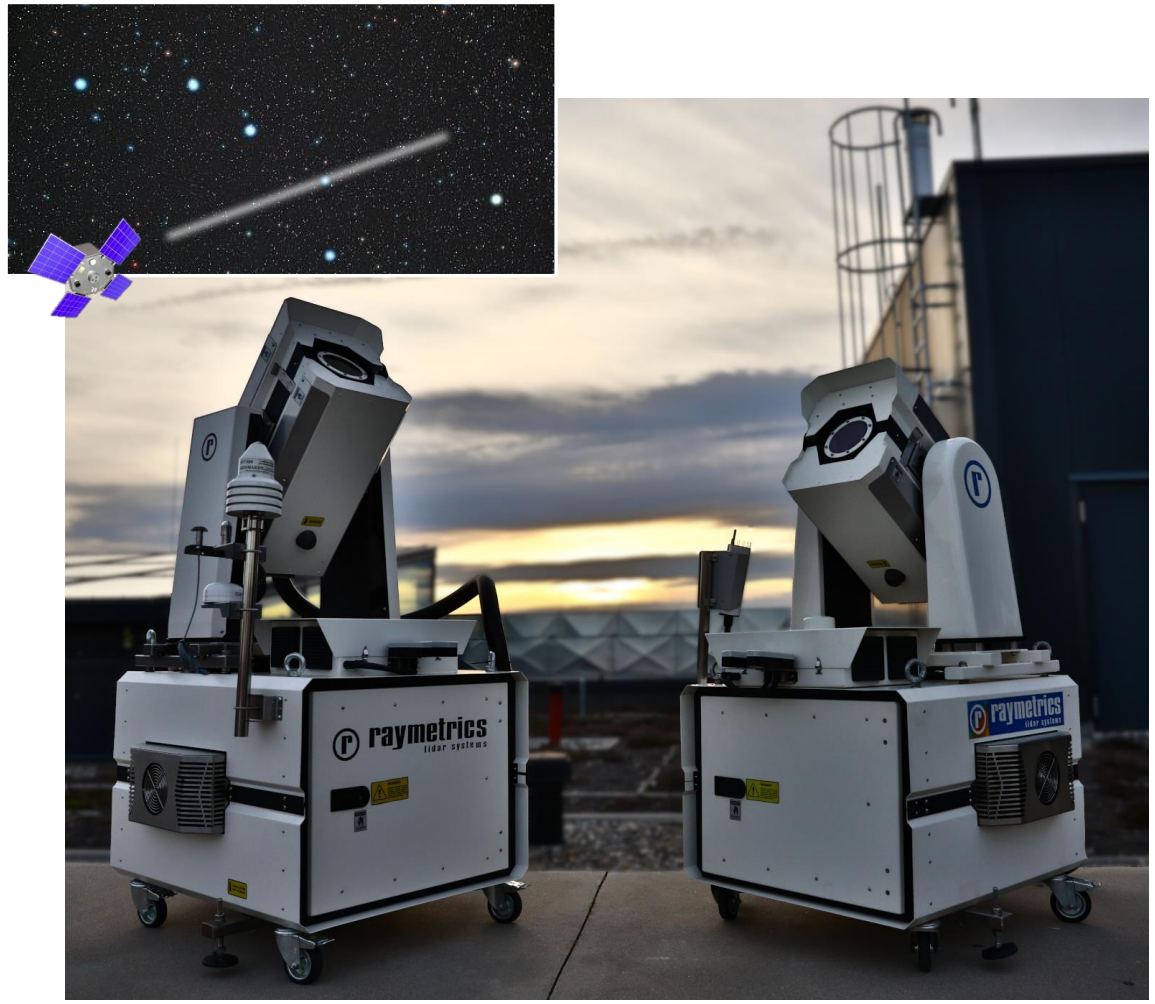
DLR SENSORS FOR IADC CAMPAIGNS

Status 06/2023

Compact staring sensor technology

- Three passive-optical staring sensors with large field-of-view (10° x 10° / 20° x 20°)
- Fully automated operation in weather-proof housing, elevation adjustable
- Size threshold (detection sensitivity) ~ 1 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)

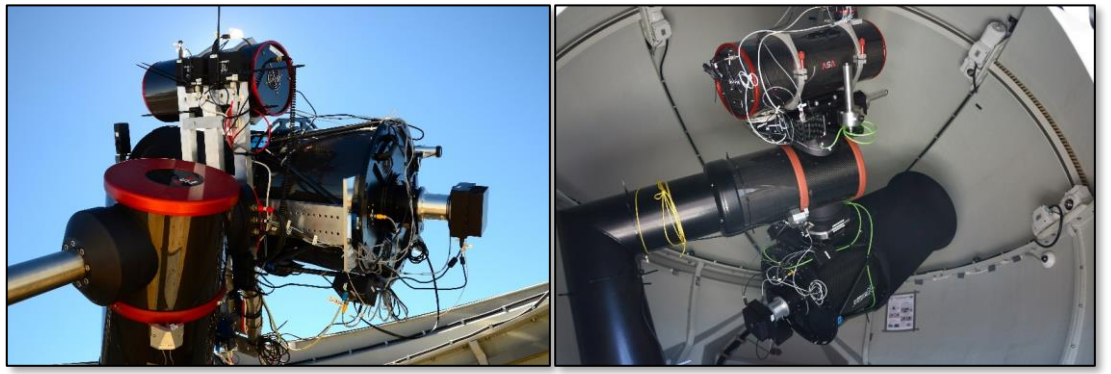
*APPARILLO: Autonomous Passive Optical Staring of LEO Flying Objects

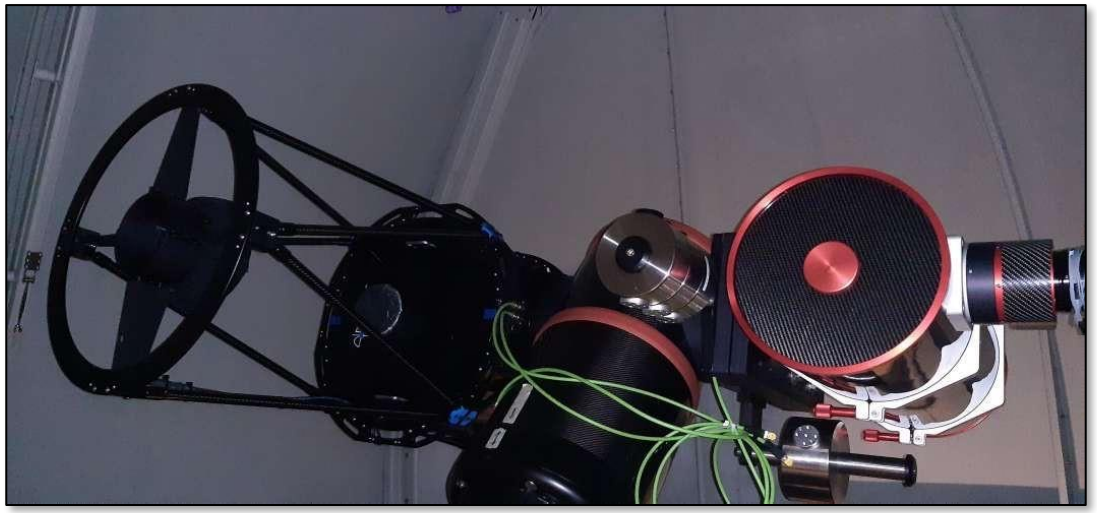


APPARILLO* systems

Autonomous Telescope Stations

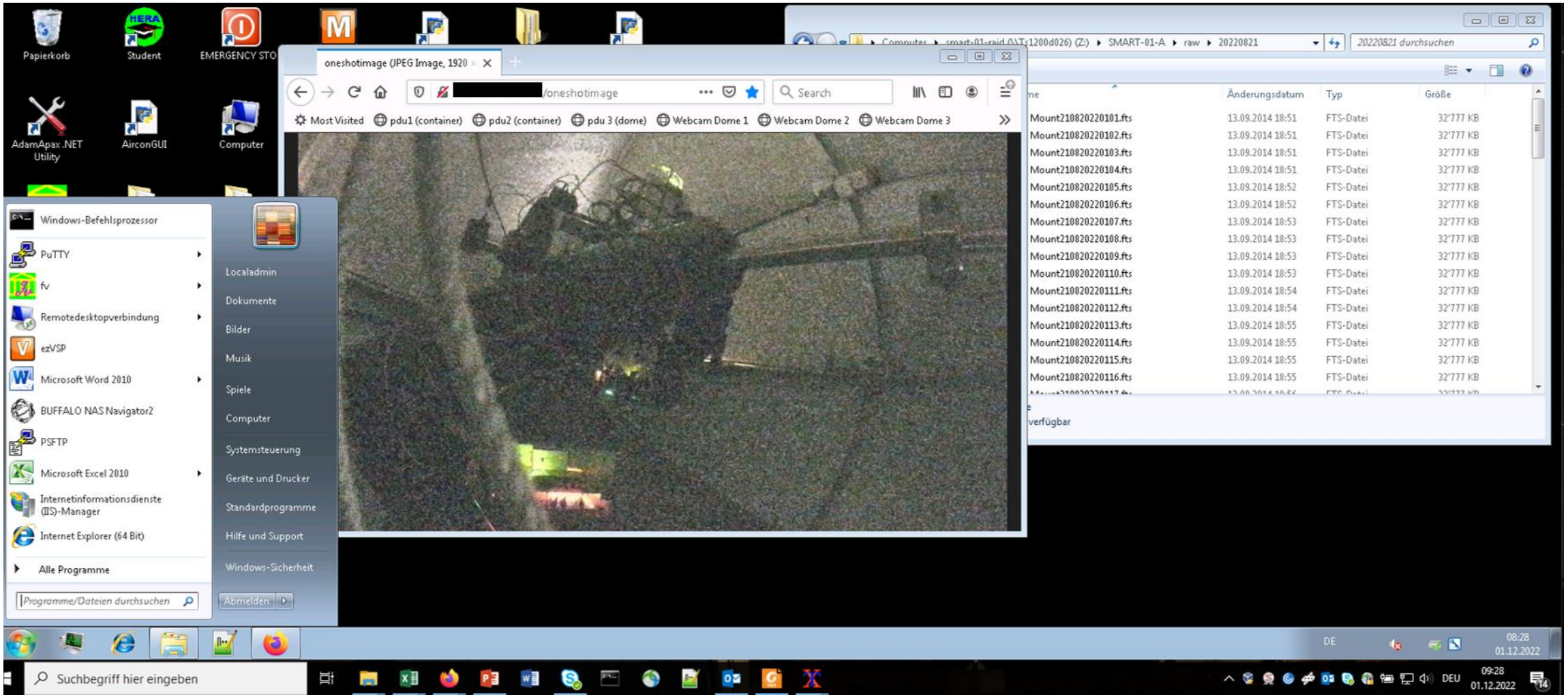
- SMART-01 Sutherland (South Africa)
  - 20cm (3.6° x 3.6°) and 50cm (0.6° x 0.6°)
- SMART-02 Kent (Australia)
  - 25cm (2.4° x 2.4°) and 50cm (0.6° x 0.6°)
- SMART-03 Zimmerwald (Switzerland, Test)
  - 25cm (2.4° x 2.4°) and 50cm (0.6° x 0.6°)
  - Deployment in South America by end of 2023
- Processing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





Space Operations and Astronaut Training

Autonomous and Remotely Controlled System



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