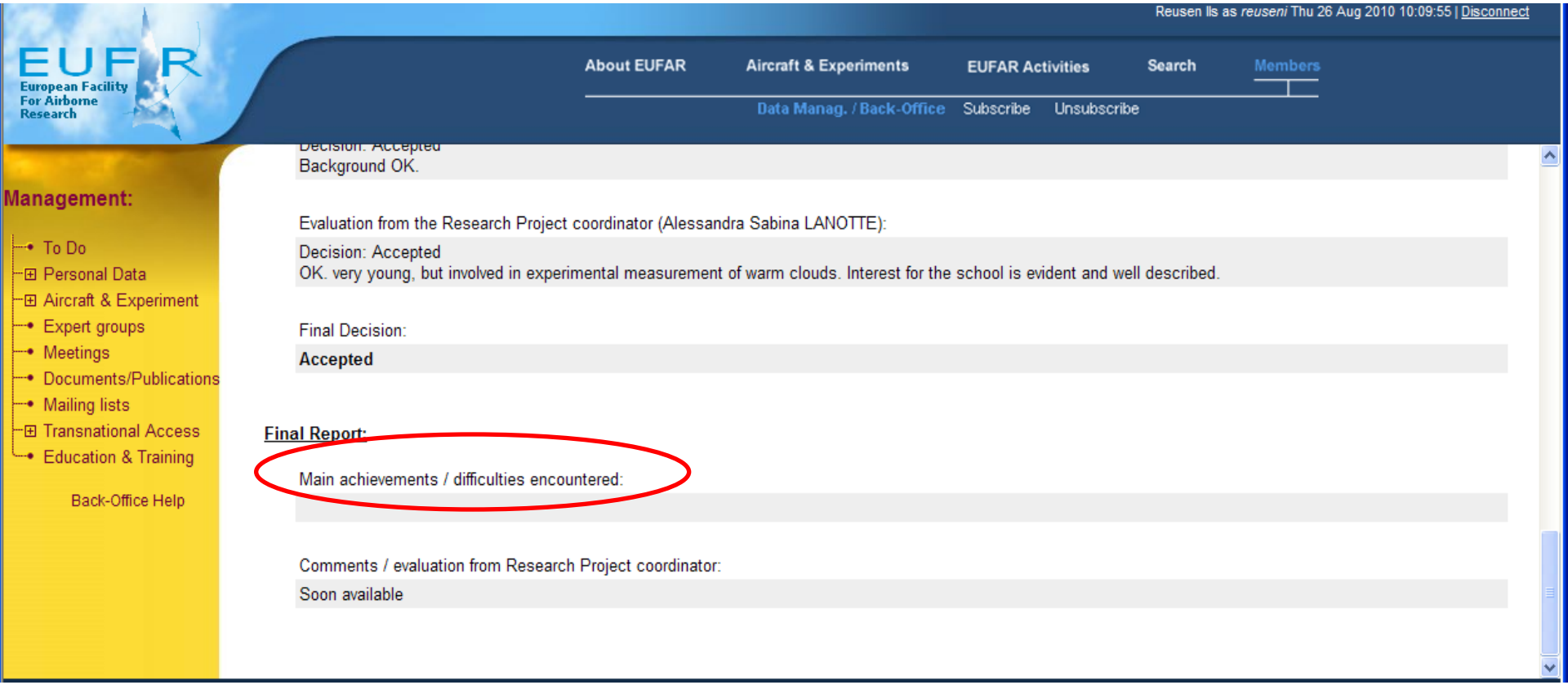

Report due 15/08/2012

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OPTIMISE Innovative Optical Tools for Proximal Sensing of Ecophysiological Processes

Working group scientific report – template

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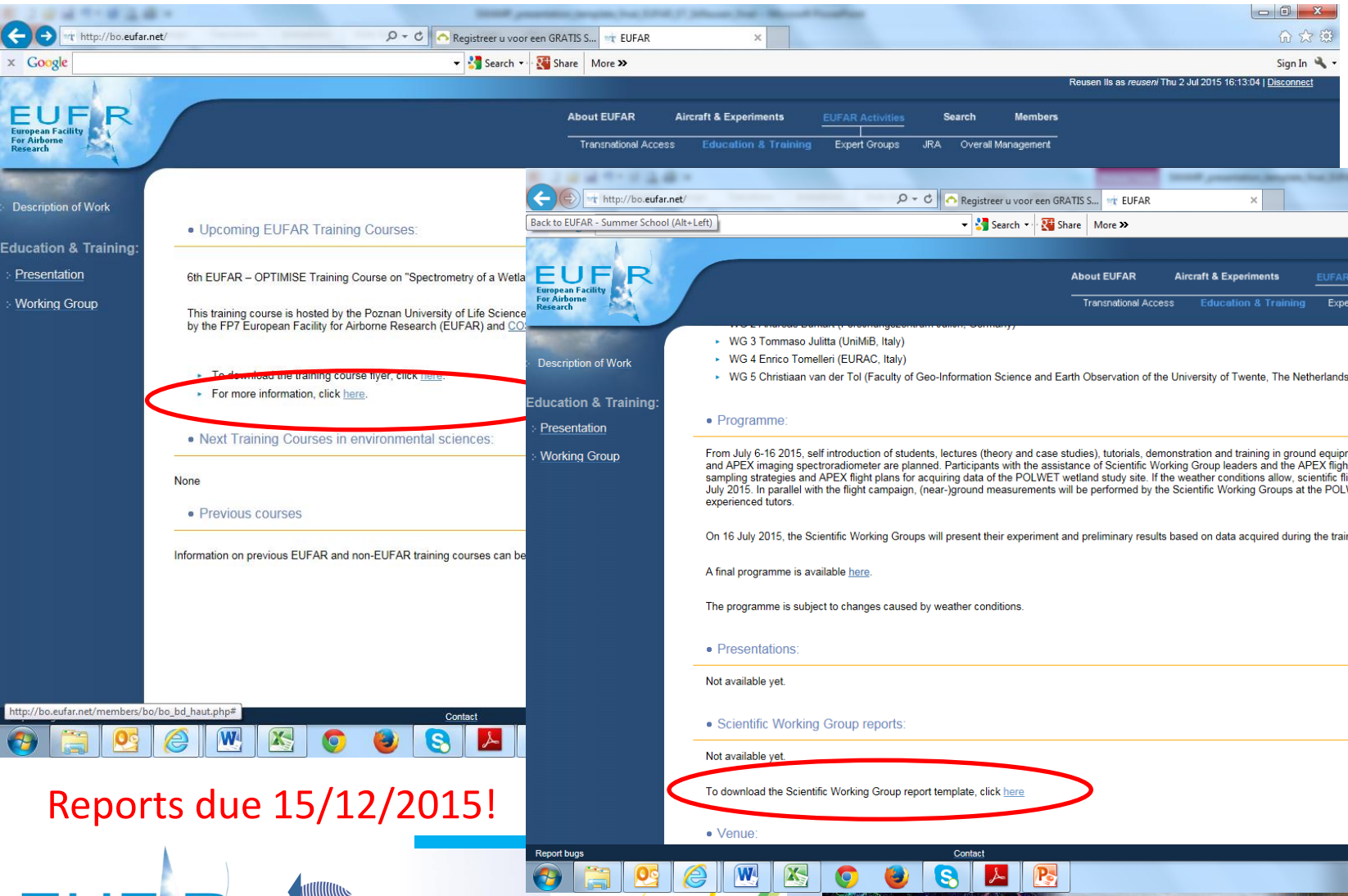

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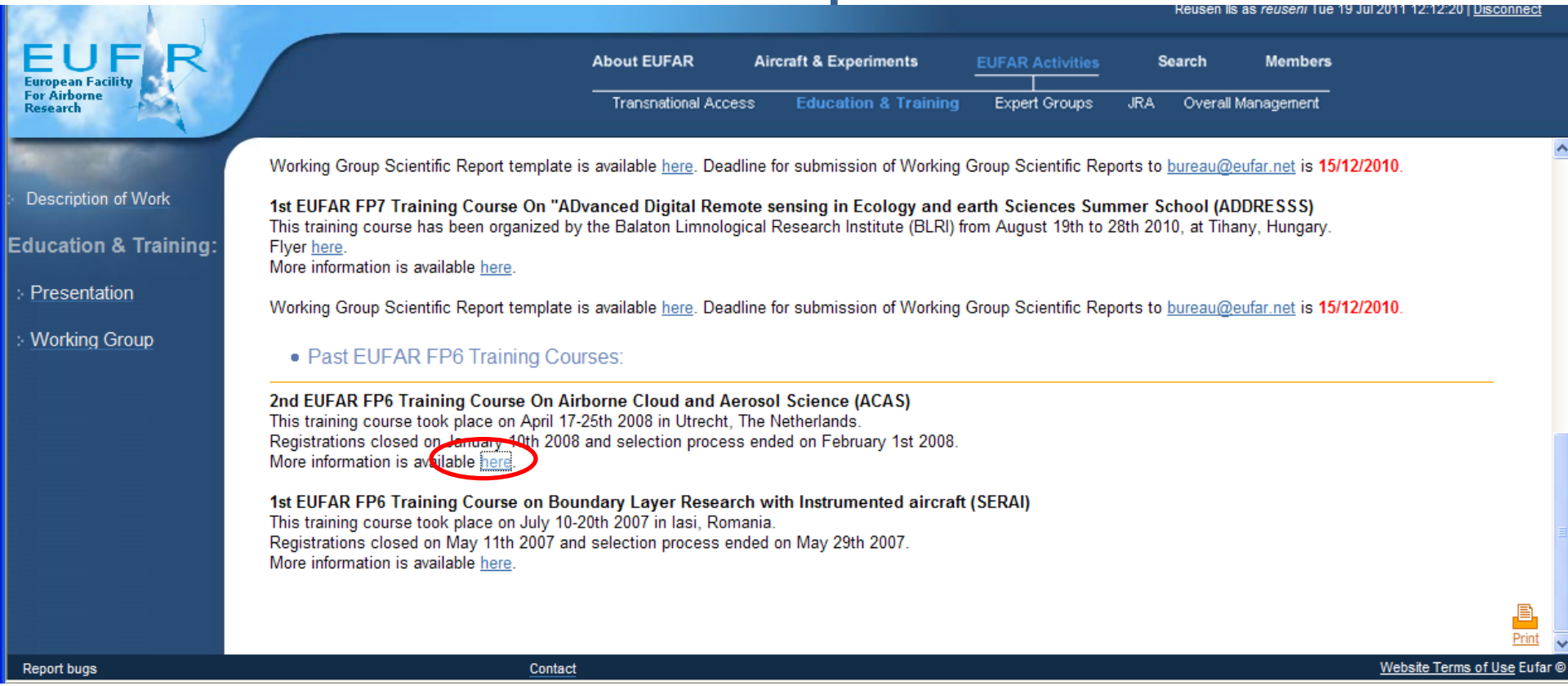

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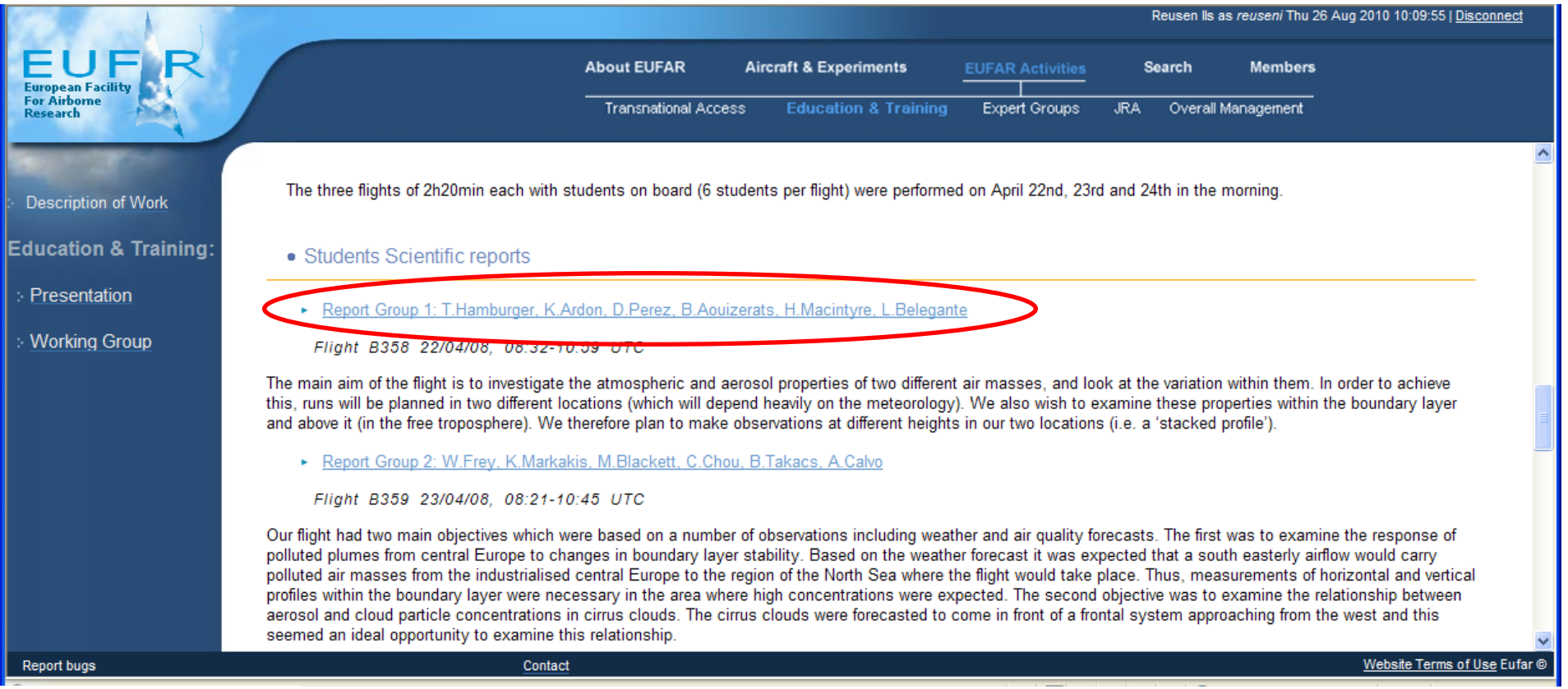

Contact person

For more info on
EUFAR Education and Training opportunities

Contact

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I wish you all an interesting SWAMP training course!

Spread the knowledge!

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

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