



European Interparliamentary  
Space Conference (EISC)

United Kingdom  
London 2009

# Space for Europe: A collection of case studies

## Introduction



Klaus Becher

Knowledge & Analysis LLP

## Space as a Problem Solver

- Practical benefits from investments in space technology
- Cost-saving solutions from space
- Space applications in support of wider policies
- Growth and wealth creation
- Improved quality of life

## The Case Studies

The Permanent Members were asked to present two case studies each from their own country.

## The Case Studies

The Permanent Members were asked to present two case studies each from their own country:

- First case — The present
  - An existing mission or application that is using satellites or other space technology successfully to solve problems, save money and create value.

## The Case Studies

The Permanent Members were asked to present two case studies each from their own country:

- First case — The present
  - An existing mission or application that is using satellites or other space technology successfully to solve problems, save money and create value.
- Second case — The future
  - A new project that will do the same in our space-enabled future.



Poland



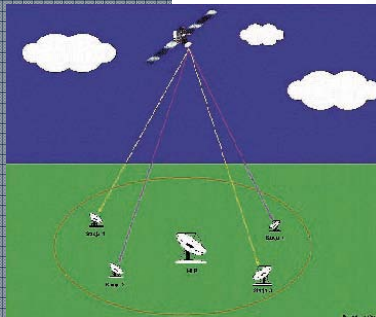
## TTS-4: Receiving highly accurate time from navigation satellites

- New Polish time transfer system.
- Provides time information of nanosecond accuracy
- Many important applications on the ground (power grids, finance, communications networks)
- Low-cost project
- Science/SME technology transfer
- Strengthened industrial base
- Enables Europe to take best advantage of Galileo's potential

NAVIGATION  
AND  
TIMING



Spain



COMMUNI-  
CATIONS

# AmerHis: Switchboard in space initiates new services and markets

- Spanish-led ESA project
- Pioneering a new era of onboard processing technology in communications satellites
- Many new, flexible applications of high-performance satellite communication
- Connects many dispersed users with each other and the Internet
- Operational and commercial success
- Strong interest in various user communities, including the defence sector





Belgium



EARTH  
OBSERVATION  
AND  
MAPPING

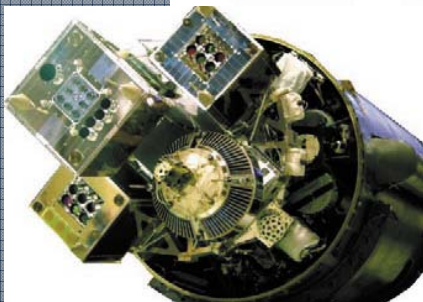
# Proba-1: A little miracle made in Belgium

- Small satellite developed in ESA with Belgian industrial leadership
- Demonstrator for onboard operational autonomy
- Still operational 8 years after launch
- Instruments on board prove to be of high value for various practical applications
- Available to schools for educational projects
- Involved many SMEs
- Increased Belgian expertise in space technology





United  
Kingdom



EARTH  
OBSERVATION  
AND  
MAPPING

# DMC: The power of small imaging satellites

- The Disaster Monitoring Constellation combines a number of small satellites owned by operators in several countries in a single constellation, coordinated by SSTL
- Permits worldwide image acquisition within 24 hours at extremely low cost
- This capability is very useful for international disaster response
- The DMC's commercial success highlights the strength of small satellites



Germany



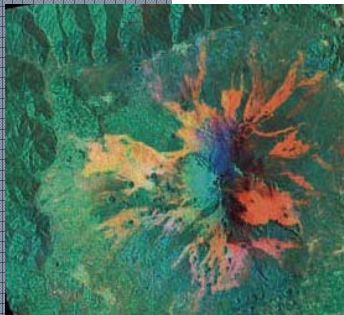
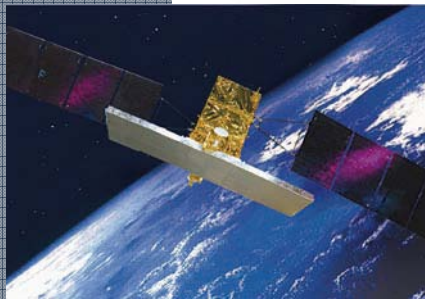
EARTH  
OBSERVATION  
AND  
MAPPING

# SAR-Lupe, TerraSAR-X and TanDEM-X: Radar observation satellites

- A set of national military and civil radar satellites
- Germany has achieved independent global reconnaissance capabilities for security and safety
- TerraSAR-X is embedded in GMES
- Innovative public-private partnership
- Pursuit of industrial leadership for Germany in radar imaging technology



Italy



EARTH  
OBSERVATION  
AND  
MAPPING

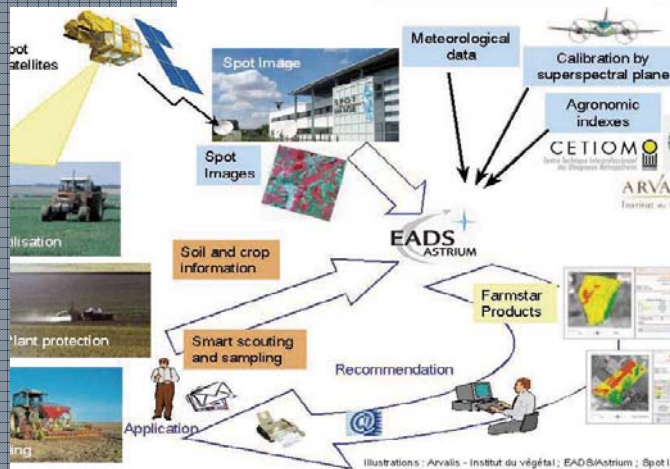
# COSMO-SkyMed: Radar images for civil and military users

- Operational constellation of high-resolution radar observation satellites
- Specifically conceived as a dual-use programme that meets both civil and defence requirements
- Precise, timely worldwide radar coverage
- Run jointly by the Italian Space Agency (ASI) and the Ministry of Defence
- Synergetic tool for the management of the full range of security risks, both nationally and in ESDP



France

# Farmstar: Guidance from space for environmentally friendly precision farming



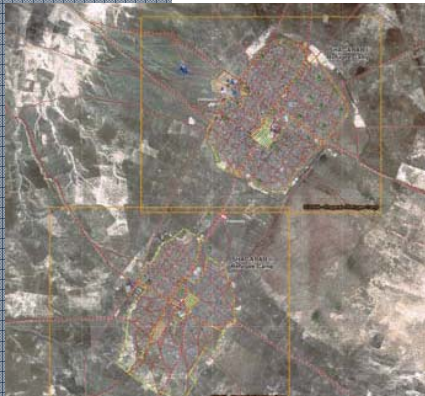
- French crop management support service
- Permits precision farming with high-resolution maps generated from satellite imagery and collateral information
- Commercial use by farmers is spreading fast
- Renders improved performance at reduced environmental impact

EARTH  
OBSERVATION  
AND  
MAPPING





Czech  
Republic



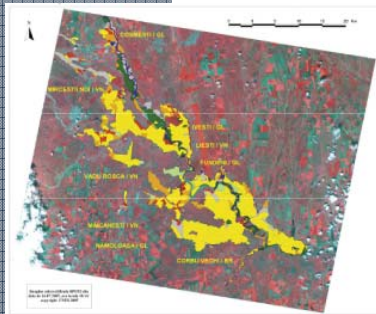
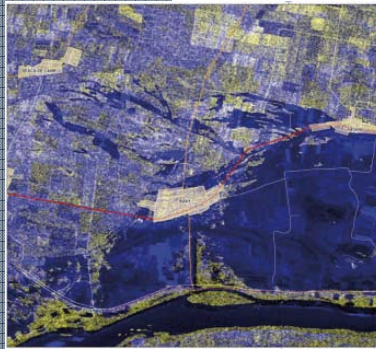
EARTH  
OBSERVATION  
AND  
MAPPING

# Respond: Instant maps for rapid humanitarian aid & disaster response

- International geo-information service (part of GMES)
- Strong participation of one GIS provider and two aid agencies from the Czech Republic
- Provides valuable instant mapping products based on satellite imagery
- In support of aid and assistance in disaster situations



Romania



EARTH  
OBSERVATION  
AND  
MAPPING

# SIGUR: Capacity building for flood disaster response

- In the major recent floods in Romania, satellite imagery from the SIGUR service demonstrated its large practical value for emergency management
- SIGUR will enable Romania to cooperate effectively with the operational disaster response mechanisms developed in GMES and the EU





Italy



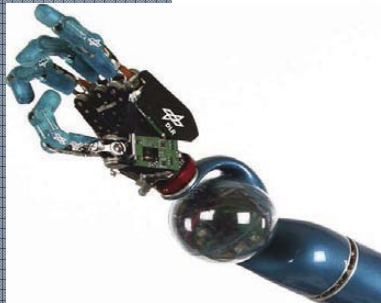
# Vega: European launcher for smaller satellites

- Italian-led new small ESA launcher
- Scheduled to enter service within two years
- Designed to make access to space easier, quicker and cheaper
- Drives innovation in launcher technology
- Expands Europe's autonomous access to space to the important field of small payloads
- Serves institutional and commercial users

LAUNCHERS



Germany



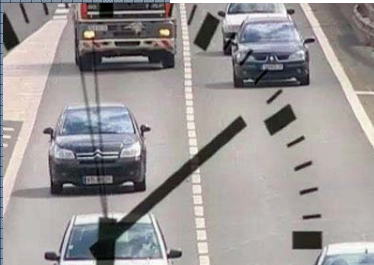
SPACE  
SCIENCE

# Robotics and research in space: Good investments for valuable benefits at home

- Germany is determined to fully exploit the unique research opportunities offered onboard the International Space Station and extend them into the future
- Human and robotic space activities complement each other
- The fascination of reaching out to the Moon and beyond is key for attracting new scientists and engineers
- Spin-offs from space robotics benefit our society



Poland



NAVIGATION  
AND  
TIMING

## GTSP and PTF: Ultra-precise Galileo time service

- Two projects: Galileo Time Service Provider and Precise Timing Facility
- Active Polish participation
- Create the cutting-edge ground-based time service infrastructure for the Galileo system
- The EU's time metrology community is building the basis for a rapidly expanding Galileo-related downstream industry
- For long-term growth, jobs and wealth creation in Europe



United  
Kingdom



COMMUNI-  
CATIONS

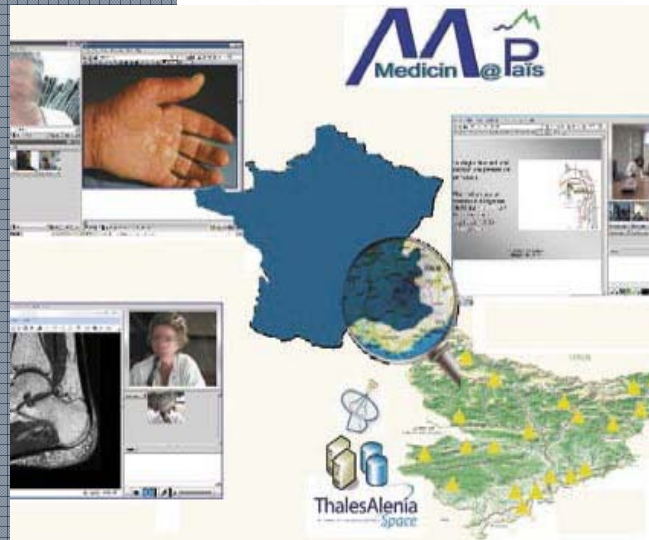
# Broadband Reach: Internet access for rural and remote areas in Scotland



- On behalf of the Scottish government, Avanti has been realising a variety of satellite-based broadband access solutions for rural and remote areas
- The success of the Reach project demonstrates that broadband delivery through communications satellites provides a viable solution for overcoming the digital divide across the European Union



France



COMMUNI-  
CATIONS

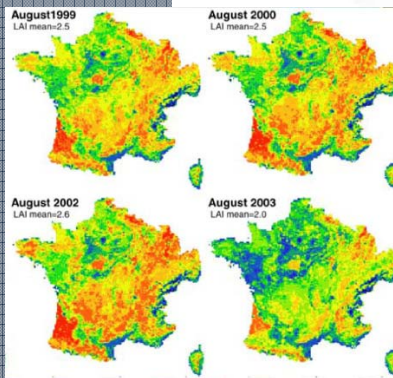
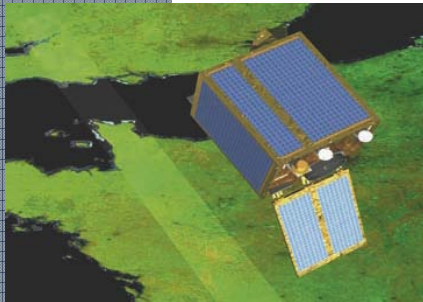
# Medicin@Païs: Telemedicine services for remote areas

- Led by the regional government of Alpes Maritimes in Nice
- Using broadband satellite links, the healthcare infrastructure of rural, mountainous areas is lifted to a higher level through remote consultation and training
- Doctors and nurses can access the expertise of university hospitals to offer better treatment and care to their patients and the elderly





Belgium



EARTH  
OBSERVATION  
AND  
MAPPING

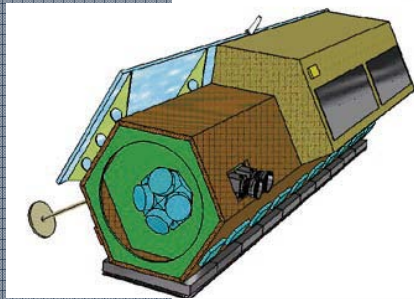
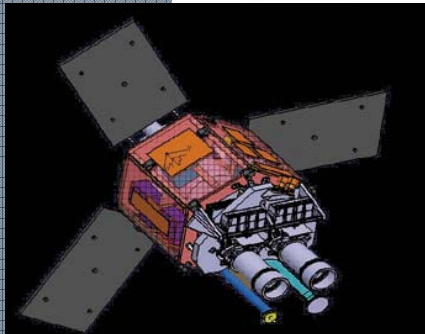
# Proba-V: Continuity for vegetation monitoring

- Belgian-led small satellite under development in ESA for launch in 2012
- Designed to extend the valuable long-term data set of the multispectral VEGETATION sensors for land-cover observation
- Data from such multispectral vegetation sensors has been available since 1998.
- Proba-V data are a key contribution to global environmental science and climate monitoring.





Spain



EARTH  
OBSERVATION  
AND  
MAPPING

## SEOSAT/SEOSAR: Spanish Earth observation satellites

- Spain is building a national Earth observation satellite system consisting of an optical and a radar platform
- The radar satellite SEOSAR is defence-oriented
- The new system will help to better satisfy the data requirements of various user communities in science and government
- Internationally, it enables Spain to share imagery with others and to support GMES/GEOSS



Romania



EARTH  
OBSERVATION  
AND  
MAPPING

# FORESAT: Sustainable forest monitoring with satellite and ground images

- Combines geo-referenced woodland photographs taken on the ground and related satellite images of forest areas in a national database
- Permits the government and citizens to monitor the state of forests and detect significant changes
- Supports law enforcement and environmental protection
- Interactive space technology application that involves the public actively

## Recent Trends

## Recent Trends

- Most cases from Earth observation and mapping (including data applications and services)

## Recent Trends

- Most cases from Earth observation and mapping (including data applications and services)
- No strict separation between national and European projects
  - Many forms of interplay and overlap
  - Considerable multilateral cooperation in almost all cases

## Recent Trends

- Most cases from Earth observation and mapping (including data applications and services)
- No strict separation between national and European projects
  - Many forms of interplay and overlap
  - Considerable multilateral cooperation in almost all cases
- Widening field of actors
  - EU, regional governments, SMEs, non-space sector users and providers
  - Numerous missions are jointly financed by more than one government department



## Recent Trends

- Most cases from Earth observation and mapping (including data applications and services)
- No strict separation between national and European projects
  - Many forms of interplay and overlap
  - Considerable multilateral cooperation in almost all cases
- Widening field of actors
  - EU, regional governments, SMEs, non-space sector users and providers
  - Numerous missions are jointly financed by more than one government department
- Broadening set of justifications for space investments
  - Key role of specific, practical benefits for society
  - Space as enabler for improved applications and services
  - Competitive use of innovation and growth opportunities
  - Increased safety and security
  - STEM recruitment

## Current Trends

## Current Trends

- Small satellites and constellations

## Current Trends

- Small satellites and constellations
- Commercial investment in space assets based on expected revenue streams

## Current Trends

- Small satellites and constellations
- Commercial investment in space assets based on expected revenue streams
- User-driven space missions, applications and services

## Current Trends

- Small satellites and constellations
- Commercial investment in space assets based on expected revenue streams
- User-driven space missions, applications and services
- Space projects are defined as elements of a wider practical framework



## Current Trends

- Small satellites and constellations
- Commercial investment in space assets based on expected revenue streams
- User-driven space missions, applications and services
- Space projects are defined as elements of a wider practical framework
- Security applications
  - Climate change and environmental security
  - Emergency and disaster response
  - Law enforcement
  - International security and defence
  - Pooled contributions to interoperable, multinational systems of systems

Thank you