UN/SKAO: Workshop on Dark and Quiet Skies for Science and Society

Interactions Between Astronomers and Industry

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Introduction to Slingshot Aerospace

Slingshot is building the most comprehensive, accurate, and actionable digital operating picture for space in order to accelerate space safety, sustainability, & security insights for our customers.

Space Object History

Space Object Tracking

Space Operations

Space Analytics

Slingshot Global Sensor Network

210+ Optical Sensors

20+ Global Sites

95% Payload Coverage

LEO-xGEO Space **Day/Night** Surveillance

8 of the 64 Eyes in the Horus Network

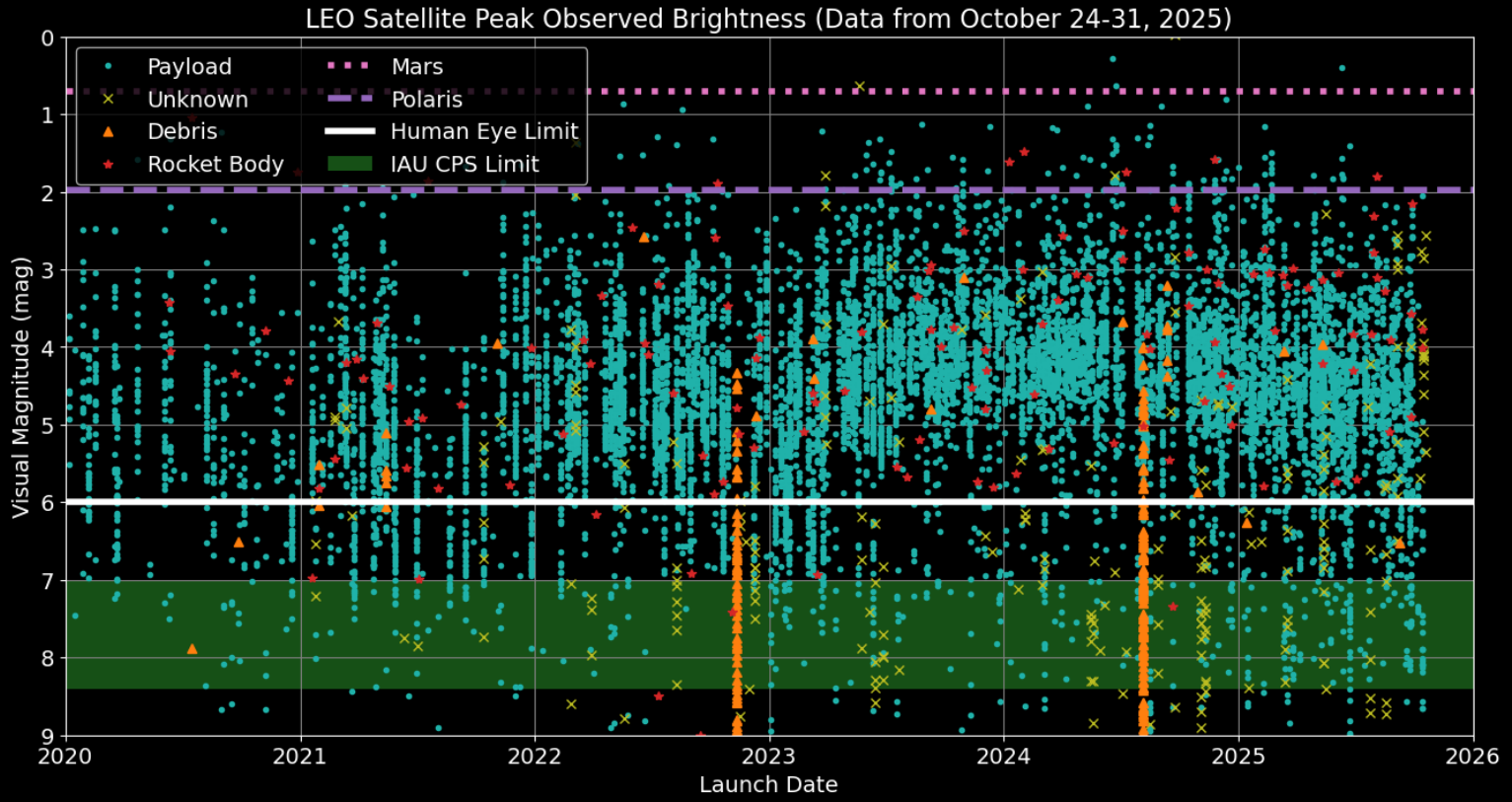
Horus-1, Sensor-3 | Horus-2, Sensor-2 | Horus-3, Sensor-4 | Horus-4, Sensor-3

Horus-5, Sensor-8 | Horus-6, Sensor-3 | Horus-7, Sensor-1 | Horus-8, Sensor-7

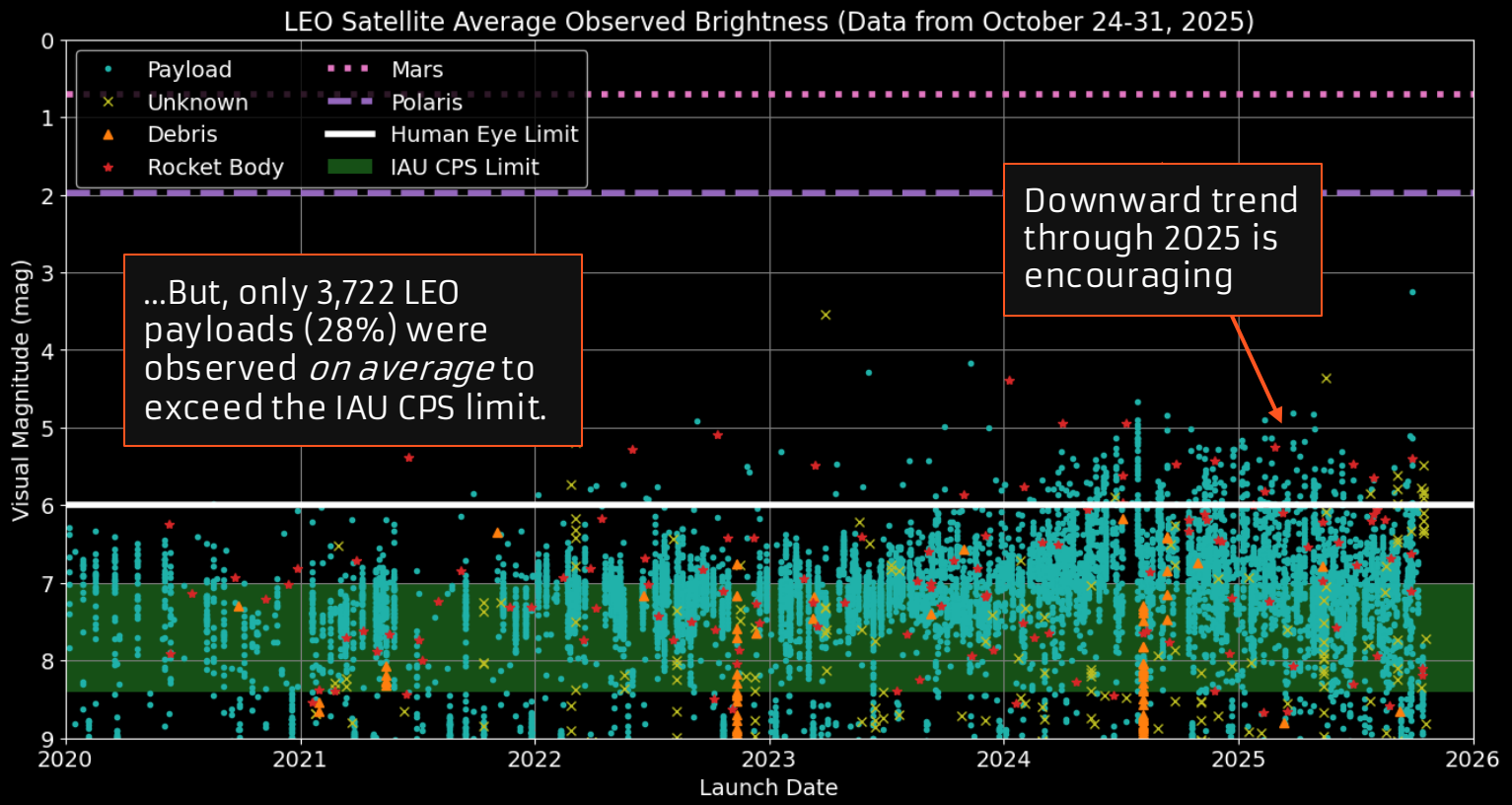
Weekly Statistics

- ~4 petabytes processed in real-time
- ~30 million observations collected

UN/SKAO DARK AND QUIET SKIES 2025



Between Oct 24-31, at least 11,075 LEO payloads (82%) exceeded the IAU CPS magnitude limit.



Slingshot can help satellite owner/operators model and verify their satellite signatures.

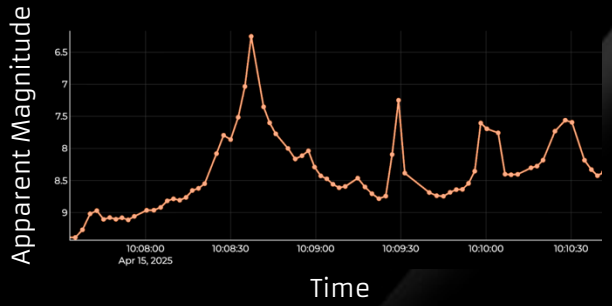
Industry / Optical Astronomy Cooperation Opportunities

1. Owner/Operators: Model your satellite brightness from the start
   - Turn the SWaP-C trade space to SWaP-RC (Size, Weight, Power, Reflectivity, and Cost)
   - Industry tools exist to create high-fidelity reflectivity models from mechanical designs and lab testing
   - Identify, characterize, and mitigate specular reflections (glints)

2. Owner/Operators: Regularly evaluate your on-orbit satellite brightness
   - Industry can monitor satellite brightness and adherence to IAU CPS limits
   - Attitude adjustments impact brightness profiles for better or worse – monitor the impacts

3. Astronomers: Advocate for bright pass prediction systems
   - Industry is *already* tracking the LEO population and collecting billions of brightness measurements
   - Industry is *already* creating photometric fingerprints to classify and alert on attitude changes
   - Next logical step: a service to provide astronomers with regular high-accuracy bright pass predictions

Fingerprinting Future Application for Astronomers

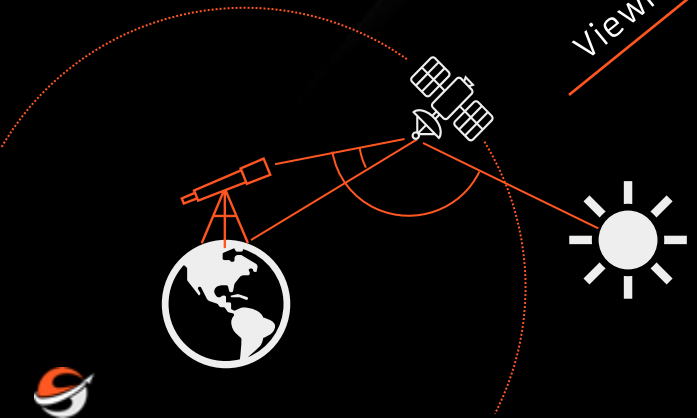


Light Curves

Viewing Conditions

Machine Learning Model

Photometric Fingerprints



Photometric fingerprints already enable:

- Classification of observed satellite types
- Attitude change detection and other anomaly reporting

On the horizon: Real-time Pass Brightness Predictions

- Given an astronomer's latitude, longitude, and altitude, Slingshot could predict all pass geometries and brightness ranges for objects expected to rise above IAU thresholds.
- Billions of collected observations per year keep photometric models updated as conditions change.