ESA Airborne and Ground Campaign Activity Programme

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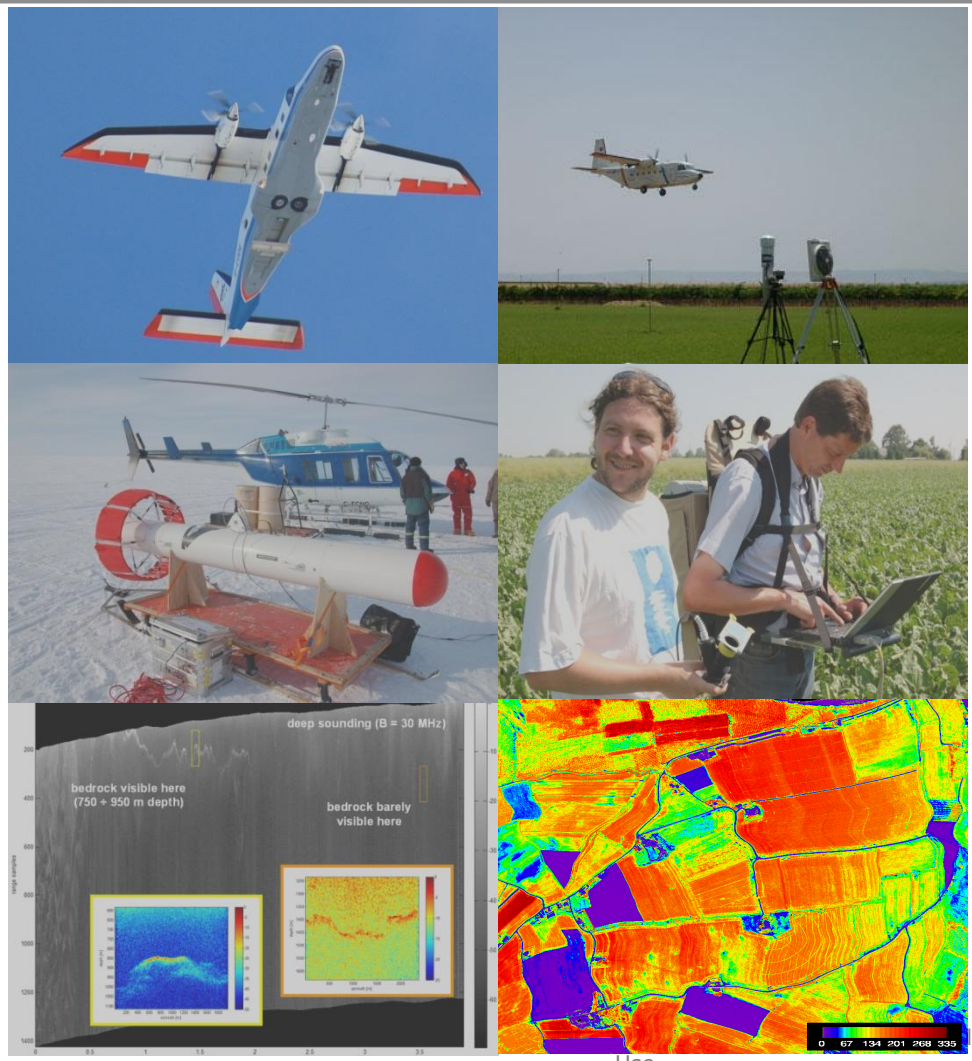
What are "ESA campaign activities" ?

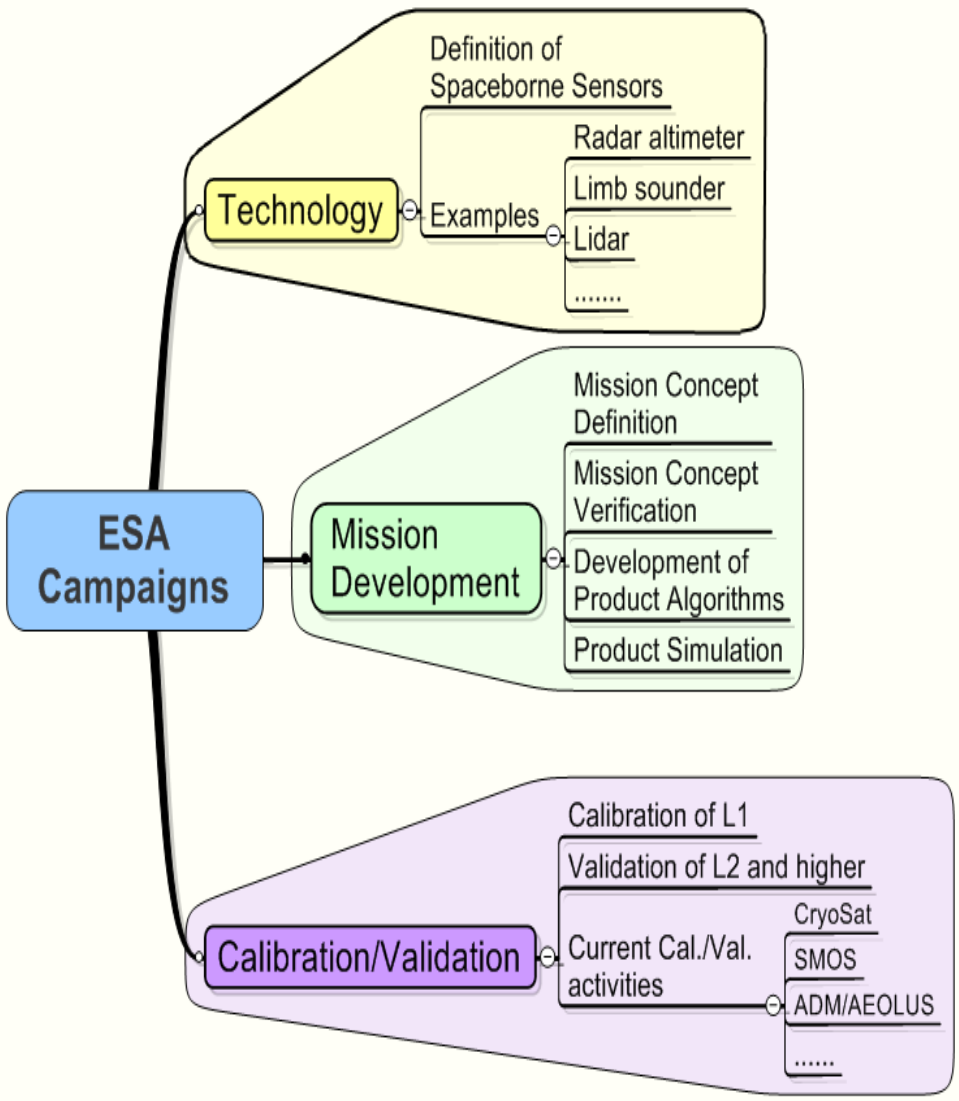
ESA campaign activities support Earth Observation satellite missions, including the following

1. Development of airborne and ground based instruments
2. International airborne and/or ground measurement campaigns
3. Airborne/ground data analysis and reporting
4. Campaign database providing access to airborne/ground campaign data to scientists



Programmatic Background

1. ESA campaign activities started in 1981
    a. 98 campaigns as of June 2012
    b. Typically 5-10 campaigns/year
2. Strategic objectives:
    a. Support to EO programs
    b. Transnational access to airborne instrumentation and data in Europe
    c. Partnerships with national and international organisation
3. Campaign activities address three main areas:
    a. Technology
    b. Mission development
    c. Calibration/validation
4. Campaign data archive supporting science, applications and education

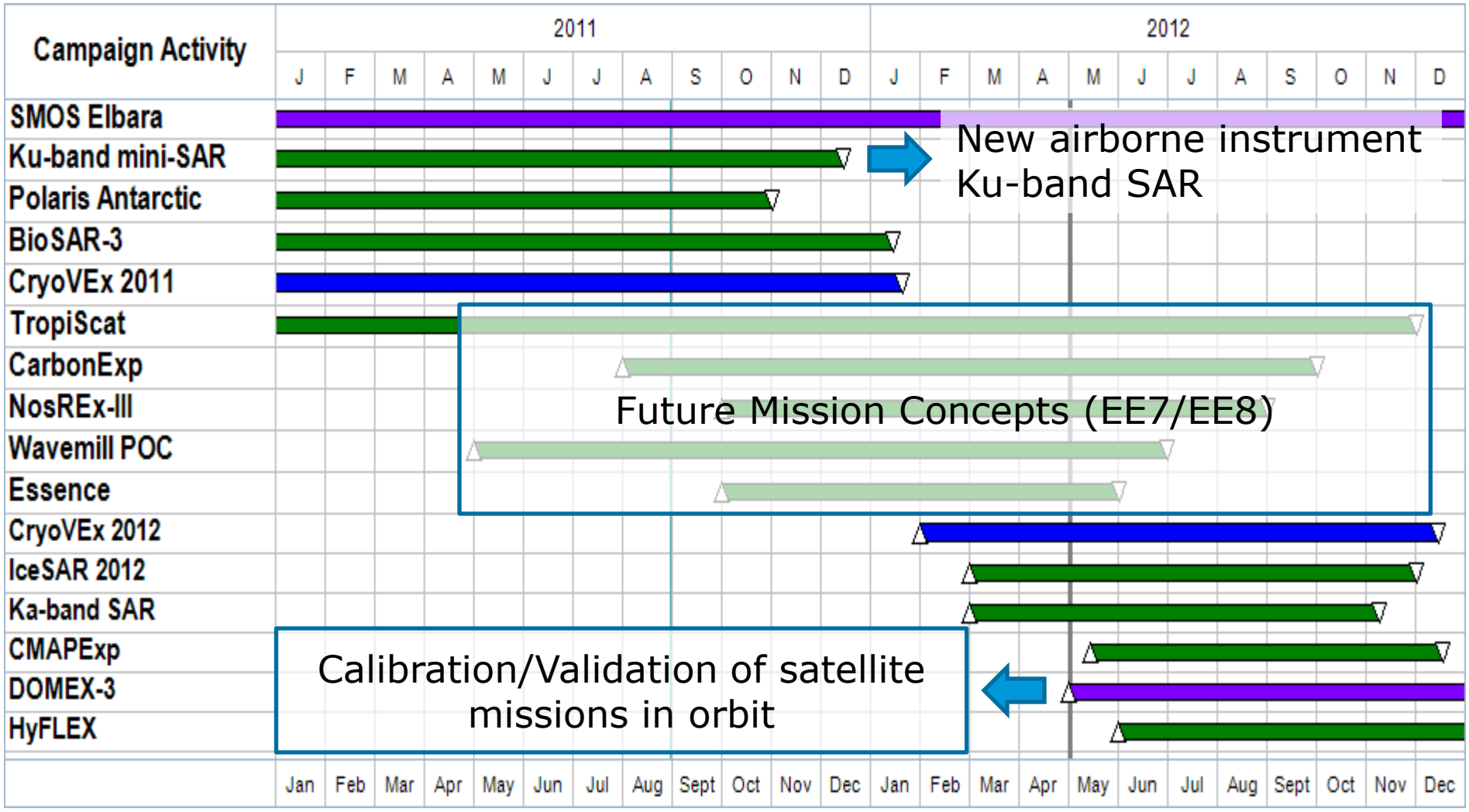


Campaigns for different project phases

1. ESA Campaigns Programme addresses all phases of ESA space missions
2. Various types of campaigns are performed during certain periods of the lifecycle of a space mission

	Pre-Phase A	Phase A Feasibility	Phase B Design	Phase C/D Development	Phase E1 Commissioning	Phase E2 Operation	Data Archive
Technology	X	X					
Mission Development (Geophysical)	X	X	X	X			
Mission Development (Simulation)	X	X	X	X			
Cal/Val				X	X	X	
Science/ Applications						X	X

Recent and near-future campaigns



Airborne and Ground Instruments

1. ESA develops airborne/ground instruments to
   a. evaluate new technology and sensing techniques for EO
   b. support satellite mission (feasibility -> in-orbit validation)
2. Some examples of instrument development
   a. ELBARA (ground L-band radiometer) SMOS
   b. SnowScat (Ku-band ground scatterometer) CoReH2O
   c. MARSHALS (airborne μwave limb sounder) PREMIER
   d. ASIRAS (Ka-band radar altimeter) CryoSAT
   e. Airflex (Optical fluorescence sensor) FLEX
   f. A2D (Doppler Wind Lidar at 355 nm) ADM-Aeolus
   g. SnowSAR (Ku-band airborne SAR) CoReH2O

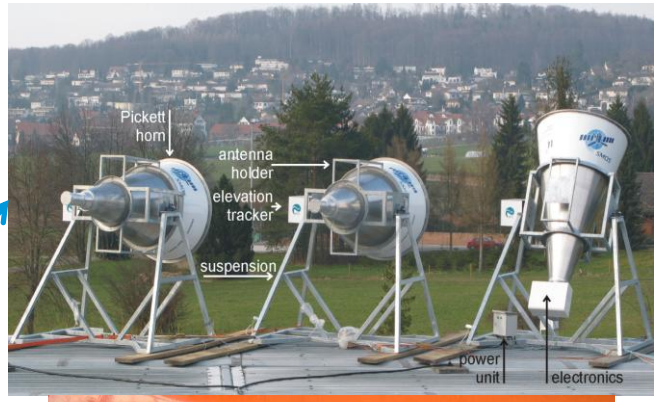
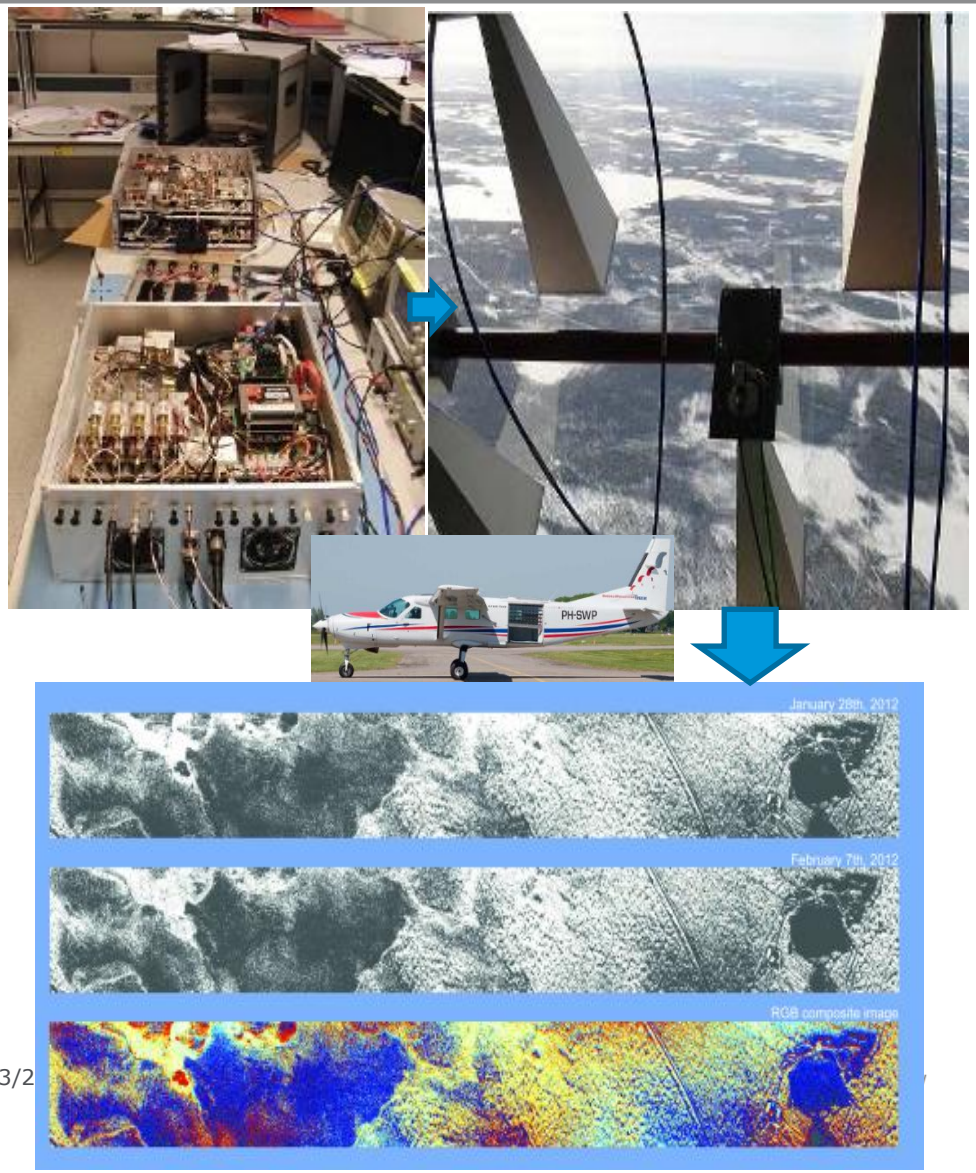


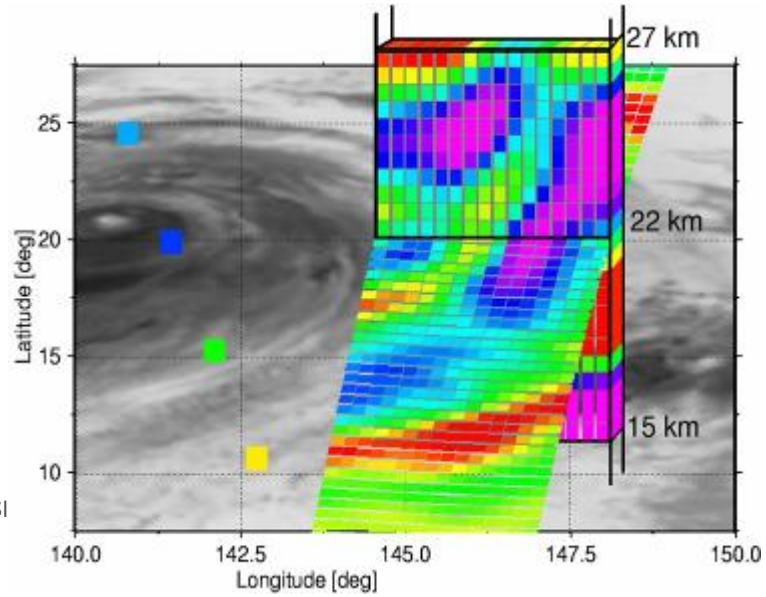
Illustration of role of ESA airborne/ground instrument development (SnowSAR)

1. ESA developed radar imaging instrument at Ku-band to support the EE7 CoreH2O mission:
    a. First prototype radar images at 17.2 GHz simulating what CoreH2o would see from space
    b. Direct support the science objectives of the mission
    c. Instrument integrated into international ESA campaigns linking scientists/users with the instrument developers
    d. Testing of a new generation of compact and lightweight imaging radar instruments
    e. Follow-on commercial activities for the small high-tech company that designed and built the SAR



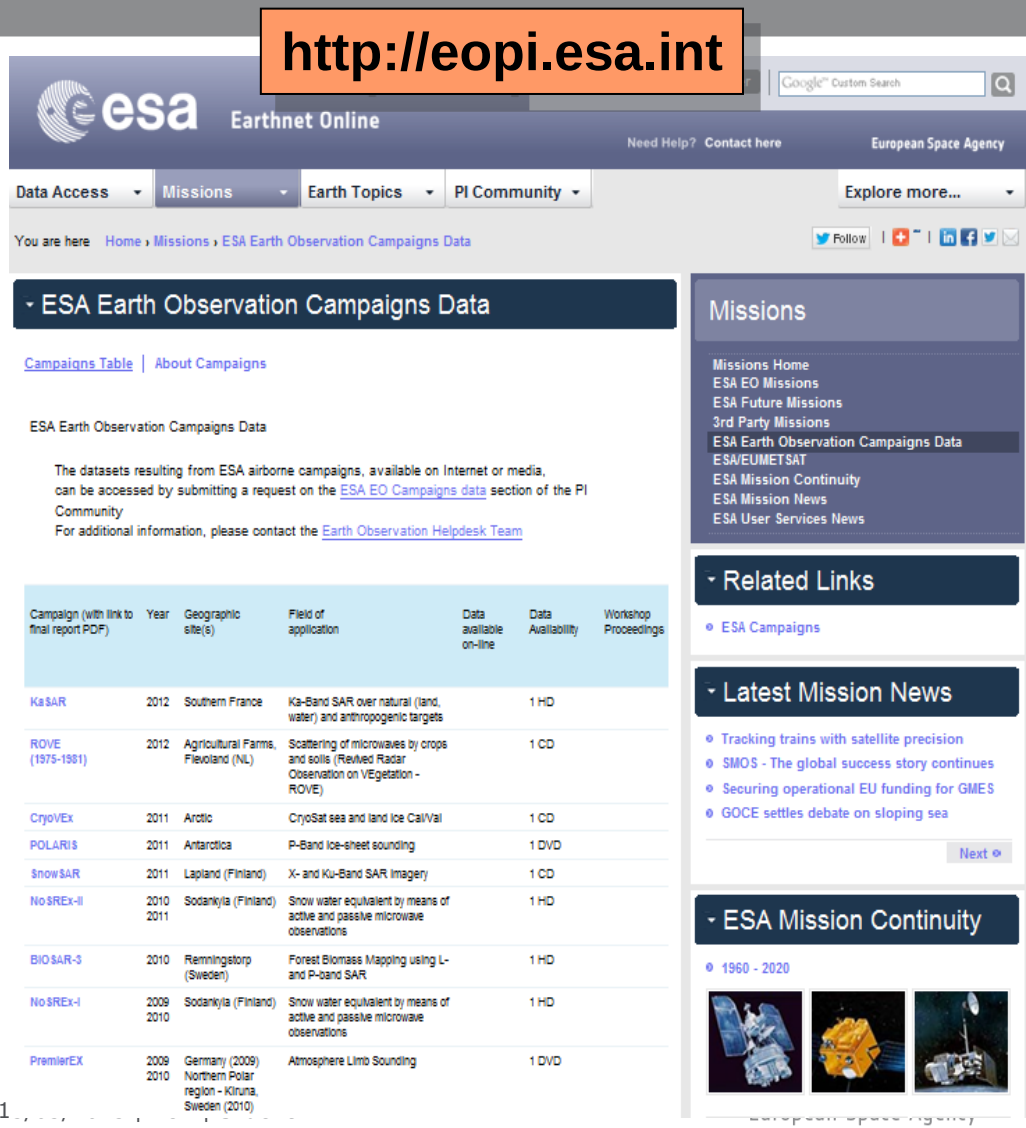
Example: Campaigns in support of mission development

1. Atmospheric campaign to support feasibility study of the EE7 mission PREMIER
   a. Campaign integrated ESA MARSCHALS mm-wave with German Infra-Red GLORIA limbsounder on the Russian Geophysica airborne platform
   b. Data acquired in Northern Sweden with UK, D and Russian participants
   c. Results from campaign demonstrated the synergy between mm-wave and IR limbsounders (fundamental to the PREMIER mission) and supported the development of the science around the mission



Access to ESA Campaign Data

1. All ESA campaign datasets formatted and documented are available through the ESA EOPI Portal
2. Data inventory includes final reports with full description of campaign activity and analyses
3. Access to datasets is provided through Category 1 mechanism (short proposal incl. identification of desired datasets)
4. Data archive continuously increase in number and variety of campaign datasets
5. Currently 43 campaign datasets available



Role of ESA campaigns and added value for new member states

Participation by new member states should be seen as part of a larger strategy in "capacity building" leading to larger roles within ESA EO satellite missions and exploitation. Benefits include:

1. Development of instrument expertise
    a. Hardware design (radar, optical, laser)
    b. Proof-of-concept for future satellite missions
    c. Explore new opportunities around drones/UAVs and small satellites
2. Access to international campaign activities
    a. Transnational access to aircraft and airborne/ground instruments
    b. Participation to international airborne/ground campaigns
    c. Scientific and technical exchange
3. Data processing
    a. Develop data processing capabilities as stepping stone to role satellite ground segment
    b. Develop scientific interpretation of remote sensing data

Potential campaign activities with Romania

1. Romania has prominent scientific institutes, research organisations, universities and SME companies involved in space activities, e.g.
    a. Romania Space Agency (ROSA) Research Center
    b. Romanian Academy of Sciences
    c. Polytechnic University of Bucharest
    d. National Research and Development Institute for Marine Geology and Geoecology (NIRD GeoEcoMar)
    e. Advanced Studies and Research Center Ltd (ASRC)
    f. National Institute for Aerospace Research (INCAS)
    g. …
2. Some ideas on potential areas to explore within ESA campaign activities
    a. Dedicated campaigns with UAVs (e.g. mini-DOAS deployment in Romania in 2014)
    b. Atmospheric campaign in support of S5P mission
    c. Testing new technologies/mission concepts for marine environment
    d. Further developing data processing chains and data analysis tools for airborne instruments

How to be become involved in campaign activities

1. ESA actively pursing opportunities in the Romania to support integration of Romanian institutes/companies in the definition and exploitation of EO missions
2. Would like to hear from you during bilateral meeting (or following the meeting) if
    a. Interested in the development of ground and airborne instruments (radiometers, radar, optical, laser…) with potential for supporting Earth Observation missions.
    b. Interested in instrument calibration and related facilities
    c. Operating airborne and ground instruments
    d. Operating airborne platforms or test sites with measuring equipment
    e. Interested and/or experienced in airborne data processing

ESA Campaigns useful links

Contact points:

Remo Bianchi (remo.bianchi@esa.int) during the splinter sessions

Malcolm Davidson (malcolm.davidson@esa.int) Head of Campaign Section following this meeting

For details on ESA Campaign activities link to the Campaign Section Web site:

http://www.esa.int/esaLP/LPcampaigns.html

For direct access to ESA Campaign Archive:

https://earth.esa.int/web/guest/campaigns