

Aspects of past and future cooperation projects in remote sensing between Germany and Latin America.

PORSEC Conference

Concepcion, Chile 29, Nov. – 03, Dec. 2004

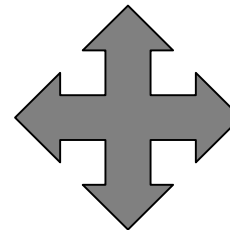
Dr. Klaus Reiniger

German Aerospace Center, DLR

- **Perception of German Space Interest in the International Context (especially versus ESA)**
 - Realize the German Space and Aeronautics programme
 - Provide contributions to international task of precaution
- **Strengthening of DLR's core competence and expertise by international cooperation and partnership**
- **Stimulate science and application of remote sensing data**
- **Networking with European and International Centers of Excellence**
- **Intensification of foreign business**
- **Support of partner industry to improve the international competitiveness**

- DLR - Agency
- DLR - Research Institutes
- Network_Points int. Cooperation

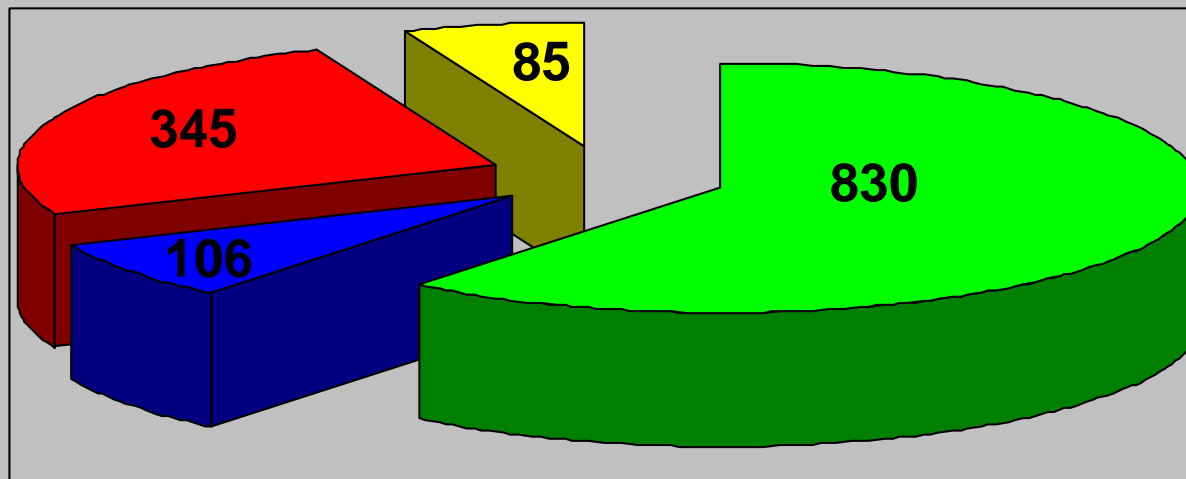
- German Federal Ministries:
BMBF, BMWA, AA, BMVBW, BMU
- Bilateral cooperation agreements
- BMBF- project organizations
- HGF Helmholtz Gemeinschaft
- ESA and European Union
- Internat. Organizations (UNO)







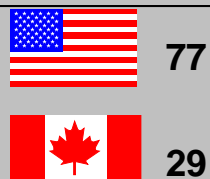
**Strategic positioning
of DLR in
International Cooperation**

- Industry
 - Small Medium Enterprises

Distribution of global cooperation projects



-  Europa
-  North America
-  Asia
-  Latin America



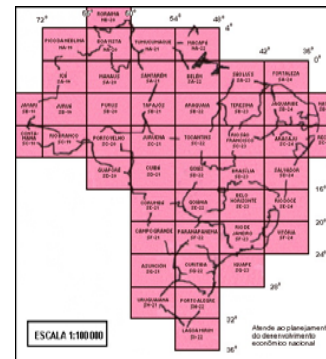
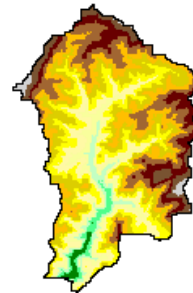
- **Framework agreements on scientific and technological cooperation between Germany and Latin American countries since early 1970**
 - **Brazil 1969**
 - **Argentina 1970**
 - **Chile 1970**
 - **Mexico 1975**
 - **Individual Agency and Institution agreements between DLR and its partners**
-
- **Scientific cooperation programmes**
 - **Individual and project agreements**
 - **Scientific coordinators and**
 - **Provision of mobility funds**
 - **Yearly mixed commission meetings**

- **Cooperation projects in space technology and application in areas**
 - **Technology development (design for suborbital, satellite services)**
 - **Remote sensing sensor design**
 - **Development of remote sensing products and its application**
 - **Provision of Ground Segment infrastructure**
 - **Provision of access to remote sensing data**
 - **Establishment of science teams**
- **Capacity building by**
 - **Workshops and lectures on Remote sensing**
 - **Integration of guest scientists into national and European projects**
 - **Support in access to funds and academic institutions**
- **Cooperation based on the principle of reciprocal benefit of both parties**

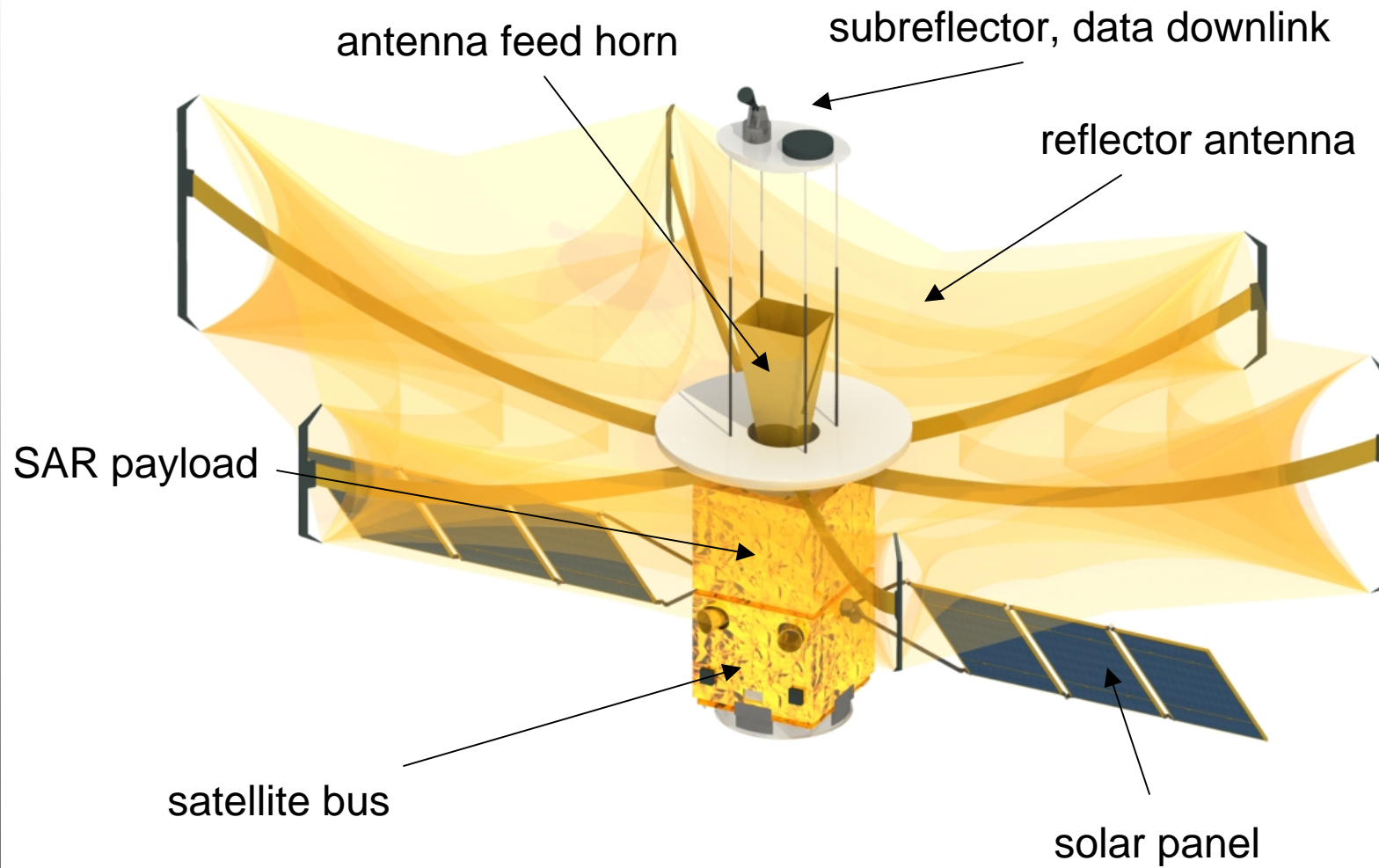
Verification of the feasibility of a satellite on the 500 kg class mission with a SAR payload.

Accomplishment of the requirements for German and Brazilian users for assessment and monitoring of Terrestrial Natural Resources, considering the following applications:

- Agriculture
- Cartography
- Disaster Management
- Forestry
- Geology
- Geomorphology
- Hydrology
- Oceanography
- Urban studies
- Defense/Intelligence

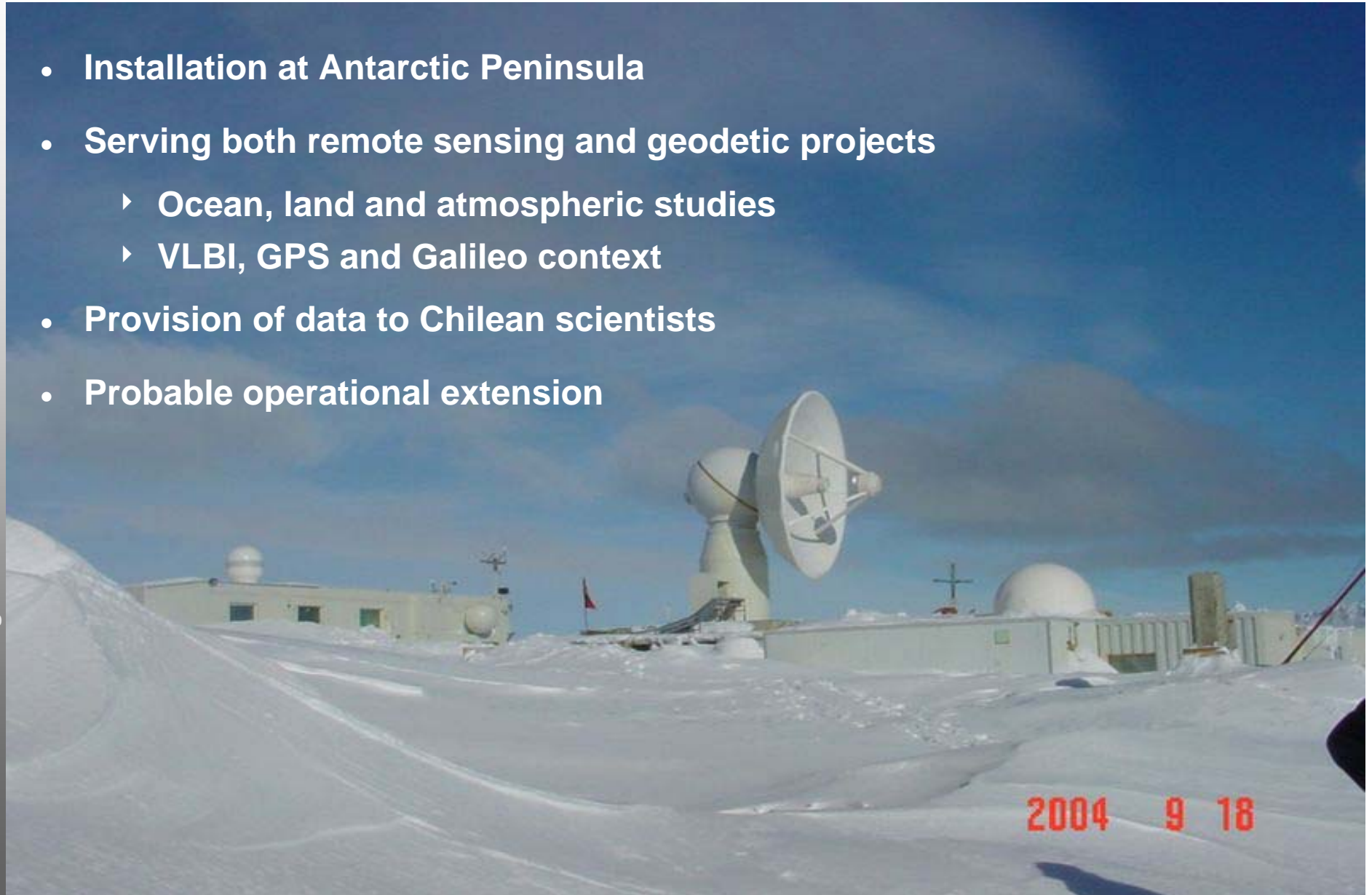


MAPSAR-1 in-orbit (top view)

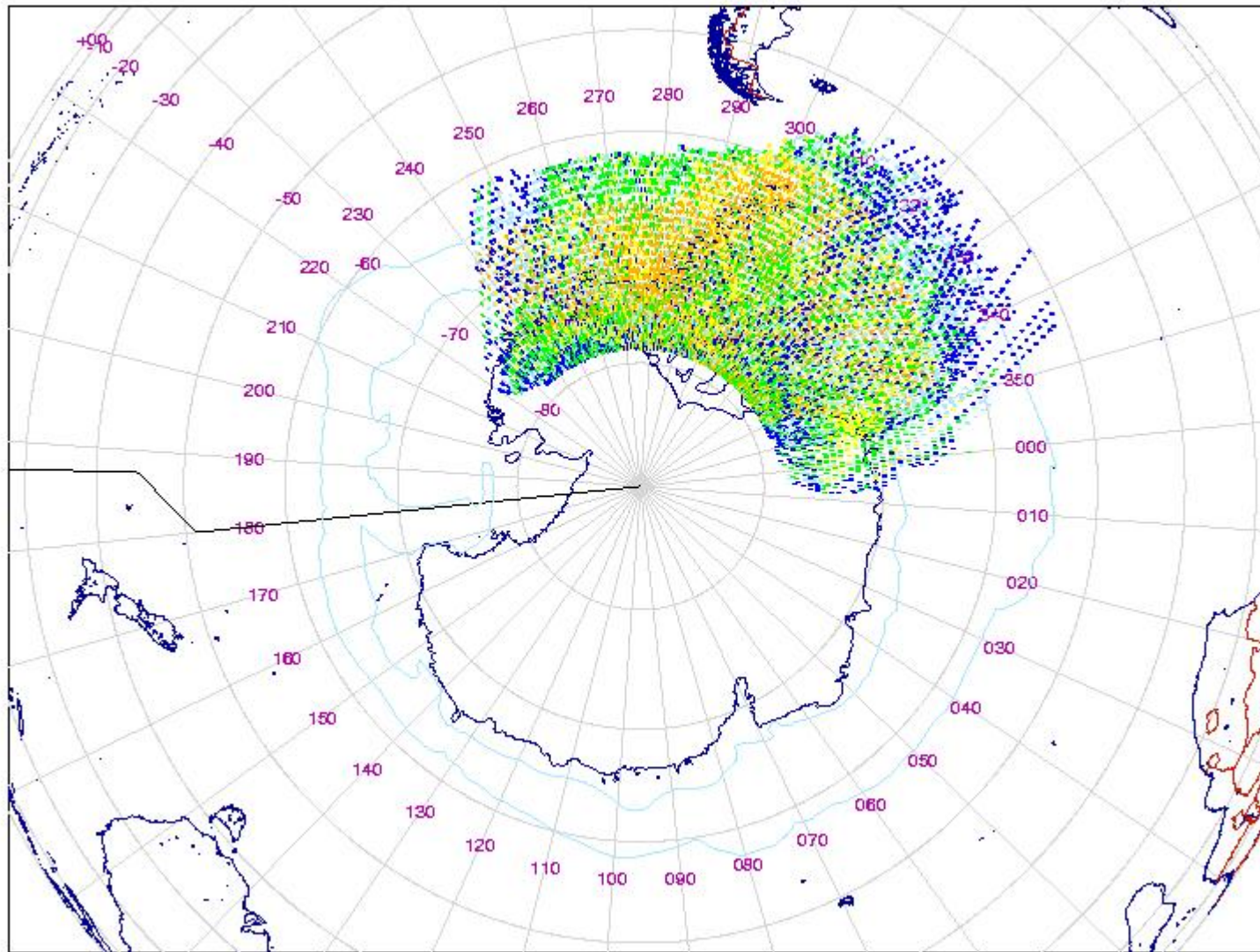


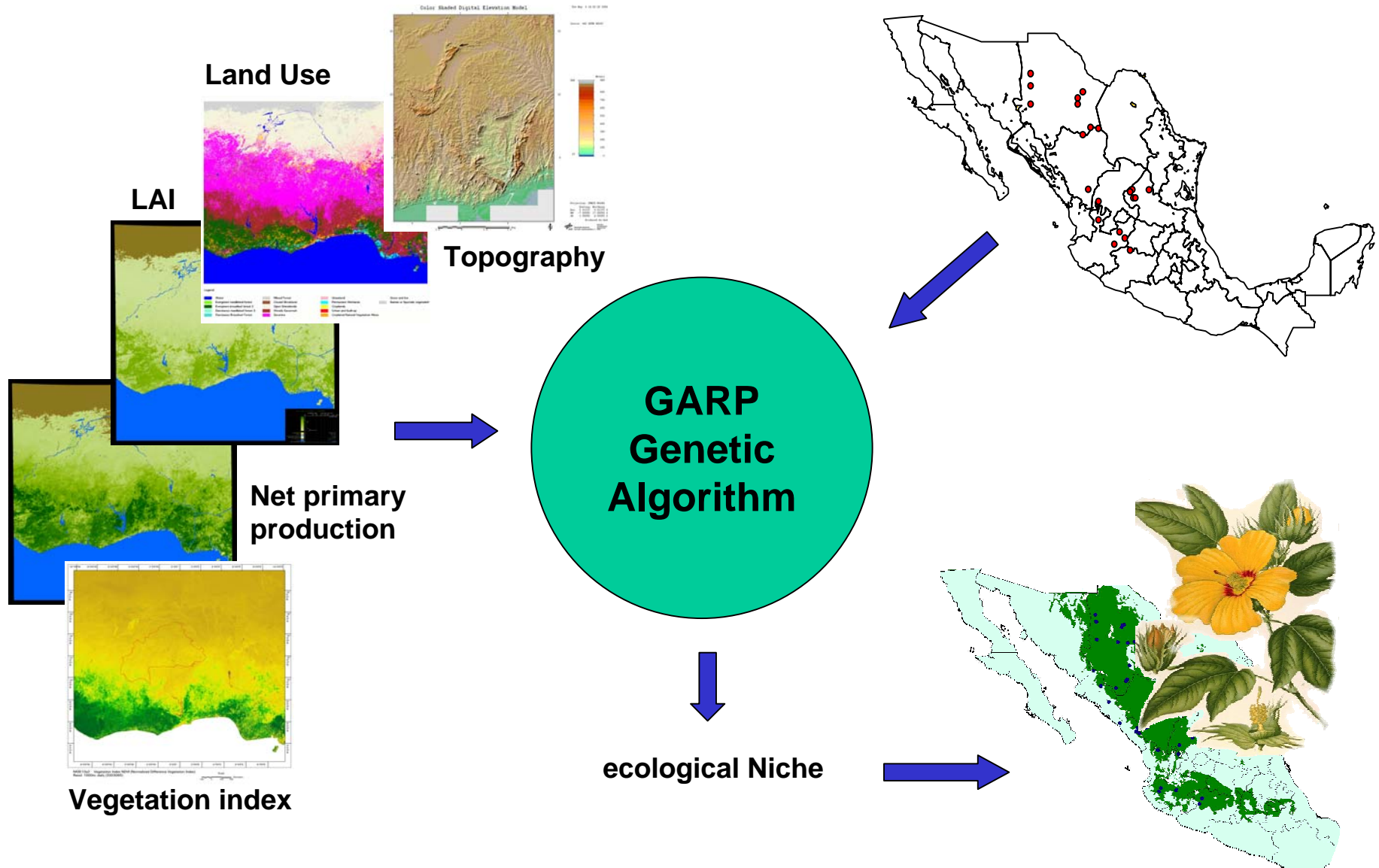
GARS - German Antarctic Receiving Station

- Installation at Antarctic Peninsula
- Serving both remote sensing and geodetic projects
 - Ocean, land and atmospheric studies
 - VLBI, GPS and Galileo context
- Provision of data to Chilean scientists
- Probable operational extension



Repetitive coverage of observed areas





- **United Nations** Convention on Biological Diversity (UNCBD)

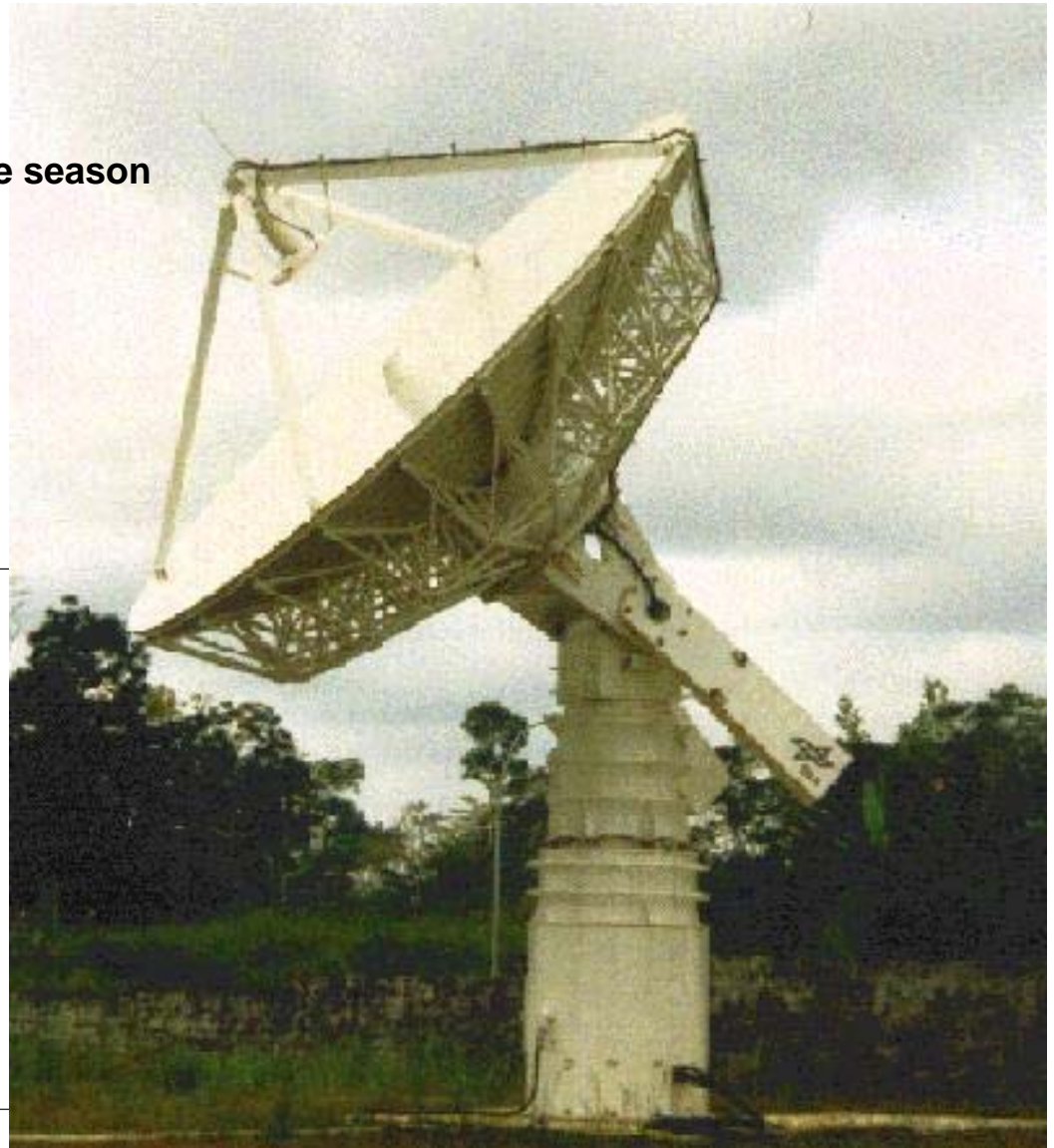
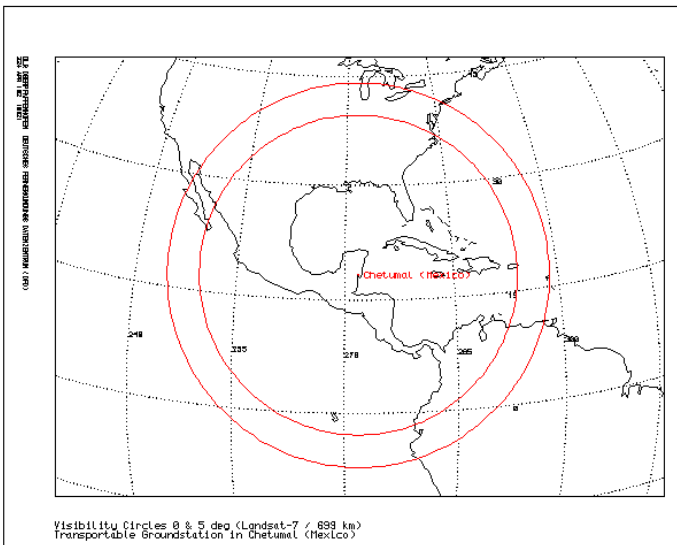


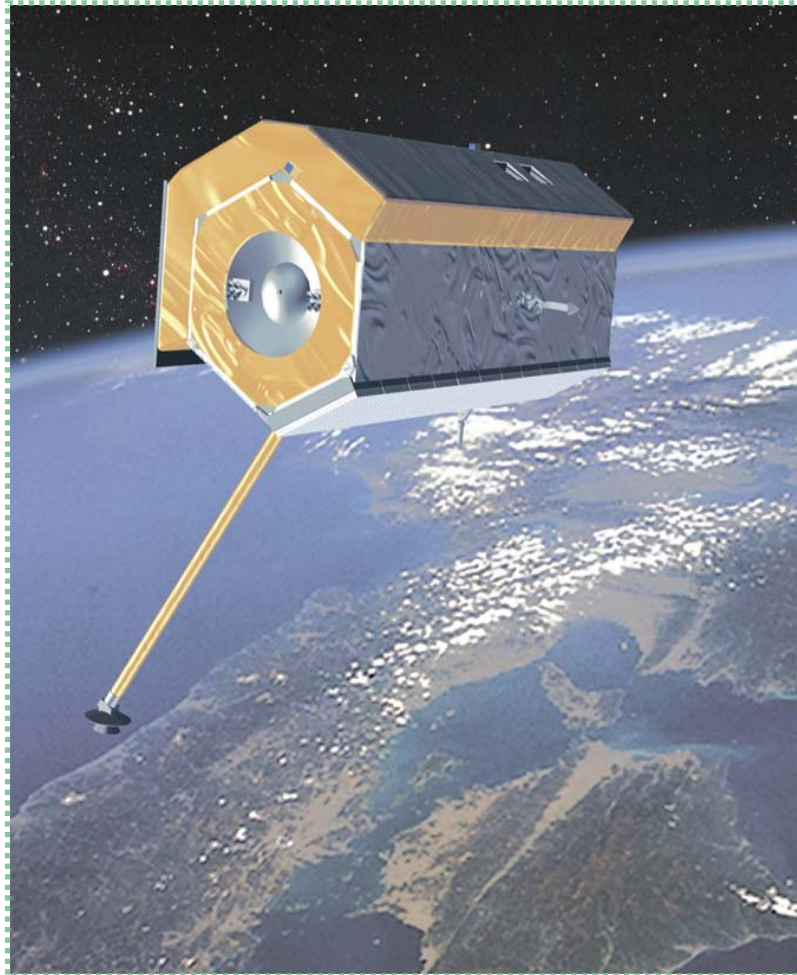
- **BMBF** German national programs: BIOLOG with BIOTA in Africa and Europe
- **EU** 6th Framework Program
- **Worldbank** Global Biological Inventory Facility (GBIF) in GEF (<http://www.gbif.org/>)



G/S infrastructure support for Biodiversity Monitoring project

- Installation at Chetumal site (2005)
- Preoperational phase before Hurricane season
- Acquisition of optical and SAR data
- Processing of data to basic products





- High-resolution radar mission
- Scientific and commercial applications
- Based on German experience
- National Implementation
- Public / private co-funding
 - *Public Private Partnership (PPP)*

- **Mission objectives**

- Enhance the Earth observation capability from space with high resolution high frequency SAR data
- To initiate a long term continuous service (10 years) with a follow-on spacecraft to be launched and operated by Astrium

- **Scientific mission objectives**

- will be oriented by the national research programs of BMBF, DLR, DFG and HGF as well as the GMES initiative of EU and ESA
- to extend the range of parameters observed and therewith to increase the knowledge of the factors determining the behavior of the environment
- to support the monitoring and management of the Earth's resources
- to better understand solid earth processes
- to improve the Earth observation services.

Space Segment



Secondary
Payload LCT

Secondary
Payload TOR

SAR Instrument

Satellite Bus



Telecommand/
Telemetry

Ground Segment

Radar Data
Downlink

MOS
Mission Operations Segment

IOCS
Instrument Operations &
Calibration Segment

PGS
Payload Ground Segment

Catalogue Browse Orders

Basic Products

Catalogue Browse Orders

Basic Products



Science Service Segment

Science
Service
System

Online Order
& Delivery
via EOWEB

Science
Coordinator
&
Order Desk

Proposal

Reports

Orders, Products

Science User Segment

Science Users



Commercial Service Segment

TSXX
TerraSAR-X
Exploitation
Infrastructure

Key
Accounts

Production
Partners

DAC
Direct
Access
Customers

DAP
Direct
Access
Partners

Browse Orders, Administration,
Products

Commercial User Segment

Standard
Customers

DAP User
Community

- **The scientific use of TerraSAR-X data is open to the international scientific community**
- **The status scientific use is gained with an evaluation process**
 - **TerraSAR-X data can be used for agreed purpose by the investigators**
 - **Investigator has to submit a science proposal**
- **Access to TerraSAR-X data after proposal acceptance**
 - **General submission => at COFUR price**
 - **AOs => special conditions**
- **Pre-launch AO**
 - **International call for proposals in April 2005**
 - **TerraSAR-X basic products**
 - **data provided free of charge**

- Every utilization of TerraSAR-X data and products that is not targeting a commercial profit oriented use is a “Scientific Use”. *
- In particular “Scientific Use” includes *
 - basic and application oriented research
 - by national and international educational and research institutions or through government sponsored projects
 - development and demonstration of future applications for scientific and/or operational use
 - preparation and execution of external financed education-, research and development programs
 - support of the TerraSAR-X project and mission (e.g. calibration and validation)

* PPP agreement

- **Goal is to stimulate the scientific use of TerraSAR-X data and to setup the Science Team**
- **AO shall be released in April 2005 (one year before the launch) and will be opened for three months**
 - **International call for proposals**
 - **AO is related to the use of TS-X Basic Products**
 - **Data will be provided free of charge (for electronic delivery)**
 - **Proposal submission via a web-interface**
(watch: www.caf.dlr.de/tsx/start_en.htm)