




Space as Enabler



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romanian space agency

The 3S - New ROSA Strategy



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Romanian Space Agency - ROSA

- ROSA - National Space Agency established 1995
- Public organization in the system of the Ministry responsible for Research and Technology
- Representative and Coordinator of space activities in Romania
- Financing agency for research in Space, Aeronautics and Security (2001 - ; STAR Programme (2012 - 2019));
- Coordinator (2004 - p) of the Inter-Ministerial (Inter-Agency) Group for Security Research; Public authority responsible (APR) for specific national critical infrastructures; National Coordinator for SSA, GNSS; CPA for Galileo PRS;
- Developer and integrator of its own RTD programmes by the ROSA Research Centre (RRC)



Romanian Space Agency - ROSA

ROSA - national representative for:

- European Space Agency (ESA)
 - Romania the 2nd former socialist country admitted in ESA (2011), ECS (2006), first ESA agreements in 1993, 1999
- European Union: GSA-AB, Galileo - Competent PRS Authority, Copernicus Committee, SST Consortium, Govsatcom, Horizon 2020 Space, Security research, Aeronautics and Galileo, Space Working party, COMPET - Space, EDA and EUSC specific issues
- UN - COPUOS (former Vp, Chair, Chair COPUOS 2020 - 2022)
- NATO and IAF, IAA, COSPAR, IISL, GEO, Eurisy, ESPI, ISECG, other bilateral agreements with national agencies (NASA, CNES, DLR, ASI, China CNSA, Ukraine, Poland POLSA, Greece HSA, KARI, others).



National Space Strategy

- Defined by means of the RTD policy, with effects on both academia and industry.
- Three constant objectives since the 90's:
 - Participation to international space missions and programmes
 - Development of specific national projects
 - Capacity building at national level

Presently ruled by:

- Romanian Research, Development and Innovation Strategy 2014 - 2020
- National RTD Plan 2015-2020 (extended to June 2014)
- Law no 262/2011 for the ratification of ESA accession and the STAR Programme
- Romania - EU Partnership Agreement 2014 - 2020: SPACE - RO Smart Specialisation



* **New Strategy 2018 - The three S**

- * materialisation of the present and the actual trend of space development.

* **Science & Technology**

- * Including Space Exploration
- * Field of applications for all areas of science
- * Driver for most technology domains

* **Services**

- * Telecommunications, Earth observation, PNT,
- * Integrated applications: precision farming, telemedicine, disaster management,

* **Security**

- * Planetary defense, Space weather, Space traffic management (SSA, SST)
- * Disaster management, prevention, recovery
- * Peacekeeping, arms control, illegal trafficking, de-mining, cybersecurity
- * Monitoring of global issues



* The three S

* Science & Technology

Space science and exploration are the continuous components of the humankind permanent evolution and are supported by

- Ambitious deep space missions, as the Lunar and planetary probes, in the same time by
- Important scientific infrastructures , as space telescopes and the space stations
- Human and robotic exploration.



* The three S

* Science & Technology

- * Science missions: Planck, Euclid, Lisa, CLUSTER II, Venus Express
- * ESA programmes: MREP, ELIPS, International Space Station exploitation, E3P
- * Center for **Small satellites** - 1 - 40 kg in LEO, test and integration
- * Center for **Launchers and spaceflight** - micro-launcher, re-entry
- * Center for **Planetary Sciences** (outer space bodies) - asteroids
- * Center for **Laser technology** - power lasers radiation hardening
- * Centre of competence for **wireless Intra-SATellite Technologies** (wireless “harnessing”)
- * For exploration, the Center of competence is the Institute of Space Sciences in Bucharest, established in the 60’s and participant to more than 60 missions.
- * Institute of Aerospace Research (INCAS), Astronomical Institute, Institute of Lasers, Institute of Microelectronics, Universities and advanced research

Institutes



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* The three S

* Services

Provided by satellite infrastructures and downstream applications, including satellite industry and launch and orbiting services, are already a permanent component of the present post industrial era. Most of them are addressed to the citizen and are sustainable.



* The three S

* Services

- * Telecommunications and Integrated Applications ESA
- * European GNSS evolution, NAVISP
- * Earth Observation Evolution Programme ESA - Earth Watch,
- * GMES Space Component, METOP, ALTIUS, Earth observation, PNT, Integrated applications: precision farming, telemedicine, disaster management, meteorology,

- * Center on **Big Data for space** - EO data and astrophysics
- * Center on **Black Sea and Lower Danube Studies**
- * Center on **Atmospheric science** (lidar) - parameters measurement
- * Center on **Space applications for agriculture**
- * Institutes, Universities: Agriculture, Geography, Forests, Environment, Land use and Geology, Companies and services



* The three S

* Security

Protection of the citizen - Services as disaster management, telemedicine, information security and protection of space infrastructures which made those applications possible - space traffic management.

Global security - A major role of space is to maintain global security against horizontal and vertical conflicts and this item is addressed to particular states or groups of countries, and this role offered the rationale for the early existence of COPUOS.

Planetary defence - Protection of the civilisation against cosmic threats - potential collisions with other cosmic bodies, protection against solar disturbances, monitoring the Earth global features



* The three S

* Security

- * National inter-agency group for security research
- * Regional Centre for the United Nations - SPIDER programme
- * PA for national space-related critical infrastructures
- * Disaster monitoring capabilities
- * ESA Space Situational Awareness
- * European Union Space Surveillance and Tracking consortium
- * European Union and ESA Govsatcom programmes
- * Proba-3 coronagraph and Asteroid Impact Mission (AIM) - HERA
- * Surveillance and tracking by mono/bistatic radar techniques - national SST surveillance network and national SW service

- * ROSA, INCAS, ISS, METRA, Industry



* Space for agriculture

- * Applications started before 1990 - Resurs / Landsat
- * Since 1992 - ESA ERS, FR SPOT, Landsat, multispectral, radar - science for agriculture
- * High level training of experts in FR and other countries
- * 1993 - CRUTA - Romanian Center for Space Apps in Agriculture
- * 1997 - Crop Information System - MARS Programme
- * 2000 - NASA - ROSA cooperation on Precision Farming
- * 2001 - CNES - ROSA common precision agriculture - project ADAM
- * 2000's - Land Use / Land Cover UN - LCCS - FAO - Food

International Agricultural Organisation



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* **Space for agriculture and environment**

- * Applications since RO joined the EU - national-wide projects and regional
- * IACS/LPIS (2002-2007) - Land Parcel Information System
- * LCCS database (2003-present)
- * Technical Assistance to Develop Romanian Environmental related GIS maps (PHARE project)
- * ROENV geoportal (2007-2009)
- * Monitoring illegal deforestation (2015 -)
- * COPERNICUS Collaborative Ground Segment (Sentinel mirror 2018)
- * **Space infrastructure - critical for agriculture!**



* **Romanian Space Agency current programs**

- National Space Programme: leader for one of the "smart specializations" of the country: Information and communication technology, Space, Security research
 - 28 Meuro 2017 / t.b. continued to 2020;
- ESA Member State: participation in 17 programs,
 - 35 Meuro 2017, 45 Meuro 2018, 329 Meuro to 2023;
 - ESA - essential due to the geo-return principles
- Coordination of national programmes in space infrastructure and space applications, including security

* **RO EU Presidency 2019**

- 2019 - Romania - chair of the EU Council for the first semester
- SPACE selected as a priority of the presidency

* **RO Chairmanship of the UN COPUOS - Committee on the Peaceful Uses of Outer Space 2020 - 2022**





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- Space services for the Union and its citizens
- Capacity building
- EU as a global actor





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Focus on:

- EU Space programme

- EU - ESA Space Council





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Extra slides



Space programs in Europe

- European Space Agency, European Union, Member States
- **ESA - European Space Agency**
 - Major space programme in Europe
 - 22 Member States with more than 99% of space budgets in Europe
 - Space agency: technology, mission management, industrial policy, space centres and laboratories across Europe
 - Programmes decided by the ESA Council at Ministerial Level - the next in 2019



Space programs in Europe

- **The European Commission**
 - Successful programmes on space applications and downstream
 - GALILEO - the European GNSS - operational 2018 and managed by the EU GNSS Agency GSA
 - COPERNICUS - Earth Observation - operational 2015
 - GOVSATCOM and SSA - Space Situational Awareness - in development
 - Grants for space research
 - EU Space Programme for 2021 - 2027 - Regulations - negotiations t.b. concluded by the RO presidency



Centres of Competence

- Nanosatellites - 1 - 40 kg in LEO, test and integration (ISS)
- Launchers and spaceflight - micro-launcher, re-entry (INCAS, PUB)
- Guidance, Navigation and Control Technologies - UAS and satellite formation flying applications
- Centre of competence for wireless Intra-SATellite Technologies (wireless “harnessing”)
- Laser technology - power lasers radiation hardening
- Planetary Sciences (outer space bodies) - asteroids
- Atmospheric science (lidar) - parameters measurement
- Black Sea and Danube studies by space technology
- Big Data for space - EO data and astrophysics
- Space applications for agriculture
- Human Space Flight support (countermeasures)



Infrastructure

Infrastructure development

- High speed testing facility - INCAS
- Microsatellite test and integration centre - ISS
- Radiation test and hardening facility - INFLPR
- Satellite ground stations (Bucharest and Cluj)
- Cheia ground q-monostatic radar for SST

Future larger projects

- GEO Satcom for public institutions
- Satellite EO data reception and processing centre
- Spaceport on the Black Sea at Capu Midia



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