

# → 7th ADVANCED TRAINING COURSE ON LAND REMOTE SENSING

4–9 September 2017 | Szent István University | Gödöllő, Hungary



# Space Related Activities in Hungary

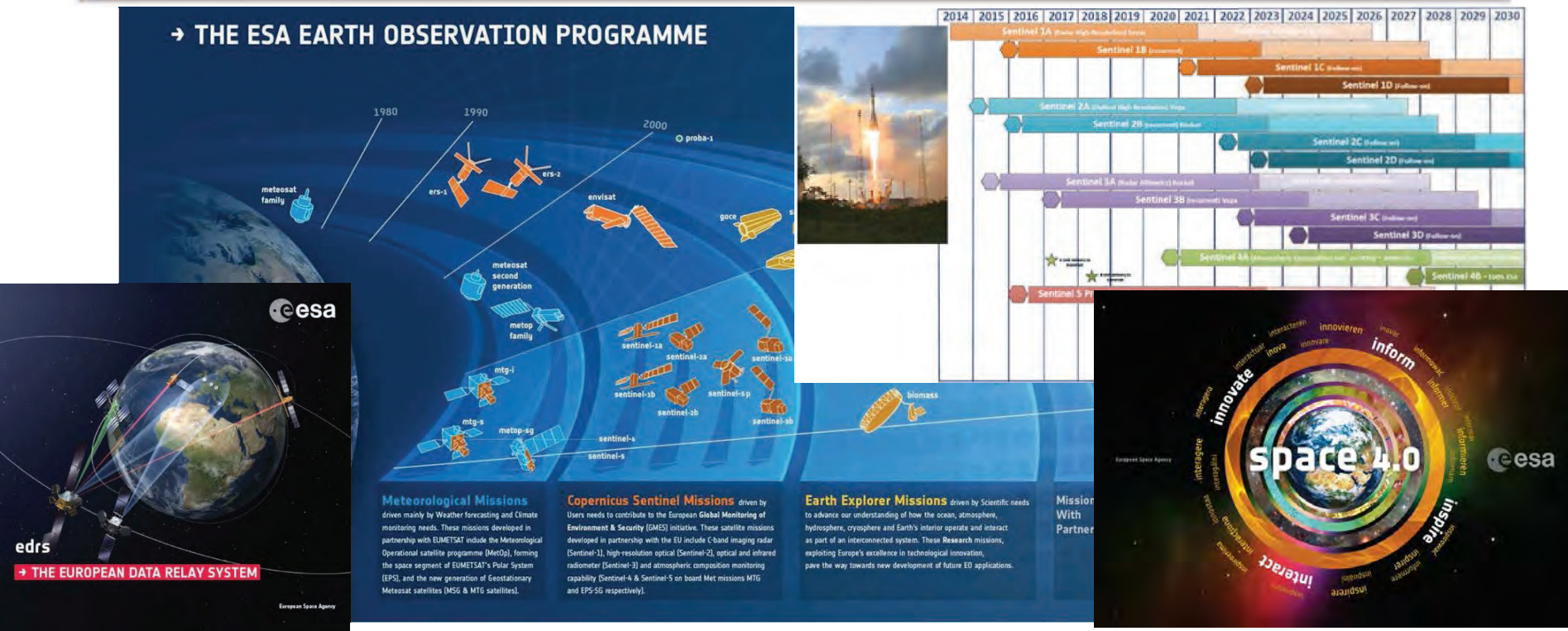
Zoltán Zboray

Hungarian Space Office  
Ministry of National Development



# Introduction

## → THE ESA EARTH OBSERVATION PROGRAMME



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# Introduction



Publications about the Hungarian  
Space Industry, 2014-2016

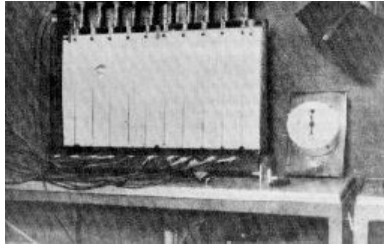


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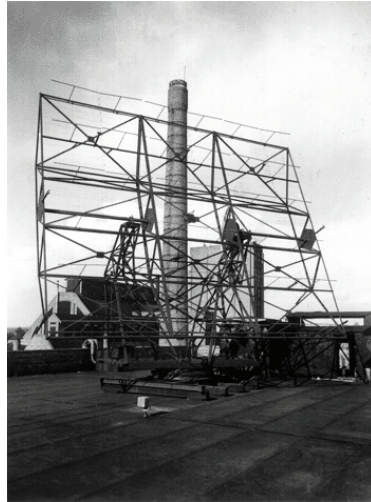
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# Milestones from the history of the Hungarian space related activities

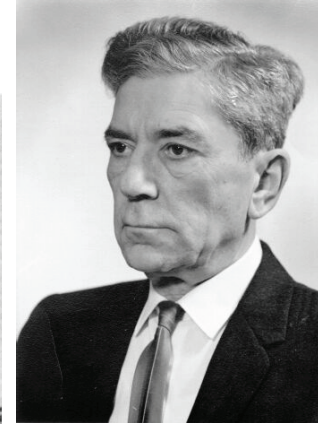
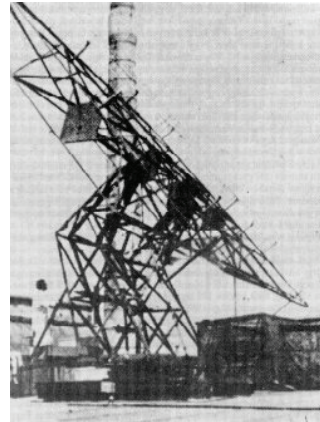
1946: The **Moon-Radar Experiment**, the beginning of Hungarian space activities



10-part coulometer for the addition of reflected signals



The antenna (6x8 m<sup>2</sup>) of the Moon-Radar Experiment  
Tungsram Research Laboratory, Budapest, Hungary



Zoltán BAY  
physicist  
(1900-1992)



Artwork for the Moon-Radar Experiment on the memorial tablet placed at Bay's house of birth in Gyula, Hungary

# Milestones from the history of the Hungarian space related activities

1967: Hungary joined the **Intercosmos** program



SAS (Signal Analyser and Sampler) plasma wave experiment, ELTE Space Research Group, 1989



„Agreement on Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes”



Intersputnik Space Communications Base, Taliándörögd, Hungary, 1977

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# Milestones from the history of the Hungarian space related activities

## 26.05.1980: The first Hungarian spaceflight



Astronauts Bertalan FARKAS (HU) and Valerij KUBASOV (USSR), ready for launch onboard the Soyuz-36 within the framework of Intercosmos program



Astronauts Bertalan Farkas (Hungary), Sally Ride and Jim Voss (United States) performing measurements with the Hungarian „Pille” dosimeter



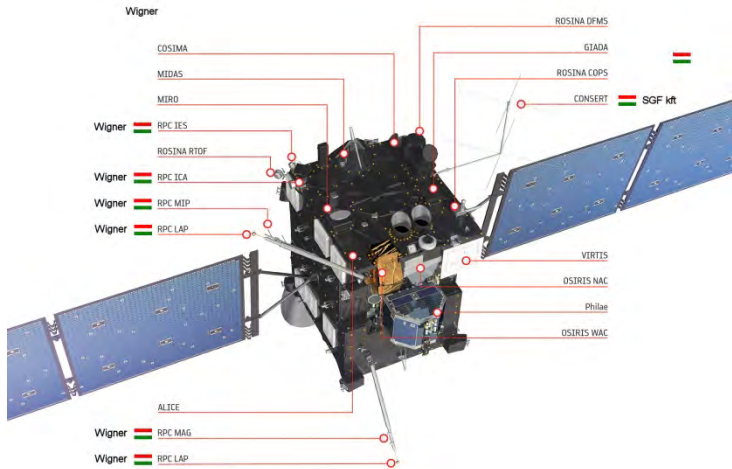
Three generations of the „Pille” dosimeter, KFKI Atomic Energy Research Institution

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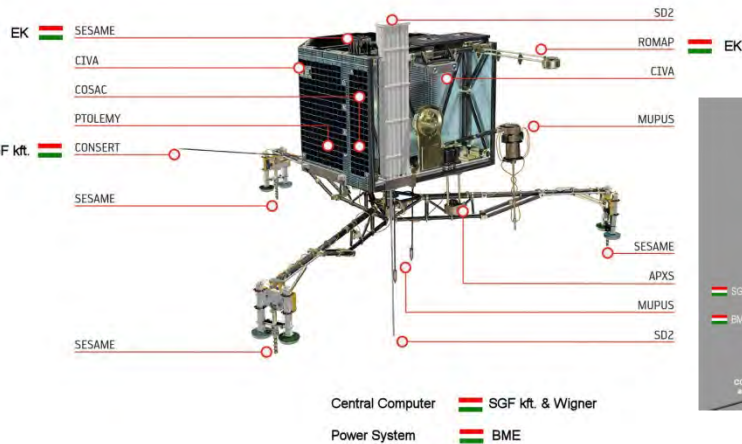
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## Milestones from the history of the Hungarian space related activities

2004: Hungarian space industry contribution to developed the **instruments of Rosetta mission**



## Hungarian contributions to the Rosetta mission



## Hungarian contributions to the Philae landing unit



## Hungarian contributions to the core system parts of Philae: Central Computer and Power System

# Milestones from the history of the Hungarian space related activities

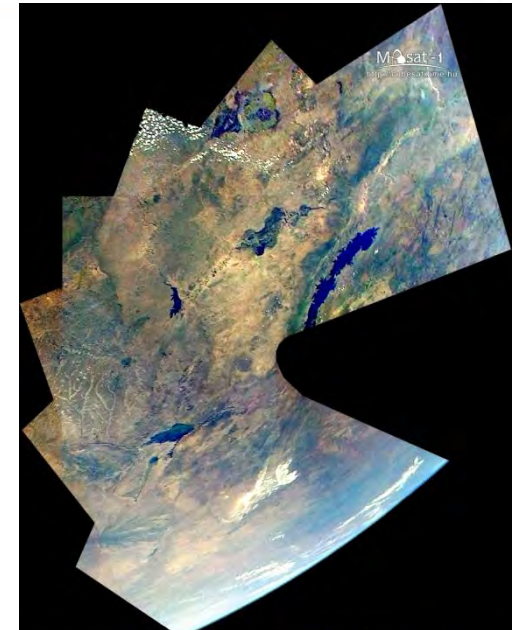
## 2012: Masat-1: The first Hungarian satellite



The Masat-1 team  
Technical University of Budapest  
(BME)



1U CubeSat (10x10x10 cm, 1 kg)



<http://cubesat.bme.hu>

Image taken by Masat-1 CubeSat (2012)

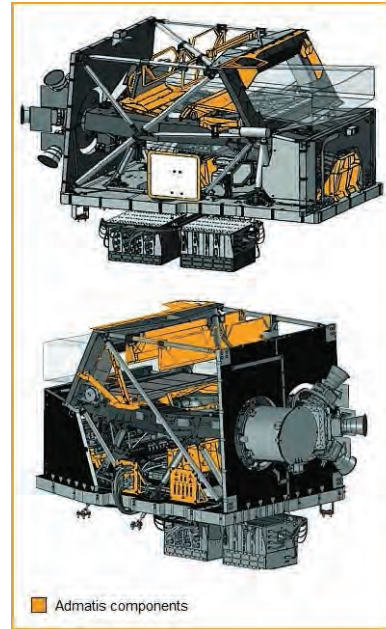
Mosaic image from overlapped Masat-1  
satellite imagery, Zambia, Africa

# Milestones from the history of the Hungarian space related activities

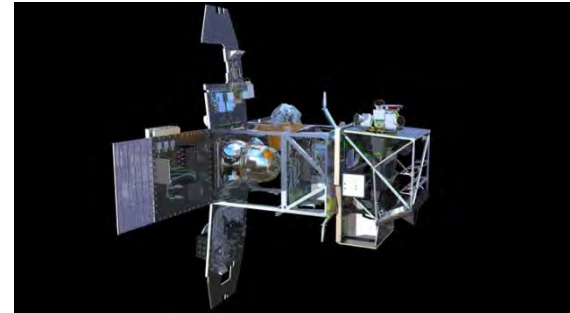
2013: Hungarian space industry developed and built satellite parts for the **Sentinel-2 MSI**



Several satellite parts of Sentinel-2 MSI,  
developed by a consortium led by  
**Admatis Ltd.**



Admatis Ltd. components in Sentinel-2 MSI



Outside and inside view of Sentinel-2

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# Milestones from the history of the Hungarian space related activities

## 2015: Hungary becomes the 22. ESA Member State

1991: General Cooperation Agreement

1998: PRODEX Agreement

1999: First round of negotiations for membership

2003: PECS Agreement

2008: PECS 5 year extension

2013: PECS 2 year extension

**24.02.2015: Hungary signed the Accession Agreement to the ESA Convention**

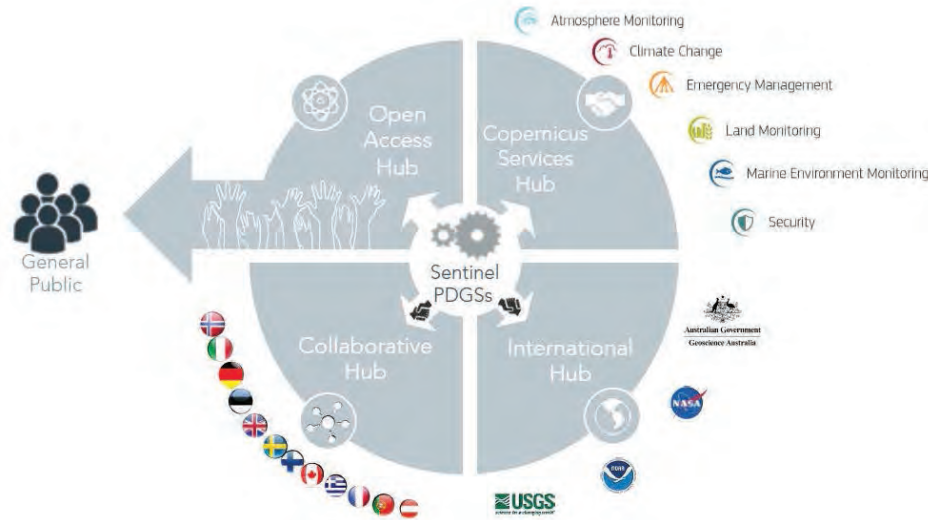
04.11.2015: Ratification of ESA Accession Agreement  
- Hungary becomes the 22. ESA Member State



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# Future plans – Sentinel CollGS in Hungary



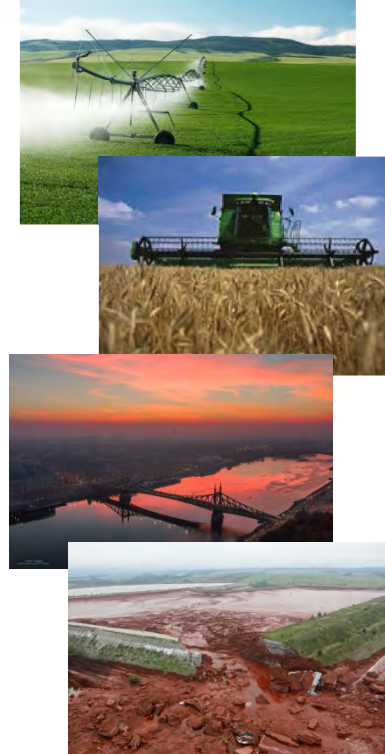
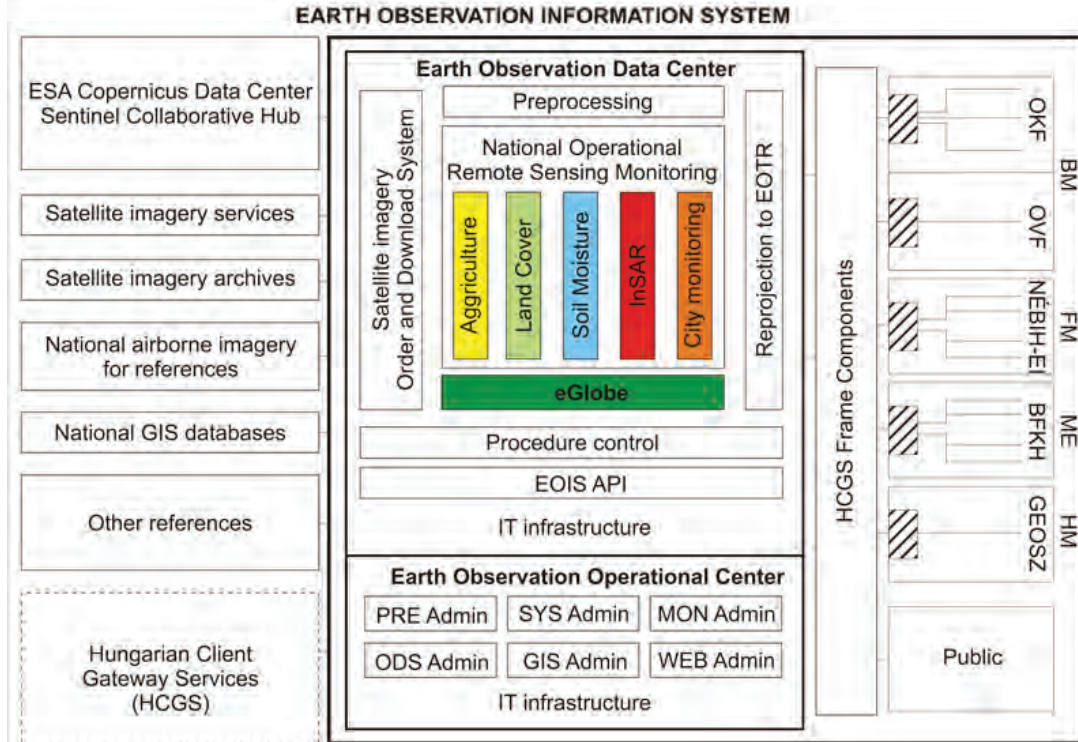
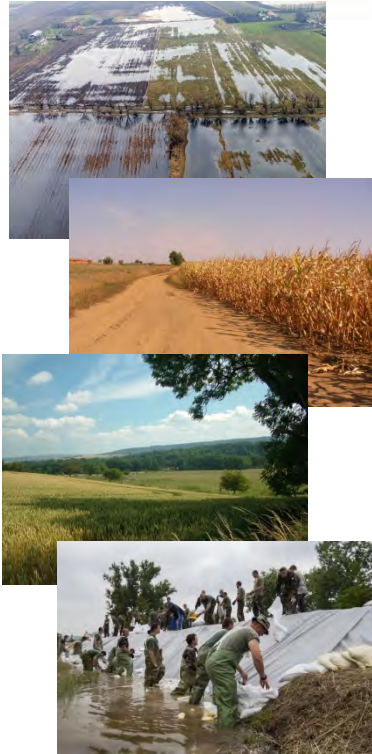
Sentinel Data Access System configuration by end Y2016 – ESA Data Access Annual Riport, 2017

Information Day, Earth Observation Round Table in 2016 – organised by Hungarian Space Office

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# Hungarian Space Office

- Independent agency, founded in 1992
- Under the supervision of the Hungarian **Ministry of National Development**.



## Responsibilities

- First pillar: **Support and coordination** with domestic space actors
- Second pillar: Bi- and multilateral **international cooperation**
- Third pillar: **Representation of Hungary** in the European Space Agency

## First pillar

- Coordination of the domestic sector
- Identification, assessment and support for productivity and growth of Hungarian space actors
- Domestic programmes for alternative technology developments that can increase cost-effectiveness for internal activities

## Second pillar

- Representation of Hungary in international organizations
- Representation in the EU
- Development and maintenance of bilateral relationships

## Third pillar

- Hungarian delegation to the European Space Agency
- Exploitation of opportunities related to ESA membership
- Supervising the Hungarian Incentive Scheme (Task Force members)
- Supervising overall geo-reurn



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# Hungarian Space Directory



Approximately 50 eligible Hungarian space actors:

- Industrial entities (SMEs)
- Academy research centers
- Universities
- Research institutes

*Hungarian Space Directory 2016* – comprehensive bilingual catalogue of these actors

# Thank you for your attention!



Hungarian  
Space Office