

**3<sup>rd</sup> International Conference on Space Situational Awareness (ICSSA)  
Tres Cantos - Madrid**

**IAA-ICSSA, 4-6 April, 2022**

# **THE NATIONAL CHALLENGES OF SPACE SURVEILLANCE AND TRACKING'S TECHNOLOGICAL SOLUTIONS**

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# Overview:

- **Romanian Space Agency's activities related to SSA/SST**
- **Romanian SST architecture**
- **Conclusions and ways forward**



# 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)



## ROSA - national representative for:

- European Space Agency (ESA)
  - Romania the 2nd EE 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 agreements with national agencies (NASA, CNES, DLR, ASI, China CNSA, Ukraine, Poland POLSA, Greece HSA, KARI, others).



## \* 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*
- ESA Member State: participation in 17 programs
- EUSST Member State: participation in 2 grants
- Coordination of national programmes in space infrastructure and space applications, including security



## \* RO EU Presidency 2019

- SPACE selected as a priority of the presidency

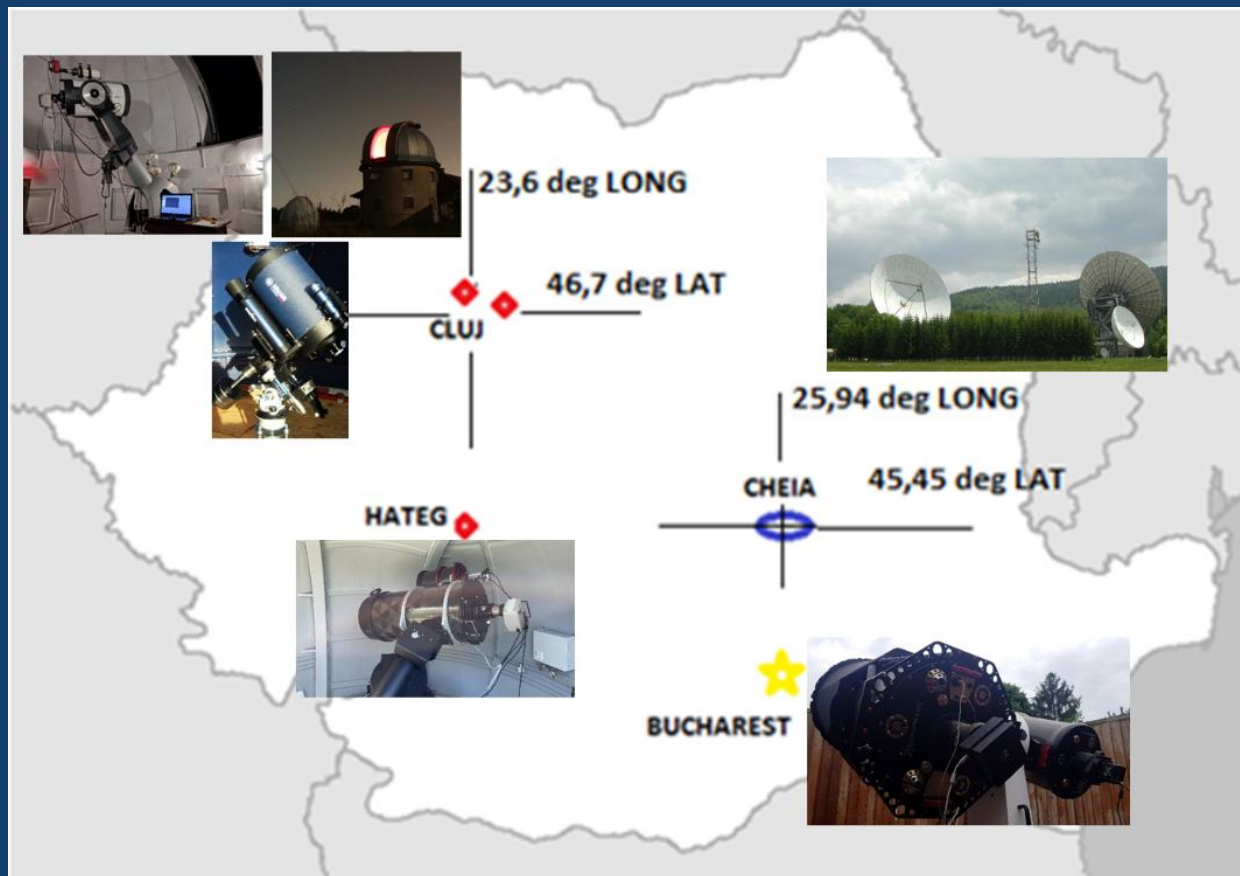
## \* RO Chairmanship of the UN COPUOS - Committee on the Peaceful Uses of Outer Space 2020 - 2022

## \* Artemis Accords (March 1<sup>st</sup>, 2022)





# Romanian SST system



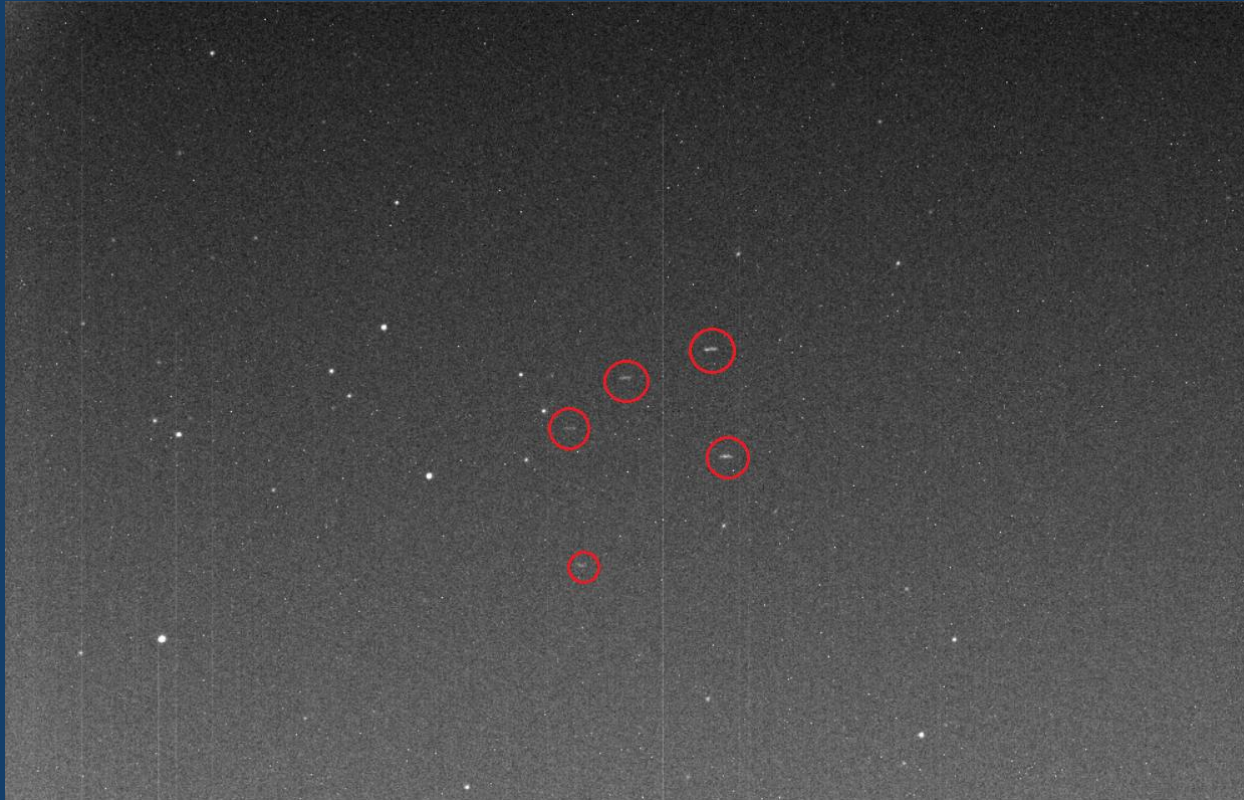
# Cluj optical sensors

*AROAC-T08 acquisition on  
24.07.2020: Conjunction  
probability between COSMOS  
2543 and COSMOS 2535. The  
stars appear as stable points  
while space objects as stracked  
(©AROAC 2020)*



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# The BERTHELOT sensor



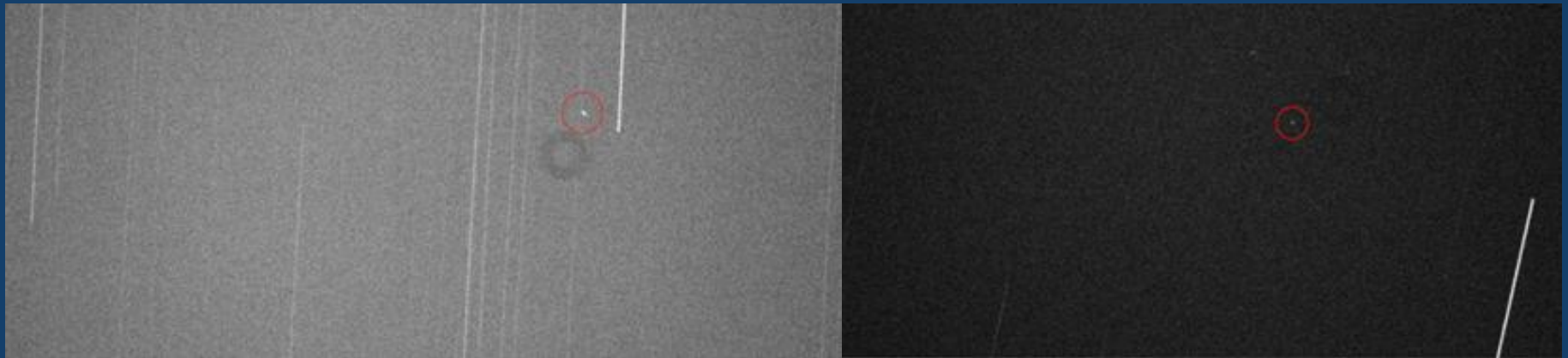
*Berthelot acquisition in surveillance mode during the observation campaign from 03.01.2021. (©AIRA,2021)*



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# The NEEMO system



*Images of some fragments taken by the sensor NEEMO on the 20th of April generated as a result of Indian ASAT test in 2019 (©AIRA, 2019); images are a constituent part of an EUSST report.*



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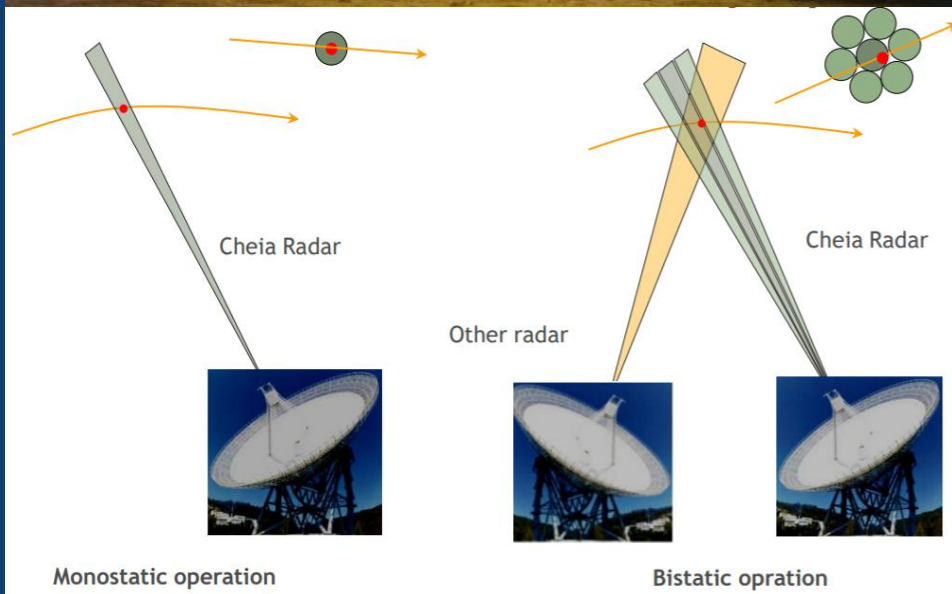
# The Cheia radar station



The main scope of this radar system shall be to detect and track LEO objects (above a defined size and up to an altitude of 200–2000km).

The sensor shall contribute to refine:

- the ESA space debris environment model containing physical and orbital information about LEO space debris,
- a future European Master Catalogue for Space debris.
- uses in the EUSST Consortium in providing data for FG and RE services



Pre-operational phase: October 2021  
Operational: March 2022



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# COST OPERATIONAL CENTRE FOR SPACE SURVEILLANCE AND TRACKING

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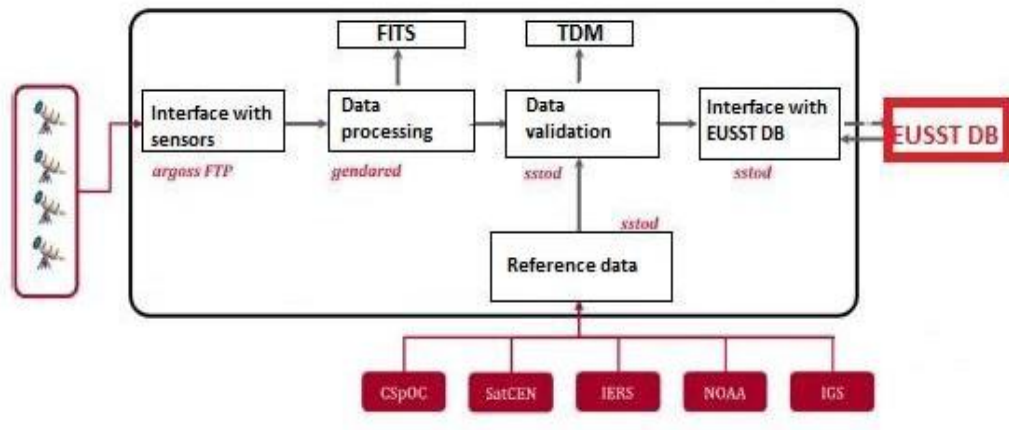


- Established in 2018 under ROSA's auspices
- Assigned to deal with:
  - Sensor planning and tasking
  - Data processing and cataloguing
  - Expertise for the national entities responsible for the management of risky situations (Government Decision no 557/2016 on Emergency Situations Risk Management)
- National funding:
  - Space objects database
  - Build-up a space objects catalogue, maintenance and updating



# COSST OPERATIONAL CENTRE FOR SPACE SURVEILLANCE AND TRACKING

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- High bandwidth dual internet connection - BGP implemented
- Local cyber security measures - linked to National cyber security operational facility
- Access control, video surveillance at all components
- ISO27001 ISMS certified (as part of ROSA)
- Accredited classified facilities: National, EUCI, NATO

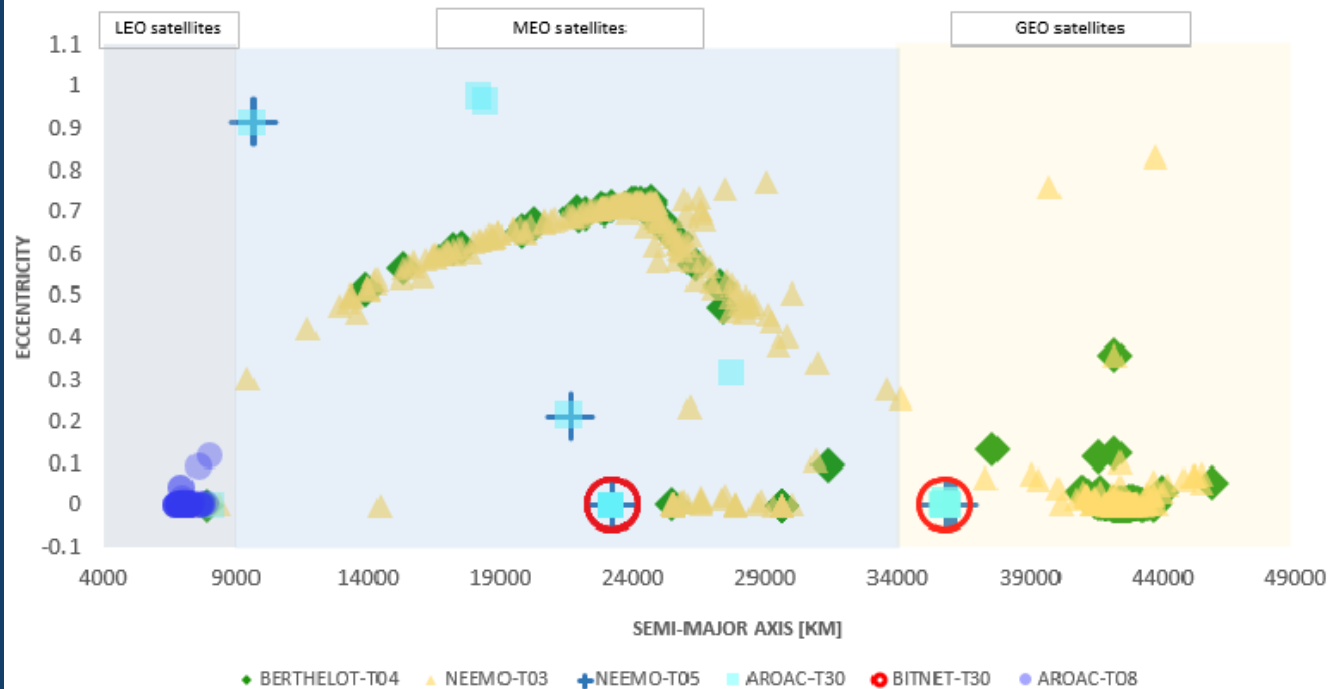
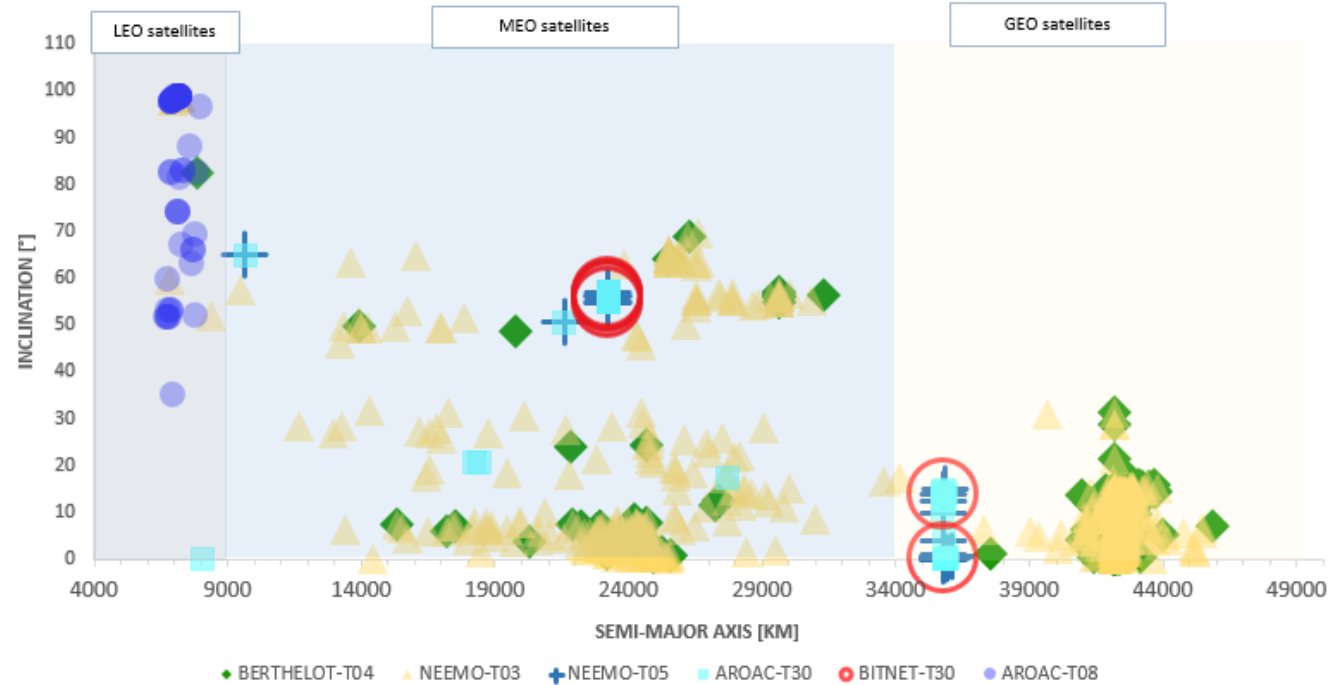
- Data centre:

- processing facilities (physical and virtual architectures available), storage, backup procedures
- data management for RE
- secure VPN connections with sensors
- EU-SST DB interface at API level



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## Recent SSA/SST national funding



### RoSSA

System for the analysis and assessment of risks in outer space (RoSSA) (2021-2023)

– 1.4 M€

<http://rossa.rosa.ro/>



Institutional capabilities and services for research, surveillance and forecasting of risks from extra-atmospheric space (2018-2021) – 1100 k€

<http://safespace.rosa.ro/>



Developing of monitoring and co-ordination space surveillance activity, to forecast the risks related to impacts of natural and artificial objects (2017-2018) – 320 k€

<http://argoss.rosa.ro/>

# Conclusions and ways forward

- \* Work in progress
- \* **Romania's plans to develop the SST capabilities are aligned with international and European objectives**, many of them being already ongoing. Establishing a SST network implies the collaboration between entities from different domains, as academia, public institutions, private sector or industry, but the experience showed that it is possible and the results of such partnerships are fruitful and satisfying.
- \* **Coordination**
- \* Outreach and transparency between industry, stakeholders and governmental entities is key, as well as the development of a structured relationship with the private sector.



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## Thank you!

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