

Astrophysicist Simonetta Di Pippo is the Director of UNOOSA.  
Dmitry Rogozin is the Director of Russian Space Agency Roscosmos.  
In this joint interview, they discuss the significance of the 60<sup>th</sup> anniversary of human spaceflight, and what the future of space exploration and governance may hold.



**The astounding achievement of Yuri Gagarin 60 years ago set the foundation of crewed spaceflight for all humanity. Looking back, how did this feat change not only space exploration but society as a whole?**

**Simonetta Di Pippo:** Gagarin's first words from space "I feel well" made us understand that humans could truly go beyond our Earth, an achievement that humanity has dreamt about for millennia and that was finally ours. That day, people all over the world marvelled at how far our species had come. His exploits, and the achievements of those who have followed him, inspire everyone to dream big, driving generations of talent to scientific fields and helping humanity advance both in space and on Earth.

**Dmitry Rogozin:** Undoubtedly, the flight of Yuri Gagarin is a landmark event of the twentieth century, one of those that set the most important directions for human development for the next millennium.

Interest in space is one of the basic characteristics of human civilization. Generations of people in different countries spent centuries thinking, working, accumulating knowledge and engineering advances to overcome gravity in order to go to space. Gagarin's flight crowned this work of many generations of the best and smartest people on the planet. Moreover, this happened only 16 years after the end of the Second World War, which for the most part took place on the territory of our country. This war claimed 27 million lives and caused enormous economic damage, equal to the annual GNP of the United States at that time.

And this flight, which took place despite the most unfavourable circumstances, is a source of enduring national pride for our citizens.

Currently, the number of people who have been in space is approaching 600. Many of them participated as part of international crews. Several of them, such as cosmonaut Alexei Leonov and astronaut Thomas Stafford, the crew commanders of the Soviet-American Soyuz-Apollo project, became friends for life. In space, some kind of cosmic brotherhood can emerge among people who rise above political divisions on Earth.

Do you remember the words of Gagarin after his flight? He said: "Orbiting Earth in the spaceship, I saw how beautiful our planet is. People, let us preserve and increase this beauty, not destroy it!". Therefore, we can say that space exploration is one of the factors that bring people together and overcome political contradictions.

**Human spaceflight is an enthralling and inspirational endeavour, but it is also extremely difficult and complex. What are some of the 'must-have' qualities and skills that astronauts need in order to succeed in the selection process and eventually fly to space?**

**Simonetta Di Pippo:** Over the course of my career, I have had the privilege to lead in the selection process for astronauts. This unique career attracts some of the best talents on our planet and is extremely competitive, with thousands of applications to start with. It also gets extremely difficult for the panel at the end, when we are often left with several stellar options who have passed a multitude of tests but need to pick just one or two. Astronauts need to have many characteristics: be great leaders, but also team players; have emotional intelligence, and able to stay cool under pressure; have the discipline to follow protocol but also the creativity to come up with solutions on the spot. Let us also not forget that astronauts must be willing to make enormous sacrifices in terms of risk and being separated from their loved ones for long periods of time. This astonishing combination of qualities makes our "ambassadors to space" truly exceptional.

**Dmitry Rogozin:** For the first space flights, both in our country and in the United States, the cosmonauts and astronauts selected were mostly military pilots. Among other things, this was due to very stringent health requirements. Then, as the years passed, scientists and researchers began to participate in space flights. And today, there have even been a few space tourists. Even the brilliant British singer Sarah Brightman intended to visit the International Space Station (ISS) on the Soyuz spacecraft. But, unfortunately, her flight did not take place.

Recently, we were approached by a successful production film studio with a proposal to shoot part of their adventure film in space, on the ISS. We decided that we could help them, given that a number of our planned scientific tasks would be carried out at the same time, so we are now preparing this expedition. The Cosmonaut Training Center is training several actresses, one of whom will become a participant in this unique film project.

This example shows that the range of professions involved in space keeps expanding annually. The absolute requirements for all of them are health, discipline and sociability.

**Space exploration has served as a role model for international cooperation, with the International Space Station (ISS) as the crown jewel of joint efforts. How can we sustain international cooperation in space for the decades to come, particularly considering the rapidly expanding volume of space activities?**

**Simonetta Di Pippo:** The boom we are witnessing in space activities is good news for humanity. It will accelerate innovation that will benefit life on Earth. However, it is also compounding issues that can only be solved through international cooperation, such as the accumulation of space debris and the need to maintain the use of space for peaceful purposes.

By participating in the Committee on the Peaceful Uses of Outer Space (COPUOS), the UN intergovernmental committee dealing with all aspects of space governance, all countries can make their voice heard in global space diplomacy. In space, we are truly one species, working to solve common problems, and we need appropriate platforms to take the necessary decisions. The extraordinary example of astronauts and cosmonauts on the ISS, working together to achieve unique leaps forward in science, inspire us all to do better in working together to tackle common challenges.

**Dmitry Rogozin:** Of course, the ISS is unique: it is technically the most complex, and probably the most expensive project in human history. More than 240 astronauts from 19 countries from all continents have been on board. This is certainly a positive experience of broad international cooperation. The station has been permanently inhabited for more than 20 years. Together with our American colleagues, we have extended its period of service to 2024. Actually, it is a pity to say “farewell” to it. Perhaps we can think of some ways to extend it, for example, by gradually replacing outdated modules with new ones. This is a subject we are discussing with our ISS partners.

**Over the past 60 years, space endeavours went from being perceived as something exclusive, only for a handful of nations, to something we inherently need to improve the well-being of people everywhere and to protect our Earth from challenges such as climate change. How did this shift happen and how do you see it continuing?**

**Simonetta Di Pippo:** There is increased awareness worldwide about the importance of space. Space technology is not only for understanding our universe, but also to help us face challenges here on Earth, and governments have been taking note of their potential. Earth Observation, GNSS and SatComs can support sectors ranging from agriculture to water management, sustainable cities, clean energy production and transportation. The negative effects of climate change, such as increased vulnerability to disasters, have also turned the attention of policymakers to space for

monitoring capabilities and the ability to provide trusted, verified data on socio-economic developments.

The level of political investment in space is also increasing. COPUOS started with just 18 Member States in 1959, and now has 95 Member States and 42 Observer Organisations. This is nearly a 25% increase in the last 5 years alone.

I see this trend continuing. As increased investments and participation in space drive scientific advancements, barriers to access the sector continue to lower.

**Dmitry Rogozin:** Space activities are certainly playing a role in globalization. We have easily become accustomed to relying on space applications, and now people on all continents, in all countries, in almost all professional areas, from agriculture to maritime transportation, make use of their potential.

Nowadays, it is hardly surprising that people separated by mountains and oceans can easily talk, and even see each other. There are many benefits from space activities, but there should be no place for segregation in space, so that all countries can benefit equally.

**Space is becoming more congested, with the number of objects launched in outer space increasing exponentially and more and more actors, not only governmental, taking part in space activities. How can we ensure the sustainability of space activities going forward?**

**Simonetta Di Pippo:** As stated by the United Nations General Assembly in 2019, space debris is a concern of all nations. The problem is reaching massive proportions: as of 1 January 2021, around 3,372 working satellite share the orbits around Earth – which is not an infinite space - with at least 8,800 tonnes of space debris. Orbiting at high speed, these objects can damage or destroy any spacecraft that crosses their path.

No country can address this problem alone: we need strengthened international cooperation and a new model of space governance based on consensus among countries, common rules and standards. In 2019, COPUOS member states came together to adopt a preamble and 21 Guidelines for the Long-Term Sustainability of Outer Space Activities. They were welcomed with appreciation by the United Nations General Assembly, and are an important expression of global commitment to responsible and sustainable space activities.

The actions of any one stakeholder in space impact all others. We need to uphold the highest standards of conduct and navigate the changes ahead in the space sector by putting the collective interest first.

At UNOOSA, we are working everyday with the past, present and future of international space law, and we look forward to continue working with the space community to deliver effective multilateral policy making. In my capacity as Senior Advisor to the Secretary-General on Space Affairs, it is my honour to lead the UN's efforts in this regard. The global space sector is developing rapidly. We have much work to do.

**Dmitry Rogozin:** There was a time when navigation was the privilege of the elite. But, over time, the old sea powers had to make room and share their skills and technologies with newcomers. And, while earlier in history, seas and oceans separated the continents and the nations inhabiting them, now they connect them. And maritime navigation is largely problem-free and not a source of a conflict. There are, of course, exceptions, and in some water areas there are still remains of outdated practices such as piracy. But there is a kind of consensus among the maritime nations regarding the rules of maritime peace.

It is much the same with outer space. We cannot, and should not, limit the number of members of the space club. And we are ready to provide assistance and, of course, help those who want to engage in space activities for the peaceful development and preservation of the ecological balance on Earth.

But the more participants engage in space activities, the more urgent the task of forming a system of space law becomes.

The foundations for it have already been laid. There are already a number of international treaties and conventions related to the prohibition of nuclear tests in space, policies for the exploration and use of outer space, the rescue of astronauts, the registration of spacecraft, etc. But it should be noted that most of these agreements were concluded in the 1960-70s, and ought to be updated. The space economy will grow rapidly this decade, the number of participants in space activities will multiply, and we need to improve the system of space law and regulation of space traffic. The role of UNOOSA in this matter cannot be overemphasized.

**UNOOSA and Roscosmos have a strong cooperation in place, including to spread awareness about the benefits of space exploration. How do you see this cooperation evolving going forward?**

**Simonetta Di Pippo:** The Russian Federation has an illustrious tradition in the space sector. This country started the unique adventure of human spaceflight with Yuri Gagarin, and made fundamental contributions to space science and innovation over the past decades.

At UNOOSA, we believe in advancing cooperation between established space nations and countries in the process of developing space capabilities. This is how we can expand access to the benefits of space for all. We already have such a cooperation with a Russian partner: together with the Keldysh Institute of the Russian Academy of Sciences, we have created an opportunity, named [ISONscope, for institutions in developing countries to acquire a small telescope and training to operate it](#), to give talent all over the world the chance to contribute to astronomical observation. The opportunity is part of UNOOSA's [Access to Space for All Initiative](#) to bridge the gap among countries in their capacity to benefit from space, which relies on essential partnerships such as this one. In the future, we are keen to continue to expand our collaboration with Russia even more, to leverage its exceptional knowledge and capabilities in the space sector for the common good.

The Russian Federation is also well represented in the permanent space exhibition that UNOOSA maintains in the UN Headquarters in Vienna: following his historic journey, Yuri Gagarin and the first woman in space, Valentina Tereshkova, visited the United Nations Headquarters in 1963 and signed the UNOOSA visitor's book, which is displayed in the exhibition together with a bust statue of Gagarin. The bust of Gagarin was presented to the Office during the exhibition held in 2011 on the occasion of the 50th anniversary of Gagarin's historic spaceflight.

In June, I also look forward to being in the Russian Federation again to attend the Global Space Exploration Conference (GLEX) 2021 in St. Petersburg and participate in a set of institutional meetings in Moscow. Since 2018, I have had no other opportunities to meet with our colleagues from the Russian Federation in their home country, also due to the pandemic, which obliged the organizers to postpone GLEX by one year. This will be a great opportunity to explore how we can take the UN/Russian Federation cooperation on space to the next level.

**Dmitry Rogozin:** The State Corporation Roscosmos and UNOOSA have long-standing warm relations. Our permanent delegation regularly participates in the work of COPUOS and its Scientific, Technical and Legal Subcommittees, as well as in inter-sessional events.

In September 2018, we hosted the first UN Conference on Space Law and Space Policy, organised by UNOOSA, in Moscow. At the event, representatives from more than 80 countries discussed legal aspects of current issues in the peaceful use of outer space. The main participants in space activities do have different approaches to a number of issues. But that is why the nations have united in an organization to seek mutual understanding and support the creation of working legal mechanisms. The problems are really common to all of humanity, and, if not solved today, in the near future they



can pose great threats on a planetary scale. We need to think seriously about the safety of space operations, about the legal regulation of space traffic management, research, development and use of space resources, eliminating space debris, etc.

The State Corporation Roscosmos, together with the Russian Foreign Ministry, has developed a concept for the creation of a Eurasian Space Educational Center in Russia under the auspices of the United Nations. The establishment of such a center in the context of the worldwide expansion of space activities and the increasing number of participants in the space club was recognized as relevant and timely. I believe that, despite the peculiarities of national space education systems, we need some unified programs that could help specialists from different countries develop common understanding of tasks and common responsibilities, use a single conceptual framework and speak the same language related to space exploration. We are pleased that our initiative was heard and now our cooperation will increase.

**Human spaceflight is the ultimate achievement in space exploration and has inspired countless individuals all over the world to dream big and strive to reach ambitious goals. How can it continue to inspire generations to come, especially in light of future goals such as returning to the Moon and landing humans on Mars?**

**Simonetta Di Pippo:** In the past, human spaceflight has been the preserve of a few countries and has been mostly a male-dominated field. The inclusion and contribution of talent from all countries, from women, from minorities and people with disabilities, will be essential for space to continue to be an inspirational field in the 21st century. Inclusiveness will bring us to the next level in space exploration and equip us with the abilities we need to fully leverage its potential, both for development here on Earth and for the future of our species, which will maybe include chapters beyond Earth. If missions to send humans beyond our planet, and maybe one day beyond our galaxy, are to succeed, we need the best that humanity has to offer, without glass ceilings, to make the best use of all the talents we have. The space sector is an accelerator of knowledge and of STEM education. Without space activities, we cannot even survive on Earth, let alone beyond.

**Dmitry Rogozin:** There is always some movement in space. And these processes cannot be ignored by researchers. Humans are made to be inquisitive, the Creator gave us the ability to see, to hear, to think, to put and to solve problems, to analyse, to compare and to draw conclusions. These conclusions are not always unequivocal. Space is complex enough that we cannot describe its nature in a short and unambiguous way.

In one of his novels, Dostoyevsky ironically described his characters as "the Russian boys" - eternally doubting established meanings: «Give them a map of the starry sky they had no idea about, and, in the morning, they will return it amended».

However, doubts and continuous search are not exclusively entitled to my compatriots. Dostoyevsky was actually echoed by Stephen Hawking, who noted that "Progress is not about replacing the wrong theory with the correct one but replacing it with a wrong, but refined theory".

Curiosity and the passion to learn are inherent human traits. And issues such as "cosmos", "time and space", "the origin of life itself" - will always fascinate people with their mystery and irrationality. Tasks such as the return of humans to the Moon and a human mission to Mars are quests that can involve multiple generations. I am not ruling out the possibility that there may be an inhabitable lunar base, and people could perform a direct and return space flight to Mars. Modern engineering advances and technical capabilities may allow us to achieve these goals in the future. And, if so, there will always be skilled craftsmen to build such a ship, brave heroes to venture on this reckless flight, and kind people to invest in this whole thing. There exists no such force in the world which could suppress the passion of mankind to overcome difficulties.