



# **SIGNS OF THE TIMES**

**News Articles for Episode 253**

# Iran unveils new 'Paveh' cruise missile that can reach Israel | The Times of Israel

#bibleprophecy, #israel, #iran, #missiles

Feb 25, 2023

Top general says Tehran still wants to kill former US president Trump, Secretary Pompeo to avenge the assassination of Qassem Soleimani

A senior Iranian general unveiled a new cruise missile with a range of 1,650 km (1,025 miles) that could potentially reach Israel in an interview with state television on Friday, in which he also reiterated Tehran's desire to kill former US president Donald Trump.

"Our cruise missile with a range of 1,650 km has been added to the missile arsenal of the Islamic Republic of Iran," said Amirali Hajizadeh, the head of the Islamic Revolutionary Guards Corps aerospace force according to the [Reuters](#) news agency.

The television broadcast what it said was the first footage showing the new Paveh cruise missile, showing the missile launch, then flying low over terrain before hitting a target.

Beyond the range, Hajizadeh gave no further details of the missile.

The Guard in the past has said it has cruise missiles with ranges of 1,000 kilometers (620 miles). It also has missiles that range up to 2,000 kilometers (1,250 miles), more than enough to reach archenemy Israel and US military bases in the region.

Iran, which has developed a long list of homegrown weaponry, including drones, naval vessels, aircraft and electronic systems, has sparked mounting concern around the world with its supply of suicide drones to Russia for use in Ukraine and fears it could send other weapons systems to Moscow.

*Iran's state TV this evening aired what it said was the first footage of the IRGC's new cruise missile, Paveh. It has a range of 1,650 km. [pic.twitter.com/iQcNRREAOU](https://pic.twitter.com/iQcNRREAOU)*

— Kian Sharifi (@KianSharifi) [February 24, 2023](#)

Israel has long warned against Tehran's missile program saying it poses a threat to Israel, the region and Europe, not just for its conventional capabilities, but also because they could eventually be used to launch nuclear weapons should Iran acquire them.

In 2018, then-US president Donald Trump pulled the United States out of the Iran nuclear deal, claiming it was too weak and didn't address Iran's missile development.

He also re-imposed crushing sanctions on Iran. Tehran has since started enriching uranium up to 60% purity — a short technical step from the 90% needed to make an atomic bomb.

Speaking to State TV on Friday, Hajizadeh also reiterated Iran's desire to kill Trump and former secretary of state Mike Pompeo for their role in the January 3, 2020, killing of Iran's Quds Force commander Qassem Soleimani in an American drone strike in Baghdad.

"God willing, we are looking to kill Trump. Pompeo ... and military commanders who issued the order (to kill Soleimani) should be killed," Hajizadeh said in the television interview.

The report on the new cruise missile came hours after Iran said it will likely send air defense systems to Syria, a move apparently meant to protect against Israeli airstrikes.

"Syria needs to rebuild its air defense network and requires precision bombs for its fighter planes," the Iranian state broadcaster said, [according to Reuters](#).

"It is very likely that we will witness the supply by Iran of radars and defense missiles, such as the 15 Khordad system, to reinforce Syria's air defenses," it added.

The state TV report follows an airstrike in Damascus last weekend that was attributed to Israel, which the news agency on Wednesday [said](#) targeted a meeting of Syrian and Iranian officials involved with the manufacture of drones, as well as members of the Lebanese terror group Hezbollah.

Syria has said five people were killed and 15 wounded in the attack on Saturday night. The Israeli military has not commented on the strike, per its policy of not generally commenting on air raids in Syria, though it has acknowledged conducting hundreds of sorties against Iran-backed groups attempting to gain a foothold in the country over the last decade. Israeli officials have previously said the IDF does not target civilians and seeks to avoid damage to residential areas as much as possible.

Iran's foreign ministry condemned the strike on Sunday, but did not mention any Iranian casualties.

It was also denounced by Russia, which like Iran is a key backer of the Syrian regime in the over decade-long civil war, as a "flagrant violation" of international law.

Israel's need to coordinate with Russia — which largely controls Syrian airspace — to carry out strikes has been cited as a chief reason for Jerusalem's reluctance to supply Kyiv with weaponry amid the Russian invasion of Ukraine. Israel has found itself at odds with Russia as it increasingly supported Ukraine while seeking to maintain freedom of movement in Syria's skies.

Also Friday, the White House said Russia is considering sending fighter jets to Iran as part of an expanding military cooperation that has seen Tehran ship growing quantities of weaponry to Moscow for use in the invasion of Ukraine.

"We believe that Russia might provide Iran unprecedented defense cooperation, including on missiles, electronics and air defense. We believe that Russia might provide Iran with fighter jets," National Security Council spokesman John Kirby told reporters.

Kirby said Iran, which is deeply isolated by Western sanctions aimed at halting its disputed nuclear program, was seeking to bolster its military with Russian help in exchange for sending armaments used in the year-long onslaught against Ukraine.

“Iran is also seeking to purchase additional military equipment from Russia, including attack helicopters, radars and combat training aircraft. In total, Iran is seeking billions of dollars’ worth of military equipment,” Kirby said.

“We were concerned it was going to go both ways, and those concerns are certainly being realized,” he said.

According to Kirby, Iran has already sent hundreds of drones, as well as artillery and tank ammunition, to Russia, saying that “Iran’s support for Russia’s war has expanded.”

# **Only 4 Percent of Americans Hold a Biblical Worldview Post-Pandemic: It 'Altered' Beliefs - Michael Foust (christianheadlines.com)**

#bibleprophecy, #america, #worldview, #christians

Mar 1, 2023

The percentage of Americans who hold a biblical worldview fell to 4 percent during the pandemic, while the percentage of self-identified Christians and born-again Christians who hold such a worldview also plummeted, according to a new poll.

The [survey](#) by researcher George Barna at the Cultural Research Center of Arizona Christian University found that the fallout from the pandemic apparently altered the worldview of Americans, including people of faith. While 6 percent of Americans prior to the pandemic held a biblical worldview, only 4 percent do today. The research center labeled it a “seemingly small but noteworthy drop.”

“It appears that as people’s lives were substantially altered by the virus and government policies, Americans were not spending the extra time devoting energy to spiritual matters and worldview enhancement,” the Cultural Research Center said in an analysis.

Further, the percentage of self-identified Christians who hold a biblical worldview fell from 9 percent pre-pandemic to 6 percent post-pandemic. Among born-again Christians, it fell from 19 percent to 13 percent. The research center categorizes individuals as born again if they believe they will go to heaven after they die because they have accepted Jesus as their savior and confessed their sins.

The data is part of the 2023 American Worldview Inventory.

“When you put the data in perspective, the biblical worldview is shuffling toward the edge of the cliff,” Barna said. “As things stand today, biblical theism is much closer to extinction in America than it is to influencing the soul of the nation. The current incidence of adults with the biblical worldview is the lowest since I began measuring it in the early 1990s.”

Only 1 percent of young adults (ages 18-29) hold a biblical worldview, according to the data.

“Young people, in particular, are largely isolated from biblical thought in our society and are the most aggressive at rejecting biblical principles in our culture,” Barna said. “Facilitating a return to biblical thinking and living in America will take an intentional, strategic, and consistent effort by the remaining population that represents this biblical approach to life.”

The Cultural Research Center defines a worldview as the “intellectual, emotional, and spiritual filter an individual uses to experience, interpret, and respond to reality.”

“Everyone has a worldview. It is the basis of every decision an individual makes,” the research center said in the analysis of the data. “The biblical worldview (also known as biblical theism) is one among numerous worldviews that exist. In the biblical worldview, people’s ideas about all dimensions of life and eternity are based on biblical principles and commands.”

The poll is the “first national study of Americans’ worldview in the post-lockdown era,” according to the Cultural Research Center.

Churches and Christian schools, Barna said, must place more emphasis on worldview development.

“The impact of arts and entertainment, government, and public schools is clearly apparent in the shift away from biblical perspectives to a more experiential and emotional form of decision-making,” Barna said. “It will require parents, in particular, and cultural leaders who care about this matter to energetically and creatively persuade children and their influencers to embrace biblical principles as the foundation for personal decision-making.”

Barna remained hopeful, saying he has seen “some evidence” indicating that “more people are waking up to the concept, the importance, and the process of biblical worldview development.”

“Perhaps the ugliness and heavy-handedness of cancel culture,” he said, “has stimulated greater interest in the potential benefits of adopting a worldview based on love and service in shaping both our culture and individual lives.”

# [EU Bankers to Discuss Creation of Centralised Digital Currency - Report \(breitbart.com\)](#)

#bibleprophecy, #currency, #digital, #bankers

Feb 21, 2023

The creation of a Eurozone-wide digital currency is to be discussed at a secretive meeting of EU bankers this week, a report has claimed.

It is claimed that central bank tsars from across the European Union are to meet in Finland on Wednesday, where they will discuss the creation of a Eurozone-wide digital currency.

The meeting will involve the vast majority of the senior figures within the European Central Banking scene, with the heads of all 20 central banks in the Eurozone to be in attendance, as well as six members of the European Central Bank's executive board.

Although the meeting had been previously announced to the public earlier this month, its agenda has largely been kept a closely guarded secret, with a [press release](#) from the Finnish central bank only saying that it will "cover various matters within the Governing Council's responsibilities".

*POLITICO*, however, now [claims](#) to have learned that the meeting will in part be about the creation of a centralised "digital euro" and how to get the general European public to accept its implementation.

It does not appear that this part of the meeting's agenda was meant to leak out into the public sphere, with the head of Ireland's central bank, Gabriel Makhoul, seemingly expressing surprise when the publication asked him about the topic.

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"Who told you that?" Makhoul apparently asked the outlet when quizzed on the upcoming meeting.

The central bank head is described as refusing to elaborate much on the topic, other than saying that "the world is moving in the direction of digital" and that it would be "wrong" for the state to "decide that it's going to opt out of providing a fiat currency that is digital and leave it entirely to the private sector".

*British security chiefs are warning Communist China could use a Central Bank Digital Currency (CBDC) to monitor and control citizens – while the British state is itself working on a CBDC. <https://t.co/2tMTKgeiwb>*



— *Breitbart London (@BreitbartLondon)* [December 24, 2022](#)

In many ways, news that Wednesday's meeting will cover the issue of creating and marketing a Central Bank Digital Currency (CBDC) for the Eurozone is not surprising, with the idea of creating such a highly controllable currency somewhat in vogue amongst the international elite.

According to *POLITICO*, European Central Bank officials are likely acting in response to the spread of cryptocurrencies as well as [China's digital yuan](#), both of which have seen significant public usage since their implementation, though for very different reasons.

Nevertheless, there has been some public scepticism about the implementation of such a digital currency, especially given the scope of centralised digital currencies for government monitoring and control. Unlike physical cash, digital currency use is [easily trackable](#), with it near-certain that whatever entity is left in charge of the digital euro will be able to see where people spend their money, what people spend their money on, and who people spend their money with.

Such a CBDC would also conceivably be programmable, meaning that its central controller could be able to lock people's spending only to certain items, objects or services.

Said entity could also conceivably tie the ability to spend the currency to other factors, meaning that the digital euro's controlling body could use the currency to enforce restrictions on the purchase of alcohol, for instance. The centrally controlled currency could also theoretically be reworked in order to serve the bloc's green agenda, preventing people from buying objects or services with a high carbon footprint once they go over a certain arbitrary threshold.

Officials within the bloc have been keen to promise that they will not do any of these things however, with ECB executive Fabio Panetta [promising](#) last month that the bloc would never take a China-style approach to the currency.

"The digital euro would never be programmable money," he promised. "The ECB would not set any limitations on where, when or to whom people can pay with a digital euro."

How believable such promises are in a post-COVID lockdown world remains to be seen, with many Europeans having only just come out of a period of [draconian restrictions](#) on their everyday life, partly enforced by limits on where and when people were allowed to spend their money.

*Banning Church and Jailing Grandma: Stories from Lockdown Ireland*  
2021 <https://t.co/FbzJNsuKyh>

— *Breitbart London (@BreitbartLondon)* [December 27, 2021](#)



# Thousands Protest Against WEF-Backed '15-Minute Cities' in Oxford (breitbart.com)

#bibleprophecy, #wef, #cities, #control

Feb 19, 2023

Thousands of protesters took to the streets of Oxford on Saturday against the World Economic Forum-backed idea of so-called 15-minute cities as the local government announced that it would be trialling such a scheme.

Last year, the Oxfordshire County and City Councils in England proposed a “traffic filter system” trial scheme that would see licence plate-reading cameras installed for the purpose of fining citizens who drive their cars to other areas of the city without exemptions or resident permits during certain times of day.

The plan, which is set to begin a trial phase next year, is part of a broader movement for the formation of a supposedly more environmentally friendly '15-minute city'.

“The 15-minute neighbourhoods proposal aims to ensure that every resident has all the essentials (shops, healthcare, parks) within a 15-minute walk of their home. They aim to support and add services, not restrict them,” the Oxford Council [claimed](#).

The concept of 15-minute cities suggests that all services, amenities, work, and leisure are accessible a 15-20 minute walk or cycle from a person's front door. Protesters argue that the measures will ghetto-ise areas and restrict their freedom to move around as they want to. Car journeys will be restricted at certain times of the day and will be policed by number plate recognition (ANPR) cameras and fines.

The idea of a 15-minute city was first coined by Colombian-born Parisian Professor Carlos Moreno, who previously served as a member of the revolutionary socialist M-19 guerrilla movement.

It has since been championed by socialist Mayor of Paris Anne Hidalgo, as well as globalist organisations such as Klaus Schwab's [World Economic Forum](#) (WEF).

The local government has denied that people will be confined to their districts, but many have raised concerns that the concept could lay the groundwork for more totalitarian control, particularly in service of the green agenda, with some expressing fears that they could be used to impose lockdowns for climate change — a claim the council denies.

*I spoke with the [@bbc](#) today at the Oxford protest against 15 minute cities (let's see how they edit the interview...). People are fed up with being told where they can and can't go. None of this is about the climate or pollution. It's about power and control. [#Resist](#) <https://t.co/MrAy7b69XO>*

— Laurence Fox (@LozzaFox) [February 18, 2023](#)

The protest on Saturday was attended by Laurence Fox, star of Breitbart News film [My Son Hunter](#), who said: “People are fed up with being told where they can and can’t go. None of this is about the climate or pollution. It’s about power and control.”

Speaking to the local *Oxford Student* newspaper on Saturday, one of the organisers of the protesters [said](#): “We’re here to come together to say no to 15-minute cities, we’re here because we’re incredibly worried about the attack on our rights, the freedom of movement, and everything that comes from freedom of movement... Most people you speak to here are going to be all for a return to local economies. But this isn’t going to achieve that, it’s going to restrict people’s rights.”

Another protester added: “We’re obviously in opposition to this rollout of 15-minute cities and the implications of what that means when you are effectively locking people into zones in their own hometowns.

“It’s made to sound like this wonderful idea because it would be fantastic if we have all these nice little community hubs with amenities within close reach, but the actual reality of what this means is that you are being tracked and traced within your own town. You’re looking at having to have permits to leave the zone that you find yourself in.”

[#Oxford](#) Masked up counter protesters call 15 Min City protesters fascist [pic.twitter.com/HTIWDe39lM](https://pic.twitter.com/HTIWDe39lM)

— Anti Lockdown Alliance(GLOBAL) (@Demo2020cracy) [February 18, 2023](#)

According to local police, around [2,000 people](#) attended the main protest on Saturday, though there were also mask-wearing “anti-fascist” counter-protesters present due to local left-wing activist groups such as Stand Up To Racism [claiming](#) that the protest against 15-minute cities was in reality a ploy by the far-right to drive recruitment.

# Wild 'super pigs' in Canada poised to wreak environmental havoc, spread disease in US, expert says | Fox News

#bibleprophecy, #pigs, #disease, #environment

Feb 21, 2023

Pigs are reportedly extremely intelligent, can grow to over 600 pounds and are hard to eradicate

A cross-bred "super pig" [from Canada](#) is poised to wreak havoc on the environment in the United States and must be dealt with aggressively and immediately, a wildlife expert told Fox News Digital.

"These pigs are easily the worst [invasive large mammal](#) on the planet," said Dr. Ryan Brook, an assistant professor in the department of animal and poultry science at the University of Saskatchewan in Canada.

These "super pigs" are actually a cross between a European wild boar and a domestic pig, Brook said.

The pigs "cause crop damage, [destroy natural environments](#), get into cities, destroy water quality and can spread disease to humans, livestock, pets and native wildlife," he also noted.

The pigs are coming into the U.S. from Canada as their numbers swell there, causing populations to migrate south. Left unchecked, these "super pigs" could negatively impact just about everyone, Brook emphasized.

"The only people who should be worried about this is anyone that lives in North America and eats meat, or eats vegetables, or [eats any foods](#) based on grain crops or spends time outside for any reason," he said.

The reason these "super pigs" are so dangerous is twofold, Brooks said.

First, they lack natural predators.

*"Wild boar farmers were told to cross the wild boar with domestic pigs to make a bigger and longer animal."*

"There are no native pigs in Canada," said Brook. "Anything that sounds like a pig and oinks like a pig has been imported."

The first European wild boars were [imported to Canada](#) in the 1980s to diversify that country's agriculture, said Brook.

While these boars sometimes managed to escape their fences, after the wild boar market peaked in 2001, some farmers had no more use for the animals.

"Many producers cut their fences and let them go," said Brook.

Initially, it was believed that these boars "would never survive a Canadian winter," particularly in the harsh cold of the country's Prairie Provinces of Saskatchewan, Manitoba and Alberta, he said.

This was quickly proven incorrect — and it presents the second reason these pigs wreak havoc: science.

The "super pigs" began with a unique set of circumstances, said Brook.

"Wild boar farmers were told to cross the wild boar with domestic pigs to make a bigger and longer animal," Brook said.

He said a domestic pig has an extra set of ribs and has larger, more frequent litters.

"This was great for wild boar farmers, but [it] was a huge problem when [these animals] got into the wild," he said.

Additionally, a scientific concept called "Bergmann's rule" has come into play — to a potentially disastrous environmental end.

Bergmann's rule states that specimens in a species "will tend to be larger the farther north you go in their range, because being big is really important to survival in the cold," said Brook.

### **SHAKIRA AND SON ATTACKED BY WILD BOARS: 'THEY'VE DESTROYED EVERYTHING'**

This has proven true for the "super pig" in Canada, with the largest one discovered weighing well over 600 pounds, he also said.

The typical male feral hog is 220 pounds, says the website for the USDA National Institute of Food and Agriculture.

The animals' size, along with their intelligence, has made the "super pigs" capable of survival in harsh conditions and therefore hard to eradicate, said Brook. He noted they've even learned how to tunnel into snow caves to keep themselves warm.

"It is much warmer under than snow than on top of it," said Brook.

Eradicating these wild pigs must be done as "quickly as possible," he emphasized.

### **RISING POPULATIONS OF WILD HOGS WORRYING EXPERTS, MANY DEEMED 'SUPER-PIGS': REPORT**

There must be "a rapid and highly aggressive response, just like dealing with cancer or forest fires — that is really the only option."

He added, "Once [the pigs] are established, you will have them for another 500 years."

Traditional hunting techniques are not effective in pig eradication, said Brook.

"Large traps and tracking Judas pigs (wild pig with a GPS collar that will lead you to other pigs), ground removal teams, fencing and education are all key," he said.

Failure to quickly eradicate the pigs will result in devastation to the environment.

"I was warned by someone in Texas, 'Stop whatever you are doing and start removing pigs and don't stop until every single one is gone,'" Brook said.

"I would echo that advice," he added.

# Task force seizures of fentanyl spike in Montana - TheBlaze

#bibleprophecy, #drugs #montana, #fentanyl

Feb 24, 2023

Rocky Mountain High Intensity Drug Trafficking Area task forces seized well over three times as much fentanyl in 2022 as in 2021, but the 2022 figure is up nearly 11,000% from the 2019 level, according to a press release from the Montana attorney general.

Task forces secured a whopping 206,955 dosage units of the drug in 2022, up from 60,577 in 2021, and 1,900 in 2019 — the figures from six task forces "are not all inclusive of drugs seized by all law enforcement in the state," according to the press release.

"The amount of illicit fentanyl coming across the southern border has skyrocketed. This poison is killing Montanans," Montana Attorney General Austin Knudsen said, according to the press release. "Our narcotics agents and troopers are getting more fentanyl off the roads than ever before, but we need additional tools and resources to keep it out of our communities."

Knudsen has called for designating drug cartels as terrorist organizations — during an [interview](#) with Chris Cuomo on NewsNation, the Montana attorney general said that the cartels are "undermining our country" and "poisoning our citizens."

Montana AG: 'I would absolutely advocate for cartels to be designated terrorist orgs' | CUOMO [www.youtube.com](http://www.youtube.com)

Fentanyl is a dangerous drug that can be deadly. The [U.S. Drug Enforcement Administration](#) describes it as "a highly addictive man-made opioid," and says that two milligrams of it is considered a possibly lethal dose.

"As 2022 comes to an end, the Drug Enforcement Administration is announcing the seizure of over 50.6 million fentanyl-laced, fake prescription pills and more than 10,000 pounds of fentanyl powder this calendar year," the DEA noted in a December [press release](#). "The DEA Laboratory estimates that these seizures represent more than 379 million potentially deadly doses of fentanyl."

DEA administrator Anne Milgram pointed to two drug cartels: "DEA's top operational priority is to defeat the two Mexican drug cartels—the Sinaloa and Jalisco (CJNG) Cartels—that are primarily responsible for the fentanyl that is killing Americans today," she said, according to the DEA press release.

# Researchers launched a solar geoengineering test flight in the UK last fall | MIT Technology Review

#bibleprophecy, #geoengineering, #solar

Mar 1, 2023

The experiment, largely designed to test equipment, took place despite deep concerns about the technology.

Last September, researchers in the UK launched a high-altitude weather balloon that released a few hundred grams of sulfur dioxide into the stratosphere, a potential scientific first in the solar geoengineering field, MIT Technology Review has learned.

Solar geoengineering is the theory that humans can ease global warming by deliberately reflecting more sunlight into space. One possible means is spraying sulfur dioxide in the stratosphere, in an effort to mimic a cooling effect that occurs in the aftermath of major volcanic eruptions. It is highly controversial given concerns about potential unintended consequences, among other issues.

The UK effort was not a test of or experiment in geoengineering itself. Rather, the stated goal was to evaluate a low-cost, controllable, recoverable balloon system, according to details obtained by MIT Technology Review. Such a system could be used for small-scale geoengineering research efforts, or perhaps for an eventual [distributed geoengineering deployment](#) involving numerous balloons.

The “Stratospheric Aerosol Transport and Nucleation,” or SATAN, balloon systems were made from stock and hobbyist components, with hardware costs that ran less than \$1,000.

Andrew Lockley, an [independent researcher](#) previously affiliated with University College London, led the effort last fall, working with European Astrotech, a company that does engineering and design work for high-altitude balloons and space propulsion systems.

They have submitted a paper detailing the results of the effort to a journal, but it has not yet been published. Lockley largely declined to discuss the matter ahead of publication, but he did express frustration that the scientific process was being circumvented.

“Leakers be damned!” he wrote in an email to MIT Technology Review. “I’ve tried to follow the straight and narrow path and wait for the judgment day of peer review, but it appears a colleague has been led astray by diabolical temptation.”



“There’s a special place in hell for those who leak their colleagues’ work, tormented by ever burning sulfur,” he added. “But I have taken a vow of silence, and can only confirm that our craft ascended to the heavens, as intended. I only hope that this test plays a small part in offering mankind salvation from the hellish inferno of climate change.”

European Astrotech didn’t immediately respond to an inquiry.

## Test flights

The system included a lofting balloon filled with helium or hydrogen, which carried along a basketball-size payload balloon that contained some amount of sulfur dioxide. An earlier flight in October 2021 likely also released a trace amount of the gas in the stratosphere, although that could not be confirmed and the system was not recovered owing to a problem with onboard instruments, according to details obtained by MIT Technology Review.

During the second flight, in September of 2022, the smaller payload balloon burst about 15 miles above Earth as it expanded amid declining atmospheric pressure, releasing around 400 grams of the gas into the stratosphere. That may be the first time that a measured gas payload was verifiably released in the stratosphere as part of a geoengineering-related effort. Both balloons were released from a launch site in Buckinghamshire, in southeast England.

There have, however, been other attempts to place sulfur dioxide in the stratosphere. Last April, the cofounder of a company called Make Sunsets says, he attempted to release it during a pair of rudimentary balloon flights from Mexico, as MIT Technology Review [previously reported](#) late last year. Whether it succeeded is also unclear, as the aircraft didn’t include equipment that could confirm where the balloons burst, said Luke Iseman, the chief executive of the startup.

The Make Sunsets effort was widely denounced by researchers in geoengineering, critics of the field, and the government of Mexico, which [announced plans](#) to prohibit and even halt any solar geoengineering experiments within the country. Among other issues, observers were concerned that the launches had moved ahead without prior notice or approval, and because the company ultimately seeks to monetize such launches by selling “cooling credits.”

Lockley’s experiment was distinct in a variety of ways. It wasn’t a commercial enterprise. The balloons were equipped with instruments that could track flight paths and monitor environmental conditions. They also included a number of safety features designed to prevent the balloons from landing while still filled with potentially dangerous gases. In addition, the group obtained flight permits and submitted what’s known as a “notice to airmen” to aviation authorities, which ensure that aircraft pilots are aware of flight plans in the area.

Some observers said that the amount of sulfur dioxide released during the UK project doesn't present any real environmental dangers. Indeed, commercial flights routinely produce many times as much.

"This is an innocuous write-up or an innocuous experiment, in the direct sense," says Gernot Wagner, a climate economist at Columbia University and the author of *Geoengineering: The Gamble*.

## **Public engagement**

But some are still concerned that the effort proceeded without broader public disclosures and engagement in advance.

Shuchi Talati, a scholar in residence at American University who is forming a nonprofit focused on governance and justice issues in solar geoengineering, fears there's a growing disregard in this space for the importance of research governance. That refers to a set of norms and standards concerning scientific merit and oversight of proposed experiments, as well as public transparency and engagement.

"I'm really concerned about what the intent here is," she says. "There's a sense of them having the moral high ground, that there's a moral imperative to do this work."

But, she says, forging ahead in this way is ethically dubious, because it takes away any opportunity for others to weigh in on the scientific value, risks, or appropriateness of the efforts before they happen. Talati adds that part of the intent seems to be provocation, perhaps to help break what some perceive to be a logjam or taboo holding up stratospheric research in this area.

David Keith, a Harvard scientist who has been [working for years](#) to move ahead with a small-scale stratospheric balloon research program, questioned both the scientific value of the effort and its usefulness in terms of technology development. In an email, he noted that the researchers didn't attempt to monitor any effect it had on atmospheric chemistry. Nor did the work present a feasible "pathway to use this method for deployment at reasonable cost," he wrote.

"So in some deep sense, while it's much more thought out, much less cowboy than Make Sunsets, I see it [as] similar," Keith said.

When asked if being provocative might have been a partial goal of the effort, Keith said: "You don't call something SATAN if you're playing it straight."

Lockley stressed that the effort was "an engineering proof-of-concept test, not an environmentally perturbative experiment," and that they obtained the standard approvals for such flights.

“I’m unaware of any prior approval process which should have been followed but was not,” he wrote in an email. “A review body may be useful, if it was able to provide good-faith and practical feedback on similar low-impact experimental proposals in future.”

## **Moral hazards and slippery slopes**

There are a variety of concerns about deploying solar geoengineering, including the danger that carrying it out on large scales could have negative environmental side effects as well as uneven impacts across various regions. Some fear that even discussing it creates a moral hazard, undermining the urgency to address the root causes of climate change, or that researching it sets up a slippery slope that increases the chances we’ll one day put it to use.

But proponents of research say it’s crucial to improve our basic understanding of what such interventions would do, how we might carry them out, and what risks they could pose, for the simple fact that it’s possible that they could meaningfully reduce the dangers of climate change and save lives. To date, though, not much has happened outside of labs, computer models and [a handful of efforts](#) in the lower atmosphere.

Several earlier proposals to carry out research in the stratosphere have been halted or [repeatedly delayed](#) amid public criticism. Those include the SPICE experiment, [which would have tested a balloon-and-hose stratospheric delivery system but was halted in 2012](#), as well as the Harvard proposal that Keith is involved with, known as SCoPEX.

The National Oceanic and Atmospheric Administration has [begun conducting](#) stratospheric flights, using balloons and more recently jets, as part of a growing US geoengineering research program. But its stated intention is to conduct baseline measurements, not to release any materials. One hope behind the efforts is to create [an early detection system](#) that could be triggered if a nation or rogue actor moves forward with a large-scale effort.

The challenges in conducting even basic, small-scale outdoor experiments that carry minimal environmental risks has increasingly frustrated some in the field—and left at least a few people willing to move forward without broad public disclosures in advance, perhaps in part to force the issue.

Scientists routinely conduct outdoor experiments without seeking up-front public permission, when doing so doesn’t present clear dangers to public health or the environment, and reveal their studies and peer-reviewed results in journals only after the fact.

The question is whether solar geoengineering research demands greater up-front notification, not because the experiments themselves are necessarily dangerous but because of the deep concerns about even discussing and researching the technology.

Columbia's Wagner says the field should err on the side of transparency. But he also says it's important to strike the right balance between how much researchers must reveal in advance, how easily carefully designed projects can be blocked, and how much support major research institutions provide for an important area of inquiry.

"This sort of thing is a direct response to other institutions' reluctance to proceed with even seemingly innocuous research," he says.

*Correction: This story has been updated to clarify Lockley's research affiliation. According to University College London, he is no longer an honorary research assistant at the institution.*