

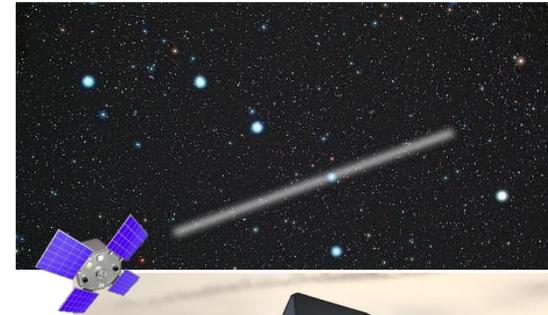
# **DLR SENSORS FOR IADC CAMPAIGNS**

**Status 06/2023**



## Compact staring sensor technology

- Three passive-optical staring sensors with large field-of-view ( $10^\circ \times 10^\circ$  /  $20^\circ \times 20^\circ$ )
- Fully automated operation in weather-proof housing, elevation adjustable
- Size threshold (detection sensitivity)  $\sim 1 \text{ m}^2$  sized objects in LEO (dusk / dawn)
- Staring lens aperture: 100 – 200 mm
- Sensor sites: Stuttgart / Oberpfaffenhofen
- Along-track precision: 500 m by astrometric calibration of track (fixed star background)

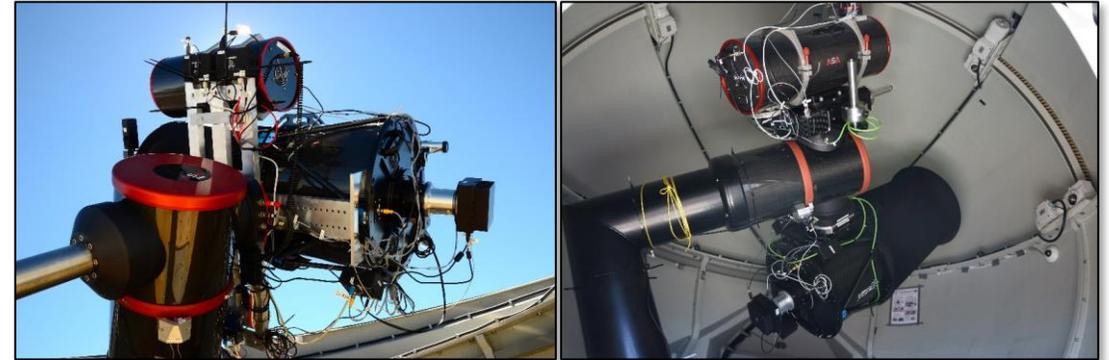


APPARILLO\* systems

\*APPARILLO: Autonomous Passive Optical Staring of LEO Flying Objects

## Autonomous Telescope Stations

- SMART-01 Sutherland (South Africa)
  - 20cm ( $3.6^\circ \times 3.6^\circ$ ) and 50cm ( $0.6^\circ \times 0.6^\circ$ )
- SMART-02 Kent (Australia)
  - 25cm ( $2.4^\circ \times 2.4^\circ$ ) and 50cm ( $0.6^\circ \times 0.6^\circ$ )
- SMART-03 Zimmerwald (Switzerland, Test)
  - 25cm ( $2.4^\circ \times 2.4^\circ$ ) and 50cm ( $0.6^\circ \times 0.6^\circ$ )
  - Deployment in South America by end of 2023
- Processing of data with BACARDI
  - Viewer at <https://bacardi.dlr.de/viewer.html>



# Space Operations and Astronaut Training



## Autonomous and Remotely Controlled System

The screenshot shows a Windows 7 desktop environment. The taskbar at the bottom contains icons for Internet Explorer, File Explorer, and several application windows. The Start menu is open, displaying a list of programs including PuTTY, ezVSP, Microsoft Word 2010, and Microsoft Excel 2010. A File Explorer window is open, showing a directory structure with a list of files. A photo viewer window is open, displaying a night image of a structure, possibly a space station or training facility.

name	Änderungsdatum	Typ	Größe
Mount210820220101.ft	13.09.2014 18:51	FTS-Datei	32'777 KB
Mount210820220102.ft	13.09.2014 18:51	FTS-Datei	32'777 KB
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## Improvements of Telescope Stations

- Latency below 24 hours (objective: below 2 hours)
- Optimized planning tool for multiple stations
  - Survey and follow-up observations
  - Test campaign planned for 2023
- Development of own telescope software SMARTies
  - Modular approach to be useful for different mounts, cameras, focusers, ...
  - Shall be open source by end of 2023

