



SATELLITES

What's Happening Above Our Heads

What follows is a brief summary of a superb and informative [webinar about satellites](#), sponsored by [Americans for Responsible Technology](#). Julian Gresser, Joe Sandri, Arthur Firstenberg and Ben Levi give an overview of the current state of affairs in the skies.

See, [5G Space Wars](#)
<https://www.youtube.com/watch?v=Qh8tIScM2a0>

Defining terms

High Earth Orbit (HEO) - c. 35,000 km above Earth (22,000 mi) (Geo-synchronous Orbit)

Middle Earth Orbit (MEO) - 2000 - 35,000 km above Earth (c. 1200 - 22,000 mi)

Low Earth Orbit (LEO) - 160 to 2,000 km (99 to 1200 mi) above Earth, but primarily in the closer range, 160-1000 km (99 - 600 mi).

Almost 100,000 satellite applications have been, or are in the process of being approved, most of which are destined for Low Earth Orbit (LEO).

Partial list of satellites beings planned, approved, or already launched

One Web - Applied for 48,000

Space X - Approved for 12,000 and applied for 30,000 more.

Amazon - 3236 authorized at LEO

Samsung - Planning 4600

Other countries launching satellites include (but are not limited to) Russia, China, and the UK.

In the case of SpaceX, there will also be millions of Earth based *User Terminals*, two million of which have already been approved, and 4 million more are planned. These *User Terminals* will be placed on homes and cars to provide yet denser ground-based wireless infrastructure than what 4G/5G antennas and satellites provide. What's going on now is a veritable "land grab" both in space, as licenses are easy to obtain, as well as on the ground, as our governments are buying into 5G hype.

Some problems with this untested and dense infrastructure include

1) Effects on every living being, including trees, flora, fauna, and bacteria, 2) insect decimation, 3) colony collapse disorder, 4) invasion of privacy, 5) global surveillance, 6) interference with weather forecasting and astronomy research, 7) [collisions and debris](#), 8) pollution from rocket launching and “dead” satellites burning up in the atmosphere, 9) extreme vulnerability to [cyber attacks](#) and [solar flairs](#), 10) interference with the electrical circuit that sustains all life, 11) no liability insurance coverage, and 12) the added radiation exposure of all Life from these densely deployed space and terrestrial wireless systems.

Joe Sandri explains that every living organism is an electrical unit that operates on its own unique spectrum channel. Sandri finds it "deeply concerning" that these potential/probable impacts on nature have been “irresponsibly understudied,” and says we need more citizens to advocate on satellites. (Not cited in webinar, but e.g. see, <http://europepmc.org/article/PMC/4410321> and https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations)

Julian Gresser tells us that deployment of these satellites violates international treaties, conventions, as well as federal laws, and in the US, their approval is a direct violation of the FCC’s own rules and procedures. Gresser urges us all to wake up from the “consensus trance” as “the stakes couldn’t be higher.”

Regulation

Satellite approval is a major Federal Action and needs regulation. Who will be responsible? [Healthy Heavens Trust Initiative](#) and the Balance Group are preparing a Petition to the FCC for Expedited Rule Making, whereby they will offer a template to the US government for guidance regarding regulating satellites. They are calling for a moratorium as well, until such time as the FCC abides by its own rules as well as the Constitution and US laws. <https://resiliencemultiplier.com/hhti/>

The Solution

Julian Gresser joins the growing number of people from around the world calling for a safer and better option - wired technology, be it fiber optic, copper, or coaxial cable.

Arthur Firstenberg’s message to the world:

“We have a radiation emergency in the sky”. Our 8 billion cellphones are “sterilizing the planet creating a demand for connectivity.” Either we choose a viable planet or cellphones. We cannot have both. (See [ECHOEarth](#))

A FEW RESOURCES FOR FURTHER INVESTIGATION

Space Debris

"Rocket exhaust destroying the ozone and dead satellites and fragments of collided satellites have turned outer space into the world's largest garbage pit." Arthur Firstenberg

"As of 2020, the United States Space Surveillance Network was tracking more than 14,000 pieces of space debris larger than 10 cm (4 inches) across. It is estimated that there are about 200,000 pieces between 1 and 10 cm (0.4 and 4 inches) across and that there could be millions of pieces smaller than 1 cm. Because of the high speeds (up to 8 km [5 miles] per second) at which objects orbit Earth, a collision with even a small piece of space debris can damage a spacecraft...debris smaller than 1 mm (0.04 inch)." The Britannica
<https://www.britannica.com/technology/space-debris>

Space companies are racing to beam web access to the entire planet. But 'space junk' is a big worry Feb. 16th, 2020 | Arjun Kharpal | CNBC

KEY POINTS

- Space companies, from Elon Musk's SpaceX to start-up OneWeb, are racing to launch satellites into space with the aim of creating global internet coverage on Earth.
- But there's one big problem, experts say — the creation of so-called "space junk."
- Debris in space can be a threat to future manned missions to space as well as satellites currently in orbit.

<https://www.cnbc.com/2020/02/17/space-junk-raise-concerns-as-more-and-more-satellites-are-launched.html>

Solar Flares, Coronal Mass Ejections (CME), & Electromagnetic Pulses (EMP)

(NB: A solar flare is one of a number of different kinds of electromagnetic pulses.)

Electromagnetic Pulse (EMP) - Program Status Report August 17, 2020 | US Dept. of Homeland Security

"On March 26, 2019, President Trump signed Executive Order (E.O.) 13865, Coordinating National Resilience to Electromagnetic Pulses, which establishes resilience and security E.O. 13865 states, "An electromagnetic pulse (EMP) has the potential to disrupt, degrade, and damage technology and critical infrastructure systems. Human-made or naturally occurring EMPs can affect large geographic areas, disrupting elements critical to the Nation's security and economic prosperity, and could adversely affect global commerce and stability. The federal government must foster sustainable, efficient, and cost-effective approaches to improving the Nation's resilience to the effects of EMPs."

https://www.cisa.gov/sites/default/files/publications/emp-program-status-report_508.pdf

NOAA Observing Slow-Moving Solar Flare Explosion On The Sun Aug. 16th, 2020 | Inigo Monson | IB Times

- NOAA's SWPC discovered a slow-developing solar flare on the sun• The solar flare may erupt into a coronal mass ejection
- CMEs could trigger disruptive geomagnetic storms on Earth

"A space weather agency is currently monitoring a solar flare that's slowly developing on the sun's surface. According to the agency's data, the solar flare could erupt into a coronal mass ejection (CME).

The development of the solar flare is currently being monitored by the National Oceanic and Atmospheric Administration's (NOAA) Space Weather Prediction Center (SWPC). The SWPC relies on the data collected by NOAA's Geostationary Operational Environmental Satellite (GOES) to monitor the solar flare."

<https://www.ibtimes.com/noaa-observing-slow-moving-solar-flare-explosion-sun-3029307>

What Damage Could Be Caused by a Massive Solar Storm? An enormous solar storm could short out telecom satellites, radio communications, and power grids, leading to trillions of dollars in damages, experts say Feb. 22nd, 2013 | Joseph Stromberg | Smithsonian Magazine

"On Wednesday, NASA released an image of a series of enormous sunspots snapped by at the Solar Dynamics Observatory, an orbiting telescope. The sunspots—the dark spots in the center of the image—are estimated to be larger in diameter than six Earths placed next to each other.

These sunspots pose no inherent danger—they're merely temporary areas of intense magnetic activity that inhibit the sun's normal convection currents—but, on occasion, the unstable area around a sunspot can trigger an unusually large solar flare, flinging streams of radiation outward from the sun. And a big enough solar flare can lead to an alteration in solar wind significant enough to set off a geomagnetic storm here on Earth, with the potential to short the circuitry on satellites and disrupt our telecommunications infrastructure worldwide."

<https://www.smithsonianmag.com/science-nature/what-damage-could-be-caused-by-a-massive-solar-storm-25627394/>

Satellites: "Hacks and Hijacks"

Fearing Satellite Hacks and Hijacks, White House Issues Space-Security Directive to Industry Manufacturers need to build in better defenses and even ways to regain control of hijacked spacecraft, directive says. Sept. 4th, 2020 | Patrick Tucker | DefenseOne

"The new Space Policy-Directive 5 urges manufacturers to design their hardware and software so that operators can monitor and adapt to 'activities that could manipulate, deny, degrade, disrupt, destroy, surveil, or eavesdrop on space system operations.'"

<https://www.defenseone.com/technology/2020/09/fearing-satellite-hacks-and-hijacks-white-house-issues-space-security-directive-industry/168262/>

PRESIDENTIAL MEMORANDA Memorandum on Space Policy Directive-5—Cybersecurity

Principles for Space Systems
NATIONAL SECURITY & DEFENSE

Issued on: September 4, 2020

MEMORANDUM FOR THE VICE PRESIDENT

THE SECRETARY OF STATE

THE SECRETARY OF DEFENSE

THE ATTORNEY GENERAL

Etc. (Not listing here all recipients)

SUBJECT: Cybersecurity Principles for Space Systems

"Space systems are reliant on information systems and networks from design conceptualization through launch and flight operations. Further, the transmission of command and control and mission information between space vehicles and ground networks relies on the use of radio-frequency-dependent wireless communication channels. These systems, networks, and channels can be vulnerable to malicious activities that can deny, degrade, or disrupt space operations, or even destroy satellites...."

<https://www.whitehouse.gov/presidential-actions/memorandum-space-policy-directive-5-cybersecurity-principles-space-systems/>

Bill Gates Gets a Piece of the Action

Bill Gates invests \$78 million in satellite antenna firm Kymeta Aug. 25th, 2020 | Joey Roulette
| Reuters

Gates's firm, which has invested in at least one other funding round, did not immediately return a request for comment.

"Billionaire Bill Gates is leading satellite antenna firm Kymeta's latest funding round with a \$78 million investment, the company's president told Reuters.

Redmond, Washington-based Kymeta, which sells pizza box-sized antennas for installation on cars, trains and boats, secured \$85.2 million in capital. It plans to launch a monthly subscription service for satellite-based internet to government customers later this year, Kymeta President and COO Walter Berger said in an interview.

'The thesis here is to advance connectivity on a global basis. Cellular doesn't do that,' he said."

<https://www.msn.com/en-us/money/companies/bill-gates-invests-dollar78-million-in-satellite-antenna-firm-kymeta/ar-BB18m21I>