Facts about Reflect Orbital's "Sunlight as a Service"

- Reflect Orbital (RO) wants customers to pay them to reflect beams of sunlight down from orbit. This is called "sunlight as a service."
- Their initial plan is for each beam to be several times as bright as the full moon and at least 5 km in diameter on the ground.
- Due to the high speed needed to orbit Earth, each satellite will shine on one point for only a few minutes at most (Reflect Orbital says 4 minutes).
- If the mirrors cannot be stowed between pointings every 4 minutes, they will sweep across the ground as they move between one target and the next.
- At their proposed size, a single RO satellite is orders-of-magnitude too faint to power a solar panel on the ground, thus many would be required to power solar panels.
- RO has applied to the FCC for their first satellite launch in mid-2026, stating they plan to launch thousands of these satellites

The costs to safety and human health

- Although the ground illumination from the first satellite will be much fainter than the Sun's, looking at the satellite with binoculars or a telescope could actually damage your eyes, similar to looking at a partial solar eclipse.
- Beams of light sweeping across the sky at night can cause problems for pilots and drivers. It has the potential to be a substantial distraction, and risks disrupting night vision, particularly with multiple beams. This could be risky around airports and could lead to accidents, similar to laser strikes on aircraft.
- Having thousands of RO satellites in orbit would lead to frequent bright flashes all over the sky for any observer on the ground. Even millisecond flashes of light at night have been shown to disrupt human circadian rhythms.
- Exposure to artificial light at night is linked to increased risks of some types of cancer.

The costs to astronomy

- Astronomy requires dark skies to see faint celestial objects. Due to scattering of light along the beam, anytime an RO satellite is above the horizon, it would disrupt any ground-based optical astronomy telescopes in the area.
- Similar to astronomical observing with a full moon in the sky, it would restrict observations to only the very brightest handful of stars and planets. This would cause the vast majority of astronomy research to be impossible while one or more of these satellites is above the horizon.
- Directly shining the beam onto a large telescope (anywhere within 5km of a large telescope facility) could damage sensitive research telescope camera equipment, which are calibrated to study faint celestial objects.

The costs to ecology

- All life on Earth – including humans, migrating birds, pollinating insects, plankton in the oceans – depends on the natural day-night cycle of light and darkness. Many hundreds of scientific studies document the importance to ecosystems and agricultural crops of protecting that natural cycle. Bird migrations, pollination, plant growth, and animal behaviors could all be disrupted by reflected sunlight from orbit.

The costs to orbital safety

- "Sunlight as a service" requires huge mirrors in orbit, which would increase the likelihood of collisions between satellites.
- Large reflector cross-sections also mean a much higher collision risk from micrometeorites and non-trackable orbital debris. Using typical rates at 625km altitude (the orbit RO proposes to use), such reflectors could expect hundreds of micrometeorite and debris impacts each year, quickly degrading the reflector and creating more diffuse and larger beams.
- Loss of control could lead to tumbling, causing erratic, bright flashes in the sky.

There are already solutions right here on Earth to many of the problems "sunlight as a service" purports to solve. This approach is simply a reckless and inefficient use of Earth orbit, a precious and finite resource.

What can individuals do?

- Submit comments to the U.S. Federal Communications Commission (FCC) demanding environmental review of reflected light from orbit.
- Contact your government representatives, no matter where in the world you live, because this light pollution will be worldwide.
- Tell others about the negative impact Reflect Orbital and other "sunlight as a service" operators could have on human health and safety, ecosystems worldwide, and the night sky.

List of astronomers who can be interviewed about the effects of "Sunlight as a Service"

- **Samantha Lawler**, University of Regina, samantha.lawler@uregina.ca, satellite reflections and orbital dynamics. Time zone: UTC-6
- **John Barentine**, Dark Sky Consulting, john@darkskyconsulting.com, environmental effects of artificial light at night. Time zone: UTC-7
- **James Lowenthal**, Smith College, jlowenth@smith.edu, importance of protecting natural darkness at night for humans and all other life. Time zone: UTC-4
- **Aaron Boley**, University of British Columbia, aaron.boley@ubc.ca, space sustainability. Time zone: UTC-7
- **Teznie Pugh**, University of Texas at Austin McDonald Observatory, super@astro.as.utexas.edu, impacts on observatory operations, astrotourism, and ecological impacts (especially in west Texas). Time zone: UTC-5
- **Michelle Wooten**, University of Alabama at Birmingham, michellewooten@uab.edu, importance of protecting natural darkness at night for humans and all other life. Time zone: UTC-5