



# Global Union Against Radiation Deployment from Space

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## For Immediate Release

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## Frequent Rocket Launches Destroy Ozone, Worsen Climate Change

### *Serious implications for SpaceX, OneWeb, and Boeing*

Thirteen companies are competing to cover the entire Earth with high-speed wireless Internet from low-orbit satellites within one to two years. This would be an ecological disaster. The biggest players are SpaceX (12,000 satellites), OneWeb (4,560 satellites) and Boeing (2,956 satellites).

The [recent finding](#), in 2018, that stratospheric ozone is still declining despite the Montreal Protocol took everyone by surprise. The increasing pace of ever-more-powerful rocket launches is a likely factor. Imminent plans for beaming high-speed Internet from space would require the launching of large rockets almost daily. This is expected to alter, if not destroy, the ozone layer and contribute significantly to climate change. Although many new rockets burn liquid fuel containing no ozone-destroying chlorine, the assumption that this is environmentally friendly is proving wrong.

Martin Ross and colleagues at the Aerospace Corporation have been sounding the alarm. Their 2009 paper, "[Limits on the Space Launch Market Related to Stratospheric Ozone Depletion](#)," pointed out that although liquid fuels do not contain chlorine, they produce significant amounts of nitrogen and hydrogen oxides, as well as water vapor and soot, when burned. All of those destroy ozone.

In a [November 2017 interview](#), Ross warned black soot from rockets remains in the stratosphere for a long time and could soon become a potent driver of climate change as well as ozone loss. "Rocket soot accumulates in the upper stratosphere, where the particles absorb sunlight," he said. "This accumulation heats the upper stratosphere, changing chemical reaction rates and likely leading to ozone loss." [A previous study](#) found the atmospheric heating effect of rocket exhausted soot is as much as 100,000 times that of carbon dioxide emissions.

In 1991, [The New York Times](#) quoted [Aleksandr Dunayev](#) of the Russian Space Agency saying, "About 300 launches of the [space] shuttle each year would be a catastrophe and the ozone layer would be completely destroyed." At that time, the world averaged only 12 rocket launches per year. Even using liquid fuel, deploying and maintaining a fleet, such as SpaceX is proposing, of 12,000 satellites each with an expected lifespan of 5 years, will likely involve so many rocket launches that an environmental catastrophe is imminent. University of Colorado atmospheric [scientist Darin Toohey has urged](#) all rocket companies to become more transparent so scientists can better study the effect rocket launches are having on the atmosphere.

Few scientists and virtually no policy makers are considering possible adverse atmosphere or magnetosphere effects of 20,000 transmitting satellites but an increasing number of scientists are urging attention to another environmental consequence of these massive programs: the increased artificial irradiation of Earth. Carcinogenic and other adverse biological effects from radiofrequency (RF) radiation emitted by wireless technologies such as cell phones and towers, smart meters, radar and other wireless devices and networks have long been known. They are [extremely well documented](#), are the subject of scores of [governmental and organizational actions](#), [multiple international appeals by scientists](#) and are only controversial for reasons having little to do with [science](#).

While public focus has been on the safety of wireless device users, an increasing number of studies show second-hand or ambient radiation levels negatively effecting [endocrine](#), [cardiac](#), [neurological](#) and other biological functions, as well as harming [wildlife](#) and [plants](#). Currently efforts are underway promoting use of higher frequencies in 5<sup>th</sup> generation [wireless known as 5G](#). While these frequencies can carry massive amounts of data, they do not travel or penetrate very well and will require an extraordinarily dense network of radiation-emitting transceivers every hundred yards or so to be functional. “[As if this isn’t bad enough](#),” said Ed Friedman, a spokesperson for GUARDS, “now we have to worry about destroying the ozone and life as we know it in order to download video faster.”

In 2011, the World Health Organization classified RF radiation as Class 2B, a *possible* human carcinogen. With this classification now outdated by further research, [numerous scientists](#) are calling for a [reclassification to Class 1](#), a *known* human carcinogen. Universal wireless from space, the goal of SpaceX, Boeing and OneWeb, would inundate the entire planet (including previously unexposed regions) with RF radiation, involuntarily subjecting all people, wildlife, and plants to the serious adverse effects of second-hand radiation exposure.

*GUARDS was formed in 2014 to prevent irreversible atmospheric and biological damage from massive deployments of altitude-based radiation-emitting intrusive technologies.*

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