## 1

#### Interpretation: LEO ends before outer space begins according to science and the Karman line is not an objective way to measure the beginning of outer space.

Sabine **Stanley, 20** - ("Low Earth Orbit: Troposphere and Stratosphere," Great Courses Daily, 7-9-2020, 1-16-2022https://www.thegreatcoursesdaily.com/low-earth-orbit-troposphere-and-stratosphere/)//AW

Even though low earth orbit includes all layers of the atmosphere, most of what people know from the atmosphere happens in the first two layers. Troposphere and stratosphere are the closest layers with the major amount of atmospheric mass. Low earth orbit somehow marks the beginning of outer space. The Karman line was a governmental attempt to mark the boundary between Earth and outer space, but they could not agree on an altitude. Thus, it ranges from 80 to 100 kilometers. What everyone agrees on are the layers of the atmosphere and their altitudes. The first layer is the troposphere. Learn more about how plate tectonics sets up life. What Is the Troposphere? The lowest layer of atmosphere is called the troposphere, with an average thickness of 10 kilometers, spread above the Earth’s surface. Everything known as ‘weather’ happens in this layer, namely, winds, thunderstorms, tornadoes, hurricanes, blizzards, and cloud formation. The troposphere is the lowest layer of the atmosphere, where weather happens, and 80% of the atmosphere’s mass is concentrated. (Image: BlueRingMedia/Shutterstock) The convective overturning of air results in all the weather phenomena. Besides, water goes through all its phases in the troposphere: vapor, rain, and snow. The ‘overturning’ is reflected in the name of this thin but dense layer: tropos is Greek for ‘turn’, referring to the overturning of air. Now, why does air overturn here? This is a transcript from the video series A Field Guide to the Planets. Watch it now, on Wondrium. Overturning in the Troposphere The overturning – vertical mixing – happens since the highest temperature of the troposphere is at the bottom. The average temperature on the surface is about 60°F, and it decreases down to an average of −75°F at the top. About 80% of the atmosphere’s mass is concentrated here. The troposphere ends with a boundary called the tropopause, where the next layer begins. Learn more about near-Earth asteroids and the asteroid belt. What is the Stratosphere? The stratosphere is the second-lowest layer of Earth’s atmosphere, starting at 10 kilometers above the surface. Unlike the troposphere, the temperature in the stratosphere increases with altitude. At the top, the temperature is around 32°F – almost 100 degrees higher than the bottom. However, the pressure decreases to one millibar, i.e., 1000 times less than the Earth’s surface pressure. The stratosphere ends at the stratopause. Does the higher temperature mean the stratopause is warm? Is the Stratosphere Warm? The higher temperature in the troposphere is the result of the Sun’s ultraviolet (or UV) radiation, trapped by ozone particles (O3). The famous ozone layer, where UV is absorbed, is located here. The highest concentration of ozone is at the lowest part of the stratosphere, but O3 can also be found up to the middle of the layer. Most of the radiated UV is absorbed by O3, breaking it into O2 and atomic oxygen (O). Next, O and O2 combine again and recreate O3. However, the absorbed energy does not create a warm environment, since the molecules are so far away from each other that collisions rarely happen. Hence, airplanes flying around this altitude need to create pressure inside the cabin and regulate the temperature. Learn more about Venus, the veiled greenhouse planet. Airplanes in the Stratosphere The cruising altitude for most commercial flights is around 39,000 feet or 12 kilometers above the surface. This means that airplanes fly in the lowest part of the stratosphere, above the weather and the turbulence it causes. The boundary of the two layers can be seen from the plane, as clouds do not enter the stratosphere. The air is too thin here, so airplane cabins are pressurized. Stratosphere is where most commercial planes fly, as the pressure is ideal for flying. (Image: Kost9/Shutterstock) Besides the commercial planes, NASA’s SOFIA also flies in the lower stratosphere. SOFIA: Stratospheric Observatory for Infrared Astronomy SOFIA is a Boeing 747 with a 100-inch telescope attached. It flies at 12 kilometers, above 99% of Earth’s atmosphere, and studies the solar system in the infrared part of the light spectrum. Transient phenomena, such as eclipses and occultations, are also studied best with SOFIA. Pluto and Saturn’s moon, Titan, was also studied by SOFIA from the stratosphere. Higher in the stratosphere, the air pressure is too low for typical airplanes to fly. Military jets and other planes that do fly at higher altitudes use their engine power to conduct the flight. However, scientific balloons are launched to collect data. The best location to do so is McMurdo Station in Antarctica, as the South Pole vortex keeps the balloons contained in a small area and does not let them fly away into the distance. It can be concluded that the first two layers of the atmosphere in the low Earth orbit are the ones humans make the most use of. Common Questions about Low Earth Orbit Q: Is low Earth orbit considered space? Low Earth orbit is the ‘circle’ around Earth’s atmosphere up to 2000 kilometers above the surface. The satellites and other human-made space objects also orbit in the low earth orbit. **The end of the orbit is the beginning of space**, where solar winds start, and the Earth’s atmosphere is too thin to be considered gas. Q: What does low Earth orbit mean? Low earth orbit extends up to 2000 kilometers above the surface. All the atmosphere layers reside in this area, with almost 80% of the mass concentrated in the lowest layer, the troposphere. The weather, winds and tornados, plane flights, and satellite orbits all occur in this 2000-kilometer-high zone before space characteristics dominate the environment.

#### Violation: (only for debris) space debris only happens in the LEO.

Kelly **Whitt, 21** - ("Kessler syndrome in real life? ISS astronauts shelter from debris," EarthSky, 11-15-2021, 1-16-2022https://earthsky.org/human-world/kessler-syndrome-colliding-satellites/)//AW

Kessler syndrome: A scenario in which the density of objects in low-Earth orbit is high enough that collisions between objects cause a cascade, with each collision generating space debris that increases the likelihood of further collisions.

#### Vote neg – two impacts:

#### They massively expand topic limits by allowing an aff that takes place anywhere in Earth’s atmosphere. That means that affs about weather balloons, missiles, school rocket projects, or airspace owned by governments could all be potential affs. Don’t let them say that they only expand it by a few thousand kilometers- our atmosphere is where most testing and air activities happen. There are more launches within our atmosphere than outside of it, so they more than double the topic prep burden.

#### Topic literature- our evidence is from a scientific source meant to clarify specifically whether or not the LEO is space from a scientific basis. Prefer it to semantic. It’s better for education because it forces the debaters to look at the substance behind the topic .

#### Drop the debater to preserve fairness and education – use competing interps – reasonability invites arbitrary judge intervention and a race to the bottom of questionable argumentation. No RVIs – they don’t get to win for following the rules.

## 2

#### Russia hates StarLink. Smith 21:

Rich Smith, 21 - ("Why Russia Is Terrified of SpaceX," Motley Fool, 2-15-2021, https://www.fool.com/investing/2021/02/15/why-russia-is-terrified-of-spacex-and-starlink/)//marlborough-wr/

SpaceX wants to bring [fast satellite broadband internet](https://www.fool.com/investing/2020/08/23/fast-broadband-from-orbit-new-data-says-spacex-can/) to the world -- and in particular, to internet users in far-flung, rural locations, where download speeds are low and prices are high. One of the first places in America to get SpaceX Starlink service was Alaska, the state with the lowest population density in the country -- just one person per square mile. The company next extended service into Canada (population density: three people per square mile), followed last month by [service in the UK](https://www.fool.com/investing/2021/02/09/spacex-starlink-wins-another-big-customer/) -- a big jump in concentration, with 650 people per square mile. (Even in the UK, there are plenty of isolated locations where internet service is expensive, slow -- or both). SpaceX's globe-spanning satellite constellation should be capable of providing 100 megabit-per-second internet service to anywhere by the end of this year. You can expect that a lot of countries, no matter how urbanized they are (or not), will be lining up to sign up for Starlink service. And the more countries Starlink signs up as customers, the better the prospects for the SpaceX subsidiary's [promised IPO](https://www.fool.com/investing/2020/02/07/spacex-will-likely-ipo-its-starlink-internet-satel.aspx). One country that most definitely does not want Starlink, however, is Russia. Just say "nyet" to fast internet As ArsTechnica.com reported last month, the Russian State Duma (Russia's congress) is currently considering legislation to impose fines upon any individual or company that signs up for Starlink -- or indeed, for any foreign-operated satellite internet system, [OneWeb or Project Kuiper](https://www.fool.com/investing/2019/06/11/could-amazon-beat-spacex-in-satellite-broadband-in.aspx) included. According to ArsTechnica, the Russian Duma may fine individual customers of Starlink up to $405 for use of the satellite internet service, and fine corporate users as much as $13,500. What does Russia have against cheap, fast, reliable internet from space? For one thing, Russian security services object that internet operated by a foreign satellite network would be immune from surveillance under Russia's System of Operational Search Measures legislation ("SORM"). For another, they suspect that Starlink is part of a U.S. government plot to deploy "predatory, clever, powerful, high-technology ... shock and awe ... to advance, above all, [American] military interests." Yes, seriously.

#### We stopped appeasing Russia – they’ll pocket concessions from coop and increase aggression – tensions aren’t the result of understandings but hardened differences

Haddad and Polakova 18 [Benjamin Haddad Director, Future Europe Initiative - Atlantic Council. Alina Polyakova Director, Project on Global Democracy and Emerging Technology Fellow - Foreign Policy, Center on the United States and Europe. Don’t rehabilitate Obama on Russia. March 5, 2018. https://www.brookings.edu/blog/order-from-chaos/2018/03/05/dont-rehabilitate-obama-on-russia/]

Obama’s much-ballyhooed “Reset” with Russia, launched in 2009, was in keeping with optimistic attempts by every post-Cold War American administration to improve relations with Moscow out of the gate. Seizing on the supposed change of leadership in Russia, with Dmitry Medvedev temporarily taking over the presidency from Vladimir Putin, Obama’s team quickly turned a blind eye to Russia’s 2008 war with Georgia, which in retrospect was Putin’s opening move in destabilizing the European order. Like George W. Bush before him, Obama vastly overestimated the extent to which a personal relationship with a Russian leader could affect the bilateral relationship. U.S.-Russia disagreements were not the result of misunderstandings, but rather the product of long-festering grievances. Russia saw itself as a great power that deserved equal standing with the U.S. What Obama saw as gestures of good will—such as the 2009 decision to scrap missile defense plans for Poland and the Czech Republic—Russia interpreted as a U.S. retreat from the European continent. Moscow pocketed the concessions and increasingly inserted itself in European affairs. The Kremlin was both exploiting an easy opportunity and reasserting what it thought was its historic prerogative.

Though Russia’s invasion of Ukraine in 2014 was the final nail in the coffin of the Reset, President Obama remained reluctant to view Moscow as anything more than a local spoiler, and thought the whole mess was best handled by Europeans. France and Germany spearheaded the Minsk ceasefire process in 2014-2015, with U.S. support but without Washington at the table. The Obama administration did coordinate a far-ranging sanctions policy with the European Union—an important diplomatic achievement, to be sure. But to date, the sanctions have only had a middling effect on the Russian economy as a whole (oil and gas prices have hurt much more). And given that sanctions cut both ways—potential value is destroyed on both sides when economic activity is systematically prohibited—most of the sacrifice was (and continues to be) born by European economies, which have longstanding ties to Russia. In contrast, the costs of a robust sanctions policy have been comparatively minor in the United States; Obama spent little political capital to push them through at home. The Obama administration also sought to shore up NATO’s eastern flank through the European Reassurance Initiative (ERI), which stationed rotating troops in Poland and the Baltics while increasing the budget for U.S. support. Nevertheless, the president resisted calls from Congress, foreign policy experts, and his own cabinet to provide lethal weapons to Ukraine that would have raised the costs on Russia and helped Kyiv defend itself against Russian military incursion into the Donbas. As Obama told Jeffrey Goldberg, he viewed any deterrent moves by the United States as fundamentally not credible, because Russia’s interests clearly trumped our own; it was clear to him they would go to war much more readily that the United States ever would, and thus they had escalatory dominance. Doing more simply made no sense to Obama. This timid realpolitik was mixed up with a healthy dose of disdain. Obama dismissed Russia as a “regional power” that was acting out of weakness in Ukraine. “The fact that Russia felt it had to go in militarily and lay bare these violations of international law indicates less influence, not more,” Obama said at the G7 meeting in 2014. This line has not aged well. Obama’s attitudes on Russia reflected his administration’s broadly teleological, progressive outlook on history. Russia’s territorial conquest “belonged in the 19th century.” The advance of globalization, technological innovation, and trade rendered such aggression both self-defeating and anachronistic. The biggest mistake for America would be to overreact to such petty, parochial challenges. The 2015 National Security Strategy favored “strategic patience”. But was it patience… or passivity? As its actions in 2016 proved, Russia is very much a 21st century power that understands how to avail itself of the modern tools available to it, often much better than we do ourselves. The same intellectual tendencies that shaped Obama’s timid approach to Ukraine were reflected in his administration’s restrained response as evidence of Russian electoral interference began to emerge in the summer of 2016. Starting in June, intelligence agencies began reporting that Russian-linked groups hacked into DNC servers, gained access to emails from senior Clinton campaign operatives, and were working in coordination with WikiLeaks and a front site called DCLeaks to strategically release this information throughout the campaign cycle. By August, Obama had received a highly classified file from the CIA detailing Putin’s personal involvement in covert influence operations to discredit the Clinton campaign and disrupt the U.S. presidential elections in favor of her opponent, Donald Trump. That fall through to his departure from the White House, the president and his key advisers struggled to find an appropriate response to the crime of the century. But out of all the possible options, which included a cyber offensive on Russia and ratcheted up sanctions, the policy that was adopted in the final months of Obama’s term was, characteristically, cautious. Obama approved additional narrow sanctions against Russian targets, expelled 35 Russian diplomats, and shut down two Russian government compounds. It’s true that Obama faced a difficult political environment that constrained his ability to take tougher measures. Republican opponents would have surely decried any loud protests as a form of election meddling on Hillary Clinton’s behalf. Donald Trump was already flogging the narrative that the elections were rigged against him. And anyway, Clinton seemed destined to win; she would tend to the Russians in her own time, the thinking went. But just as with the decision to not provide weapons to Ukraine, the Obama administration also fretted about provoking Russia into taking even more drastic steps, such as hacking the voting systems or a cyber attack on critical infrastructure. In the end, the administration’s worries proved to be paralyzing. “I feel like we sort of choked,” one Obama administration official told the Washington Post. Much ink has been spilled over President Trump’s effusive praise for Putin and his brutal regime. “You think our country’s so innocent?” candidate Trump famously replied to an interviewer listing the many human rights abuses of Putin’s Russia, including the harassment and murder of journalists. Obama, on the other hand, never had any ideological or psychological sympathy for Putin or Putinism. By the end of his second term, the two men were barely on speaking terms, the iciness of their encounters in full public view. For most of Obama’s two terms, however, this personal animosity did not translate into tougher policies. Has the Trump administration been tougher on Russia than Obama, as the president claims? Trump’s own boasting feels like a stretch, especially given how he seems to have gone out of his way to both disparage NATO and praise Putin during the course of his first year in office. Still, many of his administration’s good policies have been obscured by the politics of the Mueller investigation and the incessant furor kicked up by the president’s tweets. As Tom Wright has noted, the Trump administration seems to pursue two policy tracks at the same time: the narrow nationalism of the president’s inflammatory rhetoric openly clashing with the seriousness of his administration’s official policy decisions.

These tensions are real, but all too often they become the story. Glossed over is the fact that President Trump has appointed a string of competent and widely respected figures to manage Russia policy—from National Security Council Senior Director Fiona Hill to Assistant Secretary of State for European affairs Wess Mitchell to the Special Envoy for Ukraine Kurt Volker. The Trump administration is, in fact, pursuing concrete policies pushing back on Russian aggression that the Obama administration had fervently opposed. The National Security Strategy of 2017, bringing a much-needed dose of realism to a conversation too often dominated by abstractions like the “liberal world order”, singles out both China and Russia as key geopolitical rivals. During Trump’s first year, the administration approved the provision of lethal weapons to Ukraine, shut down Russia’s consulate in San Francisco as well as two additional diplomatic annexes, and rather than rolling back sanctions, Trump signed into law additional sanctions on Russia, expanded LNG sales to a Europe dependent in Russian gas imports, and increased the Pentagon’s European Reassurance Initiative budget by 40 percent. (A president who berated U.S. investments for European defense has actually dramatically increased American military presence on Europe’s threatened borders.) While many of these policies may have been implemented despite rather than because of the president—on the expansion of sanctions in particular, Trump faced a veto-proof majority in Congress—credit should be given where credit is due.

The Trump administration’s sober policy decisions should not excuse the president’s praise for Vladimir Putin, nor his reckless undermining of America’s stated commitment to enforcing Article 5 during his first speech in front of NATO. But the fact remains that the U.S. is taking concrete steps to strengthen Europe against Russian aggression. And let’s not be coy about it: if the president’s strident complaining about unequal burden-sharing in NATO finally snaps European allies out of their complacency and helps spur military investment on the continent, this won’t be good news for Russia either. Indeed, he will have succeeded in moving the needle on an issue that has frustrated every one of his predecessors since 1989. Has Trump’s bluster, especially on Article 5, been cost-free? Hardly. Nevertheless, talking to diplomats around town suggests that after initial months of uneasiness, most Europeans have learned to deal with the Trump administration in a dispassionate and pragmatic manner that stands in stark relief with much of the hysteria that passes for commentary in the U.S.

Each administration should be judged on what it has achieved. At the end of the Obama’s two terms, Putin had elevated Russia to a credible revisionist power on the international stage. Russia annexed Crimea and occupied much of Eastern Ukraine; by successfully propping up the degenerate Assad regime, the Kremlin gained a veto on any possible political solution to Syria, and got a meaningful foothold in the broader region for the first time since Sadat threw Soviet advisors out; and its populist allies and fellow-travelers were on the rise in Europe, fueling both anti-Americanism and illiberalism; and most damning of all, it managed to meddle, almost unopposed, in U.S. politics—all on Obama’s watch.

There is plenty left to criticize in how the Trump administration has done things in its first year. The Trump administration’s apparent unwillingness to take steps to deter hostile foreign powers from meddling in American politics is inexcusably irresponsible. And in the Middle East, the Trump administration seems hell-bent on following Obama’s myopic policy of retreat and narrow preoccupation with fighting ISIS to the exclusion of all else. But despite the president’s campaign promises, his administration has been the first in the post-Cold War era to not try for a “Reset” with Moscow. If Vladimir Putin wanted to sow chaos and confusion in Washington, he has succeeded beyond his wildest dreams. If he wanted a pliant ally in America, he has abjectly failed.

#### Appeasing Russia shreds the NPT and causes nuke prolif – extinction

Umland 17 [Andreas Umland is a German political scientist, historian and Russian interpreter, specializing in contemporary Russian and Ukrainian history. He is a Member of the Institute for Central and East European Studies at the Catholic University, and a senior research fellow at the Institute for Euro-Atlantic Cooperation in Kyiv. The Price of Appeasing Russian Adventurism. January 16, 2017. https://carnegieeurope.eu/strategiceurope/67692]

A major foreign policy challenge for the incoming U.S. administration will be how to deal with Russia’s new international assertiveness and foreign military adventures. Some signs in recent weeks, especially regarding the ongoing confrontation between Russia and Ukraine, point to a friendlier U.S. approach toward Moscow. Such a shift would have very serious consequences for the rest of the world.

A new rapprochement between Washington and Moscow may go far beyond the attempt by the administration of outgoing U.S. President Barack Obama to reset Russian-U.S. relations after the Russian-Georgian War in 2008. Supposedly, a dovish American approach toward the Kremlin would put U.S. concerns before those of countries and peoples currently in conflict with Russia.

To be sure, a number of probable members of the new administration, like Rex Tillerson, Mike Pompeo, and James Mattis, have voiced hawkish views on Russian imperialism. Yet apparently, U.S. President-elect Donald Trump and some of those advising him specifically on Russia, like Michael Flynn, Paul Manafort, and Carter Page, hope that U.S. tolerance of Russian freedom of movement in the former Soviet space—in particular, in Ukraine—would make the Kremlin more cooperative in other fields, such as the fight against Islamist terrorism, and in other regions, such as Syria or the Arctic.

However, one wonders whether Trump and other so-called Putinversteher in the incoming administration fully understand the stakes. The risks do not only concern the fundamental national interests of such pro-American countries as Ukraine, Estonia, Georgia, or Poland. The U.S. administration’s tolerance of Russia’s violation of Ukrainian territorial integrity would have larger implications for the future of humanity.

In view of the security assurances that the United States gave Ukraine under the 1994 Budapest Memorandum, a move by Washington to appease Moscow would be another crack in the splintering international nuclear nonproliferation regime. Acquiescence to Russia’s territorial gains in Ukraine would further undermine the already-shattered 1968 Nuclear Non-Proliferation Treaty (NPT), one of the world’s most important multilateral agreements.

Under the Budapest Memorandum, three official nuclear-weapons states under the NPT—Russia, the UK, and the United States—assured the inviolability of Ukraine’s borders. In two simultaneous but separate declarations, the other two official nuclear-weapons states, China and France, also expressed their respect for Ukraine’s political sovereignty. This was the core of a shrewd deal between the five guarantor states of the NPT and Ukraine (as well as Belarus and Kazakhstan), which had inherited parts of the Soviet nuclear arsenal. In exchange for Kyiv’s readiness to give up its weapons of mass destruction and join the NPT, the world’s five major nuclear powers explicitly acknowledged their obligation to observe and protect Ukraine’s territorial integrity.

But since 2014, if not before, Moscow has manifestly violated the Budapest Memorandum. As the agreement forms an important annex to the NPT, its violation through continuing Russian occupation of Ukraine’s territory undermines the logic of the international mechanism to prevent the spread of atomic weapons. That not only harshly punishes a country that voluntarily agreed to give up its nuclear weapons in exchange for security assurances. It also demonstrates how an official nuclear-weapons state can use its nuclear deterrence potential to implement and secure territorial expansion with military means.

Worse, two other official nuclear powers, Beijing and Paris, have implicitly assisted Russia in its subversion of the nonproliferation regime. Despite having expressed its respect for Ukraine’s territorial integrity, China did not support a 2014 UN General Assembly resolution against Russia’s annexation of Crimea. And several prominent French center-right parliamentarians have visited Crimea since its annexation by Russia, even though the French government that in 1994 declared its respect for Ukraine’s sovereignty was also a center-right administration (albeit under Socialist president François Mitterrand).

U.S. appeasement of Russia regarding its annexation of Crimea and interference in Ukraine’s eastern Donbas region would compound the effects of these earlier aberrations. The United States would be disregarding its earlier statements about Ukraine’s accession to the NPT and voluntary nuclear disarmament. The UK would be the only guarantor state of the NPT left that behaves more or less in line with the logic of the world’s nonproliferation regime with regard to Ukraine.