



Beware of Space Lasers

By Brad Young, Astronomy Club of Tulsa

"You know, I have one simple request, and that is to have sharks with frickin' laser beams attached to their heads". Dr. Evil, Austin Powers: International Man of Mystery

I don't like to be an alarmist, but we have a situation like something I thought was like a crazy conspiracy theory postulated by a lady Representative from Georgia with a fondness for shooting things. If you are lucky enough not to know what I'm talking about:

"In 2018 Congresswoman Marjorie Taylor Greene took to social media to share her suspicions that the California wildfires were started by 'space solar generators' which were funded by powerful, mysterious backers. Instantly, thousands of people rallied around her, blaming the fires on 'Jewish space lasers' and, ultimately, the Rothschild family." Jewish space lasers: the Rothschilds and 200 years of conspiracy theories, Mike Rothschild (2023)

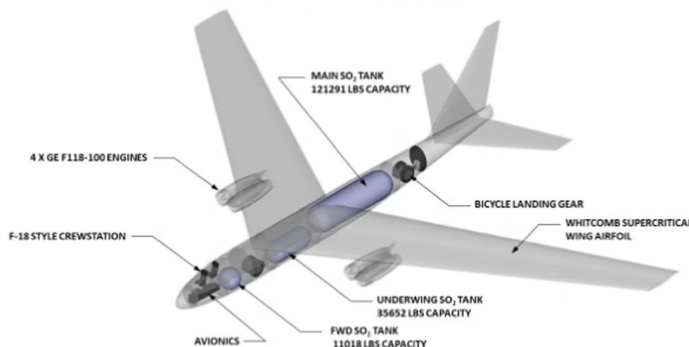
Who could have thought that would ever come to fruition. We are all aware of the Starlinks and other mega constellation satellites that have been and are continuing to be launched. If you've been outside at night or taken an image, you've almost certainly seen them or had trails across your image from them. The unfortunate news of course is that they are continuing to add not only to the Starlink fleet, but several other fleets from both private companies and governments like China. This to me was bad enough and came up at least for me as a surprise when it began. I had no idea that many satellites had been licensed to fly or that other entities would join the fray. All of that will seem like a lone cloud in the sky if either of two other ideas, now being commercially developed, are able to achieve their goals.

One is the use of space to bring solar power to Earth by reflecting the sun's rays down to receiving stations, therefore concentrating the power derived from the system. Briefly, this sort of technology would use the same type of system that unfurled the heat shield on the James Webb Space Telescope. However, the solar reflectors would be much larger and would present a very bright object indeed in the sky.

These satellites would have to orbit in sun synchronous orbit, so that they would only be affecting the night sky on certain passes near the sunset or sunrise line to reflect the sunlight when it is available. However, especially in summer at mid-latitudes, they would be able to reflect sunlight deep into the night and early in the morning and would appear for several hours at every interval of the constellation, crossing the sky as a bright object possibly rivaling the Moon. There are two companies currently commercially developing this technology and both are at the point where there is a real possibility of launch.

Even more chilling [pun intended] is the idea of injecting aerosols into the upper atmosphere to mitigate carbon dioxide and possibly refreeze the polar ice caps. This too is being seriously developed, led by the Applied Physics Department at Harvard, and would have a devastating effect on ground astronomy across the world. All nighttime skies would be always hindered, and the daytime sky would forever appear as the milky white that we have in most humid days in the summer with terrible transparency rivaling some of our most polluted cities.

TRIMETRIC SAIL 43K



<https://www.popularmechanics.com/science/environment/a41281408/stratospheric-aerosol-injections-refreeze-polar-ice/>

I can't understand how either one of these ideas is being allowed. But they had been previously predicted in several books including "The Next 100 Years: A Forecast for the Future" by George Friedman. Friedman wrote in 2009 that by 2080 solar power from space would be a major source of energy. He quotes a 2007 Defense Department study that makes the case that the technology exists, has been fundamentally available for decades, and will be necessary soon. Worst of all, that study prefers geosynchronous orbits for the solar collectors, so that they can continuously beam energy down day and night. Obviously, having highly reflective solar collectors like these, constantly sunlit throughout the night, would be a devastating blow to ground based astronomy. If there is any good news in the current plans, it is that the collectors would be low earth orbit and not interfere all night every night.

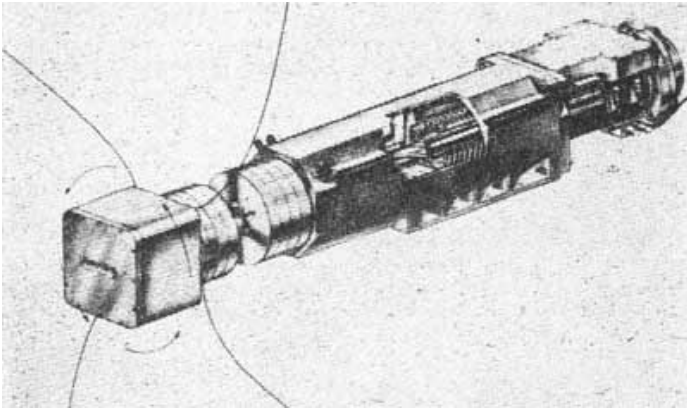


"No, I expect you to die, Mr. Bond" – Auric Goldfinger, "Goldfinger"

Even as far back as in 1941, science fiction writer (one of my favorites) Isaac Asimov published the science fiction short story "Reason", in which a space station transmits energy collected from the Sun to various planets using microwave beams. The SBSP concept, originally known as satellite solar-power system (SSPS), was first described in November 1968 by Peter Glaser in "Power from the Sun: Its

Future", in the journal Science. Although the source of transmitted power was patented to be microwaves, the collectors will still certainly reflect huge amounts of visible light. When you have a sixty year old movie that describes some of the world-shattering problems that can occur when you beam power down from space (see above), it might be time to scrap the idea.

In the 2022 book "Under a White Sky" by Elizabeth Kolbert, she describes the ongoing research in the aerosol debacle. The aerosols are designed to remove CO2 from the atmosphere and are dispersed by large aircraft flying at 60,000 feet called SAIL (Stratospheric Atmospheric Injection Lifter) and \$2.5 billion is being invested in developing the system and aircraft. There are real companies, backed by investors and government grants, developing these ludicrously dangerous systems that will certainly irrevocably change our sky, our air, and damage the environment in ways perhaps much worse than climate change.



Westford Needle dispensing spacecraft

In the sixties, the U.S. injected 480 million of tiny needles in low earth orbit in a ring around the Earth to, supposedly, improve long distance radio transmissions and facilitate weapons tracking. These Westford Needles did not accomplish the goal, and ultimately most of them reentered the atmosphere and burned up. However, there are still unknown numbers of them up there. We already have a bad

situation with low earth orbit filling with satellites that may ultimately collide and start the Kessler Effect, where debris begets debris until the whole orbital area becomes unusable. Let's not increase our odds of disaster by injecting aerosols, beaming sunlight, or continuing to launch uncontrolled numbers of satellites.

There is no way to predict what the effect of either of these weird ideas might be on astronomy, other than they will be bad. Not only visual light, but perhaps radio and infrared ground-based astronomy would be severely curtailed. And the ecological effects are mind boggling. Areas where the beams from space are shone would be dangerous to man and beast, and with the prospect of building thousands of receiving stations, the effect on migration patterns and other wildlife needs would be threatened, perhaps damaged beyond repair.

The aerosol idea is so much worse. It is thought humans, and many other species, nearly went extinct or did with the Toba super volcano eruption 74,000 years ago. For comparison, Vesuvius dropped 3 square kilometers of ash, Mt. St. Helens, 1. Toba dropped 2800, and the gas emissions were almost certainly commensurate. During these events, the air is filled with poisonous vent gas and later aerosol effluvia that dim the sun, withering crops and killing off animals who starve. Sound familiar? We have risk of such volcanic eruptions now, that we cannot control. Why introduce another, similar situation to increase our odds of devastation?

We have issues with climate change and the need for clean renewable power, and we do need solutions as time is not our friend. But these are not solutions we can tolerate, either as amateur astronomers or humans. Now is the time to make sure we take action to prevent either one of these horrible ideas from being licensed or commissioned. I will work with the IAU committee I'm on (Center for the Protection of the Dark and Quiet Sky) to figure out how to put the kibosh on the solar power satellites if possible. The aerosol idea, though less likely soon as it's not as far along, should be addressed immediately with our legislators to make sure nothing like this ever occurs in Earth's atmosphere otherwise we can say goodbye to ground-based astronomy, both professional and amateur. Starlinks snuck up on astronomy - don't let solar collector and white skies do the same.

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