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### Plan

#### Plan: The Islamic Republic of Iran should ban the appropriation of outer space by private entities

### Adv

#### The Iranian public program is set to withdraw in lieu of a rising private sector

**Alexani 18** [Tadeh Alexani, (Islamic Asad University, Guest writer, machine learning mentor, communication team member, co organizer of tedxtehran), 7-1-2018, “Iran's Private Sector to Get More Involved with Iran's Space Program“, TechRasa, https://techrasa.com/2018/07/01/irans-private-sector-to-get-more-involved-with-the-countrys-space-program/] ndsjag

The Director of the Iranian Space Agency (ISA), Morteza Barari, said that in ISA, a proper program has been developed for the withdrawal of the state administration in the country’s space sector.

According to Barari the license for the private telecommunication operators is one of these actions and they are developing a license for the private satellite operators.

At the moment, all of the world’s top reports focus on the pivotal economy of space, and now as the space sector has been linked to the private sector, statistics show that from $345 billion revenue of this sector, $260 billion of it is from the private sector,” Barari added.

“Our goal is to increase and highlight the role of the private sector in the country’s space sector, as the Ministry of Communications and Information Technology (ICT), accounted 92% of the ICT area to the sector,” he said, emphasizing the necessity of serious and effective participation of the private sector in the development of space technology.

He added that Iran has now become one of the first 9 countries in the world to achieve the full cycle of space technology: “In the meantime, the private sector has played an important and influential role in this national honor and we’re looking to ensure the business security for them to increase productivity in this field.”

“Recognizing the barriers and removing them, rectifying the rules and facilitating the development and protection of the private sector is considered by ISA”, added the Director of the Iranian Space Agency, and noted: “The field of space business is developing rapidly to such degree that the European Space Agency is currently supporting over 500 startups.”

#### Iran’s private sector has since been filling in

**Lamson 21** [Jim Lamson, (senior editor of the Texas national security review), 12-20-2021, “Iranian President Raisi’s Renewed Emphasis on Space Is Likely to Create New Tensions“, Texas national security review, https://warontherocks.com/2021/12/iranian-president-raisis-renewed-emphasis-on-space-is-likely-to-create-new-tensions/] ndsjag

Iran has two space programs: a state space program and a parallel [program](https://newlinesinstitute.org/iran/irans-military-space-program-picks-up-speed/) run by the Islamic Revolutionary Guard Corps. The state space program is under Iran’s president, who chairs the Supreme Space Council. The council, in turn, oversees the Iranian Space Agency, which contracts with entities under the [communications](https://www.mehrnews.com/news/5137592/), [defense](https://www.isna.ir/news/94071509947/), and [science](https://www.mashreghnews.ir/news/1113496/) ministries — and increasingly, Iran’s [private sector](https://www.mehrnews.com/news/5137377/). We use the phrase “state” space program rather than “civilian” because Iran’s military is fully integrated into this program.

The Revolutionary Guard’s space program exists outside this structure — and outside of Raisi’s control — just as the guard corps itself reports directly to Iran’s Supreme Leader through the Armed Forces General Staff, not to Iran’s president or defense minister. The Revolutionary Guard has organized and implemented its own parallel efforts to develop launchers, satellites, and ground facilities for military purposes. The guard has described its space efforts as a “[Super Project](https://www.mashreghnews.ir/news/1065196)” (abar-perozheh) that integrates a complex of projects related to satellites, launchers, and satellite ground stations. To implement these efforts, the Revolutionary Guard manages its own parallel ecology of implementing organizations including research centers and a university.

Iran’s goals under its state space program are longstanding and genuine. Iranian leaders see space, along with nuclear and missile capabilities, as important “[power-creating](https://www.mehrnews.com/news/5286149/)” (eghtedar-saz) industries for Iran’s economy, military, and security. Iran’s official goal is to achieve “[first place](https://rc.majlis.ir/fa/law/show/838896) in the region” in terms of space capabilities. Iranian officials frequently emphasize joining what they call the “[space club](https://www.mehrnews.com/news/5071190/)” of technologically advanced states. While Iran’s military is deeply involved in Iran’s space programs, it would be wrong to see the space program as a mere [cover](https://www.nytimes.com/2019/01/03/world/middleeast/iran-spacecraft-pompeo.html) for Iran’s significant and very public missile programs.

First, Raisi has [emphasized](https://www.farsnews.ir/news/14000905000331/) that Iranian satellite launches must become routine, what he calls “stabilizing” (tasbit) Iran’s presence in low earth orbit. This means Iran will likely increase the launches of remote sensing and communications satellites using its Simorgh and Zoljanah space launch vehicles. One outcome of the Supreme Space Council meeting was a detailed launch [schedule](https://www.aparat.com/v/LXIcp) running through 1401 (the year ending in March 2023). Iran is currently building [new](https://www.instagram.com/tv/CWx_qKYjIoX/?utm_medium=share_sheet) satellites and has a [backlog](https://www.sobhesahel.com/news/50312/) of older satellites awaiting launch. According to [industry officials](http://www.shabestan.ir/detail/News/1120955), the key “choke point” (galugah) has been “launching and launchers.” We also expect Iran to conduct test launches as part of launcher development and as incremental steps toward launching a satellite to geostationary orbit and launching an astronaut to low earth orbit. If it can overcome the launch problems it has experienced in recent years, Iran could conduct a surprising number of launches in the coming year.

#### Iran uses satellites for military capabilities and to collaborate with North Korea

**Smith 20** [Zhanna Malekos Smith, (Jessica 'Zhanna' Malekos Smith, J.D., is a Senior Associate (non-resident) with the Technology Policy Program at the Center for Strategic and International Studies in Washington, DC., ), 10-1-2020, “Iran’s Space Program and the Wall Between “Peaceful Purposes”“, Center For Strategic And International Studies (Csis), https://www.csis.org/blogs/technology-policy-blog/irans-space-program-and-wall-between-peaceful-purposes] ndsjag

The leader of Iran’s national space agency, Morteza Berari, claims that Iran’s [use of outer space is peaceful](https://www.state.gov/irans-space-program-is-dangerous-not-peaceful/).  In contrast, U.S. Secretary of State Michael Pompeo says Iran’s space program is “[dangerous](https://www.state.gov/irans-space-program-is-dangerous-not-peaceful/)” and that the Noor-1 military satellite “makes clear what we have said all along: Iran’s space program is neither peaceful nor entirely civilian.” The [United Kingdom](https://www.aljazeera.com/news/2020/04/24/significant-concern-uk-condemns-iran-ballistic-missile-launch/), [France](https://www.aljazeera.com/news/2020/04/24/significant-concern-uk-condemns-iran-ballistic-missile-launch/) and [Germany](https://www.upi.com/Defense-News/2020/04/27/Iranian-launch-of-satellite-may-violate-UN-resolution/3211588002758/) also joined the United States in condemning Iran’s launch of Noor-1 for being inconsistent with [United Nations Security Council Resolution 2231](https://www.un.org/securitycouncil/content/2231/background), which placed restrictions on Iran’s development and acquisition of nuclear weapons technology.

Historically, since Iran’s 1988 launch of the [Shahab-1 (“Meteor-1”) missile](https://www.csis.org/analysis/iran%E2%80%99s-rocket-and-missile-forces-and-strategic-options-0) from a ship in the Caspian Sea, the country has increasingly expanded its ballistic missile program.  In 2000 the Central Intelligence Agency’s Director of the Nonproliferation Center, John A. Lauder, [testified](https://www.cia.gov/news-information/speeches-testimony/2000/lauder_WMD_100500.html) before the U.S. Senate Committee on Foreign Relations that “Iran has displayed a mock-up satellite and space launch vehicle (SLV), suggesting it plans to develop an SLV to deliver Iranian satellites to orbit. However, Iran could convert an SLV into a ballistic missile by developing a reentry vehicle.”  
   
In 2015 Israel’s Eros-B satellite captured satellite imagery of a new Iranian “[missile launch site, capable of sending a rocket into space or of firing an ICBM. On the launch pad was a new 27-meter long missile, never seen before](https://www.jpost.com/Opinion/Column-one-Iran-Obama-Boehner-and-Netanyahu-388671).” More recently, on September 28, 2020 the [Iran Daily](http://www.irandaily.ir/News/274833.html) news reported that the IRGC’s Aerospace Force had developed a new generation of naval ballistic missiles, the Zolfaqar Basir, which has a range of “over 700 kilometers [434 miles] and a warhead equipped with an optical seeker.”  Previously, the IRGC’s other naval missiles, dubbed [the ‘Persian Gulf’ and ‘Hormuz’](https://www.islamtimes.org/en/news/888920/irgc-unveils-naval-ballistic-missile-zolfaqar-basir), had a range of 186 miles and 155 miles respectively.

In addition, it is no secret that Iran and North Korea have [long collaborated](https://www.armscontrol.org/act/2007-01/iran-nuclear-briefs/iran-north-korea-deepen-missile-cooperation) in developing ballistic missile technology. [Russia has also lent assistance](https://www.cia.gov/news-information/speeches-testimony/2000/lauder_WMD_100500.html) to Iran’s ballistic missile delivery systems. These relationships are concerning, warns [Dr. Peter V. Pry](https://www.amazon.com/Blackout-Wars-Initiatives-Preparedness-Electromagnetic/dp/1517621399), the former Chief of Staff of the U.S. Congressional EMP Commission, because Iran could mimic “North Korea’s lead in short order—perhaps even concurrently—to mate EMP [electromagnetic pulse]-enhanced weapons to ballistic missiles or to include light-weight EMP weapons as satellite payloads.”

According to [Iran’s 2010 military textbook, Passive Defense, as translated by the Defense Intelligence Agency’s National Intelligence University](https://www.fdd.org/analysis/2015/08/19/a-shariah-approved-nuclear-attack/), Iran has assessed the value of EMP weapons: “As a result of not having the other destructive effects that nuclear weapons possess, among them the loss of human life, weapons derived from electromagnetic pulses [EMPs] have attracted attention with regard to their use in future wars …. The superficiality of secondary damage sustained, as well as the avoidance of human casualties, serves as a motivation to transform this technology into an advanced and useful weapon in modern warfare.”  
Putting aside concerns of potential [EMP threats](https://ksr.hkspublications.org/2019/12/27/borrowing-a-column-from-thomas-jefferson-the-architecture-of-national-security-risks/), the Iranian Space Agency expects to develop five additional satellites [before March 2021](https://www.aljazeera.com/news/2020/02/space-iran-launch-observation-satellite-200203064154017.html).  Iran’s most recent launch of the Noor-1 military satellite and its domestically-built Qased rocket marked the IRGC’s [41st anniversary](https://studies.aljazeera.net/en/reports/orbit-iran%E2%80%99s-nour-1-satellite-and-two-wing-doctrine).  Interestingly, this launch was [developed and conducted in secret](https://www.state.gov/irans-space-program-is-dangerous-not-peaceful/) by the IRGC, not Iran’s national space agency, and launched from an [IRGC base, not at the civilian Imam Khomeini Spaceport](https://iranprimer.usip.org/blog/2020/jun/23/iran%E2%80%99s-ambitious-space-program) in Semnan province.  According to [IRGC chief commander General Hossein Salami](https://studies.aljazeera.net/en/reports/orbit-iran%E2%80%99s-nour-1-satellite-and-two-wing-doctrine), “Today, the world’s powerful armies do not have a comprehensive defense plan without being in space. Achieving this superior technology, which takes us into space and expands the realm of our abilities, is a strategic achievement[.]” Expanding the realm of operational abilities for Iran includes developing space situational awareness, scientific observations, as well as [counterspace capabilities](https://www.dia.mil/News/Articles/Article-View/Article/1754150/defense-intelligence-agency-releases-report-on-challenges-to-us-security-in-spa/). 

#### Scenario 1 is arms race

#### Iranian space tech is dual-use and dangerous – stokes tensions and prevents conflict resolution

Cool tech but hard to produce 🡪 needs private sector help, proves dependency in squo

Axe 2/1 [David Axe (writer, editor, and filmmaker; a former war correspondent, he has written for *Vice*, *The Daily Beast*, *The Village Voice*, and others), 2-1-2022, “Iran’s New Space Rocket Could Double As A Nuclear Missile,” Forbes, https://www.forbes.com/sites/davidaxe/2021/02/01/irans-new-space-rocket-could-double-as-a-weapon/?sh=7cc0d5372d40]

Iran has a big new rocket. And it could complicate efforts by the Biden administration to slow or reverse Iran’s work on nuclear weapons.

The Iranian regime on Monday announced it had test-launched, for the first time, its Zuljanah space launch vehicle.

“The test helped Iran to achieve its most powerful rocket engine,” Ahmad Hosseini, a spokesperson for the defense ministry in Tehran, [told](https://www.reuters.com/article/iran-satellite-int-idUSKBN2A138P) state media.

Zuljanah is an 84-foot, three-stage rocket with a solid-fuel engine in its first and second stages and a liquid-fuel engine in its third stage. The rocket can loft a 500-pound payload as high as 310 miles, according to the Iranian government.

That’s adequate to place a satellite in low-Earth orbit and, for Iran, a big step forward for both its space program and its effort to develop delivery vehicles for possible future nuclear warheads.

A [sold-fuel engine](https://www.forbes.com/sites/davidaxe/2021/01/14/kim-jong-un-throws-down-a-nuclear-gauntlet-his-regime-will-build-a-solid-fuel-icbm/?sh=368ec29e75b4) is more flexible and, because it requires less support equipment, easier to conceal than a liquid-fuel rocket is. But it requirements precise chemistry, engineering and manufacturing. “Making large solid-propellant motors is hard,” [tweeted](https://twitter.com/ArmsControlWonk/status/1356283554532126726) Jeffrey Lewis, an arms-control expert at the Middlebury Institute of International Studies in California.

Rocket in hand, Tehran now can advance both its space program and its nuclear-weapons program. Bear in mind that the very first space-launch vehicle was a version of the very first large, front-line ballistic missile—Nazi Germany’s V-2.

If you bent the Zuljanah’s trajectory, aiming for distance rather than height, you could carry a one-ton warhead as far as 3,100 miles, Lewis estimated. A weaponized Zuljanah could strike targets as far away as China and the United Kingdom.

The development adds tension to the already-fraught relations between the United States and Iran.

The administration of former President Barack Obama in 2015 negotiated an agreement—the Joint Comprehensive Plan of Action—that capped Iran’s nuclear-weapons development in exchange for relief from economic sanctions.

Then in 2018, Obama’s successor Donald Trump withdrew the United States from the deal. Trump’s move was part of a broader assault on Obama’s diplomatic legacy and also reflected a deeply-ingrained opposition within Trump’s Republican Party to any international relations based on compromise.

As the JCPAO unraveled, Iran resumed work on the basic components of a nuclear warhead. Tehran’s rockets have advanced in parallel. If Iran ever finishes its nuke, it already will have a missile capable of delivering it across much of the world.

It’s up to the Biden administration to put the genie back in the bottle. But that’s easier said than done.

President Joe Biden already has signaled the United States will rejoin the JCPOA. “We would like to make sure that we reestablish some of the parameters and constraints around the program that have fallen away over the course of the past two years,” [said](https://www.washingtonpost.com/politics/biden-iran-deal/2021/01/29/9001d8a0-625a-11eb-9430-e7c77b5b0297_story.html) Jake Sullivan, Biden’s national security advisor.

But the 2015 agreement only covers warheads, not missiles. To constrain Iran’s rocketry, Biden will need to cut an entirely new deal.

#### Advancing nuclear capabilities causes middle east prolif cascade and accidental nuclear war.

**Chilton and Hoshovsky 20** [Kevin Chilton (led U.S. Strategic Command and has participated in the Jewish Institute for National Security of America’s Generals and Admirals Program.), Harry Hoshovsky (is a policy analyst at JINSA’s Gemunder Center for Defense and Strategy.) 2-13-2020, “Avoiding a nuclear arms race in the Middle East“, Defense News, https://www.defensenews.com/opinion/commentary/2020/02/13/avoiding-a-nuclear-arms-race-in-the-middle-east/] ndsjag

Second, an Iranian nuclear breakout attempt could spur a proliferation cascade throughout the Middle East, beginning with Saudi Arabia.

Mohammed bin Salman, the Saudi crown prince, [openly stated](https://www.reuters.com/article/us-saudi-iran-nuclear/saudi-crown-prince-says-will-develop-nuclear-bomb-if-iran-does-cbs-tv-idUSKCN1GR1MN) in 2018 that if Iran developed nuclear weapons, Riyadh would quickly “follow suit.” One [suggested approach](https://foreignpolicy.com/2018/05/21/in-the-middle-east-soon-everyone-will-want-the-bomb/) would see Saudi Arabia purchase a nuclear power reactor from a major supplier like South Korea and then build a reprocessing plant that would yield enough weapons-grade plutonium in five years.

A half-decade delay isn’t optimal, however, when the goal is achieving nuclear deterrence quickly. Thus, there is the so-called Islamabad option.

This refers to Riyadh’s role in financing Pakistan’s nuclear weapons program and an alleged commitment from Islamabad that it would repay the favor. While Pakistani and Saudi officials have denied any such understanding, there is the [possibility](https://www.brookings.edu/wp-content/uploads/2016/05/acnpi_20160531_iran_deal_regional_proliferation.pdf) that the two could work out an arrangement where Islamabad could deploy some of its nuclear arsenal on Saudi soil following a successful Iranian breakout.

Although this maneuver would draw sharp, international criticism, in theory, it would allow Riyadh to remain in good standing vis-a-vis the nuclear nonproliferation treaty. Nevertheless, Pakistan might not be willing to play spoiler against a nuclearized Iran. If it is, Middle Eastern geopolitics would become extremely unstable.

If Saudi Arabia acquires nuclear weapons, many believe Turkey would follow suit. Last September, Turkish President Recep Tayyip Erdogan [declared](https://www.reuters.com/article/us-turkey-nuclear-erdogan/erdogan-says-its-unacceptable-that-turkey-cant-have-nuclear-weapons-idUSKCN1VP2QN) that he “cannot accept” the argument from Western nations that Turkey should not be allowed to attain nuclear weapons. In 1958, Charles de Gaulle proclaimed that a nation without nuclear weapons “does not command its own destiny”; two years later, France tested its first bomb. Erdogan’s comments echo those earlier remarks and raise the possibility that Ankara could become the second NATO member to leave the alliance’s nuclear umbrella in favor of its own independent arsenal.

#### Middle East war goes nuclear.

Silverstein 21 “Iran-Israel tensions: The threat of nuclear disaster looms large,” Richard Silverstein [writes the Tikun Olam blog, devoted to exposing the excesses of the Israeli national security state], 23 April 2021 <https://www.middleeasteye.net/opinion/iran-israel-tensions-threat-nuclear-war-looms-large> SM

Israel had a near-miss of potentially catastrophic proportions on Thursday. As it has done hundreds of times in the past decade, the Israeli air force attacked Iranian bases inside Syria. In response, Syrian forces fired anti-aircraft missiles of a rather primitive Soviet model, one of which overflew its target and landed some 30 kilometres from Israel’s Dimona nuclear reactor. Israel said recently that it was bolstering its defences around Dimona for just such an eventuality.

Although an Iranian general taunted Israel, implying that Iran had some responsibility for the attack, that doesn’t appear to be the case. But the missile landing inside Israel does show that if Iran wanted to attack Dimona**,** it has the capacity. And despite Israel’s best efforts, an Iranian missile could hit its target.

With that, one of the worst nuclear disasters in the region’s history could unfold, including a Chernobyl-type radioactive leak that could endanger not only all of Israel, but also many of its neighbours.

A US general has assured a Senate committee that the Syrians weren’t intending to attack Israel. Rather, a misguided missile meant to target an Israeli warplane overshot its target. He blamed it on “incompetence”, as if that was supposed to be somehow reassuring; rather, it only reinforces how easy it is even for a mistake to cause a nuclear disaster.

#### Independently, ME space race spills over into missile arms racing because of dual-use technology.

El-Zobaidi 21 “The Middle East edition of ‘Star Wars’ takes shape” Dr Haitham El-Zobaidi is the executive editor of Al Arab Group. February 24, 2021 <https://thearabweekly.com/middle-east-edition-star-wars-takes-shape> SM

The Middle East edition of ‘Star Wars’ takes shape

Countries of the region are scrambling to position themselves geopolitically on the global level through the space race.

LONDON--The Middle East is readying to enter at a reduced scale its space version of the Cold War, with successive announcements of space projects and missile development programmes. The Emirati space probe orbiting Mars and reconnaissance drones endlessly whizzing over the region’s skies are but the latest manifestations of this new regional landscape.

On Tuesday, the head of the Turkish Space Agency talked about training 10,000 space scientists within a decade so as to turn Turkey into an advanced country in the field space sciences.

The Iranians say that their missile projects are already at advanced stages. They have announced more than once the sending into space of experimental satellites as well as a spacecraft manned by a laboratory animal, in an implicit response to earlier Israeli space projects which changed from space exploration projects to plans for long-range missile defence systems to counter any possible Iranian attacks.

The space race in the Middle East reenacts, albeit at a smaller scale, the race that began in the fifties of the last century between the United States and the Soviet Union and then turned in the eighties into what was to become known as “Star Wars.”

All the parties concerned want to be part of this space race, through which they want to secure important geopolitical positions on Earth.

All space technology achievements largely reflect on the weapons systems deployed over the region’s battlefields today, especially ballistic missiles, cruise missiles and drones.

The years 2019 and 2020 were two pivotal years in the region as more countries felt the urge to quickly enter the race.

A turning point was probably the targeted attack, launched by the Houthis but with Iranians not very far behind, against the facilities of Abqaiq, Saudi Arabia, where they managed to score a hit at one of the most vital installations of the world using cruise missiles and drones.

It was not long before the Turkish drones, which were delivered to Libya, were able to turn the balance of war in favour of the Government of National Accord (GNA) as these drones cut off the logistical supply lines of the attacking Libyan National Army (LNA) led by Field Marshal Khalifa Haftar. Then, they managed to destroy a large number of the LNA’s vehicles, forcing the Haftar-led army to withdraw from the vicinity of the capital and retreat to a defensive position in Sirte.

The Turks subsequently settled the battles of Nagorny Karabakh in favour of their allies with relative ease by targeting Armenian defences and personnel, destroying entire tank regiments and armoured battalions.

Experts say that mastery of space technology is the key to dominating the skies in the region’s future battles.

This trend is based on the dual use of these technologies as a repeat of what happened during the Cold War, when satellite technologies intended for communication and television broadcasting were a welcome offshoot of espionage technology advances and satellites being put on orbit.

But the most important dimension in this race is human investment, a dimension described by the head of the Turkish Space Agency, Serdar Huseyin Yildirim, as the decisive element “in achieving the goals of the national space programme.”

Concerned countries seek to dedicate great human and material assets to the training of new generations of scientists and engineers who can contribute to the development of space programmes. This is the case of the UAE, which has announced a plan to establish a university for space sciences.

Perhaps the other pertinent aspect of the space race in the region is the mastery of technologies capable of countering missile and drone attacks.

Space detection and guidance technology provides a dual opportunity to develop systems for monitoring, tracking and destroying cruise missiles and small drones.

States interested in such systems and weapons have declared their intent to develop anti-missile missiles capable of hitting slow-moving targets or targets flying at low altitudes to avoid radar detection and sophisticated defences such as the Patriot missile system.

Halkin, a regional company specialising in the production and supply of precision-guided missiles, unveiled on Tuesday at the IDEX defence exhibition being held in Abu Dhabi the Sky Knight system, the first anti-missile system against artillery and mortar shells that is designed and manufactured in the UAE.

A tour of the IDEX exhibition reveals the growing importance of drones in modern warfare. Their prototypes occupy large areas of exhibition grounds as the difference between space and traditional warfare technologies rapidly fades away.

Iran is expanding its missile capabilities with expanding sizes, ranges and types. It recently conducted exercises in which it paraded its various missile systems and offensive drones. Its leaders make no secret of their intent to make the whole Middle East region vulnerable to their retaliatory attacks if Israel strikes at their nuclear or missile projects.

For its part, Israel is promoting the “Iron Dome” counter-technology that it developed after the 2006 war with Hezbollah in Lebanon, and has since improved its performance in repelling Katyusha rockets fired from Gaza.

#### Nuclear war causes extinction – famine and climate change

Starr 15 [(Steven, Director of the University of Missouri’s Clinical Laboratory Science Program and a senior scientist at the Physicians for Social Responsibility) “Nuclear War, Nuclear Winter, and Human Extinction,” Federation of American Scientists, 10/14/2015] DD

While it is impossible to precisely predict all the human impacts that would result from a nuclear winter, it is relatively simple to predict those which would be most profound. That is, a nuclear winter would cause most humans and large animals to die from nuclear famine in a mass extinction event similar to the one that wiped out the dinosaurs.

Following the detonation (in conflict) of US and/or Russian launch-ready strategic nuclear weapons, nuclear firestorms would burn simultaneously over a total land surface area of many thousands or tens of thousands of square miles. These mass fires, many of which would rage over large cities and industrial areas, would release many tens of millions of tons of black carbon soot and smoke (up to 180 million tons, according to peer-reviewed studies), which would rise rapidly above cloud level and into the stratosphere. [For an explanation of the calculation of smoke emissions, see Atmospheric effects & societal consequences of regional scale nuclear conflicts.]

The scientists who completed the most recent peer-reviewed studies on nuclear winter discovered that the sunlight would heat the smoke, producing a self-lofting effect that would not only aid the rise of the smoke into the stratosphere (above cloud level, where it could not be rained out), but act to keep the smoke in the stratosphere for 10 years or more. The longevity of the smoke layer would act to greatly increase the severity of its effects upon the biosphere.

Once in the stratosphere, the smoke (predicted to be produced by a range of strategic nuclear wars) would rapidly engulf the Earth and form a dense stratospheric smoke layer. The smoke from a war fought with strategic nuclear weapons would quickly prevent up to 70% of sunlight from reaching the surface of the Northern Hemisphere and 35% of sunlight from reaching the surface of the Southern Hemisphere. Such an enormous loss of warming sunlight would produce Ice Age weather conditions on Earth in a matter of weeks. For a period of 1-3 years following the war, temperatures would fall below freezing every day in the central agricultural zones of North America and Eurasia. [For an explanation of nuclear winter, see Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences.]

Nuclear winter would cause average global surface temperatures to become colder than they were at the height of the last Ice Age. Such extreme cold would eliminate growing seasons for many years, probably for a decade or longer. Can you imagine a winter that lasts for ten years?

The results of such a scenario are obvious. Temperatures would be much too cold to grow food, and they would remain this way long enough to cause most humans and animals to starve to death.

Global nuclear famine would ensue in a setting in which the infrastructure of the combatant nations has been totally destroyed, resulting in massive amounts of chemical and radioactive toxins being released into the biosphere. We don’t need a sophisticated study to tell us that no food and Ice Age temperatures for a decade would kill most people and animals on the planet.  Would the few remaining survivors be able to survive in a radioactive, toxic environment?

#### Scenario 2 is space militarization

#### Iran’s private sector is making its way to militarize space.

**Frantzman 22** [Seth J., (Seth J. Frantzman is Senior Middle East Correspondent and Middle East affairs analyst at The Jerusalem Post. He has covered the war against Islamic State, three Gaza wars, the conflict in Ukraine, the refugee crises in Eastern Europe and also reported from Iraq, Turkey, Jordan, Egypt, Senegal, the UAE, Ukraine and Russia. Born in Maine, he received his Ph.D from the Hebrew University of Jerusalem in 2010. He previously served as a research associate at the Rubin Center for Research in International Affairs at the Interdisciplinary Center, Herzliya and a lecturer in American Studies at Al-Quds University. Currently he is the Executive Director of The Middle East Center for Reporting and Analysis and a Ginsburg/Milstein Writing Fellow at the Middle East Forum. Frantzman has conducted research and worked for the JDC, The Shalem Center, the Jerusalem Institute for Market Studies and as a Post-Doctoral at the Hebrew University of Jerusalem. He was a Congressional intern for Congressman Jim Kolbe while studying at The University of Arizona.), 2-19-2022, “How Iran’s satellite program faced setbacks under Rouhani“, The Jerusalem Post | JPost, https://www.jpost.com/middle-east/iran-news/article-697000] ndsjag

Iran launched its first domestic satellite, called Omid, in 2009. In an interesting interview with Iran’s Tasnim News, the project manager for [Iran’s Fajr program](https://www.jpost.com/middle-east/iran-news/article-689699), which began after the Omid launch, discusses Iran’s satellite initiatives.

Iran’s space program has implications for the region because Iran can use it to spy on countries in the region. Iran can also use its technology potentially for rockets that might be used to threaten Israel and other countries. Iran was the 9th country in the world to put a domestically made satellite into orbit. This means that, like its drone program, Iran is one of the leading countries in this technology.

In the article, the former project manager of the Fajr satellite program discusses some of the successes and failures of Iran’s program. This is unique because it has criticism for how Iran could have better managed this industry. The Iranian space agency was starved for budgets during the Rouhani administration. Farahani says that it important to allow the private sector in Iran to play a larger role in Iran’s space race. “Today in different parts of the satellite, companies in Iran there are many Iranians who are producing satellite parts with good quality,” he says. “Since 2009, great events have taken place in the space field of Iran and the world; When we launched the Omid satellite, we actually managed to enter space with government actors and a local launcher, but at the same time, in comparison with Iran, other things were happening in the world, and that was that the private sector.”

He also points to the Iridium company that put into orbit a constellation of 66 satellites used for communications. Over time the price of satellites has also decreased from some $200 million, to less than a million, he says. “It was then that the issue of satellite systems proved to be cost-effective, meaning that a large set of low-orbit satellites could provide Internet services, and it was very likely to be economically viable, and certainly when it was operational in the field of telemetry, certainly in telecommunications. It can also be done.” He says today there are. more than 2,000 satellites in orbit. The number today is actually even more than that.

Farahani says that the Iranian Space Agency is responsible for providing licenses in Iran, alongside a radio regulatory authority. “Those who are financially weak and although technologically strong cannot get a license from the regulator, but the US regulator wants to support these actors as well, so that with the arrival of good startups in this field, leadership will be maintained in space,” he notes; contrasting the US system with the Iranian one. He points to the US example of the Swarm low earth orbit satellites, which promises low-cost satellites for communications.

#### Iran’s dual-use space militarization increases with growing threats to powerful countries

**Lim and Baram 08** [Kevjn Lim, (Kevjn Lim is a senior risk advisor for the Middle East and North Africa at IHS Markit and an adjunct research fellow at the National University of Singapore’s Middle East Institute.) Gil Baram, (Gil Baram, an expert for cyberstrategy and policy, is a research fellow at Tel Aviv University’s Blavatnik Interdisciplinary Cyber Research Center.), 2-4-2008, “Iran Is Mastering the Final Frontier“, Foreign Policy, https://foreignpolicy.com/2019/03/14/iran-is-mastering-the-final-frontier/] ndsjag

In mid-January and early February, Iran attempted two satellite launches intended for environmental monitoring purposes. The [Payam](https://www.tasnimnews.com/en/news/2019/01/15/1923553/video-shows-moment-iran-launches-payam-satellite-into-space) (Message) and [Doosti](https://www.apnews.com/4ac55c85a4c945a981310d5688e0c8ce) (Friendship) ascended aboard Iranian-made satellite launch vehicles (SLVs). Both launches [failed](https://www.rferl.org/a/zarif-confirms-failure-second-iran-satellite-launch/29773298.html) to place the satellites into orbit. The United States nevertheless protested the space launches—mostly because the[y] SLVs used the same base technology as multistage intercontinental ballistic missiles (ICBMs).

In an anticipatory tweet on Jan. 3, U.S. Secretary of State Mike Pompeo had [warned](https://twitter.com/SecPompeo/status/1080823105306718209) that “The launch will advance [Iran’s] missile program. US, France, UK & Germany have already stated this is in defiance of [United Nations Security Council Resolution] 2231. We won’t stand by while the regime threatens international security.” The administration of U.S. President Donald Trump has even reportedly revived a Bush-era [secret program](https://www.nytimes.com/2019/02/13/us/politics/iran-missile-launch-failures.html?emc=edit_na_20190213&nl=breaking-news&nlid=65669776ing-news&ref=cta) to sabotage Iran’s missile and space program by planting “faulty parts and materials into Iran’s aerospace supply chains.”

Yet the national-security significance of Iran’s space program far surpasses its implications for ICBMs. Iran’s growing presence in outer space, especially when combined with its growing capabilities in cyberspace, strengthens all aspects of its hard power.

The Islamic Republic of Iran’s space program evolved from its indigenous missile program, which began in the late 1980s with assistance mainly from North Korea, China, Libya, and the Soviet Union. In 2003, when the reformist Mohammad Khatami was president, the Iranian parliament approved the creation of the Supreme Space Council (SSC) and the Iranian Space Agency (ISA) as its executive arm, with both in turn linked to the Ministry of Information and Communications Technology.

The space program received a big boost under Mahmoud Ahmadinejad’s hard-line presidency beginning in 2005, just as Iran’s nuclear standoff with the West intensified. In February 2009, during the 30th anniversary of the Iranian revolution, Iran successfully launched its first indigenous satellite, Omid (Hope), using the Safir (Ambassador) SLV, placing it among the dozen or so spacefaring nations with independent satellite launch capability. Iran has so far successfully employed Safir-class SLVs to place in orbit four satellites carrying various telecommunications, earth-imaging and environmental monitoring equipment. Eight other documented orbital launches have failed.

In 2010, Iran unveiled its two-stage Simorgh (Phoenix) SLV, which improves on the Safir by harnessing not one but four missile engines (all based on North Korea’s Nodong missile), in turn permitting a payload capacity of up to 550 pounds—five times more than what it had thus far placed in orbit. Since 2016, Iran has attempted several launches with the Simorgh, but none, including the Payam this January, has yet proven successful. In January 2013, however, Iran reportedly dispatched a [monkey](https://www.space.com/19490-iran-launches-monkey-into-space-report.html) into space, bringing it closer to human spaceflight, which so far only Russia, the U.S., and China have achieved. In 2013, Iran also inaugurated a space monitoring center, a crucial first step toward improved awareness of natural and man-made objects, events, and activities occurring in space.

As with its nuclear program, Tehran has argued for the exclusively peaceful purposes of its space program. But Iran, a state persistently sensitive to threats against it, is likely at the very least to treat space as a potential security vulnerability. It will almost certainly try to degrade, deny, and deter attempts by others to weaponize space.

Tehran meanwhile is surely already assessing the offensive efforts of other countries. In June 2018, Trump [instructed](https://www.military.com/daily-news/2018/06/18/its-official-trump-announces-space-force-6th-military-branch.html) the Pentagon to establish a “space force” separate from the Air Force as the U.S. military’s sixth branch, in order to dominate space. [Russia](https://www.military.com/daily-news/2018/06/20/russia-warns-against-trumps-alarming-plans-us-space-domination.html) and [China](https://www.washingtonexaminer.com/policy/defense-national-security/china-warns-trump-about-dangers-of-new-space-force) demurred in response, insisting on purely peaceful uses for space. But while no space wars have yet occurred, an arms race has been quietly building up [between China and the United States](https://thediplomat.com/2017/01/how-china-is-weaponizing-outer-space/), with Russia also quickly edging in. Back in 2007, China [successfully tested](https://fas.org/sgp/crs/row/RS22652.pdf) an anti-satellite (ASAT) weapon on one of its own retired weather satellites in orbit, the first since similar tests by the Cold War superpowers in the 1980s. A 2018 U.S. Department of Defense report warned that [both China and Russia](https://media.defense.gov/2018/Aug/09/2001952764/-1/-1/1/ORGANIZATIONAL-MANAGEMENT-STRUCTURE-DOD-NATIONAL-SECURITY-SPACE-COMPONENTS.PDF) are investing in weapons capable of attacking U.S. satellites and space assets, which could transform space into a battlefield. The emerging security dilemma has accordingly prompted even other states to develop [counterspace](https://www.tandfonline.com/doi/full/10.1080/14777622.2018.1486792?scroll=top&needAccess=true) capabilities aimed essentially at mastering the new terrain.

Iran, for its part, has been slowly but steadily improving capabilities linked to intelligence, reconnaissance, and early-warning systems. It has reportedly already managed to use space technologies to spoof the GPS system of an American drone, [blind](https://www.csmonitor.com/World/Middle-East/2011/1215/Exclusive-Iran-hijacked-US-drone-says-Iranian-engineer) a U.S. spy satellite using directed energy, and use [advanced jamming](https://aerospace.csis.org/space-threat-2018-iran/) techniques against western commercial satellites. More hypothetically, with improved tracking and positioning technology, further ballistic advances could offer Iran the potential to develop Earth-based direct-ascent or on-orbit ASAT missiles, which could also target the satellites and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance platforms (known as C4ISR) that adversaries such as the United States increasingly use in integrated military operations.

#### Because the public sector has withdrawn, the private sector now develops and launches satellites

**Jalilov 2/4** [Orkhan Jalilov, (Insitute for strategic analysis, Experienced Senior Journalist with a demonstrated history of working in the broadcast media industry. Skilled in Negotiation, Analytical Skills, Translation, International Relations, and English. Strong media and communication professional with a Master's degree focused in International Relations and Affairs from Baku State University.), 3-1-2022, “Iran Unveils Its First Satellite Designed by Private Sector“, Caspian News, https://caspiannews.com/news-detail/iran-unveils-its-first-satellite-designed-by-private-sector-2022-2-4-46/] ndsjag



Eight Iranian private "knowledge-based" companies are developing a satellite named "Kowsar" which has now reached the testing and assembly stage. / IRNA news agency

The Kowsar satellite has reached the testing and assembly stage after 2 years of efforts by a consortium of eight knowledge-based private companies that have come together within the organizational framework of a company named "Omid-e Faza" (“Space Hope” in Persian).

[The Nahid-1 satellite](https://www.irna.ir/news/84565068/) is the first stage in Iran's strategic program to develop communications satellites, and it was unveiled in early 2017. The project is designed to help Iran gather knowledge, technical capacity and gain experience in designing, building and launching such satellites. The satellite was commissioned by the ISA from the country's Satellite Research Institute, itself a part of the Iranian Space Research Centre (ISRC).

#### Extinction – destruction of satellites, diminished future use of near space, and terrestrial war

Gilliard 19 [(Alexandra, a Senior Editor and interviewer of international relations experts for the International Affairs Forum. She holds an M.S. in Global Studies and International Relations from Northeastern University, and a B.A. in International Relations from Boston University, with expertise in conflict resolution, arms control, human rights issues, and the MENA region.) “What Are The Consequences Of Militarizing Outer Space?” Global Security Review, 6/10/2019. https://globalsecurityreview.com/consequences-militarization-space/] BC

Consequences of Armament and Aggression in Space

The consequences of weapons testing and aggression in space could span generations, and current technological advances only increase the urgency for policymakers to pursue a limitations treaty. As it stands, there are three major ramifications of a potential arms race in space:

The destruction of satellites

As both financial and technological barriers to the space services industry have decreased, the number of governmental and private investors with assets in space has inevitably increased. There is now an abundance of satellites in space owned by multiple states and corporations. These satellites are used to not only coordinate military actions, but to perform more mundane tasks, like obtaining weather reports, or managing on-ground communications, and navigation.

Should states begin weapons testing in space, debris could cloud the orbit and make positioning new satellites impossible, disrupting our current way of life. More pressing, however, is that if a country’s satellites are successfully destroyed by an enemy state, military capabilities can be severely hindered or destroyed, leaving the country vulnerable to attack and unable to coordinate its military forces on the ground.

Diminished future use of near space

Whether caused by weapons testing or actual aggression, the subsequent proliferation of debris around the planet would damage our future ability to access space. Not only would debris act as shrapnel to preexisting assets in space, but it would also become much more difficult to launch satellites or rockets, hindering scientific research, space exploration, and commercial operations.

From the past fifty-odd years of activity in space alone, the debris left behind in Earth’s orbital field has already become hazardous to spacecraft — a main reason why the U.S. and the Soviet Union did not continue with ASAT testing during the Cold War. If greater pollution were to occur, space itself could be become unusable, resulting in the collapse of the global economic system, air travel, and various communications.

Power imbalances and proliferation on the ground

Only so many states currently have access to space—which means any militarization be by the few, while other states would be left to fend for themselves. This would establish a clear power imbalance that could breed distrust among nations, resulting in a more insecure world and a veritable power keg primed for war. Additionally, deterrence measures taken by states with access to space would escalate, attempting to build up weapons caches not dissimilar to the nuclear weapons stockpiling activities of the Cold War.

In any arms race, it is inevitable that more advanced weaponry is created. Yet, this does not only pose a risk to assets in space. Should a terrestrial war break out, this weaponry may eventually be deployed on the ground, and space-faring states would be able to capitalize on the power imbalance by using these new developments against states that have not yet broken into the space industry or developed equally-advanced weaponry.

#### **Scenario 3 is North Korea**

#### Noko and Iran have been increasingly collaborating on space through the private sector which opens up avenues for the ballistic missiles programs

**Lewis 14** [Jeffrey Lewis, (Jeffrey Lewis has been the Director of the East Asia Nonproliferation Program at the James Martin Center for Nonproliferation Studies (CNS) since 2010. Before coming to CNS, he was the Director of the Nuclear Strategy and Nonproliferation Initiative at the New America Foundation. Prior to that, Dr. Lewis was Executive Director of the Managing the Atom Project at the Belfer Center for Science and International Affairs, Executive Director of the Association of Professional Schools of International Affairs, a Visiting Fellow at the Center for Strategic and International Studies and a desk officer in the Office of the Undersecretary of Defense for Policy. He is also a Research Scholar at the Center for International and Security Studies at the University of Maryland's School of Public Policy (CISSM). Dr. Lewis received his Ph.D. in Policy Studies (International Security and Economic Policy) from the University of Maryland and his B.A. in Philosophy and Political Science from Augustana College in Rock Island, Ill. He is the author of Minimum Means of Reprisal: China's Search for Security in the Nuclear Age (MIT Press, 2007) and publishes ArmsControlWonk.com, the leading blog on disarmament, arms control and nonproliferation), 1-13-2014, “The Axis of Orbit: Iran-DPRK Space Cooperation“, 38 North, https://www.38north.org/2014/01/jlewis011314/] ndsjag

In 2012, I attended a Track II meeting with some North Koreans where they mentioned a series of space launches. A series, I asked? They didn’t want to say more, but left me with the distinct impression that we’ll be seeing a lot more launches from the DPRK. After that meeting, North Korea tried twice—a failed launch in April and then succeeding in December 2012.

Iran, too, has been launching satellites—and monkeys—into space. While I am sure most North Koreans and Iranians dream of the stars, it is understandable for those of us in the United States to wonder whether they have more earthly aims. One need not be a cynic to look askance at North Korean and Iranian aspirations regarding the peaceful use of outer space when Pyongyang publishes pictures of the now famous “Map of Death.”

Given the state of relations between North Korea and Iran, the mind tends to wander onto the subject of missile cooperation between the two. Part of the fascination is simply the joy of a super villain team-up. The better part, though, is a question about whether a negotiated agreement with either can work in isolation. Can we reach an agreement with Iran to deal with its worrisome nuclear and ballistic missile programs if there are no constraints on North Korea? How about the other way around?

We have known for a long time that North Korea and Iran cooperate on missiles—just look at the resemblance between Iran’s Shahab-3 and Pyongyang’s Nodong missile. But in recent months, there have been rumors about a relationship that go beyond the odd missile sale (or six). Last year, Western diplomatic sources told Kyodo’s Inoue Tomotaro that Iran now stations four missile experts at a facility in North Korea about 85 kilometers from the Chinese border. The source said the mission included experts from Iran’s Ministry of Defense and Armed Forces Logistics as well as the private sector. Subsequent stories linked the Iranian “engineering team” to the Shahid Hemmat Industrial Group. Although none of the stories say so, the rumor is that the Iranians are stashed in the Chongju area safely out of Pyongyang. (Seriously, can’t one of these guys put up a picture with a Farsi caption like “the [best Kebab stand](http://www.mobysonline.com/) in North Pyongan Province” or something?)

Then Bill Gertz at the Washington Times got into the act, claiming that a team of Iranians traveled to Pyongyong to work on a larger “super ICBM,” long suspected to be under development. Like all of his stories, this one seems to be a mixture of genuine reporting, balderdash, and naked partisanship. Gertz wrote the story to discredit the interim nuclear deal with Iran, on the laughably flimsy premise that the Iranians were in North Korea at the same time Kerry was in Geneva. Yes, that’s right: He’s [slut-shaming](http://www.huffingtonpost.com/2013/10/30/slut-shaming-teen-girls_n_4178812.html) the Iranians for two-timing us with Pyongyang. (Never mind that we aren’t negotiating with Iran concerning its ballistic missile programs. We probably should have that conversation, but when we do, Gertz will be against it!)

Second, there are rumors the Iranians and the North Koreans signed a secret annex to the recent Memorandum of Understanding (MOU) on scientific and technical cooperation. Both country’s official news agencies, [KCNA](http://www.kcna.co.jp/item/2012/201209/news02/20120902-09ee.html) and [IRNA](http://old.irna.ir/News/General/Iran,-North-Korea-sign-agreement-on-scientific,-academic,-technological-cooperation/80303242), reported that they signed an MOU, which the Iranians described as “conducting research studies, exchange of university students and researchers, setting up joint laboratories, sabbatical studies, exchange of technological know-how, Information Technology, energy, environment, sustainable development, agriculture and food stuff.”

Finally, both Iran and North Korea are probably working on larger space launch vehicles than the existing models. The North Koreans have said [they want to place a satellite in geostationary orbit](http://www.northkoreatech.org/2012/04/19/dprk-promises-more-satellite-launches/), which means a bigger rocket is needed. The [Three Revolutions Museum’s space exhibit](http://www.youtube.com/watch?v=7HxQxjOrVwM) in Pyongyang shows an artist’s conception of a much larger rocket in a larger gantry tower that we’ll call the Unha-X. The North Koreans also have gantry towers at the Sohae launch pad that, as [Nick Hansen has observed](https://www.38north.org/2012/04/nhansenfp041112/), suggests something larger than the Unha is in the works. Iran, too, [wants to place satellites in geostationary orbit](http://www.presstv.com/detail/230008.html). We don’t know that they’ve discussed the matter, but let’s assume it came up.

This is where things get interesting. North Korea and Iran might choose to cooperate to make a larger SLV that could also serve as an ICBM, just as the US Titan II, built in the early 1960s, could put astronauts in orbit or, if the balloon went up, rain megatons of death and destruction down on the Soviet Union. But a large liquid-fueled ICBM would have significant military limitations—such a missile takes a long time to fuel and must be based in a vulnerable silo. (Although the North Korean’s road-mobile KN-08 is hardly a model of invulnerability, a workable mobile missile would offer North Korea far more survivability.)

#### North Korean nukes only get to space because of Iranian development – the plan solves by undercutting private development

Park 12 [John S. Park (Stanton Nuclear Security Junior Faculty Fellow @ MIT, adjunct lecturer @ Harvard Kennedy School), 12-19-2012, “The Leap in North Korea’s Ballistic Missile Program,” The National Bureau of Asian Research, https://www.nbr.org/publication/the-leap-in-north-koreas-ballistic-missile-program-the-iran-factor/]

Although sporadic cooperation between North Korea and Iran on missile development has been well documented, analysts viewed this interaction largely through the lens of serial commercial transactions. The conventional wisdom was that cash-starved North Korea found a lucrative client in Iran. As a result, analysts tended to view the two pariahs’ long-range missile development programs as largely independent endeavors. However, North Korea’s sudden success on December 12 was not the result of good fortune but rather was the fruition of its increasing institutional cooperation with Iran. In September 2012, North Korea and Iran signed a scientific and technological cooperation agreement. Largely dismissed as a propaganda ploy, it provided an organizational framework to set up joint laboratories and exchange programs for scientific teams, as well as to transfer technology in the fields of information technology, engineering, biotechnology, renewable energy, and the environment. In practice, the projects created a cover for these regimes to weather U.S.-led sanctions related to missile-proliferation activities. The new bilateral agreement thus appears to have formalized a recent mechanism through which both regimes had been regularly procuring specialized components, as well as sharing technical data and expertise. When one side masters or acquires a key missile-related technology, the other now institutionally benefits.

Further technical analysis is likely to show that North Korea’s recent success was rooted in Iran’s orbital launch of its Omid satellite atop the Safir satellite carrier in February 2009. This landmark event was itself likely facilitated by Russian missile cooperation with Iran in the 2005 period. Under the innocuous title of “civilian scientific and technological cooperation,” the North Korea–Iran agreement provides a conduit for Pyongyang to access earlier Russian inputs into the Iranian program. Of particular significance to North Korea is Russia’s proven long-range missile technology.

**NoKo space access spills over to war which causes EMP, Van Allen, Nukes, turns every impact.**

**Davis 17** [ M., 2017. North Korean nukes and space war | The Strategist. [online] The Strategist. Available at: <https://www.aspistrategist.org.au/north-korean-nukes-space-war/> [Accessed 12 January 2022] Dr Malcolm Davis Senior Analyst Contact informationContact information EXPERTISE Space Policy, Space Security, Strategy & capability development, future warfare and military technology & Chinese military modernisation.]

North Korean nukes and space war

North Korea’s launch of a Hwasong-12 IRBM over Japan on 28 August, a second launch on 15 September (once again overflying Japan), and its test of what is either a boosted fission weapon or an early generation thermonuclear weapon on 3 September have accelerated the rush towards a major military crisis on the Korean peninsula. One aspect of North Korea’s nuclear developments that warrants closer attention is its ability to use nuclear weapons to generate electromagnetic pulse (EMP) attacks, or threaten low-Earth orbiting satellites in space.

The testing of higher yield nuclear weapons gives North Korea the ability to attack electrical and electronic systems over a wide area. Detonating a nuclear weapon at high altitude, such as in low-Earth orbit (LEO), would generate EMP, which would fry electrical and electronic circuits over a large geographic area.

EMP isn’t new; we’ve known about it since the Cold War, as a result of high-altitude nuclear testing such as the ‘Starfish Prime’ test in 1962. The effects of that test on terrestrial electrical systems generated concerns that the Soviet Union could blanket the US or NATO with sufficient EMP to burn out critical command and control networks and disrupt Washington’s nuclear retaliatory capability in the opening stages of a nuclear first strike. Such an attack would have had an even more devastating effect on non-hardened civilian infrastructure.

Earlier this year, North Korea’s testing of ICBMs included trajectories lofted to very high altitudes, which allowed Pyongyang to test warhead re-entry survivability, and minimised the risk of US military retaliation. The tests also demonstrated North Korea’s ability to detonate a nuclear weapon at high altitudes to generate EMP. Carrying out such an attack wouldn’t require accurate guidance, or high-yield warheads that are capable of surviving the heat of atmospheric re-entry, or even ICBMs.

A 2008 EMP Commission report (PDF) found that exo-atmospheric detonations of nuclear weapons would directly affect critical civilian infrastructure, most notably for power generation, telecommunications and data networks, as well as robotic industrial and manufacturing infrastructure. Analysis in June of this year on 38 North suggests that North Korea is already well placed to cause substantial damage to unprotected civilian networks using such attacks. That would hold true against the US, as well as its allies such as Japan and South Korea, or even Australia.

Evidence given by Peter Vincent Pry to the 2004 EMP Commission suggested that (PDF, p. 5) North Korea, with Russian assistance, was developing a ‘super-EMP’ weapon designed to affect a broad range of electronic systems. Such a weapon could be delivered by a missile, or it could be deployed in a satellite in a manner similar to the Soviet-era Fractional Orbital Bombardment System (FOBS).

If North Korea could detonate a nuclear weapon in space, it could also undertake a ‘Van Allen’ attack that would be designed to excite and expand the lower Van Allen radiation belt around Earth, exposing up to 803 satellites in LEO to high levels of radiation. US Defense Threat Reduction Agency analysis in 2010 suggested that satellites in LEO, which are not hardened against radiation found in higher orbits, would be vulnerable to nuclear detonations that ‘pumped’ the intensity of the Van Allen belts. Weeks or months of cumulative damage generated by passing through the zones of radiation would cause those satellites to fail. A Van Allen attack is highly indiscriminate: any satellite passing through the excited lower belt would be damaged. US satellites would be just as defenceless as those belonging to China, Russia or other states.

Certainly satellites could be replaced, but it would take years to completely restore the lost capability. The requirement to wait until Van Allen belts returned to normal levels of radiation, limited launch capability, long production queues, and the high cost for new satellites would slow the process down. If a combined Van Allen and EMP attack was effectively carried out, the ability to re-establish space systems could be at risk if satellite production facilities were damaged. In the interim, global economic systems would fall apart as the vital communications links for stock markets collapsed.

The Trump administration is maintaining that ‘all options are on the table’ for dealing with North Korea’s growing nuclear threat. The prospects for war on the peninsula are bad enough, with massed North Korean artillery attacks on Seoul a leading concern as well as the prospect of a general North Korean offensive into South Korea. The risk of a war escalating across the nuclear threshold raises the spectre of the first use of nuclear weapons in anger since Nagasaki—against South Korea, Japan or US territory—and the possibility that Pyongyang could devastate its opponents’ economies with EMP and destroy vital space infrastructure with Van Allen attacks. In any war, North Korea would certainly face defeat and, with it, the end of Kim Jong-un’s regime. In confronting his fate, Kim Jong-un would have everything to gain and little to lose by employing such a devastating tactic.

### Framing

**The standard is maximizing expected wellbeing**

**First, pleasure and pain are intrinsically valuable. People consistently regard pleasure and pain as good reasons for action, despite the fact that pleasure doesn’t seem to be instrumentally valuable for anything.**

**Moen 16** [Ole Martin Moen, Research Fellow in Philosophy at University of Oslo “An Argument for Hedonism” Journal of Value Inquiry (Springer), 50 (2) 2016: 267–281] SJDI

Let us start by observing, empirically, that a widely shared judgment about intrinsic value and disvalue is that pleasure is intrinsically valuable and pain is intrinsically disvaluable. On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues**.** This inclusion makes intuitive sense, moreover, for there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels, and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have. “Pleasure” and “pain” are here understood inclusively, as encompassing anything hedonically positive and anything hedonically negative.2 The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values**.** If you tell me that you are heading for the convenience store, I might ask: “What for?” This is a reasonable question, for when you go to the convenience store you usually do so, not merely for the sake of going to the convenience store, but for the sake of achieving something further that you deem to be valuable**.** You might answer, for example: “To buy soda.” This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: “What is buying the soda good for?” This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: “Well, I want it for the pleasure of drinking it.” If I then proceed by asking “But what is the pleasure of drinking the soda good for?” the discussion is likely to reach an awkward end. The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good.3 As Aristotle observes**:** “We never ask [a man] what his end is in being pleased, because we assume that pleasure is choice worthy in itself.”4 Presumably, a similar story can be told in the case of pains, for if someone says “This is painful!” we never respond by asking: “And why is that a problem?” We take for granted that if something is painful, we have a sufficient explanation of why it is bad. If we are onto something in our everyday reasoning about values, it seems that pleasure and pain are both places where we reach the end of the line in matters of value.

**Moral uncertainty means preventing extinction should be our highest priority.**

**Bostrom 12** [Nick Bostrom. Faculty of Philosophy & Oxford Martin School University of Oxford. “Existential Risk Prevention as Global Priority.” Global Policy (2012)] These reflections on **moral uncertainty suggest** an alternative, complementary way of looking at existential risk; they also suggest a new way of thinking about the ideal of sustainability. Let me elaborate.¶ **Our present understanding of axiology might** well **be confused. We may not** nowknow — at least not in concrete detail — what outcomes would count as a big win for humanity; we might not even yet **be able to imagine the best ends** of our journey. **If we are** indeedprofoundly **uncertain** about our ultimate aims,then we should recognize that **there is a great** option **value in preserving** — and ideally improving — **our ability to recognize value and** to **steer the future accordingly. Ensuring** that **there will be a future** version of **humanity** with great powers and a propensity to use them wisely **is** plausibly **the best way** available to us **to increase the probability that the future will contain** a lot of **value.** To do this, we must prevent any existential catastrophe.

**Reducing the risk of extinction is always priority number one.**

**Bostrom 12** [Faculty of Philosophy and Oxford Martin School, University of Oxford.], Existential Risk Prevention as Global Priority. Forthcoming book (Global Policy). MP. http://www.existenti...org/concept.pdfEven if we use the most conservative of these estimates, which entirely ignores the possibility of space colonization and software minds, **we find that the expected loss of an existential catastrophe is greater than the value of 10^16 human lives**. **This implies that the expected value of reducing existential risk by a mere one millionth of one percentage point is at least a hundred times the value of a million human lives.** The more technologically comprehensive estimate of 10 54 humanbrain-emulation subjective life-years (or 10 52 lives of ordinary length) makes the same point even more starkly. Even if we give this allegedly lower bound on the cumulative output potential of a technologically mature civilization a mere 1% chance of being correct, we find that the expected value of reducing existential risk by a mere one billionth of one billionth of one percentage point is worth a hundred billion times as much as a billion human lives. **One might consequently argue that even the tiniest reduction of existential risk has an expected value greater than that of the definite provision of any ordinary good, such as the direct benefit of saving 1 billion lives.** And, further, that the absolute value of the indirect effect of saving 1 billion lives on the total cumulative amount of existential riskâ€”positive or negativeâ€”is almost certainly larger than the positive value of the direct benefit of such an action.