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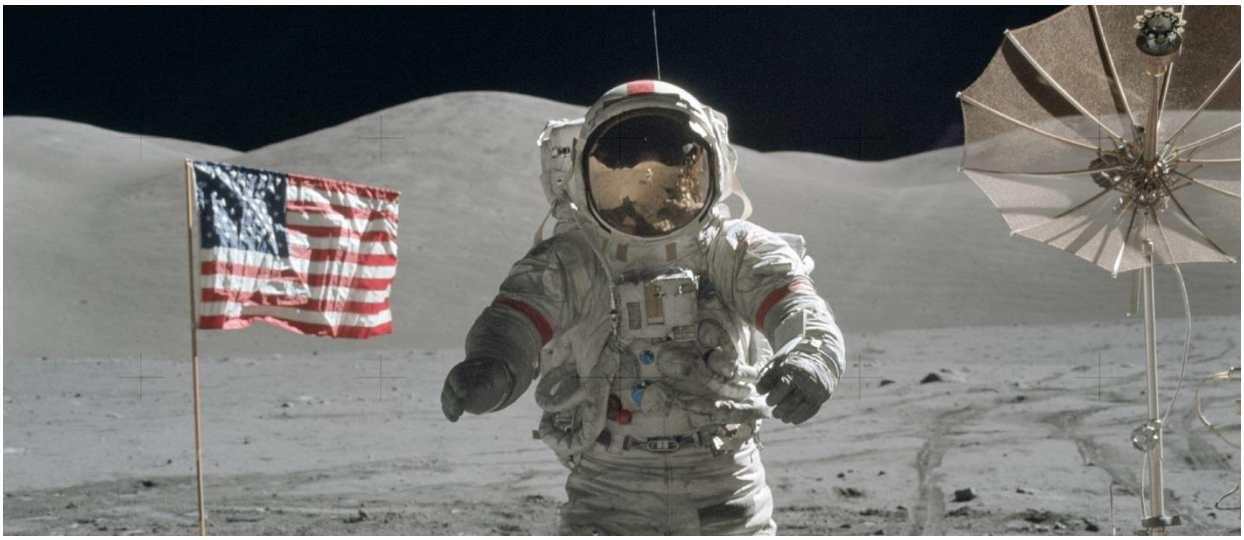

Moon Landing Anniversary

The Future of Meta-Geopolitical Competition in Outer Space

Nayef Al-Rodhan

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On July 20th 1969, the dominoes were lined up for the **first moon landing** in the history of humankind. Impressive new technologies (illustrated by the Saturn V rocket launcher, still the most powerful ever built), an unconditional trust culture within NASA, **political commitment** and justification, and personal motivation of those involved were key components for the success of the mission. With **400,000 people working** on the project, it took the NASA less than two years to go from Apollo 1's deadly fires to 11's moon landing. Speed and refusal of bureaucracy were motivated by the political climate created by the Cold War.

President Kennedy addressed the Nation in one of his most moving speeches in 1962 to inspire public support among all Americans in the face of the Soviets' threatening advancement and achievements in the race for space. NASA funding thus reached an (inflation-adjusted) **47 billion USD per year**, representing roughly 4.5% of the Federal budget. The successful landing on the Sea of Tranquility reflected a **major political and scientific triumph**, not just for the US, but for humanity as a whole. However, as international and domestic challenges have shifted, so has the interest in outer Space, and especially the Moon. **Fifty years on, what have we learnt, and what next?**

Meta-geopolitics, the Seven Capacities of States, and Outer Space

I have previously proposed a "Meta-geopolitical" framework that combines traditional and **new dimensions of geopolitics** in our globalized, connected and interdependent world, thus offering an all-encompassing analysis of the contemporary geopolitical implications for all state activities, including **Outer Space**. The state of space power can be analyzed considering the mentioned Seven State Capacities, namely: *social and health issues, domestic politics, economics, environment, science and human capital, military and security issues, and international diplomacy*.

These dimensions are ever so relevant given that with the end of the Cold War, the **number of actors has multiplied** and the use of space application has exponentially increased, with consequential geopolitical and strategic implications. Non-military and commercial use are just as prominent nowadays, and states have nothing to gain from focusing on military interests alone. As space is characterized by a high level of **instant connectivity and interdependence**, states need to ensure that their capacities in all seven dimensions of power are aligned to achieve desirable National Interest goals, as well as global peace and security. Some priorities are more obvious than others, so what is the strategy when it comes to space power and policy?

Strategic culture Paradigms and their relevance to Cooperation and Competition in Space

In space policy, as well as in policy-making in general, an important aspect needs to be kept in mind, namely Strategic Culture. This **connects culture with national and security interests**. In other words, strategic culture – known as a set of beliefs, perceptions of self and the other, historical baggage and exaggerations, metaphors, symbolisms, and geopolitical vision – is a paradigm of analysis that inevitably influences the **motivations of a state's actions**, and thus is critical to understanding such actions. For example, China's space and military programs are the same entity, exposing a clear strategic hard power use of space, and are marked by the century of humiliation, and resilience. Europe's strategy can be summarized as one of cooperation; as its goal is to pool resources to conduct more ambitious projects. In their historic rivalry with Russia, the United States have had a consistent **strategic culture centered around exceptionalism**, value-driven policies, casualty aversion, and strong leadership. They cooperate with other nations, but retain a position of natural leader, protecting their own interests and setting the rules. The arms of the Russian strategic culture, on the other hand, are largely enhanced by legitimacy and patriotism; as maintaining a martial political culture to **militarize its strategic culture** is a priority. These strategies can be traced back to various historical contexts which crystalize the very essence of the space race.

Historical geopolitical competition in Space: US-USSR

When the Soviet Union successfully launched its first satellite **Sputnik in 1957** and sent the first human

– **Yuri Gagarin** – into orbit in 1961, the United States was facing a humiliating situation. President Eisenhower, who created NASA as a reaction to the Soviet threat, handed the torch to JFK. To quotePresident Kennedy: *"No nation which expects to be the leader of other nations can expect to stay behind in the race for space"*. Trusting his young engineers, who were eager to play a central role

in scientific achievements, JFK launched the Apollo Missions in May 1961 with an initial budget of 531 million USD. Between 1960 and 1963, the number NASA employees increased from 10.000 to 36.000. **Apollo 1 was launched in 1967**, killing all three astronauts aboard in a fire. Unmanned trials followed, until Apollo 7. With the integration of the Saturn V rocket launcher, the command module, and the LEM Lunar module, the Apollo statecraft was now matching, and surpassing anything the Soviets had manufactured thus far. The **competition between the two superpowers** was the political justification they both sought to propel their respective agendas.

Contemporary geopolitical competition in space: counter-space measures and space debris

Even though the willingness to send people to the moon is still part of the rhetoric, states are **increasingly approaching space from a security angle**, with aims of dominance especially given the high relevance of space assets to terrestrial military power. Consequently, the competition in space has largely been focusing on counter-space capabilities. Depriving others of the benefits of superior space capabilities has become a priority.

This increasing **competitive mentality and persistent lack of trust** – even amongst allies such as the U.S. and Europe – is best reflected in the development and use of four different types of glocalization systems. In fact, the US's GPS, the European's GALLILEO, the Russian's GLONAS, and the Chinese's BEIDU are parallel systems that illustrate the state of competition well enough.

There are (thus far) four different types of counter-space measures: *kinetic physical*– predominantly including **anti-satellite weapons** (direct-ascent ASAT), *non-kinetic physical* – such as laser beams, *electronic* – radiofrequency energy to interfere or jam satellite communication, and *cyber* – software and network techniques controlling, interfering, destroying computer systems with satellite connections. These "space weapons" encompass both weapons placed in space and those on Earth capable of targeting space assets, as well as weapons which transit in outer space. While there are intentional threats caused by counter-space activities, there are also dangerous unintentional ones, including **space debris and collision risks**. Most space debris (expired spacecrafts, spent rocket boosters etc.) continue to exist in the Low Earth Orbit (LEO), which includes the International Space Station (ISS). These objects (mostly untraceable given their small size) can travel up to 28,000 km/h. The congestion thus created increases the chances of collisions, highly dangerous for both satellites and the ISS. As we look forward, challenges continue to multiply.

Future challenges: a renewed space race?

Space is either safe for all or for no one.

In fact, outer space is arguably the **last true global commons** and it is crucial that it remains a resource to be used by all for the benefit of humanity. Future challenges in space require solutions based on what I have named the *Multi-Sum Security Principle.* My principle states that: *"In a globalized world, security can no longer be thought of as a zero-sum game involving states alone. Global security, instead, has five dimensions that include human, environmental, national, transnational, and transcultural security, and, therefore, global security and the security of any state or culture cannot be*

achieved without good governance at all levels that guarantees security through justice for all individuals, states, and cultures."

I have also previously suggested " Symbiotic Realism" as the more relevant and sustainable IR paradigmfor Space faring nations. **Symbiotic Realism** is a theory of relations in a globally-anarchic world of instant connectivity and interdependence. It aims to provide a comprehensive framework for understanding the character of relations generated by **four interlocking facets of the global system**: the neurobiological substrates of human nature; global anarchy; instant connectivity; and interdependence. It provides a way of understanding how a myriad of actors, including states, transnational corporations, women, the biosphere, and civilizations, help to shape and are shaped by the global system. It also contains a clear normative commitment to **moving beyond the present limits** of the structure and political organization of the global system towards a more just and peaceful global order.

Cooperative security is thus key as we cannot think of security in a zero-sum game involving states alone. A legal framework of cooperation is pivotal to ensure that deployment and testing in space is regulated, but also to coordinate efforts in space debris de-cluttering (see recommendations by UNOOSA on mitigation strategies). However, the Space Treaty of 1967 remains the basic guideline of international space law. Geopolitical realities are constraining any progress in international rules and regulations. This introduces an **ongoing tendency to militarize space**, to develop technologies to counter attacks (i.e. China's quantum computer satellites) or to further explore outer space as **an isolated national strategy** (i.e. use of AI for deep space exploration). The current legal framework is outdated, and insufficient to regulate competitive situations which now also include private companies. **The space race is renewed as new actors have emerged** and **commercial companies**, like SpaceX, Blue Origin, Bigellow, and others are now on the forefront of space activities. SpaceX has been mandated by NASA to carry cargo to the ISS with the Falcon 9 rockets and plans to use these rockets and the Crew Drago vehicle to ferry astronauts back and forth. Though **geopolitical and economic competition in space will not stop here**; American, and most recently French, leaders have ordered the creation of military space forces.

The new Artemis program is progressing with the aim of **placing humanity on the Moon by 2024**, this time to stay. There are also plans in the works to get humans to Mars by 2035. Deep space exploration will also continue, and the relevance of **very sophisticated Artificial Intelligence** will be required as we seek more knowledge about our Universe, and while we seek resources, and search possible habitable exo-planets.

Outer space endeavors are risky, expensive, and will require **significant international cooperation by state and non-state actors**. The task is too vast and too important for narrow terrestrial national interest concerns. With the expansion of economic space activities farther from the Earth, which will be the trend in the 2020s and 2030s and beyond, the risk of extending also the **weaponization of space** to the Moon region and beyond is becoming very real.

Under these circumstances – and given that outer space is *congested*, *contested* and *competitive*, the global community must act in a **spirit of collaboration and non-conflictual competition**, and be bound by one fundamental principle: *if space becomes critically unsafe, it will not be selectively unsafe, but rather unsafe for all.*