

50 Years After the Moon Landing: Why Europe Should Lead the Next 50

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50 years since the first astronauts stepped foot on the moon, it would be easy to be complacent about human space exploration today. After all, humans have not ventured out of low-earth orbit since 1972. Achievements in space since the Apollo missions have flown under the radar for most of the regular public. However, the world is actually in a very different place now than it was 50 years ago, when the Soviet Union and United States were the sole spacefaring powers. Today, 72 countries have space programs, 14 have launch capability, and six have highly developed space capabilities (China, Europe, India, Japan, the US, and Russia). Space agencies, private commercial entities, international organizations, amateur space enthusiasts, multi-national corporations, and public-private partnerships comprise the diverse landscape of actors involved in space today. The total global space economy is estimated to be well over \$383.5 billion.¹ In particular, the European space industry is one of the largest in the world, and contributes around €53-62 billion to the European economy. Manufacturing is a significant part of this, with European companies producing around one-third of the world's satellites.² Within 10 years, it is expected that there will be a thriving low-earth orbit eco-system, space tourism, a permanent moon base, and shortly thereafter, a manned trip to Mars.³

At the same time, this new phase in space activity is not just confined to the peaceful realm of scientific, commercial, private, and industrial goals. There is a heavily militarized narrative emerging too, and it is rapidly elevating the stakes. The Trump administration is moving forward with plans to create a Space Force as a sixth branch of the US military, India recently exploded a satellite – something China proved it could do 12 years ago – and efforts to create more laws governing activities in space at the United Nations have repeatedly failed. US officials talk about the Space Force in terms of 'allies' versus 'adversaries', and have even publicly promoted the slogan, 'Always

the predator, never the prey', to justify its creation.⁴

Space Force proponents and UN diplomats alike keenly sense impending danger in the form of a space arms-race and describe it as the next battlefield. The term 'Space Race 2.0' is increasingly invoked.⁵ So, are we on the verge of a new Space Race or entering a new Space Age? And what should Europe's role be in the midst of this growing sector of human activity?

Global Commons vs. Battlefield

Despite the ratcheting up of rhetoric surrounding space as a battlefield, it is formally designated as part of the global commons. Immediately after the launch of Sputnik 1, the 1958 UN General Assembly stipulated that, 'it is the common aim that outer space should be used for peaceful purposes only', and that all of the members of the UN wish 'to avoid the extension of present national rivalries into this new field.'⁶ Subsequent to that, the 1967 Outer Space Treaty formalized international space law, designating space as a peaceful domain and banning the placement of nuclear weapons there. The treaty is now recognized as significantly outdated, but since it was signed, certain countries, especially the United States, have been spoilers to new agreements. Part of the problem is that the UN frames debates about space as an issue of arms control, which is highly controversial among states. Thus, there is a lack of progress on the diplomatic front, and discussion of a binding treaty is a non-starter.

Nonetheless, I argue that the many non-state actors involved in space – scientists, astronauts, engineers, and even private entrepreneurs – have played a large role in keeping space a peaceful domain. Simply put, space is not weaponized. Despite the militarized narrative coming from governments, wars cannot be fought in

space, and there are no weapons in space that could target Earth. There are some limited counter-space capabilities, such as the Indian and Chinese anti-satellite attacks from Earth, and it is conceivable that a cyber-attack on a satellite could be orchestrated (although there is almost no evidence of this happening). One could conceive of using satellites for other purposes, such as co-orbital attacks, but the technology does not exist yet.⁷

So far, space has been predominantly about scientific discovery, Earth monitoring, and technological advancement. The militarized narrative has little basis in action. This is where there is an opportunity for Europe to not only become a leader in the science of space, but also contribute to maintaining space as an integral and indispensable part of the global commons.

European Space Capability

From the beginning of the Space Age, Europeans have approached space exploration in a highly cooperative way. In 1958, the same year that NASA came into existence, European scientists proposed the creation of a similar European space organization: the European Space Research Organization (ESRO) and the European Space Vehicle Launcher Development Organization (ELDO).⁸ The initiative was spearheaded by Eduardo Amaldi (Italy) and Pierre Auger (France) who had previously launched the European Nuclear Research Organization (CERN).⁹ Then, on June 24, 1960 a European Study Group convened to discuss what form cooperation might take, and what conditions would be necessary. This led to the more formal European Preparatory Commission for Space Research (COPERS), which established ESRO and ELDO in 1964.

The ten countries involved in ESRO from the start – Belgium, Denmark (a few months after the others), Germany, France, Italy, the Netherlands, Spain, Sweden, Switzerland, and the UK – included many who were not in the European Community, necessitating keeping this new institution outside of the European project. ELDO and ESRO were eventually combined and re-named the European Space Agency (ESA) in 1975, which is today comprised of 22 member states, including non-EU countries Norway and Switzerland. Despite the ESA's continued location outside of EU institutions, all non-ESA EU member states have observer status in the ESA and the EU is the biggest donor to the ESA's budget, which is around €5.72 billion per year.

The ESA has an ambitious program for space which includes human spaceflight (exclusively through the International Space Station – ISS), unmanned exploration missions to other planets and celestial bodies, satellites for Earth observation, and developing launch vehicles (especially for NASA). The ESA is clearly the main institution for Europe when it comes to space, but recently, the EU has started to carve out more of a role for itself.

The 2009 Lisbon Treaty gave the Parliament and Council the power to launch a European Space Program. Following through with this, in April 2019, the Parliament voted overwhelmingly in favor of creating the European Union Agency for the Space Program (EUASP), which builds upon the existing European Global Navigation Satellite Systems Agency (GNSS), and will have its own budget (likely over €16 billion). Through the GNSS and ESA, Europeans own and manage a number of key satellite constellations: Galileo, Copernicus, and EGNOS.

The new EU Agency for Space will have a kind of division of labor with the ESA. ESA will be responsible for development and design of the satellite systems, and research and development into future space activities. The EU agency will manage operations, communications, security accreditation, and make sure that users from a range of industries (automotive, telecommunication, agriculture, consumer, and surveying) benefit from the satellites. It also has a special emphasis in the future on maintaining and developing low-cost launch capabilities. On May 28, 2019, the EU and the European Space Agency met for the first time in 8 years, indicating the increased need to bring EU and European priorities together as space capability increases.¹⁰

What Role for Europe in Space?

Understanding and preparing for Europe's future role in space necessitates looking beyond intra-European cooperation to the emerging global landscape. Naturally, Europe has had a long history of cooperating with the US. Since the late 1960s, NASA has cooperated closely with ESRO and then ESA, albeit with Europe as a junior partner.¹¹ For example, in the 1970s, ESRO countries contributed the lab in Spacelab, while NASA provided the space shuttle, and over the last 20 years, the ESA has been a significant part of the ISS. Today, however, the European contribution to NASA is highly significant. The ESA is providing the heavy-lift launch vehicle (Ariane) for the next manned rocket, the Orion spacecraft, which will be used for multiple launches to the moon and beyond – NASA's new Artemis program. Europe also cooperates extensively with China, such as in terms of astronaut training, Earth observation, and the upcoming ESA-China mission to investigate the sun. With Russia, the ESA cooperates at all levels, even maintaining a permanent headquarters in Moscow. Russian and ESA astronauts regularly serve together on the ISS.

Europeans are uniquely positioned to be a strong space actor in that they have had long experience at working in this sector, are comfortable with pooling of resources, and have not had significant obstacles in relationships with other actors, such as the US-China break.¹² At the same time, Europeans have recognized the growing challenges in space as the landscape of actors becomes more crowded. For example, in 2016, the EU's new Global Strategy

stipulated, 'In space we will promote the autonomy and security of our space-based services and work on principles for responsible space behavior, which could lead to the adoption of an international voluntary code of conduct.'¹³ The Global Strategy explicitly recognizes space as a key area for defense, among other things. The European role in space should be to counteract the increasingly militarized rhetoric, and to prevent the cultivation of sharp divisions between 'allies' and 'adversaries.'

First, even though the tide is turning, the EU and ESA have not yet taken steps to realize Europe's full potential in space. In particular, the EU should include space in its goal to achieve strategic autonomy, specifically so that it can promote a peaceful and cooperative vision for this domain. In terms of human spaceflight, Europeans tend to be overshadowed by American efforts, despite indispensable contributions. The ESA has been relatively less ambitious compared to the US, and has not invested as much as the US on various initiatives like the International Space Station. For example, the ESA only established its Astronaut Centre in 1990. The EU and ESA should realize the tremendous potential in human spaceflight. As the chairman of Boeing said, 'The space program has the biggest technology ripple benefit of anything we invest in today.'¹⁴

Even beyond the potential for new breakthroughs in science and technology, a project such as a manned flight to Mars carries with it tremendous added-value in terms of inspiring new generations of scientists and creating a shared sense of identity. Setting bold and transformational goals, as John F. Kennedy did in 1962 with his famous moon speech (i.e. 'We choose to go to the moon in this decade...'), can both inspire a leap forward in STEM research and bring people together under a common cause. The EU has shown its dedication to funding science (i.e. Horizon 2020 and the European Research Council) so a long-term investment, growing beyond the proposed €16 billion for the 2021-27 EU budget for space research makes sense. Investing in space means advancing the whole economy in terms of science, medicine, climate change, agriculture, technology, and industry.

In the US, governmental support for space research is mercurial, always dependent on the political administration of the day. The single most important thing that scientists and astronauts say that they need in order to achieve the next level of goals in space is consistent support for it. In Europe, the EU-ESA have the potential to carry on with space initiatives over the longer-term, which is a distinct advantage.

Second, the EU should breathe new life into an International Code of Conduct in Outer Space. In 2008, the EU drafted an EU Space Code of Conduct, which Australia, Canada, and Japan endorsed, but not the US, China, Russia, India, and Brazil. It stipulated that states devise, 'policies and procedures to minimize the possibility of accidents...or any form of harmful interference with other

States' right to the peaceful exploration and use of outer space.' Since then the EU has worked with the US and others to put forward an International Space Code of Conduct, but it has thus far not been accepted. There is a dire need for this code, which the EU could spearhead, especially if it seeks input from other countries in advance. To advance this goal, the EU should launch a Space Diplomacy unit or taskforce connected to the External Action Service to support the work of the ESA. This need not be comprised of career diplomats, but could rely on ESA astronauts, space practitioners, ESA spokespeople, or scientists with an interest or knowledge about the peaceful use of space. A Commissioner with a space portfolio could also promote public understanding of the benefits of space within Europe.

Third, in its public diplomacy efforts, the EU should seek to actively weaken the 'space-as-a-battlefield' concept, and instead emphasize space's historic role as part of the global commons. This influence would help to mitigate the 'space forces' of the world. Although the Trump administration is doing the international equivalent of 'swaggering' with its space force plans, China, Russia, and Japan (and possibly India soon) have already quietly set up space forces within their militaries. The EU as the strongest diplomatic and soft-power actor in the world, could push the formal discussion of space back to the global commons rather than a war-fighting domain.

Conclusion

On this 50th anniversary of the moon landing, it is worth recalling the spirit of that endeavor. Despite all of the talk of the Space Race, when Neil Armstrong and Buzz Aldrin stepped foot on the moon it was about an achievement for humanity – 'one small step for [a] man, one giant leap for mankind.' A plaque still sits on the moon, reading, 'Here men from the planet Earth first set foot upon the Moon. July 1969, A.D. We came in peace for all mankind,' along with messages from 73 heads of state, an Apollo 1 mission patch, and medals from two Russia cosmonauts. Space, and its inherent ability to remind us of our common humanity, is worth fighting for, and the EU-ESA can be the leader in achieving this. Through pursuing strategic autonomy in space, Europe can preserve this as a domain for peaceful international cooperation.

Notes

- 1 In 2017, according to The Space Foundation, *The Space Report 2018: The Authoritative Guide to Global Space Activity*, July 2018.
- 2 http://europa.eu/rapid/press-release_MEMO-18-4023_en.htm
- 3 Boeing Company Chairman, President, and Chief Executive Officer Dennis Muilenburg, keynote address, JFK Space Summit, JFK Library, Boston, June 19, 2019.
- 4 Theresa Hitchens, 'Experts Warn Space Force Rhetoric Risks Backfiring', *Breaking Defense*, 28 May 2019.
- 5 For example, Rajeswari Pillai Rajagopalan, 'The global space race, 2.0', *The Washington Post*, 13 Feb 2018; Rahul Sachitanand, 'Space race 2.0: A low-down on the great flight', *Economic Times*, 25 Aug 2018; Alistair Charlton, 'Space Race 2.0: How SpaceX, Virgin Galactic, Blue Origin and more will take us to the stars', *International Business Times*, 11 July 2017.
- 6 1348 (XIII). "Question of the peaceful use of outer space," 792nd plenary meeting, 13 December 1958.
- 7 Brian Weeden and Victoria Samson (eds), *Global Counter-Space Capabilities: An Open Source Assessment*, Washington DC: Secure World Foundation, April 2019.
- 8 European Space Conference Ministerial Conference, "Minutes of the meeting held in Paris on 13th December 1966, CSE/CM (Dec. 66) PV 1 Final, Folder ESC 1, EUI Historical Archives.
- 9 Europe in Space: A survey prepared by the European Space Research Organisation (ESRO), March 1974, EUI Historical Archives.
- 10 <https://spacewatch.global/2019/05/first-eu-esa-space-council-in-eight-years-held-discusses-space-as-enabler/>
- 11 Roger M. Bonnet and Vittorio Manno, *International Cooperation in Space: The Example of the European Space Agency*, Cambridge: Harvard University Press, 1994, p. 75.
- 12 The 2011 Wolf Amendment in the US put heavy restrictions on cooperation with China in space. China's behavior in the space sector, including anti-satellite testing, creation of space debris, and stealing of US science prompted this.
- 13 EU Global Strategy, p. 42
- 14 Muilenburg, JFK Space Summit, June 19, 2019.

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