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The Evolution of French Space Security

AUTHOR
Makena Young

A Report of the CSIS Aerospace Security Project

CSIS | CENTER FOR STRATEGIC & INTERNATIONAL STUDIES

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Center for Strategic & International Studies
1616 Rhode Island Avenue, NW
Washington, DC 20036
202-887-0200 | www.csis.org

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Part of the International Security Program at CSIS, Aerospace Security is led by Senior Fellow Kari A. Bingen and includes a distinguished group of expert affiliates spanning national security, civilian, commercial, and international aerospace issues.

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Introduction

In the last decade, there has been an international resurgence of focus on space for commercial, civil, and military activities. Over 90 countries are operating in space, commercial companies launch dozens of satellites a month, and at least 12 nations have dedicated military organizations for space. Space is now a critical domain for many nations around the globe, and both individual countries and multinational coalitions have recently released space policies and strategies. European nations have taken a greater interest in space security by investing in space for national security purposes. Among them, France stands out.

France has a long history in space, starting in 1961 with the establishment of the Centre National D'Etudes Spatiales (CNES). It is the third-oldest space agency behind NASA in the United States and Roscosmos in Russia. In 1965, France became the sixth country to orbit a satellite and the third to have a domestic launch capability.[1] CNES implements France's civil space strategy across "areas of strategic, economic, and scientific importance" to further French and European interests in the space domain.[2] The importance of CNES to French space strategy has continued to grow, and CNES had the largest budget of any civil space agency in Europe in 2019 at €2.2 billion ($2.0 billion).[3] CNES priorities include helping to establish downstream business and encouraging start-ups and new companies to utilize the data from space capabilities.[4] The agency has also expressed interest in opening access to its space data for increased collaboration to create new value from already collected information, specifically in Earth observation missions.[5] One example of this is forming partnerships with industry—in 2014 CNES joined with Airbus to open data from an Earth observation satellite, Spot, to independent researchers in the hopes of advancing scientific knowledge and analysis.[6]

In addition to its substantial civil space program, France has long understood the value of space to its military missions. In 1983, French prime minister Laurent Fabius created a working group to assess the advantages of a military space program. The working group produced a report in 1986 that found having indigenous space-based surveillance capabilities was as crucial to the nation's strategic independence as a nuclear program.[7] As a result, the French government launched its first military satellite program, an optical reconnaissance system called Helios, in cooperation with Italy and Spain, in 1995.[8] However, this momentum would not last long, and by the early 2000s, the French military space program had significantly slowed down. This deceleration was due to waning interest from international partners and the ascendency of the European Union and European Space Agency (ESA) as European-wide collaborative space entities.[9]

The evolution of European thinking on space security is important context for understanding French views and actions regarding space. ESA is one of the largest space organizations in Europe and was established by 10 founding members in 1975—the same year the organization launched its first scientific satellite mission. After three decades of successful missions and partnerships with other international civil space agencies, ESA published a European Space Policy in 2007. The policy was drafted jointly with the European Commission, the politically independent executive arm of the European Union which drafts legislative proposals, to create a unified framework for European nations to work together in space.[10] This policy aimed to "contribute to strengthening the global role of Europe in the space domain through a joint international cooperation strategy."[11] This marked the beginning of a much larger role for Europe in international space missions as ESA became a full partner in the International Space Station (ISS) and developed the capability to launch its own astronauts.

After working jointly with ESA for some time on space policy, the European Union adopted its first space strategy in 2016, focusing on the importance of space data for European citizens. The strategy recognized that space is increasingly a priority for the European Union and outlined four overarching goals: harnessing the benefits of space for European society and its economy, creating a globally competitive European space sector, supporting European autonomy and security in space, and promoting international cooperation.[12] More recently, the European Union released a 2021-2027 space policy that established an investment program aiming to create jobs across Europe, fund science and research, foster a robust space economy, and promote policies regarding security, defense, and digital technology.[13] The European Union Space Programme delivers free services to EU citizens through two flagship space programs, Galileo and Copernicus, which are navigation and Earth observation systems, respectively.[14] Charles Michel, the president of the European Council, believes that "developing our space sector will help us reinforce our strategic autonomy—goal number one of our generation."[15]

The North Atlantic Treaty Organization (NATO) has also evolved its approach to the space domain in ways that affect European security and space interests. In 2019, NATO recognized space as a new operational domain and adopted the organization's first Space Policy. NATO secretary general Jens Stoltenberg described this new space policy as a first acknowledgment that the alliance relies on space assets for essential military functions.[16] NATO has made it clear that space is critical for a

robust security and defense policy, and it plans to enhance the alliance's space domain awareness capabilities. Beyond recognizing space as an operational domain, in June 2021, NATO leaders announced the extension of Article 5 to the space domain, which establishes that an attack on any of the allies would be considered an attack on them all.[17] That same year, NATO announced the Strategic Space Situational Awareness System (3SAS), to be built at NATO headquarters in Brussels and funded by Luxembourg. NATO also pledged €1.0 billion ($1.1 billion), spread across 2020 to 2034, for developing satellite communications services. This is the largest NATO investment in space capabilities thus far.[18]

Beyond multinational obligations, many European nations have shown an increased interest in space defense policy in the last decade. France, Germany, Italy, and the United Kingdom have all created military space commands to exist alongside corresponding civil agencies in the space domain. Of these nations, French officials have been the most outspoken in Europe regarding space defense capabilities. France is the only European country that has openly discussed its intent to develop defensive counterspace capabilities, and since the election of French president Emmanuel Macron in 2017, the nation has elevated the strategic importance of military space operations in its overall defense strategy.

France is the only European country that has openly discussed its intent to develop defensive counterspace capabilities.

Modern Evolution of Space Strategy and Policy

Today, France operates over a dozen military satellite programs, the majority of which are communications satellites, followed by intelligence, optical reconnaissance, and one early warning satellite.[19] In addition to military systems, France operates a variety of additional satellite systems, including for communication; Earth observation; science, technology, and education; and traffic monitoring.[20]

A strength in France's position comes from developing indigenous capabilities to support its space security and warfighting missions that have also elevated the capabilities of Europe. French strategy documents refer to "France and Europe," indicating a strong emphasis on maintaining national autonomy as well as a full commitment to elevating and participating in broader European efforts on space security. This mirrors the country's defense strategy stemming from the post-World War II era and Charles de Gaulle, who broadly advocated for fierce French independence alongside a united European posture.[21]

The 2017 Defence and National Security Strategic Review

The election of French president Emmanuel Macron in 2017 was an inflection point for France's space security policy. In September 2017, Macron gave a speech in which he spoke of having an "ambitious space policy" for both France and Europe as a whole, "consolidating a competitive European industry on a global scale."[22] By all accounts, it seemed that the focus at this time on ramping up space capabilities came from the president himself. Commander of the French Space Command Major General Michel Friedling confirmed this assessment in 2020 remarks: "the

impulse came from the president himself, saying that space was a matter of national security."[23] This shift in space as a national security priority aligns with French leadership publicly discussing developing active defenses in space, such as a laser that can blind sensors on other satellites. Such discussions have moved France to the forefront of the debate over norms of behavior in space and what it means to "weaponize" space. This is unique in a public framing in which many other nations, including the United States, have been more reluctant to openly address active defensive capabilities on orbit.

Though France did not recognize space as a warfighting domain until 2019, a 2017 *Defence and National Security Strategic Review*, a follow-on to a 2013 white paper on the same topic, refers to space as an operational environment, along with land, sea, air, and cyberspace. Space is highlighted as "a domain of strategic and military rivalry."[24] The review emphasizes that space is of "crucial importance" to France's defensive capabilities and calls out the need to monitor objects in low Earth orbit (LEO) and geosynchronous Earth orbit (GEO), as well as to bolster early-warning capabilities for ballistic missile threats.[25] The document went on to note competition in the domain from other countries in space and called on the military to further develop partnerships with its allies "to secure our military space assets."[26]

The review called for a modernized approach to both designing and operating assets in space and asserted that countries are capable of advancing military space operations under the guise of civilian goals. It advocated for new defense practices in the space domain, noting that "the problem of space weaponization must be now addressed in new terms."[27] The conclusion calls specifically for the security of both national and shared space assets and, importantly, for "the capability to act against security threats."[28] This foreshadowed a shift in French posture toward active defenses in space.

Following the release of this overarching review, France began working on a corresponding strategy specific to space. In 2018, the French government approved the 2019–2025 Military Planning Law, which was informed by the strategic review and laid out a spending plan for future years. It included a goal of increasing acquisitions for a more well-equipped military by 2030 and allocated €3.6 billion ($3.9 billion) over seven years to space defense, particularly in communication, monitoring, and surveillance satellites.[29]

In 2023, the 2024–2030 Military Planning Law was released, which detailed a goal for better space domain awareness and active defense in low Earth orbit. Three satellite programs were detailed as patrolling satellites (YODA program), on-orbit lasers (FLAMHE project), and ground-based lazing systems (BLOOMLASE project), which aim to be operational by 2030. In the six-year period, €6.0 billion ($6.5 billion) will be dedicated to space.[30]

2019 Space Defence Strategy

A key event that may have contributed to France's shift in space policy involved a Russian satellite. In September 2018, France publicly accused Russia of espionage by interfering with a French-Italian military satellite, Athena-Fidus. The Russian satellite Luch had been operating in GEO for years and was notorious for making unusual maneuvers and positioning itself close to other satellites. French

minister of defence Florence Parly publicly spoke of Luch approaching Athena-Fidus too closely in an attempt to intercept or monitor communications from the satellite.[31] In early 2021, Macron's office mentioned other similar incidents but did not give any further details.[32] The United States has been outspoken about other unusual activities by Russian satellites, and Luch in particular, but no events involving French assets have been addressed publicly by the United States.

Both countries have continued to speak out against Russian activities in space, and both France and the United States publicly condemned Moscow in November 2021 for an anti-satellite (ASAT) weapon test that created over 1,500 pieces of space debris.[33] In the United Nations General Assembly's First Committee in October 2022, France co-sponsored a resolution which called for states not to conduct destructive ASAT tests.[34] The resolution was adopted by a large majority of nations, including France, but China, Russia, India, Iran, and North Korea remain unsupportive. France has never conducted an ASAT test.

In 2019, as a show of continued momentum from the 2017 strategic review and the Luch event, the French Ministry for the Armed Forces released a comprehensive Space Defence Strategy, a 60-page document outlining the essential functions for the French armed forces in the space domain. The Space Defence Strategy called for a more robust space defense policy and increased emphasis on strategic autonomy in space. It presented a road map to strengthen space defense doctrine, reorganize space-governing organizations and personnel, and develop new space defense capabilities. The strategy does not pull any punches. The executive summary begins by stating, "a revolution is taking place in the use of space," and emphasizes that French space actors, both in government and the private sector, must be able to defend against threats in the space domain.[35]

Consistent with the language in the 2019 Space Defence Strategy, France has been notably vocal about its plans to defend its space assets, and Minister Parly has been up front about the capabilities the country plans to field. In a bold public statement, she declared that if French assets in space were threatened, "we intend to blind those [satellites] of our adversaries. . . . We reserve the right and the means to be able to respond: that could imply the use of powerful lasers deployed from our satellites or from patrolling nano-satellites."[36] Minister Parly also announced France's intention to launch small surveillance satellites, described as "fearsome little detectors that will be the eyes of our most valuable satellites."[37] France is not the only country able to field active and passive defenses in space. Still, it is unique in its decision to publicly discuss the types of defensive counterspace weapons it currently has or may be developing.

"We reserve the right and the means to be able to respond: that could imply the use of powerful lasers deployed from our satellites or from patrolling nano-satellites."

– French minister of defence Florence Parly

Recent Developments

Creation of the French Space Command

In 2019, President Macron elevated the existing Joint Space Command under the French Air Force to become the French Space Command, or Le Commandement de l'Espace (CDE), which was declared fully operational in September of 2020.[38] The CDE sits under what is today called the French Air and Space Force and includes members of the other French armed services.[39] Along with the establishment of the CDE, France pledged a substantial €4.3 billion ($4.6 billion) from its defense budget to invest in space infrastructure between 2019 and 2025. One of the CDE's first investments was the procurement of services from the French company Safran Data Systems to expand space situational awareness (SSA) sensors and capabilities.[40]

Contributions to NATO

In 2020, NATO approved the French request to create a new Centre of Excellence focused on space in the southern city of Toulouse. This will be NATO's 27th Centre of Excellence and the second that France hosts, after the Air Operations Centre of Excellence. The center will host 42 experts in space security, 25 of whom will be French. The new center is expected to be in place by 2025, and its main goals will be to draft policy, improve capabilities and alliance interoperability, and identify lessons learned.[41]

AsterX Space Exercise

In April 2021, France led its first international military space exercise, AsterX. Major General Michel Friedling described the tactical exercise as a "stress test" for the country's military space response.[42] Prior to the test, France had participated in similar international wargames, but this was the first time the country organized and conducted its own exercise. Germany, Italy, and the United States were key participants. A second AsterX was conducted in April 2022, in which 50 participants from the United States and European countries spent six days working through 16 escalation scenarios in space. The AsterX game continued in 2023, establishing the exercise as an annual event.[43] The wargame was named as a tribute to France's first satellite, Asterix, which referenced a French cartoon in which a village chief of the same name is constantly worried the sky will fall on his head. This continuing exercise follows the 2019 military space strategy, which emphasized France's desire to lead further allied cooperation in the space domain.

Space Industrial Base

In parallel with its civil and military space initiatives, France has developed a robust space industrial base. Three corporations in particular—Airbus, Thales-Alenia, and ArianeGroup—are all substantial actors in the global commercial industry.

Airbus is a multinational corporation that was started in France and maintains its head office in Toulouse, though the official headquarters is now located in the Netherlands.[44] Formed in 1970, the company has three main business lines: commercial aircraft, defense and space, and helicopters. Airbus is the second-largest aerospace company in the world, behind Boeing, and its defense and space sector is arguably the preeminent exporter of Earth observation satellites.[45] This sector also provides experimental platforms for scientific research on the ISS, supports the European Service Module of the Orion Deep Space Crew Vehicle, and supports some U.S. Department of Defense space programs.[46]

In parallel with its civil and military space initiatives, France has developed a robust space industrial base.

Thales-Alenia Space is a multinational aerospace manufacturing venture, with France's Thales owning a 67 percent share and Italy's Leonardo owning a 33 percent share. The company is the second-largest commercial provider of modules for the ISS and the largest satellite manufacturer in Europe. Thales-Alenia Space supplies a majority of the pressurized modules on the ISS and has partnered with U.S. company NanoRacks to supply the pressurized structure of the commercial module on the ISS. In addition to partnering with civil space agencies with great success, Thales-Alenia Space is developing on-orbit servicing capabilities to extend the operational lifetime of satellites on orbit, to include repairs, maintenance, refueling, inspection, and sustainable satellite de-orbiting.[47]

Global conglomerate Safran has strong ties in France, and the French arm of the organization has provided "its greatest successes in the aviation, space and defense industries."[48] Safran joined with Airbus to create ArianeGroup in the early 1970s, which now provides a broad range of products and support for the French government.[49] The company has 11 subsidiaries, and one of its largest is Arianespace, which focuses on launch services and commercial space transport. Arianespace manages the launch services for the ESA-run Guiana Space Centre, often called Europe's Spaceport, which is located on the northeast coast of French Guiana.[50] The spaceport hosted its first launch in 1970, and its proximity to the equator makes it ideal for launching satellites into GEO.

Ariane 5 parepares for launch at the Guiana Space Centre.

Photo: NASA/Bill Ingalls via Flickr, licensed under CC BY 2.0 DEED.

Space launch has historically been an area of commercial focus, including within the French industrial base. Commercial companies have been integral to the success of France's space launch capabilities at the Guiana Space Center. Three main launch vehicles have historically been operated at the spaceport: the Ariane 5, Vega, and Russian Soyuz. The Ariane 5 heavy launch vehicle was developed by ESA and was able to launch many of the heaviest spacecraft in production. It is now described as a "global benchmark for launches to geostationary transfer orbit," with 117 successful launches that placed 227 satellites into orbit.[51] It flew its last flight on July 6, 2023.[52] The next-generation Ariane 6 vehicle is in production, with plans for a first launch in the summer of 2024 after a series of delays.[53] The Vega launch vehicle, also developed by ESA, is a four-stage launcher used for small satellites and scientific missions.[54] The next-generation Vega vehicle, Vega-C, completed its first flight on July 13,

2022, from French Guiana. Vega-C suffered a launch failure during its second flight in December 2022. The Vega-C has many of the same capabilities as the Vega vehicle but can deliver an additional 800 kg to a polar orbit and has a larger fairing that can carry almost double the payload volume delievered to orbit.[55] A Vega-E vehicle, designed to be more affordable than its predecessors, is also in development, with its maiden flight projected for 2026.[56] The third launch vehicle is the Soyuz medium launch vehicle, which was developed by the Russian Federal Space Agency and traces its heritage to the launch of Sputnik in 1957.[57] This medium launch vehicle was first used at the European spaceport in 2011. Soyuz launches operated by Arianespace were suspended on March 4, 2022, in response to sanctions imposed on Russia after its invasion of Ukraine.[58] In total, Arianespace has launched over 1,100 satellites, including over half of the geostationary telecommunication satellites currently in service.[59] The company has launched from both the spaceport in French Guiana and the Russian-operated Baikonur Cosmodrome in Kazakhstan.[60]

In addition to heavy industry, new space companies are also ingraining themselves in the French defense ecosystem, a strategy underscored by President Macron. In October 2021, he committed €30.0 billion ($32.4 billion) for investment in high-tech sectors of the French economy, telling an audience that "we want to have Elon Musks in France."[61] He also noted that the swift success of SpaceX is an indicator of the rapid pace of global innovation, previously stating that the company had "destabilized" the European space industry.[62]

One example is the commercial company Hemeria, created in 2019 as an offshoot from a multinational defense company to focus on sovereign activities in France.[63] Hemeria was awarded a contract from CNES for the YODA program, which is planned as an "eyes in orbit" demonstration.[64] This program aims to design and build two demonstrator reconnaissance small satellites in GEO, meant to be "bodyguard satellites" to protect national security satellites from threats or "hostile maneuvers" in orbit.[65] These demonstrators are scheduled for a 2024 launch, with follow-on operational satellites planned to be in orbit by 2030. This project underscores France's desire to invest in commercial space companies that can contribute capabilities to protect national security assets in space.

Regional Relationships

Germany

Germany's space security strategy is primarily focused on missions through its civil space agency, the German Aerospace Center (DLR), partnering with ESA and the European Union, rather than investments in national military space capabilities. The DLR is Germany's national agency for aerospace, energy, and transportation research. It implements the majority of the country's space strategy, including managing the national space program, advising government officials, and representing the country in international forums.[66] In 2019, Germany committed €3.3 billion ($3.6 billion) over several years to ESA programs for telecommunications, Earth observation, technological advancement and commercialization, and human spaceflight. Germany is ESA's largest contributor, followed by France and Italy, providing almost 23 percent of the organization's budget.[67]

In September 2020, the German military established its own space command center, the Air and Space Operations Centre (ASOC), which focuses on "information reconnaissance" and the collection of SSA data.[68] ASOC was opened by the federal minister of defence and chief of staff of the Air Force, as the German Air Force oversees space operations.[69] This joint command was established in response to NATO's declaration of space as an operational domain.[70] In Germany's High-Tech Strategy, released in 2020, spaceflight was designated a key enabling technology for the German government.[71]

Germany was an initial competitor in hosting NATO's space Centre of Excellence, which ultimately ended up in Toulouse, France. Instead, during an October 2020 meeting, NATO defense ministers agreed to the establishment of a NATO Space Centre at the NATO Allied Air Command in Ramstein, Germany. In contrast to the NATO Centre of Excellence in France, which focuses on space training

and education, this center will support NATO activities, missions, and operations to increase NATO space domain awareness. The center will initially be staffed with experts who already work at the Allied Air Command, including representatives from the U.S. Space Force.[72]

In 2023, Germany released an updated National Space Strategy focused on the ways space can impact Earth and the economic developments in the sector, with the federal minister for economic affairs and climate action penning the foreword to underscore this emphasis. The language throughout the strategy is largely framed around how space capabilities can support Germany and Europe. The document outlines nine priorities for German space policy: European and international competition; space as a growth market; climate change, resource protection, and environmental protection; digitalization, data, and downstream activities; security, strategic options, and global stability; sustainable, safe use of space; space research; international space exploration; and space activities in the context of recruiting and attracting talent.[73]

France and Germany have an extensive history of cooperation in space, including military space missions. In 2002, France and Germany signed the Schwerin Agreement, which grants each country partial access to the other's space systems. In this agreement, Germany is able to access up to 5 percent of the Helios 2 military Earth observation satellite system, while France benefits from access to the German SAR-Lupe constellation, a five-satellite constellation dedicated to military intelligence, surveillance, and reconnaissance through synthetic aperture radar (SAR) imaging.[74] In a 2019 speech, Minister Parly identified Germany as an important ally in space, saying "in particular, I count on Germany to be at the heart of space surveillance."[75]

Italy

Similar to Germany and a majority of other European nations, Italian space strategy is largely developed and implemented through its civil space agency, the Italian Space Agency (ASI). Italy is the third-largest financial contributor to ESA and is a strong partner with NASA and other nations who support the ISS.[76] ASI released its *Document on the Strategic Vision for Space, 2020-2029*, centered on three main pillars: bolstering of the Italian space economy through investments and new ventures, research and innovation, and strengthening the country's international role in space.[77]

The Italian parliament commissioned a government report on space in 2019, which resulted in the Government Guidelines on Space and Aerospace, released by the Prime Minister's Office.[78] These guidelines underscore the principles and international understanding of responsible uses of the space domain regardless of geopolitical developments. Based on these guidelines, the Presidency of the Council of Ministers released a National Security Strategy for Space as part of its space strategy.[79] The document outlines the need to strengthen and protect national space capabilities, increase the resiliency of Italy's national space infrastructure, protect classified information, and focus on international cooperation and the promotion of sustainable operations in the domain. International cooperation is cited as a vital tool in the success of this strategy, with cooperation through NATO, the European Union, and ESA highlighted as essential to the safety, sustainability, and security of Italian space assets. The strategy seeks a "stable space environment" governed under

international law and in accordance with the UN Charter so that nations do not have to "resort to the development of self-defense capabilities."[80]

In 2020, the Italian Joint Space Operations Command became operational. Its first action was to "link the existing Air Defense Network with Early Warning and Missile Defense and Space Situational Awareness to 'spot, identify, and react to any threats brought into space or against space assets.'"[81]

Italy also has a long history of space collaboration with France. In 2001, France and Italy signed an intergovernmental agreement focused on optical and radar federated Earth observation. Collaborating with systems that collected data in two different yet complementary ways, this allowed France to access 75 images per day from the Italian COSMO-SkyMed SAR satellite constellation and in return provided Italy with access to the French Spot 5 civilian Earth observation imaging satellite system.[82] The Spot 5 sensor was decommissioned in 2015, though the imagery it collected remains available.[83]

France and Italy also collaborated on two military satellites, Athena-Fidus and Sicral 2. Athena-Fidus was targeted by the Russian satellite Luch in 2018. Athena-Fidus is a wideband military communications satellite that was funded equally by both nations, although they operate separate parts of the satellite. Notably, Italy did not protest as forcefully or publicly as France did after the Luch incident. The Sicral 2 satellite provides narrowband communication services to the French and Italian militaries and was funded 62 percent by Italy and 38 percent by France.[84]

In March 2021, France and Italy announced a high-level working group focused on space launch and the economic repercussions from the delayed development of the Ariane 6 and Vega-C launchers. A press release for the working group further outlined a shared vision between the two countries for a cohesive European set of launch vehicles with coordinated and complementary technological and industrial approaches to their development. The document also mentions an agreement with Germany on the future of liquid propulsion engines, a German strength.[85]

Partnerships with the United States

France has consistently been one of the United States' strongest allies, and that cooperation has extended into space. The United States and France have partnered on civil space missions for decades, and the two nations signed a Framework Agreement for Cooperative Activities in the Exploration and Use of Outer Space for Peaceful Purposes in 2007.[86] This led to cooperation between NASA and CNES on space exploration, Earth observation and monitoring, space operations, and space science and research on missions such as CALIPSO and Jason.[87] At a 2009 Civil Space Cooperation Forum, NASA and CNES agreed to partner on four specific scientific missions: the Mars Atmosphere and Volatile EvolutioN mission, the Magnetospheric MultiScale mission, the Convection Rotation and Planetary Transits mission, and the Surface Water and Ocean Topography mission.[88] CNES also played a large role in NASA's 2018 Mars Discovery Program.[89] In June 2022, France became the 20th signatory to NASA's Artemis Accords, agreeing to partner on the Artemis mission to the Moon and adhere to a shared vision for safe and sustainable actions in space.[90]

One of the most recent examples of U.S.-French teaming in space is the James Webb Space Telescope (JWST). A joint mission between NASA, ESA, and the Canadian Space Agency, the JWST is the most advanced space telescope ever launched. In addition to supporting ESA contributions to the telescope, CNES has been involved in the project since 2004 and has financially supported the Mid-Infrared Instrument, which enables the telescope to see distant galaxies and deep space activities like comets and newly forming stars.[91] After many delays, the JWST was launched on the morning of December 25, 2021, on an Ariane 5 rocket out of the Guiana Space Centre.[92] The mission has been an initial success, producing clear deep space images and detecting carbon dioxide in the atmosphere of other planets.[93]

In addition to a strong partnership between civil space agencies, both France and the United States have placed increasing importance on national security space. In 2016, the French minister of defence and the U.S. secretary of state issued a joint statement of intent on the future of bilateral military cooperation. This included expanding cooperation in the cyber domain—an ongoing process since 2010—and in the space domain to include joint training events, reciprocal visits at respective air force bases, and exchanges between military leaders in each country's space command.[94] Additionally, France has a liaison officer stationed at the U.S. Combined Space Operations Center in Colorado Springs, Colorado. In a March 2020 statement, then French liaison officer Colonel Oliver Fleury spoke about the ambitions the U.S. and French military commands share as well as the shared commitment to facing risks and threats together as allies in space.[95]

To further integrate military approaches, France and the United States participate in hosted wargames. Each year since 2001, the United States has hosted an annual Schriever Wargame focusing on space capabilities and operations, and France has been a participant since 2012.[96] Originally run by Air Force Space Command, the U.S. Space Force led its first Schriever Wargame in 2020, with 200 attendees from eight countries: France, Germany, Australia, Canada, Japan, New Zealand, the United Kingdom, and the United States.[97] Similarly, the United States participated in France's first space-focused wargame, AsterX, in its inaugural 2021 game as well as the following iterations in 2022 and 2023. Participation from military leaders in these wargames builds confidence and insight into the strategy and decisionmaking of each, especially with regard to space threats.[98]

International partners come together for the 2023 Schriever Wargame.

Photo: U.S. Space Force by Judi Tomich.

Similarly, the United States Space Command hosts the Global Sentinel event, an international convention designed to advance international cooperation through data sharing and spaceflight safety.[99] In January 2022, 25 nations participated in the ninth iteration of Global Sentinel, including

France, Germany, and Italy, among others from Europe.[100] While not a wargame, this event has participating nations work through potential scenarios in the space domain, enhancing cooperation and information sharing and building reciprocal awareness of each countries' space capabilities.

As collaborators and allies in many areas, space is becoming a higher-priority item between France and the United States. After a meeting with President Macron, U.S. vice president Kamala Harris announced new initiatives for cooperation in space and cybersecurity. The November 10, 2021, announcement indicated that the countries would come together to fortify comprehensive dialogues on space, including climate change; access to and quality of education in science, technology, engineering, and medicine; and norms and guidelines for the long-term sustainability of the domain.[101] The United States also committed to joining the Space Climate Observatory, an international network that uses space assets to learn more about the impacts of climate change.[102]

As collaborators and allies in many areas, space is becoming a higher-priority item between France and the United States.

In November 2022, the first U.S.-France Comprehensive Dialogue on Space was held in Paris "pursuant to their shared goal of advancing bilateral space cooperation."[103] The dialogue was cochaired by executive office representatives from the U.S. and French governments, resulting in a joint resolve to strengthen the coordination of national security space capabilities both bilaterally and within NATO. Both sides celebrated the signature to respective treaties earlier in the year: France to NASA's Artemis Accords and the United States to France's Space for Climate Observatory Charter. The latter highlights the importance of space science and Earth observation to both nations, including climate change monitoring.[104]

Bilateral space cooperation has also extended to the industrial and technology sectors, including through an initiative by CNES called Connect. Connect is a French initiative to foster space-related industrial innovation. CNES plans to establish hubs in Denver, Colorado, and Houston, Texas, to expand the industrial relationship between the two countries. The initiative aims to provide entry points for French companies into the United States and for U.S. companies into the European market.[105]

Areas of Potential Cooperation

In the near term, the countries may be able to come together through both public policy discussions and technical developments. France and the United States will continue to build upon their relationship through civil space missions such as the Artemis program, increased participation in launch missions, and the development of coordinated military space strategy. Additionally, both countries are regional leaders and should continue the multilateral development of space norms and behaviors—both by acting responsibly in space and publicly discussing bad behavior in space. This could include coordination of public and private messaging to Russia and China on their

activities in space, including norm setting on defensive counterspace operations and appropriate uses of active and passive capabilities. This could be strengthened by continued participation in military wargames, exercises, training, and personnel exchanges that can solidify a joint operational understanding. Joint coordination of space situational awareness operations for improved threat detection and characterization is another capability which could help underscore public policy decisionmaking. While Paris continues to strive to build its own autonomy, there will be natural tensions and competition with partners and allies doing the same, including the United States. But given shared threats and interests, there is more collaboration to be found than competition.

Given shared threats and interests, there is more collaboration to be found than competition.

While France clearly values its partnerships with the United States in space, it is attempting to develop independent capabilities in the military, civil, and commercial space sectors. French strategy has defined success as operational independence, as Minister Parly has noted: "If we want to be able to carry out real military operations in space, then we need to develop the ability to act alone."[106] A key issue to watch is how quickly France moves to develop and operationalize these capabilities. While French officials indicate a strong interest in working with others in Europe and the United States, they are equally enthusiastic about guaranteeing that they can act independently.

Conclusion

"I want a France that is faithful to its commitments in the Atlantic Alliance, but which is also the engine of European strategic autonomy."[107]

– French president Emmanuel Macron

France stands apart from other European nations in its desire for strategic autonomy in space and its public desire to develop active defenses for its critical space systems. Other European actors in space, such as Germany, Italy, and the United Kingdom, are relatively more focused on cooperation and maintaining sanctuary in space rather than gaining strategic independence as a space power. After the announcement of the creation of French Space Command in 2019, Germany's Thomas Jarzombek stated, "We need a robust answer to the challenges in space, but I see this as a job for the European Space Agency and the EU."[108] This sentiment indicates that France stands apart in its steadfast desires for independent capabilities that can rival those of the major historic space powers.

In France, the combination of interest from a new president paired with repercussions from what it considered to be Russian interference with a key military satellite propelled space to the top of its military priorities. A similar incident in space perpetrated by either China or Russia that threatens key space assets or access to space-based capabilities could propel other European countries to take a stronger stance on space security and cause them to consider developing defensive counterspace capabilities of their own—especially if they do not see the United States as capable or willing to protect their space systems from attack. At the moment, however, most of France's European counterparts appear to place a higher priority on the advancement of NATO and EU space policies and capabilities than on bolstering their own independent capabilities. As other European nations

develop and update their national security strategies and space policies in particular, a key indicator to watch is whether they follow France's lead and begin talking publicly about the need for defensive space capabilities.

In many ways, France appears to be looking to the United States as the model of a fully developed space power, particularly for how the United States utilizes and empowers its commercial space sector. While there are many successful private space companies in Europe, and France specifically, they are less common, and the industry is not as nurtured as in the United States. As more national budgets are allocated to encourage commercial growth, the European commercial space sector will likely see the most change in the coming years. A March 2020 EU Industrial Strategy recognized the importance of space technologies to Europe's industrial base and called for a decreased reliance on non-European countries for technical expertise and services.[109]

This is a pressure point for France, as President Macron has spoken multiple times about the need to strengthen the space industrial base in the country. A key issue to watch is the flow of private capital into French and other European space companies, particularly start-ups, and whether it follows trends seen in the United States, where a massive influx of venture capital funding has stimulated a boom in commercial space innovation. France is making a concerted effort to build a space capital in Toulouse. It plans to locate the French Space Command's military headquarters, the NATO Centre of Excellence, and substantial industrial parks for space companies. This indicates that space is considered a vital industrial sector for France and that Toulouse will be at its center.

Space launch is a commercial sector that will likely continue to grow. The most notable milestones are the high-profile launches and launch vehicles that have recently debuted: the successful launch of the JWST from an Ariane 5 rocket on December 25, 2021, followed by the debut of the Vega-C light launch vehicle. These may be indicative of future progress, as both projects overcame significant delays spanning nearly a decade that resulted in a late but successful result. The ambitious timelines of these planned next-generation launch vehicles will cement France's role in the global launch market.

While commercial space capabilities have traditionally been focused on launch, communications, and remote sensing, many private companies within the United States and in other nations are developing and deploying a wide variety of new commercial space services, and some of these services have the potential to provide important new military capabilities. For example, private companies are testing active debris removal systems and on-orbit servicing satellites that could (in theory) be adapted to serve as defensive counterspace capabilities.[110] Private companies are also increasing the quality of SSA data and frequency of its collection, including plans to deploy space-based SSA systems.[111] These commercial space services could provide a relatively quick way for militaries to advance their space capabilities in response to shifts in national space policy and strategy. It could also create further justification for Russia, China, or other nations to accelerate counterspace programs if these commercially derived capabilities are perceived as offensive or destabilizing.

As noted in France's 2017 strategy, "Ambition must be twofold: to preserve its strategic autonomy and to build a stronger Europe to face the growing number of common challenges."[112] France has detailed threats from both Russia and China in its military planning documents, and both countries

have significantly more advanced capabilities in space than European nations. Countering France and other European nations in space is likely a lesser included case in the Russian and Chinese space strategies, which are aimed primarily at the United States. However, countries such as Russia and China could use the words and actions of France—and any other nations that follow suit—as an excuse to justify bolstering their own space and counterspace capabilities.

Though officials have been outspoken about brazen counterspace actions in space, France entertained the idea of partnering with Russia and China on their proposed International Lunar Research Station in the summer of 2021.[113] While this may only have been intended to signal a degree of autonomy, French alignment with Russia or China for space missions could create tensions with the United States and other Artemis partners. To date, there has been no signature from China or Russia to establish plans to build the proposed International Lunar Research Station. Partners from Russia's lunar moon missions, including ESA, terminated agreements with Russia after its invasion of Ukraine in early 2022.[114] However, France has had partnerships with China in space dating back to 1997. The countries have collaborated on a number of space missions, including a joint oceanography satellite launched in 2018 by civil space leads, the China National Space Administration and CNES, to monitor ocean and atmospheric science.[115] The countries have also held at least a dozen space cooperation meetings, the latest of which was held in 2019.[116]

Perhaps the most significant takeaway in the advancement of French space policy is France's willingness to speak openly and candidly about overarching goals in space—and the expectation of being taken at its word. If French officials speak openly about the development of a security technology or a worry of a particular kind of counterspace attack, it is a likely indicator that they intend to address the issue proactively. This willingness to speak publicly and candidly about specific defensive capabilities and military plans and postures in space may be one of the greatest differences between the French and U.S. approaches to space policy. As France continues to bolster every aspect of its space policy, officials seem to be making their playbook public. Major General Friedling described the space philosophy in France quite succinctly: "We're saying exactly what we're going to do, and we will do it. And this is not the case of many other actors in space."[117]

About the Author

Makena Young is a fellow with the Aerospace Security Project at the Center for Strategic and International Studies (CSIS). Her research interests include international collaboration, space security, and orbital debris. Prior to joining CSIS, Ms. Young worked for the Federal Aviation Administration as an aerospace engineer, focusing on automatic dependent surveillance-broadcast certification and integration in small aircraft. She holds a BS in aeronautical and astronautical engineering from Purdue University with minors in international relations and environmental engineering.

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