



# ASI contributions for WG1 activities



## Inter-Agency Space Debris Coordination Committee



# FLYEYE OPTICAL TELESCOPE

Thanks to the **EU Recovery Fund**, three large projects devoted to the space debris have started

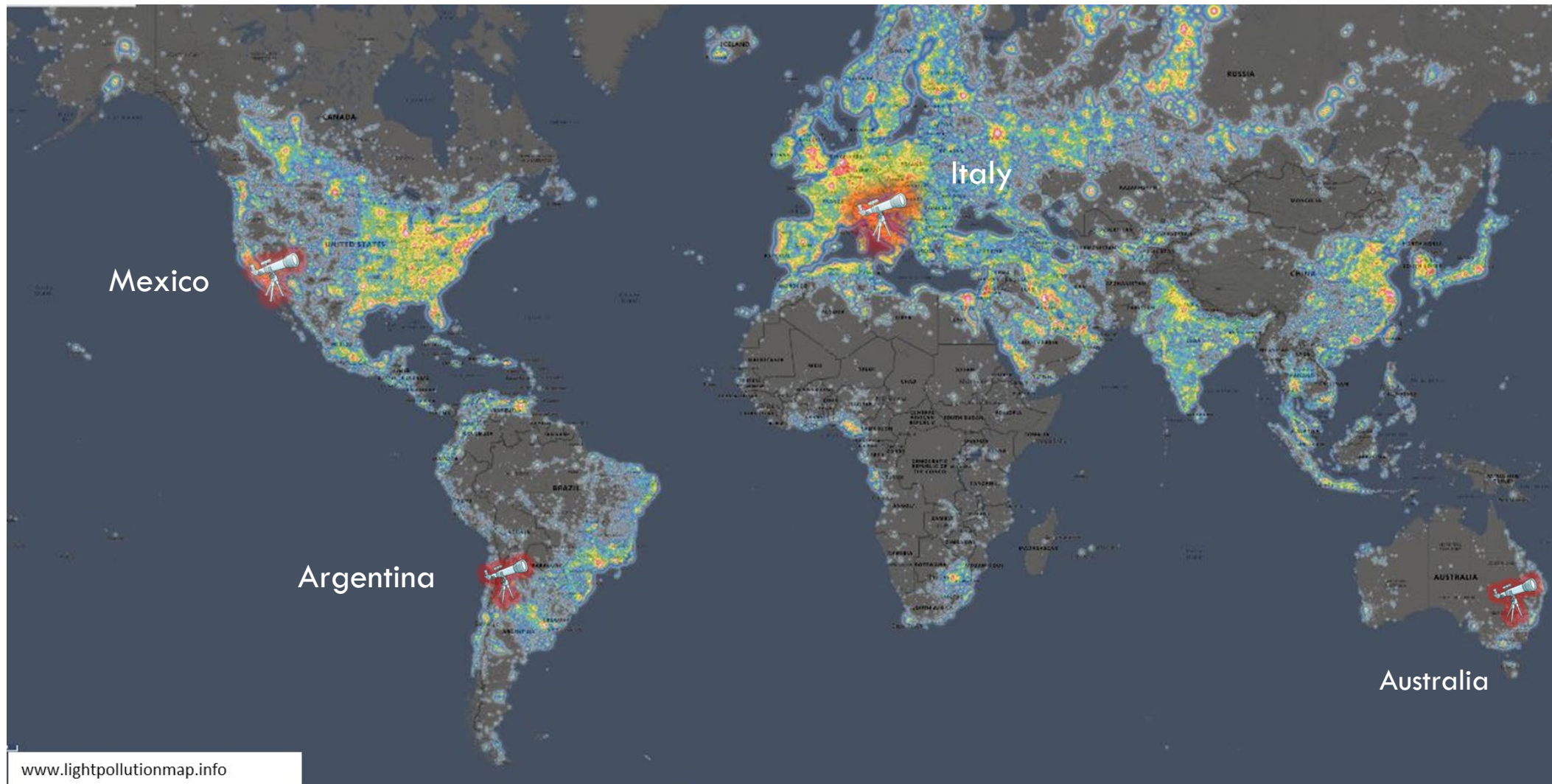
Development of an **optical telescope network** for detection and tracking (PM E. Vellutini, WG4)

- 'Flyeye' telescope, already selected by ESA for NEO
  - 16 optical cameras and 45 square degrees
- ✓ To be placed **worldwide** thanks to **international collaborations**
- ✓ Deployment completed **by June 2026**



Credit: ESA, OHB S.p.A.

# FLYEYE OBSERVATIONAL NETWORK



# SPACE DEBRIS LASER-RANGING STATION

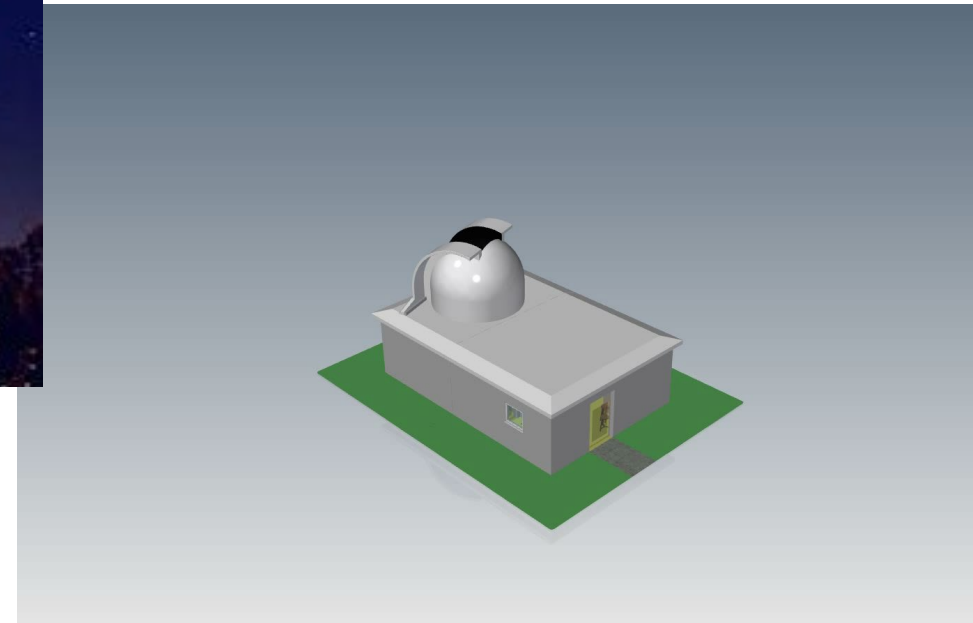
Development of a **Space Debris Laser-Ranging (SDLR)** station for tracking space objects, from LEO (cooperative/non-cooperative) to GEO (cooperative)

➤ Based on new technology with **adaptive optics system**

- ✓ 10 deg/s , 0.5-1 micron
- ✓  $0.3 \text{ m}^2 @ 600 \text{ Km}$
- ✓ high-resolution **lightcurves**
- ✓ **tumbling** frequency measurements
- ✓ imaging for object **characterization**
- ✓ 24/7 operations

➤ Hosted **at the ASI Space Geodesy Center**, Southern Italy (City of Matera)

➤ Completed by June 2026.



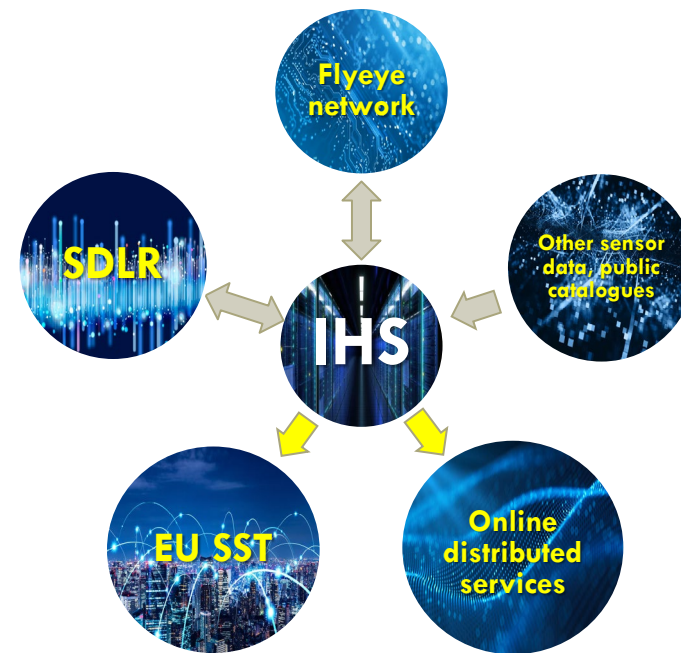
*Laser Ranging Station*



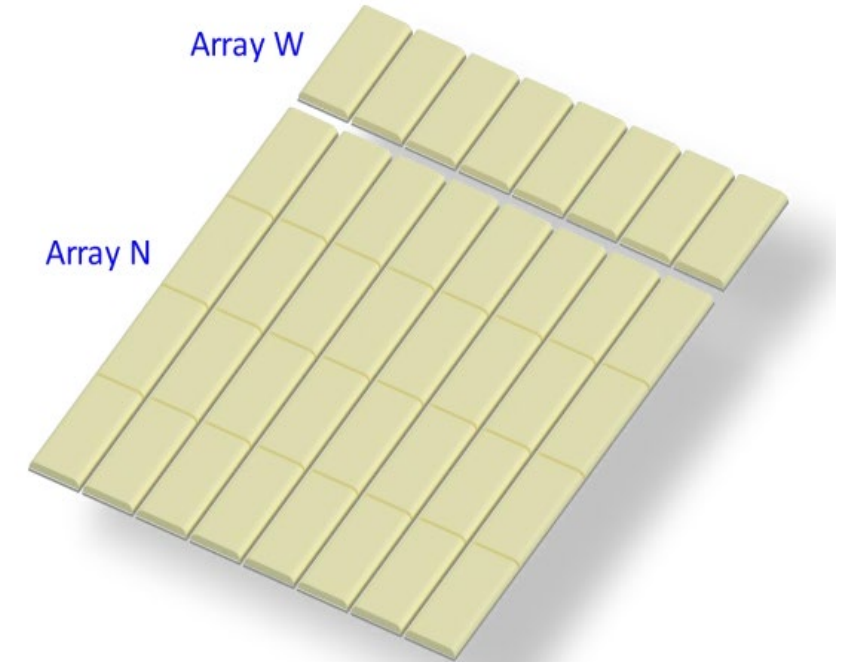
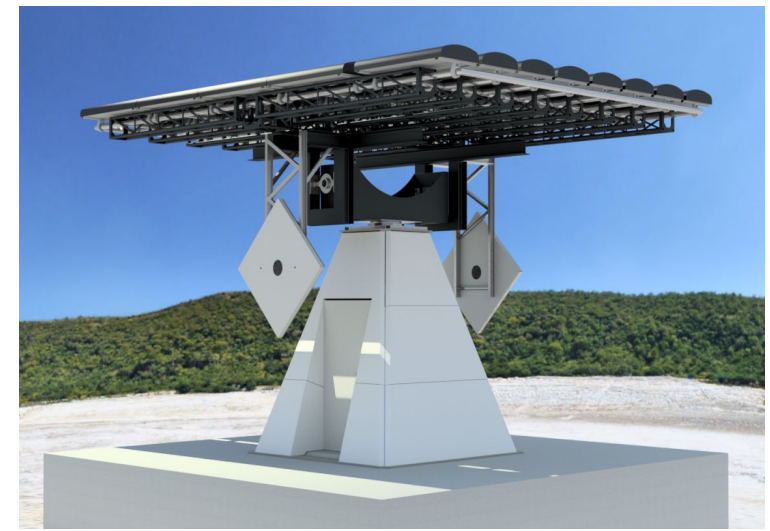
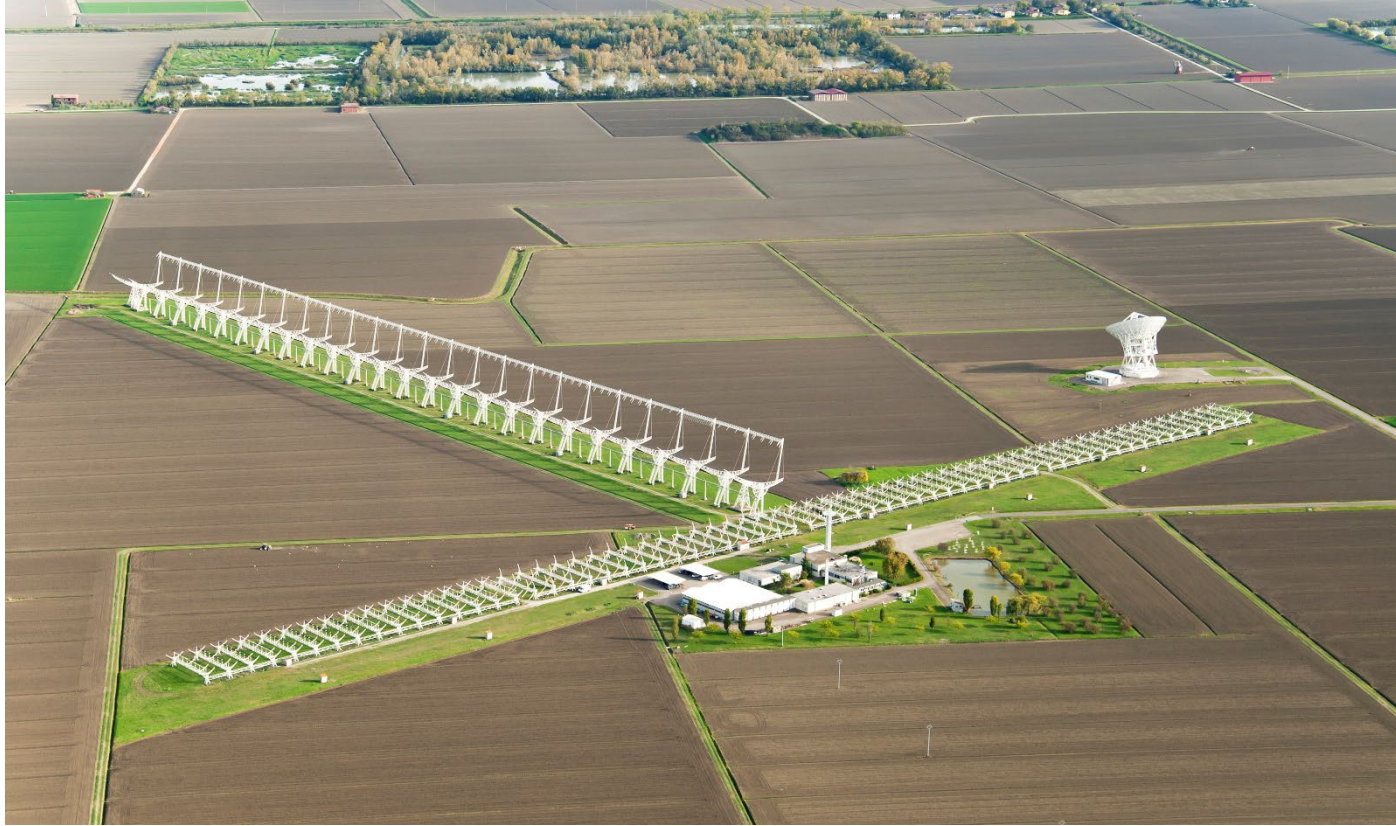
# HW AND SW INFRASTRUCTURE (IHS)

Development of a Services and Control Center for supporting Space Surveillance and Tracking activities and future national Space Traffic Coordination

- **Complex system of HW and SW**
  - ✓ **tasking** ASI observational sensors
  - ✓ **collecting** and **processing data**
  - ✓ providing services:
    - re-entry, fragmentation and collision avoidance, collision avoidance manoeuvre and in-orbit servicing**
  - ✓ including Space Weather data and simulations
- Hosted in the **Space Geodesy Center** and **ASI HQ**
- Large companies, SME and National Universities involved
- Hosted in **Matera**, completed by 20206



# BIRALES upgrade



Refurbishment of the total N-S and E-W arms of the Northern Cross:  
→ Array of 256 receivers, 11.000 m<sup>2</sup> of collettive area on the N-S;  
→ Array of 384 receivers, 19.000 m<sup>2</sup> of collettive area on the E-W.

TX antenna compose of two array in one panel:  
Array wide: 7° x 45° (HxV) survey mode  
Array narrow: 7° x 7° (HxV) high sensitivity mode



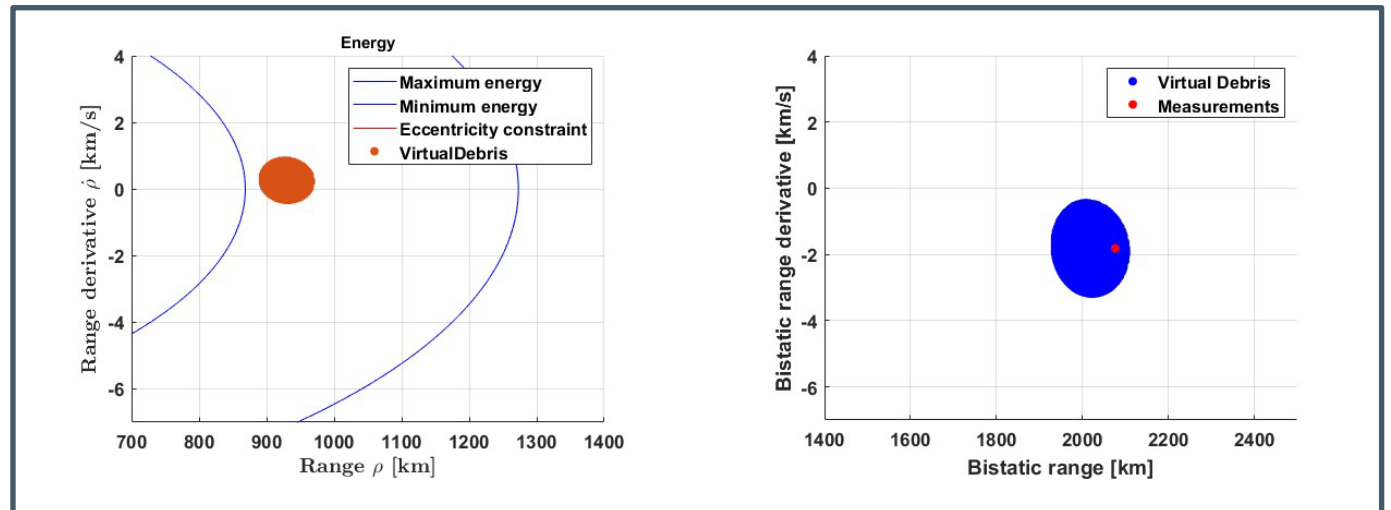
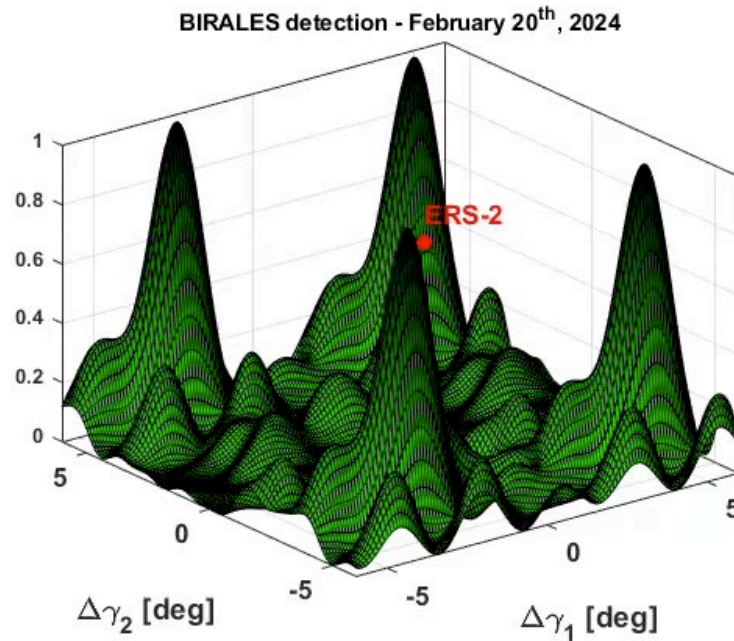
# SUPPORT TO IADC ACTIVITIES

## ► Support to re-entry campaigns:

- Aeolus
- ERS-2

## ► Advances on BIRALES data processing pipelines to solve ambiguities:

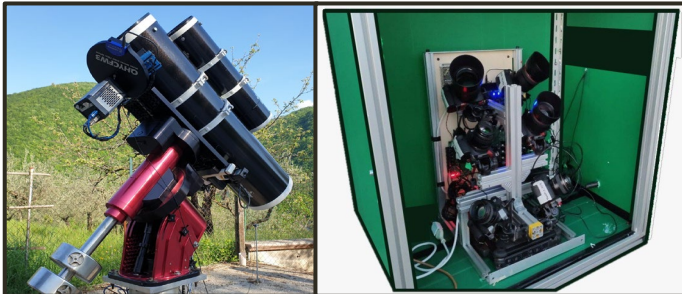
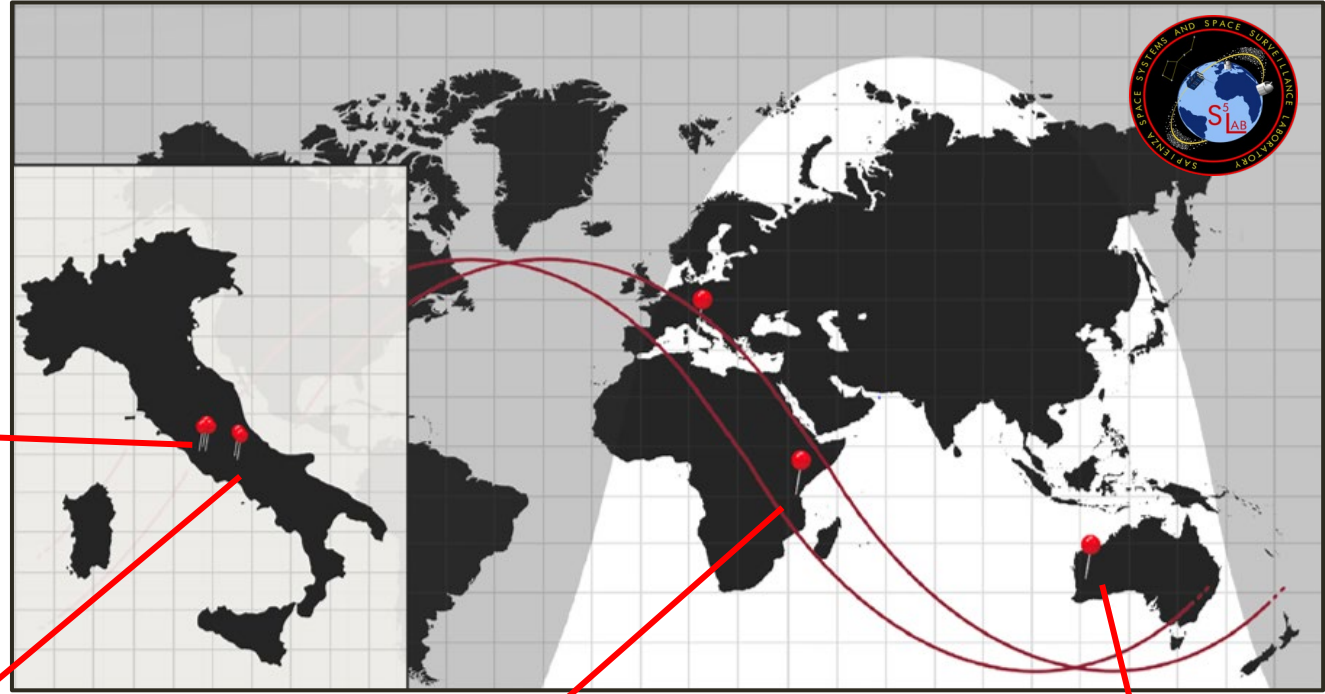
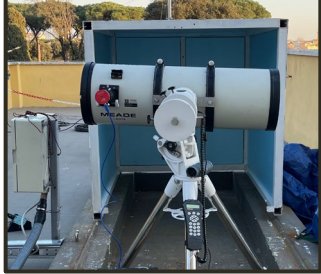
- Admissible region-based approach on current configuration
- Use of E-W arm upgrade to install ad-hoc receivers for ambiguity solution



# Activities at UNIRM1

## Observation network

Inter-Agency Space Debris Coordination Committee



### EQUO OG

New observatory  
installed at **Broglia  
Space Center (Malindi,  
Kenya)** in collaboration  
with **ASI**





# Activities at UNIRM1

## Network recent updates

## Inter-Agency Space Debris Coordination Committee

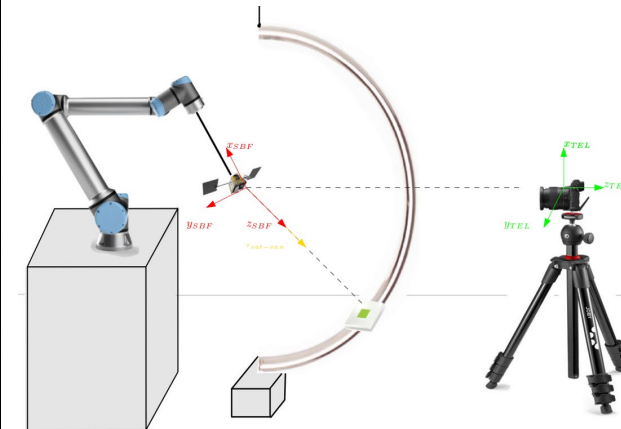
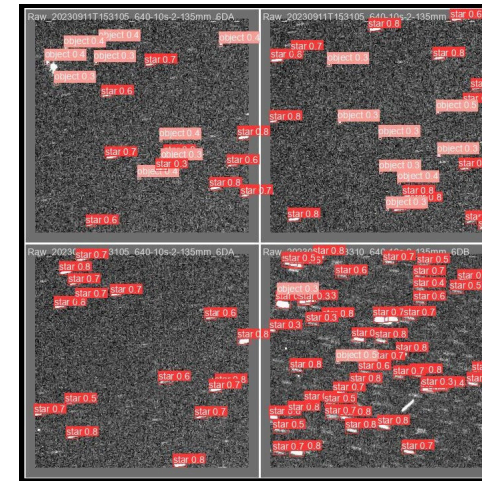
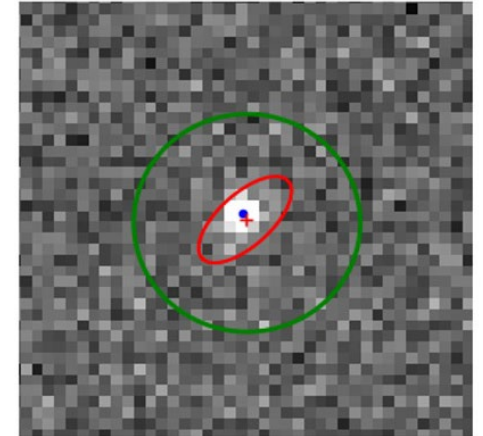
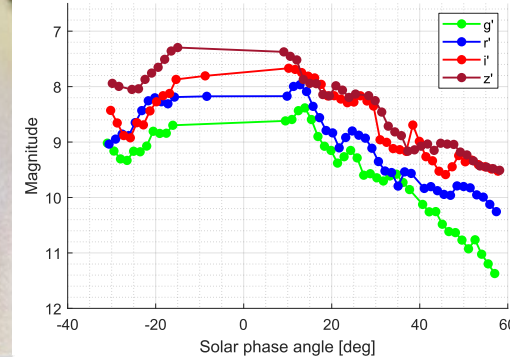


## HARDWARE

- Photometric filters: Sloan SDSS
- Color filters: LRGB
- NIR/SWIR astronomical camera
- Robotic arm for light curve reconstruction

## SOFTWARE

- Real time tracking
- Artificial Intelligence based detection



## **ASI main Contribution on:**

**IT 34.1 “Feasible options to study Molniya population of space debris” (lead ASI and CNES)**

**IT 39.2 “Permanent IT on fragmentations”**

**IT41.2 Exploitation of data acquired**

**Support to re-entry campaigns**