Official Chapter of DarkSky International

Statement on Reflect Orbital's Proposed Satellite Illumination System

January 2026

DarkSky Southern Arizona categorically opposes “Sunlight as a Service” systems such as Reflect Orbital's recent proposal to the U.S. Federal Communications Commission (FCC).[1] Such schemes represent not merely further incremental assaults on the night sky, but rather unprecedented acts of environmental vandalism that could fundamentally alter Earth's natural light-dark cycle on a planetary scale.

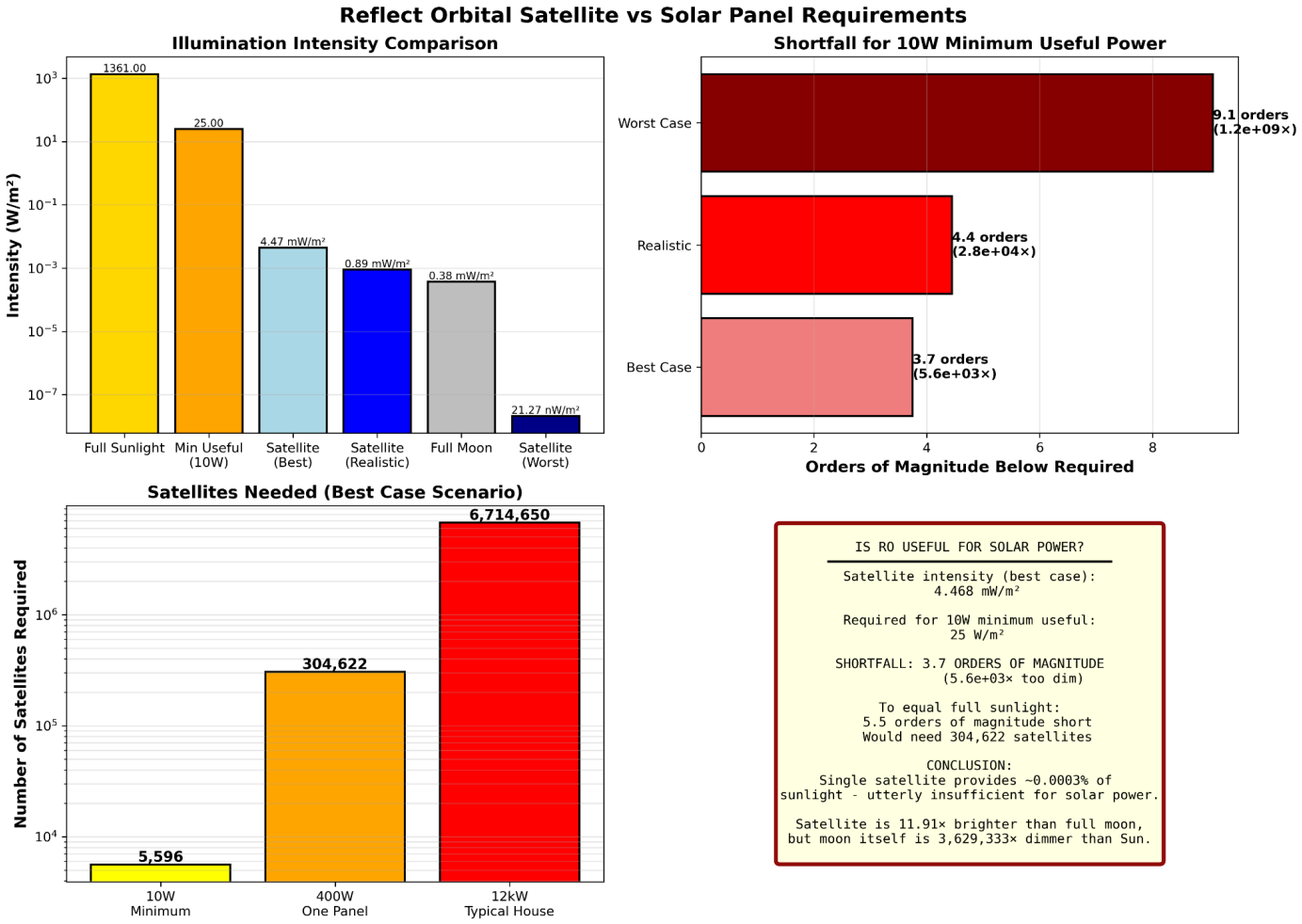
After decades of painstaking work to reduce ground-based light pollution—educating communities, reforming lighting codes, protecting dark sky places, and documenting the measurable harms of artificial light at night—we now face a proposal to ***deliberately beam sunlight from space to the night side of Earth***. The sheer audacity of this concept, combined with its utter pointlessness, demands an unequivocal response.

The Fundamental Absurdity

Reflect Orbital, an American space company, proposes launching **thousands of satellites** equipped with mirrors to reflect sunlight onto Earth at night, creating illumination levels of 0.8–2.3 lux (up to 12 times brighter than a full moon) across areas up to 5 kilometers wide. This illumination would last only minutes as satellites pass overhead, requiring multiple satellites for continuous coverage of any single location. Among the company’s main stated applications of this light is to illuminate solar-power stations during twilight, extending the amount of time per day they can generate electricity.

This is not innovation. It is a mere light show, not a power source, as it falls 3-5 orders of magnitude short of solar panel requirements as shown in the diagram below.

[1] FCC File No. SAT-LOA-2025.



A Solution in Search of a Problem

The question must be asked: ***What problem does this solve?***

- **Outdoor lighting?** We have extraordinarily efficient LED technology that provides targeted, controlled illumination exactly where and when needed.
- **Emergency illumination?** Ground-based systems can be faster to deploy, more reliable, and don't depend on orbital mechanics.
- **Extended daylight for events?** Portable lighting systems cost a fraction of satellite deployment and don't require international coordination to turn on.
- **Agricultural applications?** Plants require darkness for essential metabolic processes. Disrupting photoperiodism with unpredictable illumination would harm, not help, crops.

There is no legitimate use case that justifies the astronomical cost, complexity, and environmental harm of space-based illumination.

The Devastation: Light Pollution Without Precedent

From the perspective of light pollution science, Reflect Orbital's proposal represents a nightmare scenario that transcends every category of harm we have documented over decades of research:

1. No Mitigation Possible

Every principle of responsible outdoor lighting—the foundation of our work—becomes *completely irrelevant* in the face of space-based illumination:

- **Shielding:** You cannot shield against light from above. Full-cutoff fixtures, carefully aimed luminaires, building setbacks—all resulting from decades of mitigation experience—will be rendered meaningless.
- **Targeting:** A 5-kilometer-wide beam cannot discriminate. It illuminates everything—possibly including protected wilderness, residential neighborhoods, observatories, wildlife corridors, Indigenous sacred sites and more.
- **Control:** Individuals, communities, and nations would have no ability to opt out, dim, or shield themselves from illumination. The night sky becomes someone else's billboard, someone else's light source, imposed from above.
- **Timing:** Unlike ground-based lights that can be turned off, orbital illumination occurs according to satellite passes— potentially occurring during critical ecological windows for nocturnal species.

2. Ecological Catastrophe at Scale

After decades of research documenting how even modest levels of artificial light at night disrupt navigation, reproduction, feeding, and predator-prey relationships across hundreds of species, we now face a proposal to multiply these impacts on a global scale with *moving, unpredictable* light sources:

- Nocturnal species evolved with predictable celestial cues. A full moon is constant, follows known cycles, and allows evolutionary adaptation. Reflect Orbital's beams would be **arbitrary, sweeping, and varying**—fundamentally incompatible with biological rhythms developed over millions of years.
- Migratory species navigating by starlight would face sudden disorientation during critical journeys. Unlike ground-based light pollution that creates predictable gradients, orbital beams could appear *anywhere, anytime*.
- Desert ecosystems in Southern Arizona where solar farms are located—already stressed by ground-based light pollution from growing urban areas—would face an entirely new category of disruption with no possibility of creating dark refugia.

3. The Defeat of Decades of Conservation Work

Southern Arizona has achieved remarkable successes in dark sky conservation:

- Multiple International Dark Sky Communities and Parks
- Protective lighting ordinances in Tucson and Pima County
- The Dark Sky Network—a regional monitoring system we launched in 2025 to track and respond to light pollution
- World-renowned astronomical observatories protected by careful lighting management

All of this work—every ordinance fought for, every retrofit completed, every community educated—may become irrelevant if satellites are deployed to beam light from above.

We could install perfect full-cutoff fixtures on every street, eliminate all uplight and light trespass, maintain exemplary lighting standards—and satellites would still illuminate our protected areas with no regard for terrestrial conservation efforts. The sheer *futility* this creates for ground-based mitigation efforts cannot be overstated, especially in the absence of regulations.

4. Ground-based Astronomical Observation Rendered Impossible

Southern Arizona hosts observatories representing over $550 million in annual economic impact.[2] Their institutions chose this location **specifically for its dark skies**. Reflect Orbital's system would:

- **Increase background skyglow** from scattered light even when beams are not directly overhead
- **Create sudden brightness spikes** that could damage sensitive detectors if a beam crosses an observatory in spite of promises to avoid illuminating observatories
- **Render time-sensitive observations unusable** during unpredictable illumination events
- **Eliminate the possibility of truly dark reference sites** for calibration and baseline measurements

Combined with satellite megaconstellation light pollution and orbital debris concerns, Reflect Orbital represents an existential threat to ground-based astronomy.

The Compounding Crisis: Orbital Environment Degradation

Recent research reveals that the orbital environment itself is in crisis. The '*CRASH Clock*'—measuring time until catastrophic collision without collision avoidance—currently stands at **2.8 days**, compared to 121 days in 2018.[3] Adding thousands more satellites with large mirrors:

- **Increases collision cross-sections dramatically**
- **Accelerates debris generation** in an already critically crowded orbital environment
- **Creates additional safety hazards** from mirror malfunctions or failures to stow

We are simultaneously degrading both the orbital environment and the ground-level environment in ways that compound each other's harms.

The Regulatory Vacuum

The fact that companies like Reflect Orbital can seek FCC approval for orbital illumination satellites **without environmental review under the U.S. National Environmental Policy Act (NEPA)** reveals a catastrophic gap in space governance.[4] The FCC regulates radio spectrum, not environmental impacts. YSatellite operators exploit this jurisdictional void to:

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[2] University of Arizona News, “Economic impact of UArizona space sciences rivals that of Super Bowl” (February 8, 2023) Economic impact of UArizona space sciences rivals that of Super Bowl | University of Arizona News

[3] Thiele, S., Heiland, S. R., Boley, A. C., & Lawler, S. M. (2025). An Orbital House of Cards: Frequent Megaconstellation Close Conjunctions (Version 1). arXiv. https://doi.org/10.48550/ARXIV.2512.09643

[4] See DeMarchi, L., (2025). “How NEPA applies to U.S. space activities”. Aerospace Corp. issue brief. HOW NEPA APPLIES TO U.S. SPACE ACTIVITIES

- Launch constellations affecting global ecosystems
- Create permanent light pollution visible worldwide
- Risk cascading collisions threatening all space operations
- Appropriate a global commons—the night sky—for private profit

All without meaningful environmental impact assessment or public consent.

Our Position

In alignment with the view of our parent organization,[5] DarkSky Southern Arizona categorically opposes proposals such as Reflect Orbital's as they are currently conceived—and we struggle to envision *any* configuration of space-based illumination that would be acceptable given the fundamental incompatibility with responsible outdoor lighting principles and the documented harms of artificial light at night.[6]

We therefore demand:

- **Immediate consultation with potential adversely affected parties** as required by Article IX of the Outer Space Treaty;[7]
- **Regulatory reform requiring comprehensive environmental review** under NEPA for all satellite systems with potential environmental impacts;
- **Independent environmental impact assessment** conducted by qualified experts before any "Sunlight as a Service" deployment;
- **A burden of proof on operators** to demonstrate no harm to ecosystems, human health, astronomy, and the night sky environment;
- **A new international treaty framework** recognizing Earth's night sky as a global commons requiring protection; and
- **A moratorium on the launch and deployment of orbital illumination systems** until comprehensive environmental and safety studies are completed.

A Final Note on Absurdity

There is something profoundly telling about a proposal to launch thousands of satellites to reflect sunlight onto Earth *at night*—the very definition of night being *absence of sunlight*—to provide brief illumination that could be achieved far more efficiently, affordably, and sustainably with a simple light switch.

This is not progress. This is not innovation. This is technological hubris seeking validation through environmental destruction.

For three and a half billion years, Earth has had a natural day-night cycle. Countless species have evolved in relationship with darkness. Human cultures have developed in communion with starlit skies. The night sky is not an untapped resource. It is not a blank canvas. It is not waiting to be improved upon.

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[5] DarkSky International, "DarkSky International opposes Reflect Orbital's proposed orbital illumination system" DarkSky International opposes Reflect Orbital's proposed orbital illumination system (December 19, 2025)
[6] For documented harms see DarkSky International, (2025). Artificial Light at Night: State of the Science 2025. Zenodo. https://doi.org/10.5281/ZENODO.15492392
[7] 610 U.N.T.S. 205, 18 U.S.T. 2410, 6 I.L.M. 386 (1967). The full text is available at 2222 (XXI). Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

It is the night sky that we all share. It should remain dark.

About DarkSky Southern Arizona

DarkSky Southern Arizona is an all-volunteer local chapter of DarkSky International, whose mission is to restore the nighttime environment and protect communities and wildlife from light pollution. DarkSky Southern Arizona aims to preserve and sustain dark night skies vital to our region's natural and cultural heritage by promoting responsible outdoor lighting practices through education, advocacy, and community engagement. Learn more about DarkSky Southern Arizona and our work at: DarkSky Southern Arizona