



# EUFAR

## Expert WG meeting 02

Atmospheric temperature measurement  
from research and operational aircraft

*11/12 November 2020*



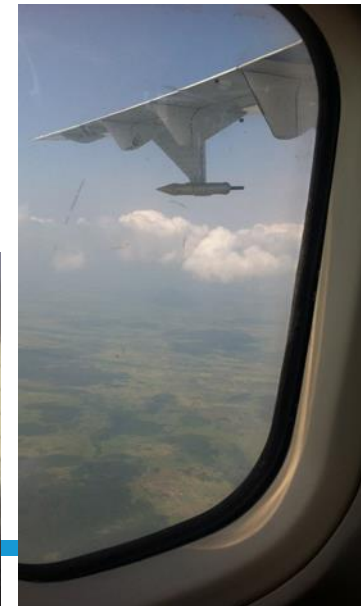
# What is EUFAR?

- ▲ EUFAR is the European Facility for Airborne Research in Environmental and Geosciences
- ▲ EUFAR links the operators of research aircraft and their instrumentation, scientific users and funding agencies
- ▲ EUFAR aims to enhance collaboration, spread best practice, promote efficiency and enhance user access to both the facilities and their data
- ▲ EUFAR website provides a central information portal

Keywords:

Environmental  
sciences  
Geo sciences  
Airborne research  
Atmospheric  
measurements  
Remote sensing  
Multi-domain

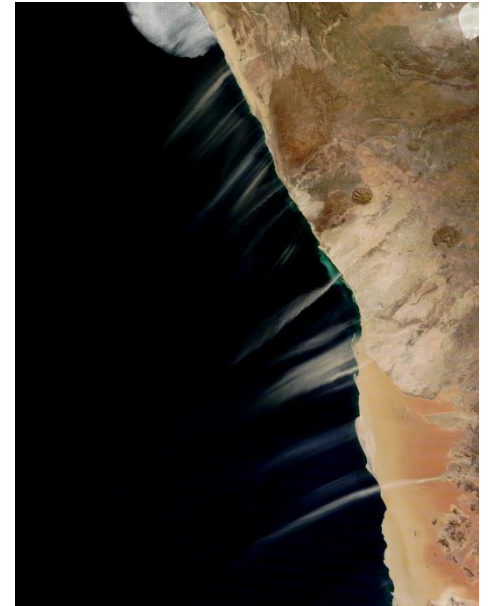
[www.eufar.net](http://www.eufar.net)  
[bureau@eufar.net](mailto:bureau@eufar.net)



# What for?

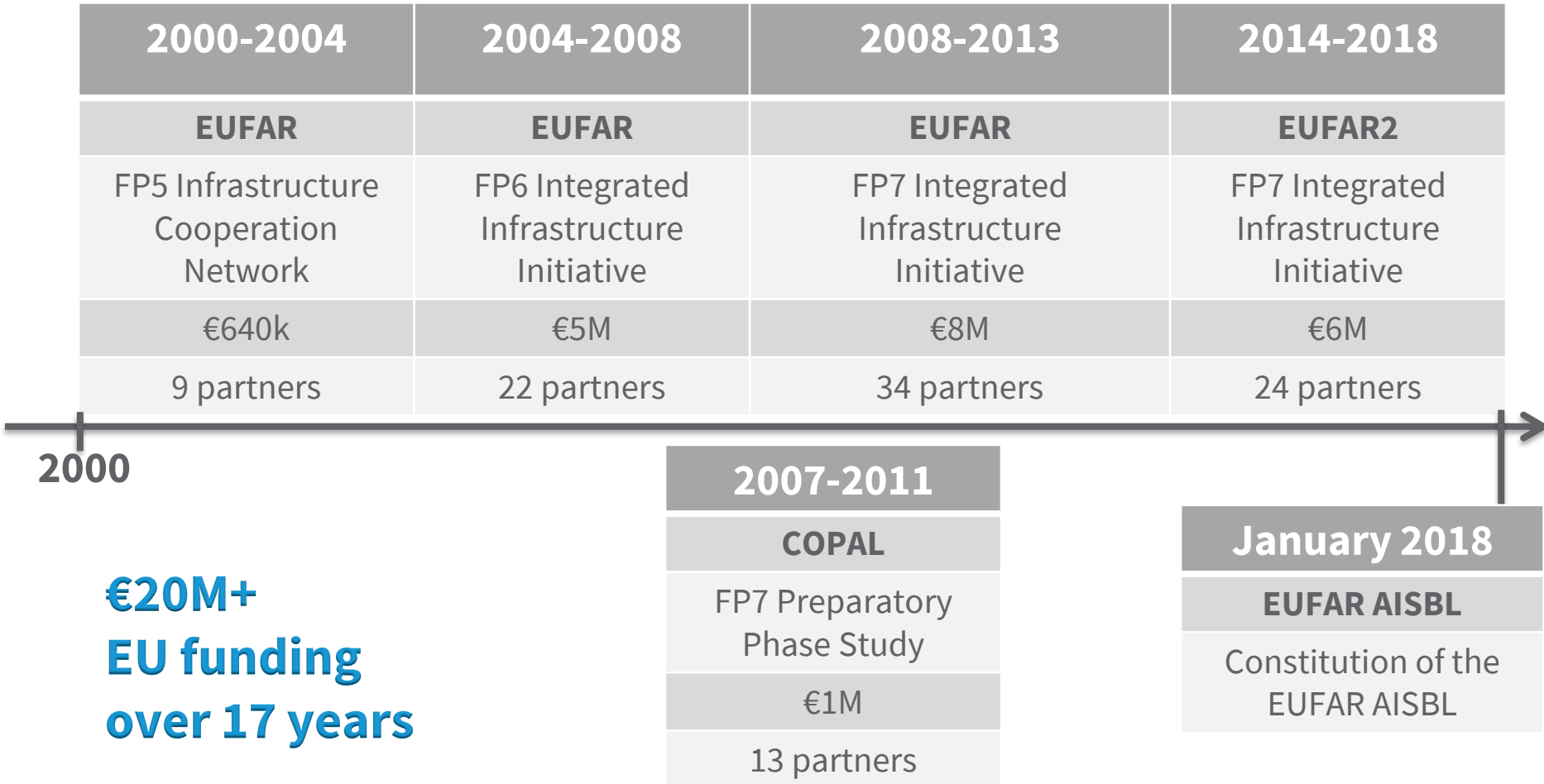
- ▲ Airborne observational research contributes incremental developments in the scientific understanding of Earth-System processes.
- ▲ These developments proceed in parallel with the capability to observe these processes on a global scale from space and to model them in operational Numerical Weather Prediction (NWP), climate and Earth-System models.
- ▲ The fields of science impacted by an airborne research observing capability are very broad, and span the atmosphere, ocean, land surface and biological systems.
- ▲ Airborne observations continue to be required to support Earth-System model development and space-based observing programs such as COPERNICUS.

An example of the application of EUFAR airborne measurements:



Two FP7-EUFAR-funded research flight campaigns clustered with the AEROCLO-sA umbrella flight campaign took place in Namibia in Aug and Sept 2017 (EriSMA and ALLDUST-SA) to investigate sources and emissions of dust in Namibia

# EUFAR's timeline



Formed in January 2018 as a legal entity

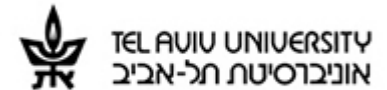
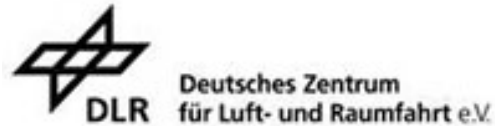
## Objectives

- ▲ Assure the continuity of EUFAR
- ▲ Coordinate the distributed existing infrastructures
- ▲ Consolidate the network of airborne research infrastructures
- ▲ Forum for discussion of future platform requirements
- ▲ Implement and manage a scheme of Open Access
- ▲ Pursue European research infrastructure integration
- ▲ Broaden the airborne research community to access additional financial resources

## Strategy

- ▲ Support core activities of the network and maintenance of EUFAR website
  - ▲ Apply for EU funding to
    - support the mobility of personnel in the framework of Open Access (ERI or MSCA)
    - cover activities external to the self-financing perimeter of the structure (TA, ET, JRAs, specific core developments)
-

# Members and Partners



# EUFAR capabilities

## Atmospheric in-situ observation













- Atmospheric composition (trace gases and aerosols)
- Cloud and precipitation microphysics
- Radiative transfer (visible to sub-millimetre)“
- Atmospheric dynamics and thermodynamics

## Airborne imaging of the Earth's surface

- Hyperspectral imaging (Vis, Near-IR, Thermal-IR)
- Lidar terrain-scanning
- Synthetic aperture radar
- Soil / Vegetation / Water / Minerals

## Categories

- Jet / Large / Medium / Small aircraft

 <p><b>ASK18 - FUB</b> Freie Universität Berlin, Institut für Weltraumwissenschaften Troposphere D-KMET Alexander Schleicher GmbH &amp; Co, ASK 18</p>	 <p><b>ATR42 - SAFIRE</b> Service des Aéronefs Français Instrumentés pour la Recherche en Environnement Troposphere F-HMTO ATR, ATR40-520</p>	 <p><b>Atelec - SAFIRE</b> Service des Aéronefs Français Instrumentés pour la Recherche en Environnement Troposphere F-BLEB Piper Aircraft, PA23-250 Aztec</p>	 <p><b>C201 - FUB</b> Freie Universität Berlin, Institut für Weltraumwissenschaften Troposphere D-EAFU Cessna Aircraft Company, T207A Turbo Skywagon</p>
 <p><b>C208 - CzechGlobe</b> Ústřední výzkumný ústav letecký AV ČR Troposphere OK-CZG Cessna Aircraft Company, C-208 B Grand Caravan</p>	 <p><b>C208 - DLR</b> Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) Land/Sea surface properties, Troposphere D-FDLR Cessna Aircraft Company, C-208 B Grand Caravan</p>	 <p><b>DO228-901 - DLR</b> Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) Land/Sea surface properties, Troposphere D-CODE Dornier Flugzeugwerke, Do 228 - 101</p>	 <p><b>DO228-212 - DLR</b> Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) Land/Sea surface properties, Troposphere D-CFFU Dornier Flugzeugwerke, Do 228 - 212</p>
 <p><b>FA20 - DLR</b> Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) Land/Sea surface properties, Troposphere D-CMET Dassault Aviation, Mystere / Falcon 20 E-5</p>	 <p><b>FA20 - SAFIRE</b> Service des Aéronefs Français Instrumentés pour la Recherche en Environnement Troposphere F-GETH Dassault Aviation, Mystere / Falcon 20 GF</p>	 <p><b>G550 HALD - DLR</b> Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) Land/Sea surface properties, Troposphere, UTLS (Upper Troposphere, Lower Stratosphere) D-ADLR Gulfstream Aerospace, G550</p>	 <p><b>King Air - INCAS</b> National Institute for Aerospace Research Troposphere j2018 Hawker Beechcraft, King Air C90 GTx</p>



# Which activities?





# Knowledge and Expertise Transfer

- ▲ Expert Working Groups
    - Sharing of knowledge
    - Widest use of best practices in airborne measurements
  - ▲ Technology Transfer
    - Use of innovative new measurement technologies with the maximum benefit to the EUFAR community
    - Exploitation of such developments made by EUFAR operators and users for societal benefit
  - ▲ Education & Training
    - Organisation of training opportunities in airborne measurement topics to early-career scientists
    - Organisation of visits to aircraft/instrument operators for exchange of knowledge and know-how
  - ▲ ICARE conference
    - Organisation of the ICARE conference in collaboration with ICCAGRA
-

# Workshop objectives

- ▲ [Workshop: Aircraft Weather Observations and their Use, ECMWF, Feb 2020](#)
  - ▲ Presentations of work on quality control and bias removal in AMDAR and Mode-S temperature data
  - ▲ Seeking to compare experience between research and operational users of airborne temperature observations
  - ▲ Survey current developments in airborne temperature sensors
  - ▲ Compare data processing algorithms that are used across the research and operational communities
  - ▲ Identify and quantify errors and biases in measurements and how these may be minimized
  - ▲ Make recommendations on best practices in airborne temperature measurement
-

# Contact details

Phil Brown, Chair of the Executive Board  
**Met Office**

E-mail: [phil.brown@metoffice.gov.uk](mailto:phil.brown@metoffice.gov.uk)

Élisabeth Gérard, Executive Secretary  
**Météo-France**

E-mail: [bureau@eufar.net](mailto:bureau@eufar.net)