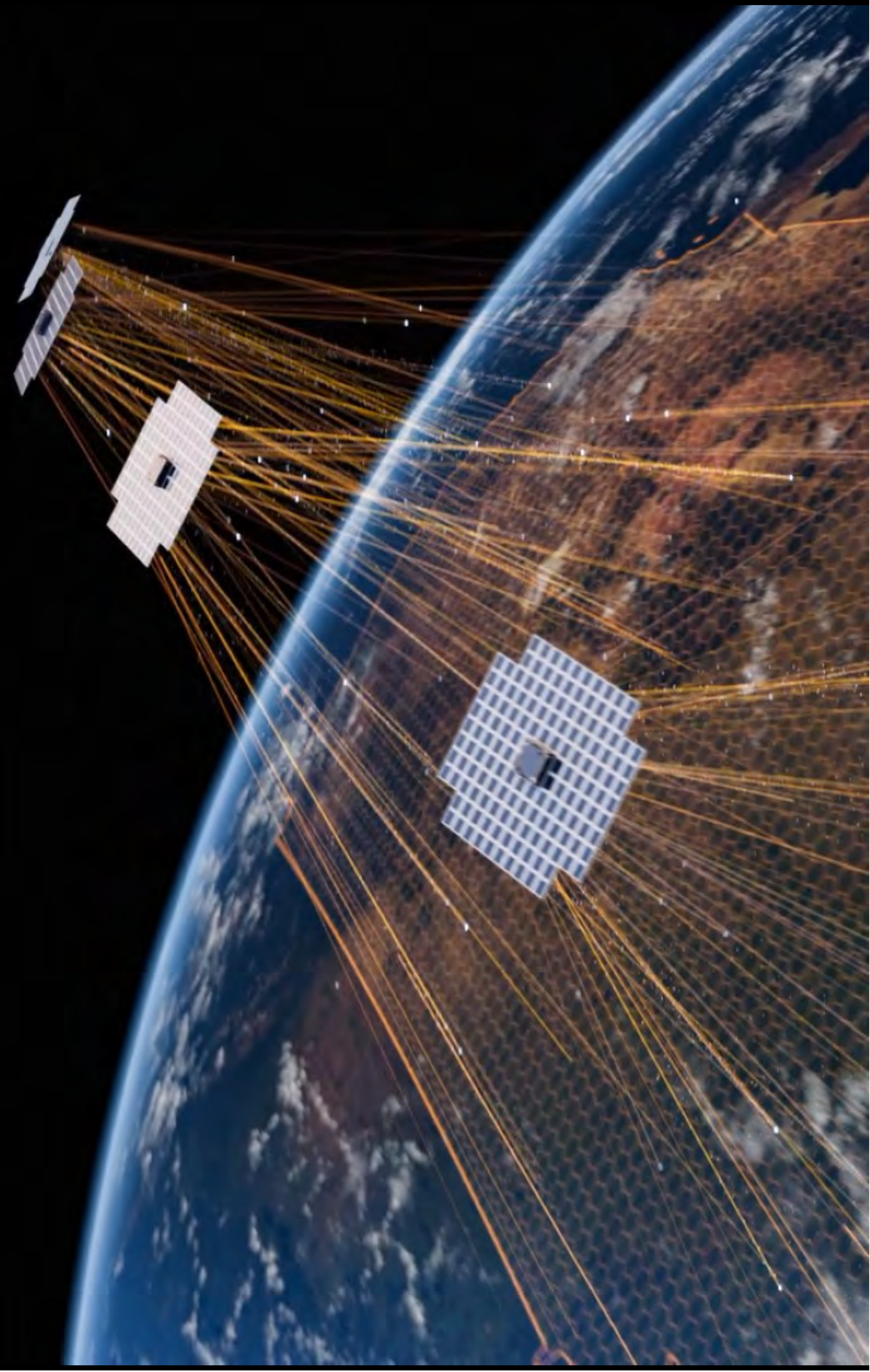
AST SpaceMobile

Mission and Mitigations



Nasdaq **ASTS**

December 2025

BUILDING THE FIRST DEDICATED SPACE-BASED CELLULAR BROADBAND NETWORK

COVERAGE EVERYWHERE

Eliminates cellular coverage gaps and dropped connections globally

COMPATIBLE WITH EXISTING DEVICES

Seamless service with no modifications required to consumer devices

CELLULAR BROADBAND FROM SPACE

5G / LTE data rates with low latency and cellular-quality service levels with native cellular capabilities

DEEP WIRELESS ECOSYSTEM PARTNERSHIPS

50+ operators globally with nearly 3 billion existing subscribers: AT&T, Verizon, Vodafone, Rakuten, Bell Canada, American Tower, Google, stc group

INVESTMENT IN NETWORK

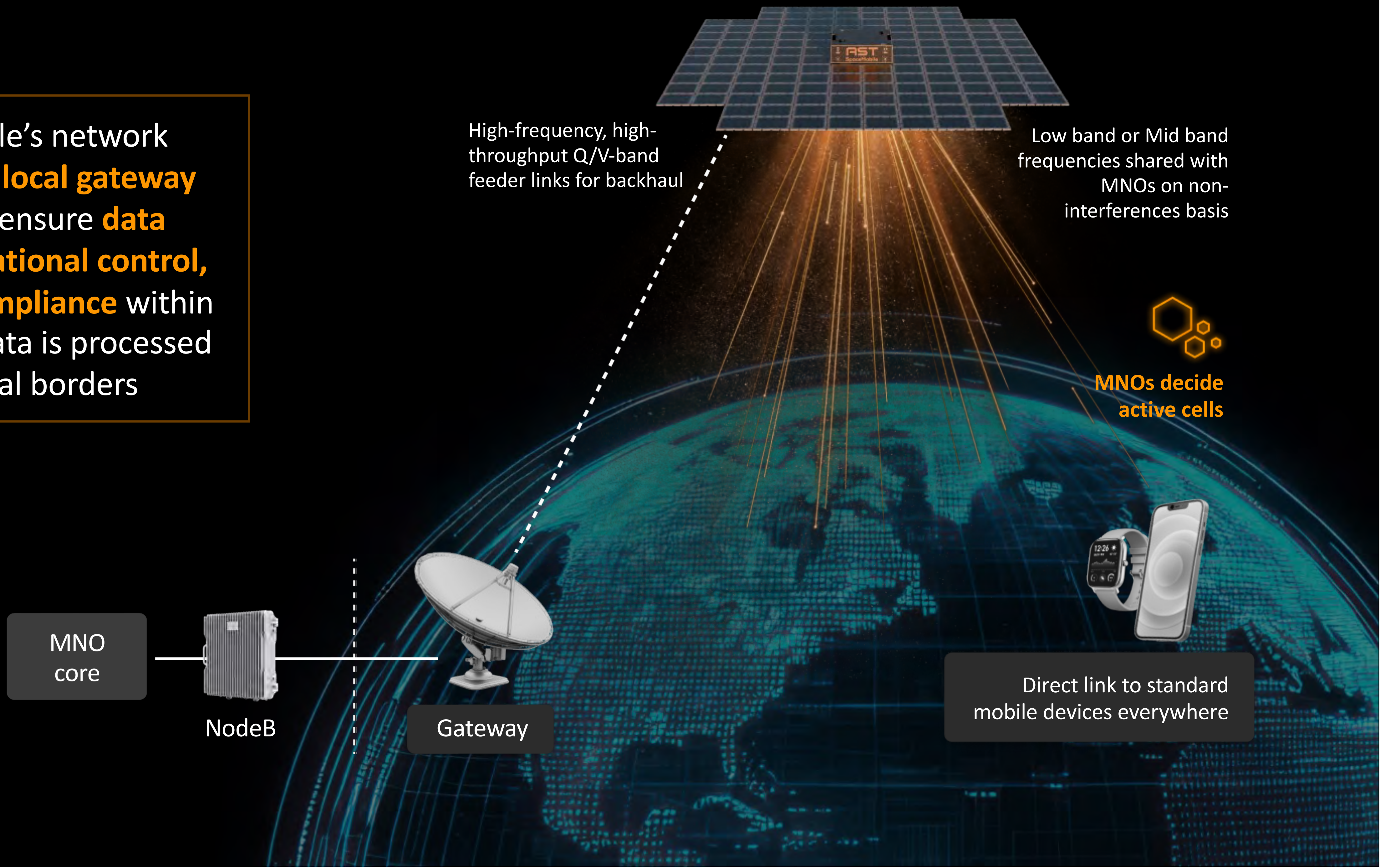
Raised over $3 billion to fund network build and technology. Proprietary technology with 3,700+ patent and patent-pending claims

AST SpaceMobile ARCHITECTURE

AST SpaceMobile

AST SpaceMobile's network architecture uses **local gateway** deployment to ensure **data sovereignty, operational control, and regulatory compliance** within each market. All data is processed within national borders

Seamless integration to MNO Core Network



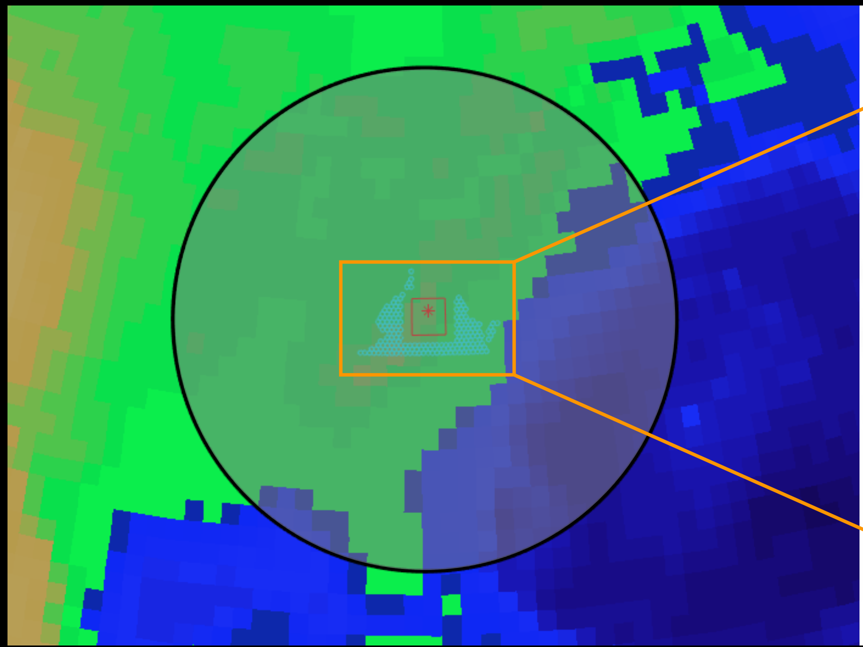
Radio Astronomy Interference Mitigation – Low/Mid-band

AST SpaceMobile

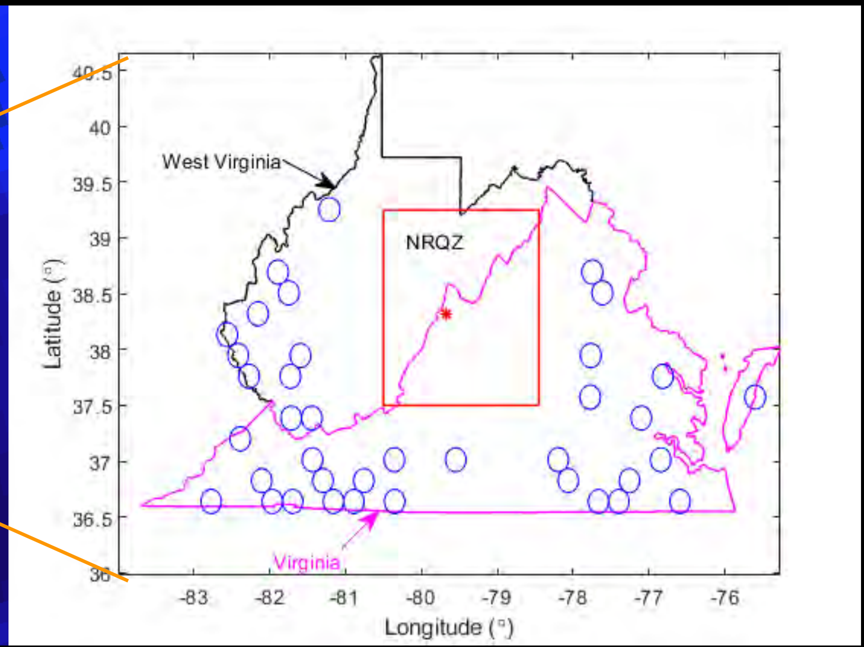
- In Radio Frequency the large AST phased arrays become an advantage
  - Large array size generates narrow beam patterns of ~50 km
  - Ground cells have fixed centers and can be turned on and off

In 2020, an interference analysis was conducted for the US NRQZ

- A combination of turning off nearby cells and reducing Tx power shows we can meet the interference limits
- Currently coordinating tests with Caltech and a DSA-2000 Array element in NV, USA



NRQZ at the nadir region of the satellite



Combination of turning beams off and reducing power meets requirements

Radio Astronomy Interference Mitigation – Q/V Band

AST SpaceMobile

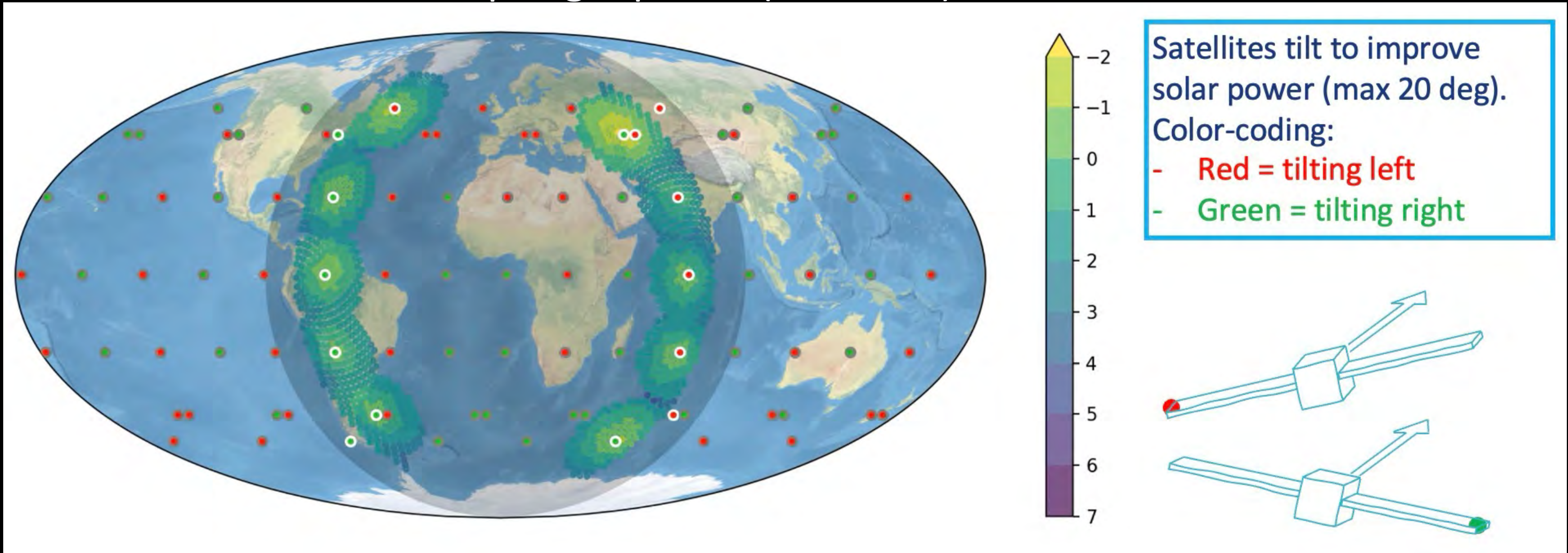
- Gateway links are in the Q/V bands
  - Uplink: 45.5 – 51.4 GHz
  - Downlink: 37.5 – 42.5 GHz
- Highly directional (<10 km) with low sidelobe levels
- Build-out ground infrastructure avoiding co-location of gateways with RAS sites
- If co-location occurs, gateway redundancy supports hand-off during observations
- Currently coordinating interference testing with VLBA antenna in Brewster, WA, USA

Optical Astronomy Interference Mitigation

AST SpaceMobile

- Satellites below 700 km are illuminated for 60-90 minutes near dusk/dawn
  - Tilting the satellites toward the sun increases power AND reduces brightness

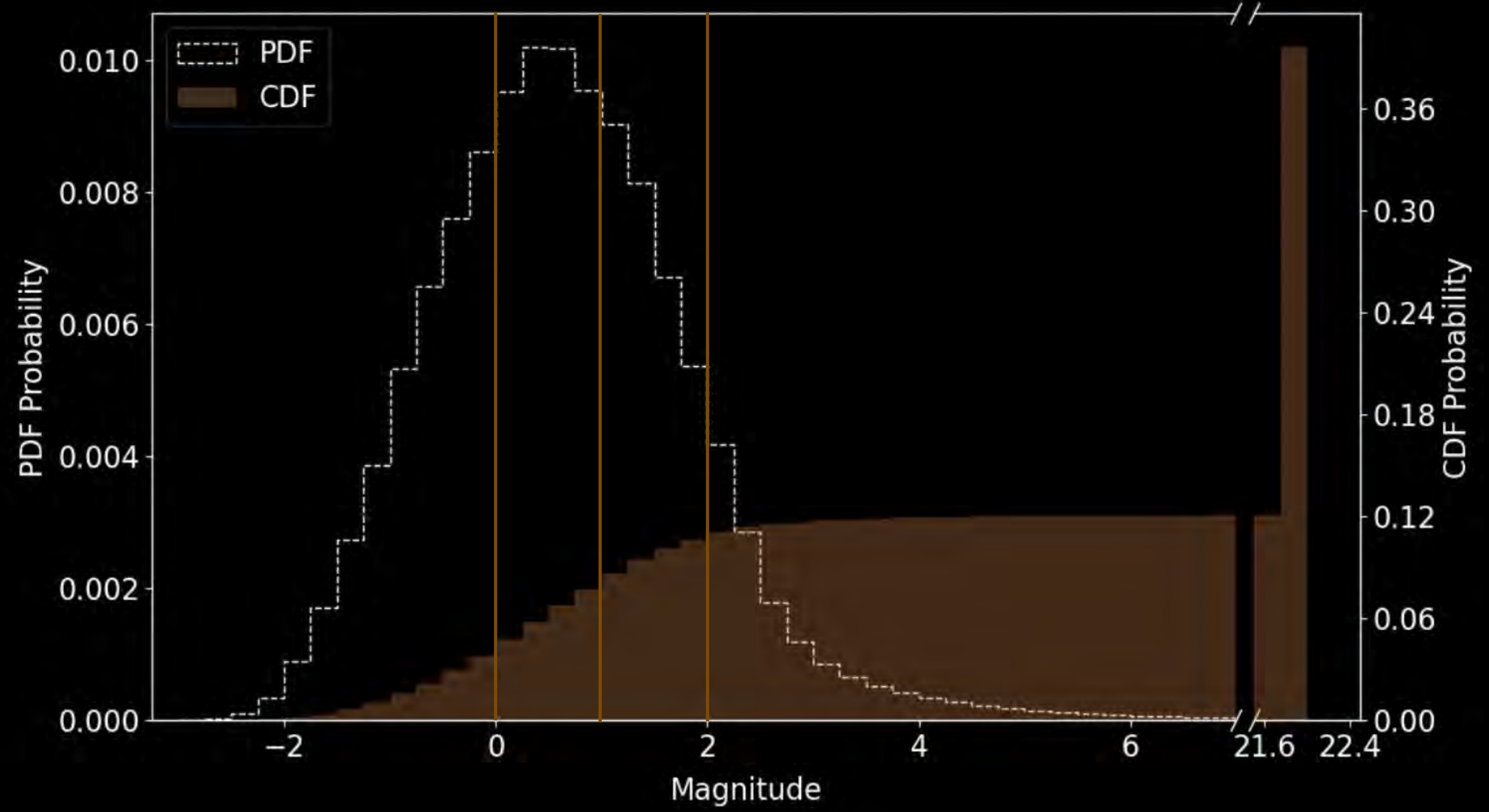
Spring Equinox (~Mar. 20)



Brightness: Probability and Cumulative Probability

AST SpaceMobile

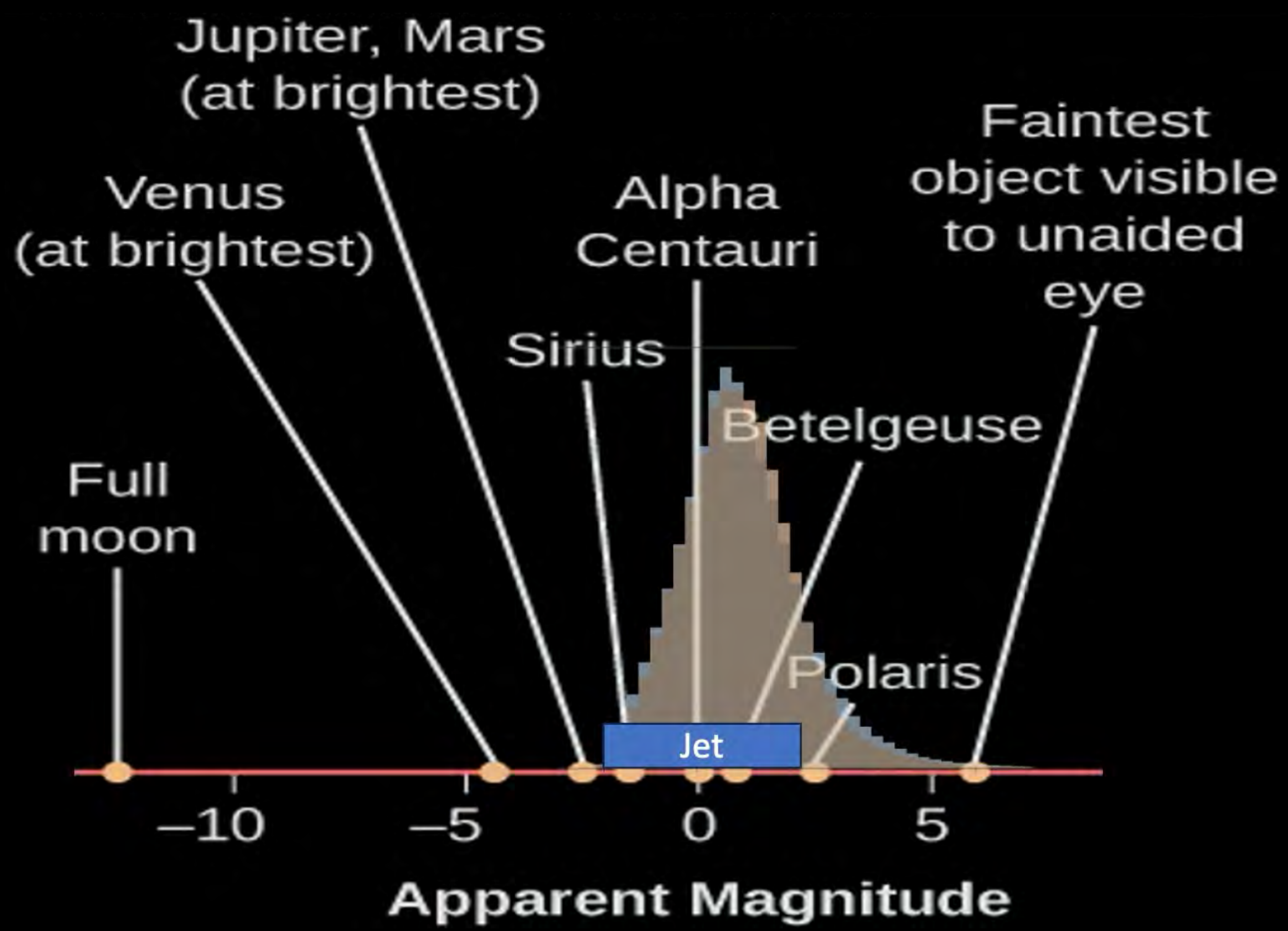
- The diagram below quantifies the PDF and CDF of satellite magnitude
  - Simulation is based on current filing of 248 satellites
  - Somewhat pessimistic reflectivity model compared to observations
  - Measured distribution typically shown by count (when visible)
  - Most likely magnitude (when visible) is ~0.5
  - Cumulative probability of being visible is only 12%
  - Not visible due to being in Earth shadow occurs 27.5%
  - Not visible due to daytime / twilight occurs 60.5%



Optical Astronomy Interference Mitigation

AST SpaceMobile

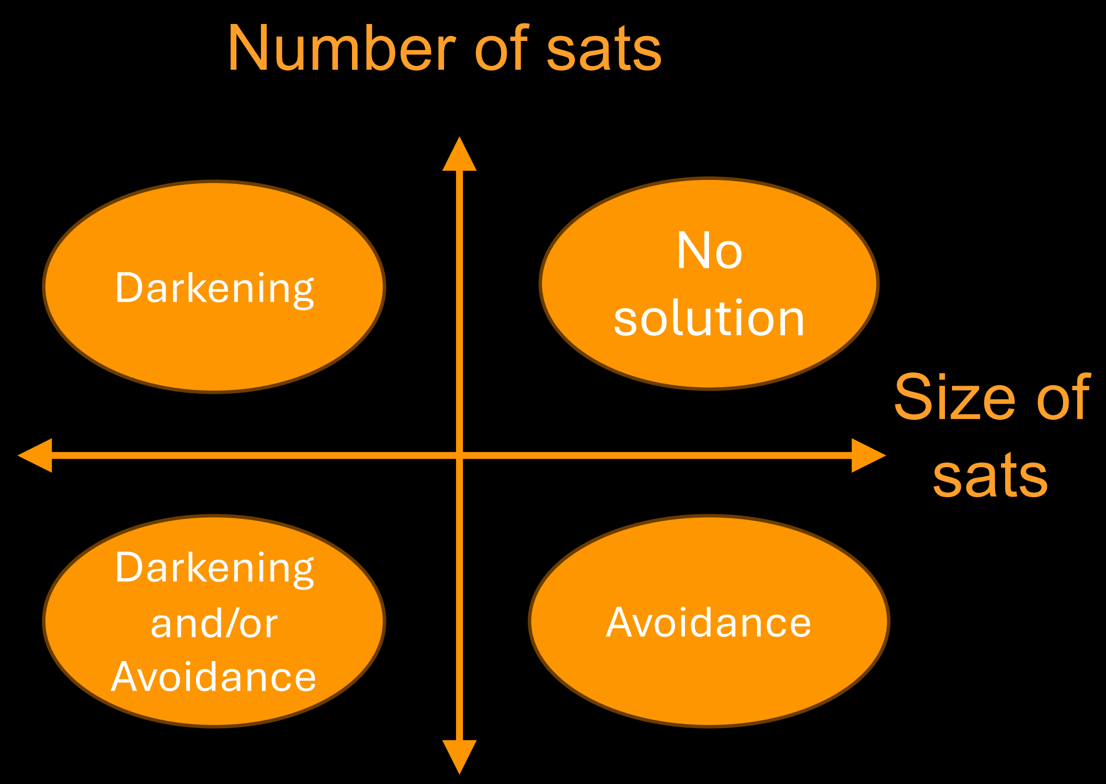
- This diagram shows a range of visual magnitudes with representative objects
  - Full moon, Venus / Mars / Jupiter at their brightest, stars down to Mag-7
- The brightness range for a typical jet airliner flying at 30,000 feet is also shown
- The simulated distribution of AST Block-2 satellite brightnesses is shown for cases that are brighter than Mag-7
  - Between ~90 minutes after dusk to ~90 minutes before dawn the satellites are below Mag-7
- While steps to darken the satellites have and will continue to be taken, getting below Mag-7 is not a realistic goal



Optical Astronomy Interference Mitigation

AST SpaceMobile

- The desire is to maximize science and avoid sensor damage
- The mitigation space has two axes:
  - For "mega-constellations*", darkening is the only viable path – Avoidance is not feasible
  - For smaller (Large*) constellations avoidance is an alternative option
    - Satellite ephemeris (position vs. time) information is made available for scheduling



- Satellite crossing time of a telescope field of view is only a few seconds
  - Primary uncertainty in ephemeris is the time of crossing, so a few additional seconds of margin is introduced

*Please refer to backup slides for discussion of proposed constellation nomenclature

Optical Astronomy Interference Mitigation – Case Study

AST SpaceMobile

- A simulation was created to look at the operational impact on the Legacy Survey of Space and Time (LSST) at the Vera Rubin Observatory
- Always nadir pointing vs Roll-Tilted to reduce array illumination time were both modeled
- Assumptions
  - The full ITU filing of 248 satellites
  - A 30 second image exposure
  - Mean = averaged over all possible LSST images
    - Declination: -90 up to +33.5
- The resulting impact was less than 0.4%
  - This is ~2 weeks over the 10-year survey

% Time in Camera FOV

	Nadir	Roll-Tilted
Winter Solstice	0.1624%	0.0805%
Spring Equinox	0.0958%	0.0408%
Summer Solstice	0.1057%	0.0431%
Fall Equinox	0.0915%	0.0383%

Crossing Probabilities

	Nadir	Roll-Tilted
Winter Solstice	1.0972%	0.5736%
Spring Equinox	0.6502%	0.3036%
Summer Solstice	0.7305%	0.3100%
Fall Equinox	0.6246%	0.2868%

Summary

- AST SpaceMobile recognizes the importance of coexisting with, and minimizing the impact on the astronomy community

- We are working with members of both the radio and the optical astronomy community to model impacts and to verify through experimental testing

- We believe that through coordination with optical observatories that we can eliminate FOV crossings with minimal science impact

- We believe that by proper selection of gateway locations and darkening beams near RAS facilities that we can meet desired radio interference levels

AST
SpaceMobile

Backup Slides

Proposed Satellite Constellation Nomenclature

AST SpaceMobile

Tier	Size (# sats)	Optical Impact (Wide-Field Imaging)	Optical Impact (Diffuse Sky Brightness)	Radio Astronomy Impact	Space Environment / Debris Impact
0 — Micro	1–9	Negligible; streaks extremely rare.	None.	None beyond individual transmitter coordination.	None; behaves as isolated spacecraft.
1 — Small	10–49	Streaks rare; minimal effect on survey cadence or artifact rates.	None detectable.	Limited interference; manageable through standard coordination.	No meaningful aggregate impact.
2 — Medium	50–99	Streaks occasionally present in large-area surveys but do not materially affect operations; saturation artifacts extremely rare.	None measurable.	Low aggregate RFI impact; dish-based observatories affected only during occasional passes.	Similar to historical systems (Iridium, Globalstar); manageable conjunction load.
3 — Large	100–999	Noticeable trail incidence in wide-field optical data; masking overhead increases; low-level contamination of time-domain photometry becomes non-negligible; occasional saturated events.	Local or episodic increases possible; globally negligible.	Increasing occupancy of protected bands; sidelobes and out-of-band emissions begin raising cumulative noise floor.	Collision-avoidance burden rises; small contribution to reentry flux.
4 — Mega	1,000–9,999	Persistent trail incidence in survey data (e.g., Rubin/LSST, Pan-STARRS, ZTF); frequent masking needed; higher chance of saturation and ghosting; algorithmic mitigation becomes mandatory; increased photometric systematics.	Measurable global increase in sky brightness at ~21–22 mag/arcsec^2 level; affects deep imaging limits and exposure times.	Continuous or near-continuous RFI presence; significant sidelobe contamination; impacts on both narrowband and broadband radio observations.	Major contributor to conjunction density; significant share of global reentry mass flux; debris cascade sensitivity increases.
5 — Giga	≥10,000	Near-continuous trail presence across long-exposure synoptic surveys; deep exposures (ELT, Rubin) frequently intersect trails; unavoidable contamination without coordinated avoidance.	Global diffuse brightness elevation detectable everywhere; faint-object detection thresholds degraded; impacts cosmology and low-surface-brightness science.	Persistent RFI, including far-sidelobe contamination; effectively continuous sky occupancy for major observatories (e.g., SKA, ngVLA).	Dominant driver of orbital crowding; global atmospheric reentry material flux becomes climatologically significant; high sensitivity to debris cascades.