

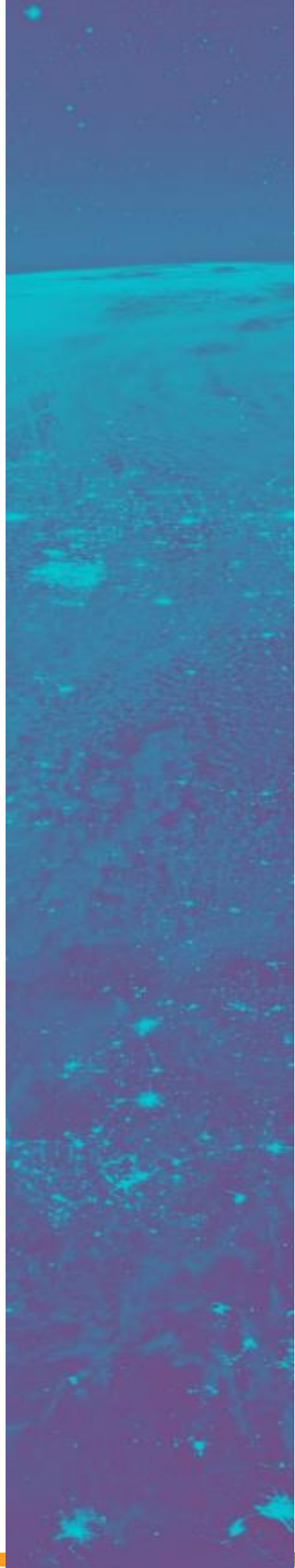
THE **SPACE ECONOMY** INITIATIVE

How to Scale-Up **Insights Report**

July 24, 2020



UNITED NATIONS
Office for Outer Space Affairs



INTRODUCING THE **SPACE ECONOMY**

The level of political and economic capital being invested in space is higher than ever. Estimates indicate the global space economy grew to \$ 414,75 billion in 2018. Space and satellite technology are pillars of modern society. They provide policymakers with invaluable data and information, helping make effective fact-based decisions across a range of policy areas – from urbanisation to national crisis response, with the COVID-19 pandemic being the most recent example of ‘space-enabled’ policy decisions being made at scale.

Expanding the global space economy, responsibly and sustainably, is a fundamental driver behind efforts to bring the benefits of space to everyone, everywhere. Further, these developments can support countries in efforts to ‘build back better’ using space services to face policy challenges, while contributing to innovation, job and revenue creation.

Around the world, many space activities at the national level include a role for a publicly funded ‘space agency’ or similar institution. This central public entity is often also part of a much broader stakeholder ecosystem including both private and other public sector entities, all contributing to the national space sector. Moreover, to truly identify and realise the socio-economic benefits of a strong space sector, we must look beyond just the immediate context; from agriculture to finance, from education to transport, space is making tangible contributions across a huge range of fields.

At the United Nations Office for Outer Space Affairs (UNOOSA), ‘Space Economy’ is a concept that captures, in the broadest sense, the role space is playing to support sustainable socio-economic development. Unpacking such a complex picture is what we aim to achieve with the Space Economy Initiative. We seek to spotlight insights, success stories and experiences from across the international space community. We want to identify the key elements of growing healthy, prosperous space economies and then share such building blocks with all stakeholders pursuing responsible and sustainable space economy growth.

THE WEBINAR SERIES

To unpack how different countries are strengthening their respective space sectors UNOOSA has established a webinar ‘space economy’ series to bring together space economy experts from across the international space community.

The sessions are designed to tackle this complex subject by focussing on some of the more fundamental elements of a healthy space economy. For example, we will provide a platform to share insights from commercial space entities on how to go from the ‘start-up’ phase to being well-established. Further, we will look at financing space activities, exploring success stories on how mixed public-private funding models are helping space economies thrive. The series will touch upon the nexus between government, industry and academia, and how to leverage this nexus to maximise innovation and growth in the space economy. We will also look at what this all means outside the immediate domestic context and the link between growing space economies at the national level and supporting responsible and sustainable space activities at the international level.

All these considerations will be taken in the context of the current developments with regards to how space economy can play a key role in supporting socio-economic development, as countries build-back-better in response to the COVID-19 crisis.

The series is composed of topic-specific sessions, touching upon the elements below:

- **Introducing ‘Space Economy’**
- **Making the Case for Space:** building the policy case, public support and initial investment.
- **Scaling-Up: Success stories from the scale-up to established phase.**
- **Access to finance:** building a sustainable financial system for space
- **International cooperation to grow responsible and sustainable space activities:** bringing the international normative framework into the domestic context.
- **Innovation and growth in the Space ecosystem:** the nexus between government, industry and universities.
- **Using space to building back better:** supporting countries post-COVID 19 recoveries.

During the series UNOOSA collates the experiences being shared by experts, to build insights of ‘what works’ with regards to building strong, responsible and sustainable space economies.

These success stories will play a key role towards publishing a set of ‘building blocks’ that can be used as a reference point in support of further growth in the global space economy and how this growth can help bring the benefits of space to everyone, everywhere. The following section includes the summary reports of each webinar, with “Introducing Space Economy” being the first one

INSIGHTS REPORT

HOW TO SCALE-UP

This insights report captures the remarks and experiences shared during our third webinar session with space economy experts. Building on the previous webinars, we addressed one of the key building blocks for healthy space economies identified in the kickoff webinar - How to Scale-Up: from the startup to the established phase.

In this session, we heard about initiatives to provide support to startups to scale-up and listened to success stories of startups that got off the ground.

Experts from the European Commission, the Swiss initiative 'Space for Impact' and startup companies such as MzansiSat, a South Africa-based satellite operator, and Dipteron, a Brazilian/German enterprise specialized to develop an application to detect mosquito risk areas, shared insights on their work and experience.

The recording of the webinar is available on oosa.org and can be viewed [here](#).

SPEAKERS

INSIGHTS

Space Economy experts from across the international space sector were each given time for remarks on their personal experiences working in the field before switching into a moderated discussion to dig deeper into the topics and insights that had been shared.

- *Ms Jolanda van Eijndhoven, **European Commission***
- *Mr Victor Stephanopoli, **MzansiSat***
- *Ms Ana Cristina Galhego Rosa, **Dipteron***
- *Mr Gaetan Petit, **Space for Impact Initiative***

Jolanda van Eijndthoven

European Commission

Ms Jolanda van Eijndthoven is Deputy Head of Unit at the Directorate-General Defence Industry and Space. She joined the European Commission in 2002, after having worked for the Dutch Ministry of Finance advising on EU law in the area of taxation. Since joining the DG Defence, Industry and Space Unit in 2018, Jolanda initially dealt with legal and institutional aspects of Galileo/GNOS and more recently works in the Space Policy Unit.

She has an academic background in Law, with a Master's from KU Leuven, Belgium in Energy and Environment Law and a Master's degree in Law from the University of Leiden, the Netherlands.

Ms Van Eijndthoven highlighted the Galileo and Copernicus Masters, the two major innovation competitions for Satellite Navigation and Earth observation, run by the European Commission together with European Global Navigation Satellite Systems Agency and European Space Agency. The objective of these programmes is to scout for the most innovative navigation and earth observation application. Through the feedback collected from the companies which were awarded the masters, it emerged that some of the companies still had difficulties in putting the startups on the market. Besides, input from EU space-based SMEs highlighted that such companies have a rejection rate of 14% when applying for loans from banks compared to 8% of other companies

This information triggered the European Commission to develop a new Space Entrepreneurship Initiative called CASSINI, which is intended to foster entrepreneurship in the sector. The initiative aims to expand the number of space startups in the EU and increase their chances to succeed, accelerate and secure growth, and scale-up.

Looking at the lifecycle of a startup, CASSINI is intended to focus on the generation of ideas, development of a minimum viable product, and market testing, but will also have spillover effects on the growth and finance phases as well.

CASSINI tackles the following issues that space-based startups identified as hurdles they were facing: lack of awareness and limited access in financial communities for getting the necessary financing.

The initiative further aims at streamlining existing support initiatives for innovation and startups, and create a coherent and long-term structured and scalable public support mechanisms. Some of the problems identified are the lack of awareness about potential EU space technology, high technology and market risks of ventures, and limited awareness in financial communities of the potential.

CASSINI is intended to cover the whole space value chain, from upstream suppliers and manufacturers to downstream applications. It gives access to all types of funding, public and private, grants, equity, debts and links it with existing mechanisms and instruments such as the ones offered by the European Investment Bank.

It was also highlighted that the initiative is structured in a way so that all member states can benefit from it, whether or not they have a traditional space industry.

Ms Van Eijndthoven also presented another initiative that the European Commission has set up to assist startups. ESCALAR, which is a broader initiative and does not only focus on space activities, supports venture capital and growth financing for companies, helping them scale up. This initiative comes at a bit of a later phase for startups and is a good successor to CASSINI. It enables venture capital funds to increase investments by financing through, for instance, the European Investment Bank and European Fund for Strategic Investment.

*Jolanda's insights starts at min. 4:00
and can be viewed on the session recording, uploaded to UNOOSA's YouTube channel [here](#).*

Victor Stephanopoli

MzansiSat

Mr Staphanopoli is Chief Operating Officer (COO) of MzansiSat, a South African space company aiming to be the first private prospective satellite operator. Their aim, working with government and the private sector, is to provide internet connectivity anywhere inside South Africa by 2025. The company is a fully South African operation, supported by European Regulatory resources and market intelligence.

As COO, Victor engages in planning and executing rollout of commercial Satellite Internet Service at the national level. Such activities are driven by the creation of relevant product and service portfolio based on current and projected capacities, maintaining and creating strong relationships with industry, customers and regulators, plus driving the Infrastructure-as-a-Service agenda.

Mr Stephanopoli presented MzansiSat, which is a project company that aims to design and build South Africa's first privately owned and operated telecoms satellite.

The company started in 2014 and is currently building satellite infrastructure and service capabilities intending to connect everyone in communities in South Africa with super-fast broadband.

The first step of the company was to assess the needs of their customers versus their wants. Mr Stephanopoli emphasized the importance of an entrepreneur to find overlap between those two areas.

43% of inhabitants in South Africa do not have an internet connection and MzansiSat wants to reconcile the countries, ensuring connection across the entire country.

MzansiSat aims to build an ecosystem where people can actively contribute and model their systems on top of the satellite infrastructure that MzansiSat provides. Mr Stephanopoli described the role of

the company as analogous to building the rails of a railroad, and others come later to add the trains and service.

In the space sector, South Africa currently does not have the market maturity of some other markets so MzansiSat is aiming to first build a foundation for telecoms and a foundation for rural 5G.

The company aims to reconcile technological innovation with the true needs of the populations in the areas they will serve.

*Victor's insights start at min. 11:58
and can be viewed on the session recording, uploaded to UNOOSA's YouTube channel [here](#).*

Ana Cristina Galhego Rosa

Dipteron UG

Ms Galhego Rosa is founder and CEO of DIPTERON UG, a company that delivers services to detect Aedes mosquito risk areas based on artificial intelligence that combines satellite data and ground data. The service informs the risk areas of Aedes breeding sites which allows policy makers taking mitigation actions against Dengue, Zika and Chikungunya outbreaks especially in tropical and subtropical areas of the world.

Ana Cristina holds postgraduate degree in international law and international trade law at Lisbon University, Portugal, a master advance degree in air and space law at Leiden University, the Netherlands, and attended the Space Studies Program of the International Space University. Since 2008, she has served as legal adviser of the Brazilian delegation during the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS).

Ana Cristina is a member of the Brazilian Association of Air and Space Law, the International Institute of Space Law, and the Women in Aerospace-Europe.

Ms Galhego Rosa introduced DIPTERON UG, a start-up, formed in 2018, specialized to develop an application for detecting Aedes mosquito risk areas based on artificial intelligence that combines satellite data and ground data.

DIPTERON's vision is to create a better environment by minimizing mosquito diseases around the globe and to make it possible DIPTERON application can provide enough information on the control of mosquito diseases and the information about risky areas.

The project started in 2015 and after winning 3 competitions, it incubated at the European Space Agency and became a company in 2018.

The company has two strategic partners: VISIONA, a Brazilian Space company, specialized on the design and development of satellite applications, and HOSTmi, a German company incubated at European Space Agency which builds and operates digital platforms in the space sector.

Ms Galhego Rosa gave remarks on what entrepreneurs need to think about when setting up a space company.

1. Market Segmentation Analysis: assess opportunities in the ground services, satellite services application, and the launch vehicle industry.
2. Legal challenges and insurance: governments regulate the transfer of any technology, commodity, software or information that is strategically important to national security and because of this each country has its export control regimes. Entrepreneurs need to be aware of international and national space laws and norms, ITU regulations and also consider intellectual property and insurance.
3. Project: develop an idea, build a team, prepare a business model and business plan.
4. Fundraising: research and find different kinds of financing including investment rounds, grants, innovation calls, startup loans, and incubation programs.

Ms Galhego Rosa shared further insight and mentioned other crucial aspects drawn from her personal experience:

- Team: Equity and vesting agreement is the most important condition for a new company. As there is a lack of resources at the beginning, this guarantees the rights for all members of the team, avoiding misunderstanding. This is also true for co-founder agreements. Companies forget about this “minor“ detail. The communication between the founders needs to be clear and specific.
- Competition: Participation in competitions is important. Success in competitions can help to get grants, etc. They are going to bring at least very good networking. And if the competition is won, the startup can get money and a stamp for the project besides visibility.
- Incubation Program is important to grow. It is advantageous because of the opportunities for mentorship, funding calls, and access to networking. It is important to pay attention to the country chosen to establish the startup. Ms Galhego Rosa strategically chose Germany to incubate because of the localization of potential partners.
- Marketing: have a Strategic Partnership and to make use of the Public Relation strategy. Make your company visible, attending space events and let people know about your product.
- Financing: make your company develop and running and ranted in some competition and went for startup credit loan

Ms Galhego Rosa finally mentioned the challenges she met during her path, which were the lack of resources; dealing with the technical environment (as a lawyer); to be constantly multitasking; and moving to a new country (Germany, where her potential partners were located).

Ana Cristina's slides are available [here](#).

Her insights start at 18:38 min in the recording [here](#).

Gaetan Petit

Space4Impact

Mr Petit is Co-Founder and Project Manager at Space4Impact, an initiative to foster economic growth of space sector activities that are in alignment with the UN Sustainable Development Goals. The main objectives of this initiative are: to promote space technology & startups that help to achieve the UN SDGs and foster the economic growth of the space sector; to bring political & financial actors together to raise awareness and trigger opportunities, and engage the private sector to invest in new ventures and support early-stage companies.

Gaetan academic background is in engineering having graduated from EPF Lausanne in 2013. After one year of research on sleep mechanisms' neuroanatomy at Harvard Medical School, he completed a PhD on human sleep modulation at ETH Zurich. Gaetan has subsequently worked at ESA, including for the Advanced Concepts Team at the European space agency as a Neuroscientist before joining the Swiss Space Center in 2019.

Mr Petit presented Space4Impact, an initiative to promote space technologies linked to the SDGs and run with the ESA business incubator in Switzerland.

The project aims at boosting a space ecosystem and to address the lack of communication that often occurs in space companies among customers, entrepreneurs, investors and bankers, policymakers and other stakeholders. Space4Impact intends to better connect them to foster space companies that do work in line with the SDGs, to help companies find the right investors and customers also outside space sectors.

Space4Impact started with the “PROMOTE & CONNECT“ phases which were intended to bring diverse stakeholders together. These phases included raising awareness of new space companies and technologies and doing a startup competition, to help startup entering new markets. The intent of these early phases was also to connect ideas and to show corporations how their needs could be answered with space technologies.

Mr Petit also presented examples of New Space companies from Space4Impact ecosystem:

- Astrocast aims to build-up a constellation of CubeSats to deliver IoT globally. It has engaged with a maritime company to connect hardware in seas and also worked on infrastructure monitoring to connect infrastructures in remote areas.
- INVOLI aims to increase traffic management awareness through safe integration of drones in the airspace. They have a project with the World Bank to help the airport in Tanzania with traffic management, and with a Swiss telecommunication provider to install air traffic receivers.
- WeGaw provides snow/ water monitoring for flood/rapid melt early diagnosis and water management. WeGaw does this monitoring almost in real-time and is working with a Spanish and a Canadian company.
- Dotphoton supports companies using EO data by reducing the weight of images without losing quality. It works also in the medical field and with microscope companies.
- Picterra is an AI-powered platform that makes geospatial imagery analysis easy and cost-effective and has been recently working on monitoring deforestation.

Gaetan's slides are available [here](#).

His insights start at 33:10 min in the recording [here](#).

CONCLUSIONS and NEXT STEPS

Speakers provided information about scale-up opportunities for space startups and shared insight and first-hand experience in setting up space entities.

We heard about the programmes available at EU level for space entities, mainly by looking at CASSINI, the European Commission's new Space Entrepreneurship Initiative. As we go-ahead to build sustainable space economies, more programmes are designed and implemented to foster entrepreneurship in the space sector. Among them, CASSINI aims to expand the number of space startups and increase their chances to succeed and scale-up. We also looked into Space4Impact, another initiative aiming at supporting startups, with the aim of better connecting space stakeholders to foster space companies that do work in line with the SDGs.

Looking instead at startups, we benefited from the experience of MzansiSat and Dipteron. Having a clear vision about what the company wants to offer is a pre-conditions for each startup. While connecting everyone in communities in South Africa is MzansiSat's objective, one of the key elements of their strategy was to find an overlap between the needs of their customers versus their wants. DIPTERON's experience instead gave a full overview of what prospective companies need to focus on to start, mainly market segmentation analysis, legal challenges, project, and fundraising are crucial elements.

What advice did our expert give to new space entrepreneurs?

Find a niche and focus on the application of the space technology, not just on the space technology itself, but ensure that potential customers fully understand what the company is offering them and what the value of the product is. Looking for incubation programmes is also very valuable because it allows to connect with similar stakeholders and activities, and to promote the product. Coaching and getting support and advice from established companies is another important element to make a startup grow, together with looking at what exists and best practices in other countries.

Lastly, secure funding is a crucial element and the greatest challenge that space entities face. An element that emerged in our previous sessions and widely known as a necessary but difficult step, Access to Finance will be the topic of our next session on 5 August. We will focus on how to build sustainable financial systems for the space economy and how to attract resources necessary to get a startup off the ground.

THANK YOU

The webinar was made possible with time, support and expertise of our speakers; Jolanda van Eijndthoven, Victor Stephanopoli, Ana Cristina Rosa Galhego and Petit Gaetan.

Thank you to all UNOOSA colleagues who supported the webinar's delivery, including Julia Milton for her assistance in drafting this report.

Moving forward, the Space Economy Initiative aims to support healthy space economies in both theory and practice. For an initiative funded entirely by voluntary contributions, donor support is crucial to realising this vision. Should you be interested in contributing to this work to build responsible and dynamic space economies that accelerate sustainable socio-economic development, please get in touch with Ian Freeman at ian.freeman@un.org or Veronica Cesco at veronica.cesco@un.org.