MALTA NATIONAL SPACE **STRATEGY**

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Xjenza
The Malta Council for Science & Technology

GOVERNMENT OF MALTA

MINISTRY FOR EDUCATION, SPORT, YOUTH, RESEARCH AND INNOVATION

PARLIAMENTARY SECRETARIAT FOR YOUTH, RESEARCH AND INNOVATION

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FOREWORD

HON. KEITH AZZOPARDI TANTI MP

PARLIAMENTARY SECRETARY FOR RESEARCH, INNOVATION AND YOUTH

Today, the space ecosystem plays a fundamental role in our everyday lives. Many of the services we use, particularly with respect to communication, observation and navigation rely on data derived from space.

In recognising its significance, governments across the globe have stepped up their efforts to further understand how space research and technology can improve the lives of their citizens. Malta also recognises the potential of space and is committed to support the development of space related capabilities and the growth of a thriving space sector.

The Government, through its pursuit of an economic smart specialisation strategy, is now focusing on the next phase of Malta's economic development by recognising the need to be prepared for the jobs of the future which will deliver sustainable economic growth and employment.

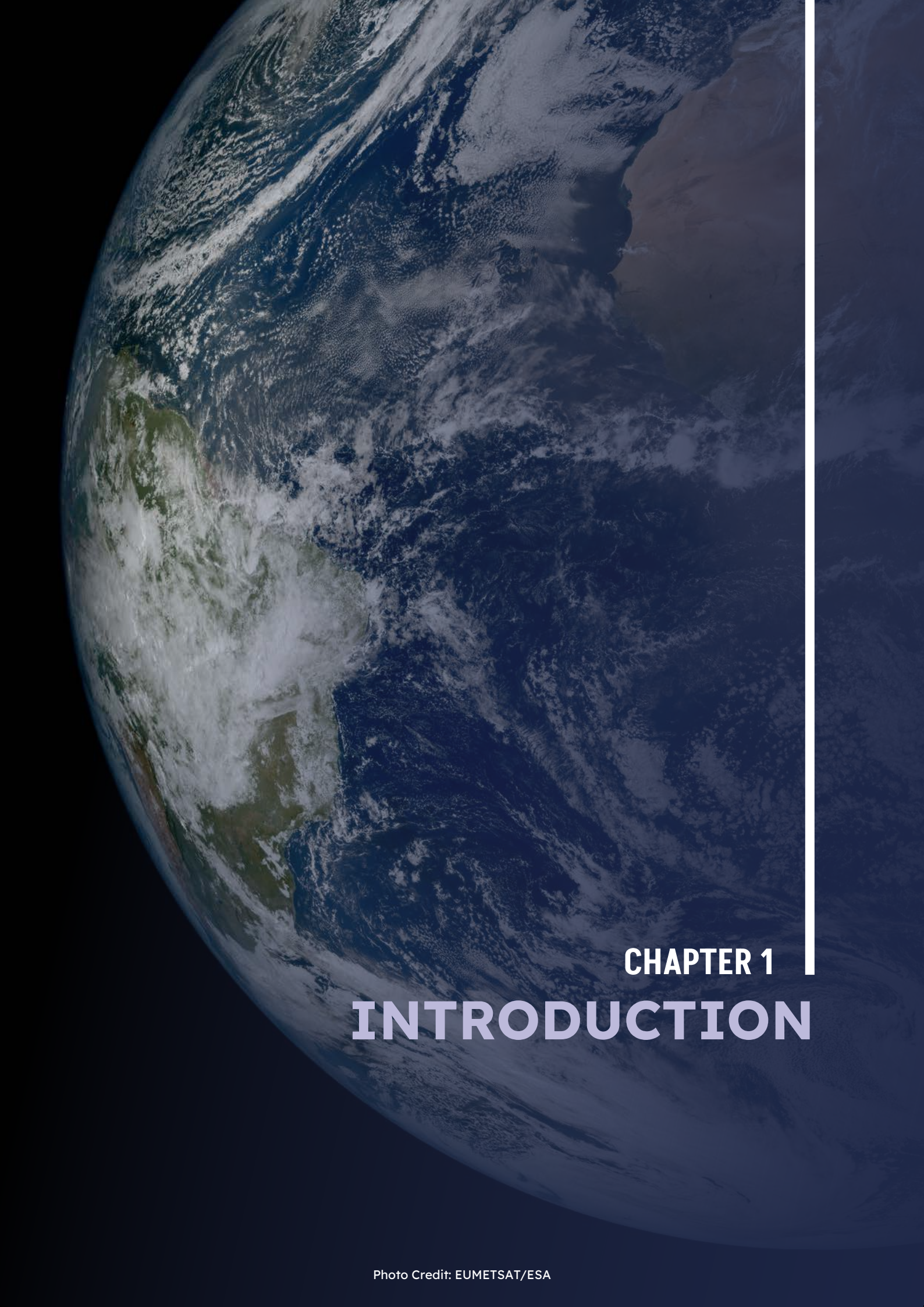
Engagement with space develops skills and knowledge across a range of technological domains which will support the delivery of this ambition. Growing Malta's space sector will support Malta's workforce for a future increasingly focused on the use of emerging technologies, such as those set out in Malta's research and innovation priority areas including artificial intelligence, machine learning, blockchain, robotics and smart manufacturing.

Government is committing to work with businesses and researchers to help develop a strong and expanding space sector. Malta must ensure that local enterprises are equipped to seize new opportunities presented by the evolving global space market for business, research, society, the economy and the environment.

The time is right for Malta to implement its first National Space Strategy which will enable the development and expansion of a sustainable space sector as well as our capacity for research.

The Malta National Space Strategy will achieve this by focusing on advancing foreign direct investment and space business attraction, harnessing space innovation, supporting the development of a highly skilled and adaptable workforce, building international linkages and enhancing our ability to utilise and incubate emerging technologies.

The Malta National Space Strategy will be reviewed and updated during its implementation between 2021 and 2027 to ensure that Malta's space sector evolves alongside the global space market, enabling Malta to seize the opportunities and benefits of space for our economy, our citizens and our environment.



CHAPTER 1
INTRODUCTION

Photo Credit: EUMETSAT/ESA

1.1 PREAMBLE

This National Space Strategy document, the first of its kind in Malta, provides a blueprint for the development of a space sector. This Strategy articulates an ambitious but realistic vision for Malta's space sector and provides a roadmap so that, by 2027, Malta will have made tangible progress towards an economically sustainable and internationally respected space sector while delivering quality careers for the economy of the future.

The National Space Strategy, which has been developed within the context of existing national policy documents thus ensuring strategic alignment and coherence, complements the overall direction and growth intentions for the local economy as supported by various Government budget documents.

The Strategy is driven by a set of thematic goals covering the relevant themes which are deemed to be critical for the successful achievement of the space strategy vision. Underpinning the Strategy are five Pillars, which are enabled by concrete key strategic actions designed to realise Malta's space vision by 2027.

This Strategy also embodies Malta's new Space Policy Framework aimed at providing stable guidance and policy direction to support the initial growth of a novel space economy in Malta until 2027, following which the national strategic direction will be adjusted in line with sectoral requirements. This Strategy thus represents a direct and ambitious evolution of Malta's initial National Space Policy published by the MCST in 2017.

1.2 CONTEXT FOR MALTA'S SPACE STRATEGY

Just like space itself, the space economy is vast and ever-expanding. Departing from the narrow view of 'space' involving the launching of rockets and satellites, space economics also encapsulates a complex and widening space value chain that ranges from the segment relating predominantly to the manufacturing of objects to be sent to space (dubbed 'upstream activity'), to the other segment which involves the use of space objects to deliver products and services back on Earth (dubbed 'downstream activity').

Defining the 'space economy' is key for the development of a space strategy as it allows one to take stock and to chart a course for a future state. However, unlike other sectors, 'space' is not recognised as an industry in international statistical standards and definitions with coverage and methodologies of data collection differing. Furthermore, data on the space economy contribution is likely to be fragmented.

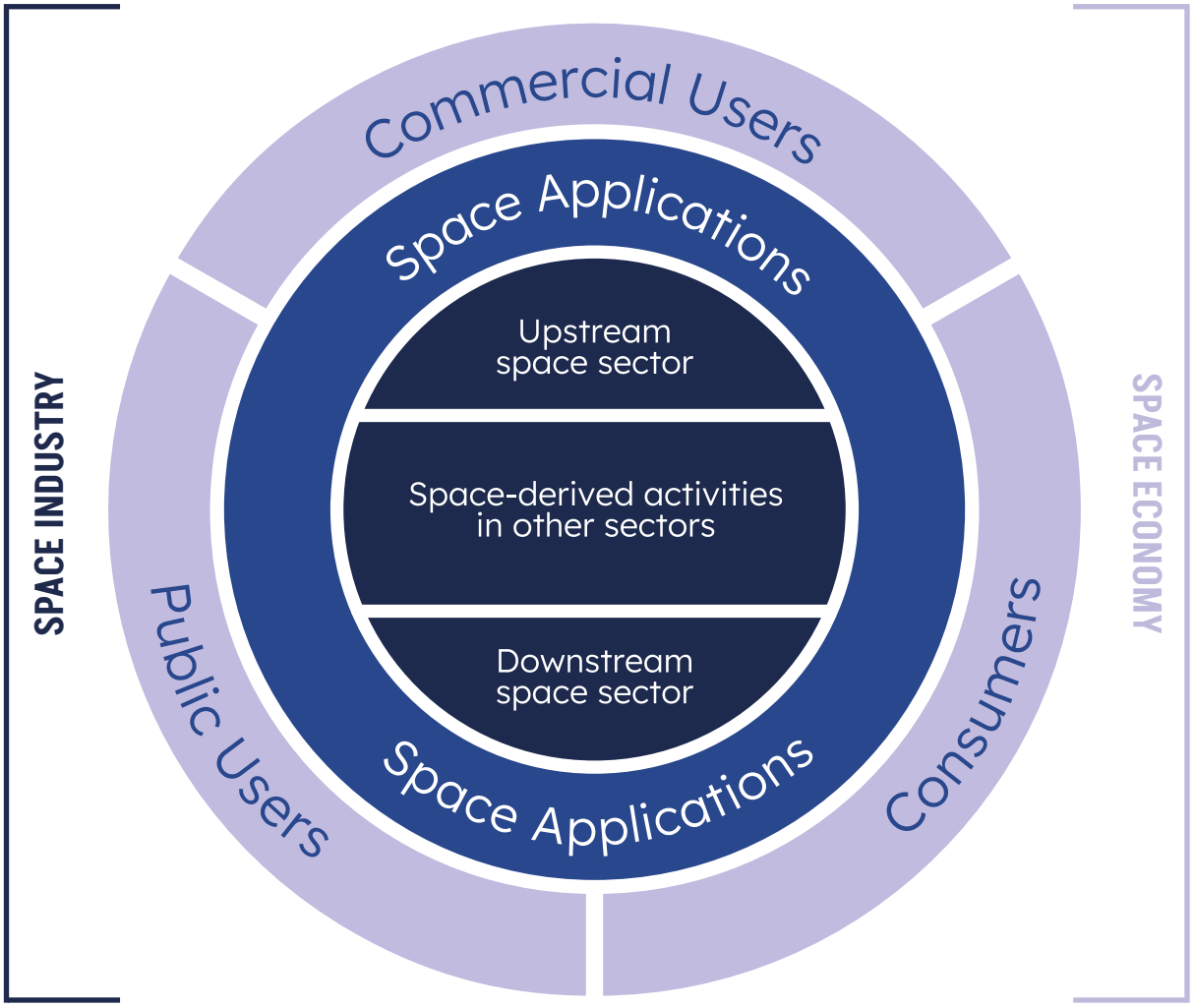
The OECD defines the space economy as "the full range of activities and the use of resources that create and provide value and benefits to human beings in the course of exploring, understanding, managing and utilising space"[1]. As such, there is a broad range of activities which could be considered to form part of the space sector including but not limited to:

- The manufacturing of components forming part of space objects.
- The launching of objects into space.
- The analysis and processing of data and information obtained from space objects.
- Research, development and innovative activities related to space objects or derived from data and information obtained from space objects.
- Administrative, legal and financial services to space-related activities.
- Other support services to space-related activities.

Although the space economy can be defined in a multitude of ways often categorised by product, service, objective, value chains or impacts for the purposes of this strategy, we will be adopting the OECD definition of space economy, broadly categorizing it into three components: the upstream sector, the downstream sector and space-derived activities in other sectors. Thus, for the remainder of this strategy document, the following definitions apply:

- Space technology users: these can be public users (such as Ministries, Authorities and Governmental bodies), commercial users and end-consumers.
- Space industry: a subset of the space economy which includes all organisations engaged in any space-related activity, whether such organisations are commercial entities earning revenue from downstream, upstream or space-derived activities; or non-commercial entities engaged in space-specific research and expertise throughout the space supply chain.
- Space-related activity: this may include space manufacturing (design/ manufacturing of space objects and subsystems such as astrionics); space operations (launch and operation of space objects); space applications (applications of data and signals); and ancillary services (support services such as legal, accounting, insurance, consultancy, software and IT services, amongst others).
- Space technology: any technology related to the process of entering and retrieving space objects and data from space.

[1] OECD, "Measuring the Economic Impact of the Space Sector", 2020. https://www.oecd.org/innovation/inno/measuring-economic-impact- space-sector.pdf



SCOPE

Upstream space sector –
scientific and technological foundations of space programmes, manufacturing and production of space infrastructure

Downstream space sector –
daily operations of space infrastructure and "down-to- earth" activities that directly rely on the provision of space capacity to exist and function

Space-derived activities in other sectors –
new activities in various economic sectors that derive from or have relied on space technology transfers

ACTIVITIES

Fundamental and applied research; scientific and engineering support; dedicated ancillary services; supply of materials and components; design and manufacturing of space equipment and subsystems; integration and supply of full systems; space launch

Operations of space and ground system; supply of devices and products supporting consumer markets; supply of services supporting consumer markets

Activities/products/services derived from space technology, but not dependant on it to function

Source: Adapted from London Economics, in 'Size & Health of the UK Space Industry' (January 2019) and the OECD Space Forum, in 'Measuring the Economic Impact of the Space Sector' (October 2020).

Space technologies have become ubiquitous. They have integrated seamlessly into our lives, enabling services that we rely on daily such as weather forecasting, satellite-based media and location services to name but a few. In addition, space technologies and space data are becoming increasingly important to the functioning of the modern economy. They support advances across multiple sectors such as marine and environmental protection, energy, medicine, and communications. Space technologies also support the work of emergency services during times of crisis by providing real-time satellite images, telecommunications, and navigation services.

As a first consumer of and investor in space research and technology development, the significant contribution of space to the lives of citizens has been a long-term focus of many governments. However, a paradigm shift has occurred in recent years, which has seen substantial and growing private sector investment in commercial space technologies and activities. The global space economy grew to €309 billion in 2017 having grown by an average of 6.7% per annum between 2005 and 2017, almost twice the 3.5 % average yearly growth of the global economy[2]. Furthermore, the commercial space industry has been estimated to grow to approximately €2.3 trillion by 2030[3].

The uses of space technologies are not limited solely to the space sector. Space-derived data products can support the continued growth of the Maltese economy in sectors of national importance through the development of advanced applications for areas such as maritime services, aviation and the sustainable use of resources. They also support the development of key skills necessary for sectors that have been identified as strategically important to Malta such as smart manufacturing, health and future digital technologies[4]. In addition, technologies developed for space are increasingly adopted by other domains such as the medical and aerospace sectors where there is a requirement for high quality products with a low tolerance for failure. Likewise, technologies developed for terrestrial applications may also be used for the space sector.

1.3 MALTA'S SPACE SECTOR ENGAGEMENT

Availability of data pertaining to Malta's involvement in the Space Industry is currently very limited. This weakness in data availability has also been noted in the National Space Monitoring Report 20195.

[2]"The future of the European space sector". European Investment Bank. 2019. https://www.eib.org/attachments/thematic/future_of_european_space_sector_en.pdf
[3] Ibid.
[4] "Malta's Smart Specialisation Strategy 2021 - 2027". Malta Council for Science & Technology. 2020. http://mcst.gov.mt/wp- content/uploads/2020/10/Malta-RIS3-2021-2027_DRAFT-PUBLIC-CONSULTATION-Oct2020.pdf
[5] National Space Monitoring Report 2019. http://mcst.gov.mt/wp-content/uploads/2021/03/National-Space-Monitoring-Report-2019.pdf

Notwithstanding the above data limitations and difficulties in measuring the space economy in Malta, it is to be noted that there is an element of activity in this area. In terms of the upstream sector, activities are still nascent and predominantly focused on the academic sphere. This includes, for instance, the work being undertaken by the Astrionics Research Group at the University of Malta with respect to electronic systems on satellites, research carried out by the ISSA (Institute of Space Sciences and Astronomy) on space debris detection using multi-pixel instruments and, more recently, research in the biomedical sphere spearheaded by University of Malta's biomedical faculty where bacteria samples have been sent via capsule to the International Space Station for specialised testing.

On the downstream activities, the 'industry' is believed to be more mature with potential local activity in areas such as:

- Satellite Communications: such well-established technologies can be used in the broadcasting and telecommunications industries, particularly in sectors such as maritime, offshore and aviation. The spectrum for satellite services is governed by the International Telecommunications Union (ITU) and satellite capacity is equitably allotted to all ITU Member States, including Malta. However, Malta's allocation to such space resources is currently unused[6].
- SATNAV Satellite-based navigation: just like satellite communications, satellite-based navigation is a well-established and well-regulated activity, which is nowadays considered crucial for land, maritime and aeronautical transportation as well as navigation. With the proliferation of smartphones, SATNAV applications have also become widespread and indispensable for the general phone user when it comes to personal navigation. Although activity in this downstream sector is still limited in Malta, the barriers to entry are low in terms of the opportunity to exploit open data sets and satnav to develop innovative solutions.
- Earth Observation (EO): As users of satellite based EO services, Malta is well-established in this area with data from satellites being used for agricultural control with remote sensing, land-use planning by the Mapping Unit at Planning Authority, environmental monitoring by ERA, maritime vessel tracking and oil spill detection by Transport Malta, and security / emergency applications. However, it should be noted that the remote sensing sector can be further exploited as it presents additional potential in addressing societal challenges[7].

[6] https://www.mca.org.mt/initiatives/satellite-services
[7] Grixti, S. & Foden, J. 'A Study on the Exploitation of Satellite-Based Information in the Maltese Islands', Chapter 4 in Formosa, S. (Ed.). (2017). Emergent realities for social wellbeing: environmental, spatial and social pathways. Malta: University of Malta. Department of Criminology.

- ICT: Malta has successfully developed substantial talent and capacity for ICT activities with Information and Communication activities accounting for around 10% of total GVA during 2020[8]. In addition, data-intensive sectors such as gaming and financial services are also well-established, enjoying synergies emanating from the proliferation of ICT skills. ICT is expected to be fundamental to maximising the value-add of the above-mentioned downstream activities as well as creating synergies with other industries both on a local and international level. An established ICT infrastructure and well-trained workforce is crucial to the development of a space industry, given the technological reliance of activities ranging from mission planning, object design, navigation, ground control, data processing and supporting administrative functions.

Regarding the third component of the space industry, composed of space-derived and ancillary services directed towards the space industry (for instance legal and financial services, software and IT services, market research and consultancy services, amongst others), Malta is very much well-equipped to cater for the space industry's needs, although an element of specialisation from a human capital perspective would need to occur to address space industry nuances.

1.3.1 FUNDING INSTRUMENTS

Malta does not have a dedicated space budget per se but steps are being taken to make funds available for the advancement of the sector. To date, Malta has invested in space primarily through the provision of funding to undertake research in the area (via the Government Budget Allocation for R&D [GBARD]). This funding is committed through the establishment of research institutes and through other infrastructural investments such as the setting up of the Malta Space Task Force.

The Maltese Government has already followed the necessary steps to create the Space Research Fund which aims to support research, development, and innovation in the Space sector in Malta. This fund is supported by MCST funding initiatives such as the FUSION Research and Innovation scheme and an R&D fund issued by Malta Enterprise[9]. These schemes do not specifically target the space sector but offer support to research and development initiatives across a variety of fields. Complementing these local funds is an array of EU funds which specifically target space (Horizon, InnovFin, EU Space Programme) and general research and innovation projects (InvestEU).

[8] NSO, "Gross Domestic Product: 2020".
[9] In the past, it was also supported by the MCST bilateral space fund (MCST-CNES).

LOCAL FUNDING INSTRUMENTS					
NAME	**DESCRIPTION**	**SOURCE**	**VALUE (€)**	**TARGET BENEFICIARIES**	**ELIGIBLE ACTIVITIES**
Space Research Fund 2021	Financial support for research, development, and innovation in the downstream Satellite Earth Observation (EO) sector.	MCST	Up to €150,000 per proposal	Open to all Maltese legal entities	Specifically, projects that deal with the processing and exploitation of data collected through EO satellites.
FUSION R&I: Research Excellence Programme	Financial support for the early-stage development of innovative projects, through a bottom-up approach. All scientific research areas considered.	MCST	Up to €50,000 per project	A partnership or LLC, a professional body, NGOs; Non-profit making entities	All scientific research areas are being considered, and for projects which may be commercially applicable.
FUSION R&I: Commercialisation Vouchers Programme	Support through the assessment of commercialisation potential prior to the undertaking of research and development (5 Vouchers: IP Check, Market Research, Product Development Costing, Economic Impact and Risk Profile)	MCST	Voucher format (Value depends on type of support)	Inventors and researchers	All research and development projects
FUSION R&I: Technology Development Programme	State financing in the form of grants for research, development and innovation in science and technology (builds on the outcome of the Commercialisation Voucher Programme	MCST	Up to €295,000	Inventors and researchers (following on from previous programme)	Research, development, and innovation preferably within the Smart Specialisation Areas identified in Malta's National Research and Innovation Strategy 2020.
Research and Development 2020	Financial support to assist Industrial Research and Experimental Development activities required by industry for the acquisition of knowledge leading to the development of innovative products and solutions.	Malta Enterprise	This scheme has a budget of €5,000,000 per annum and an overall budget of €20,000,000		
MCST-CNES Space Bilateral Fund	Programme support through the funding of costs related to the Maltese participation in collaborative projects with the Centre National d' Études Spatiales (CNES), the French Space Agency	MCST & France's National Space Agency (CNES)	The grant covers eligible costs of the project, capped to a maximum of €50,000	Any Maltese entity that had responded to the Council's Expression of Interest (EOI)	Space Research and Technology and cooperative activities such as training, workshops, and joint research proposals

EU FUNDING INSTRUMENTS						
NAME	**DESCRIPTION**	**SOURCE**	**VALUE €**	**TARGET BENEFICIARIES**	**ELIGIBLE ACTIVITIES**	**TIMELINE**
Horizon (2021-2027)	To support research and innovation including the development of innovative space technologies and operational concepts "from idea to demonstration in space", and to use space data for scientific, public, or commercial purposes.	European Commission	€95.5 billion (total fund)	Any legal entity may participate in the Horizon 2020 Programme, provided they are a member state or associated country.	Activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service, or solution.	Projects through 2021 -2027
InnovFin Space Equity Pilot (Under Horizon)	To support the innovation and growth of European smaller and medium-sized space technology companies	European Commission and European Investment Bank	Falls under Horizon Scheme	ISEP will invest in venture capital and other risk-capital funds focused on innovative SMEs and small midcaps that aim to commercialise new products and services linked to space data and space technologies.	InnovFin supports activities, which by their nature are riskier and harder to assess than traditional investments, and therefore often face difficulties in accessing finance.	Projects through 2021 -2027
InvestEU Fund	To support investment across a number of policy areas including research innovation and digitisation. The scheme will bring together the European Fund for Strategic Investments and 13 other EU financial instruments.	European Union	EU budget guarantee of €26.2 billion with a plan to mobilise €372 billion of public and private investment	Private entities; SPVs or project companies, large corporates, midcaps, SMEs. Public-sector entities. Mixed entities. Not-for-profit organisations.	Financing projects in research and innovation, taking research results to the market, digitisation of industry, scaling up larger innovative companies, artificial intelligence and more	Projects through 2021 -2027

1.3.2 GOVERNANCE

Responsibility for the coordination and governance of space-related matters in Malta presently resides within the MCST which currently falls under the portfolio of the MEYR. The role of the Space Directorate within the MCST includes:

- Leading the development, monitoring and review of the Malta Space Policy in collaboration with and support of relevant stakeholders.
- Building and fostering stakeholder relationships across the public, private, research and academic sectors as well as developing relationships with international space agencies.
- Developing, operating and managing space initiatives such as space funding and space education programmes.
- Promoting the sector through awareness-raising initiatives and capacity-building measures; and
- Representing Malta on EU and international space-focused fora.
- More recently, a Malta Space Task Force falling under the auspices of the MEYR, has been established and mandated with identifying opportunities for Malta to engage in the international space sector and to attract space commercialisation and innovation activities to Malta.

1.3.3 DEVELOPMENT OF HUMAN CAPITAL

Development of human capital through dedicated tertiary courses is one way to equip the labour force with the necessary skills to be able to enhance the value provided in a particular sector. In this regard, the space sector is no exception.

The Institute of Space Sciences and Astronomy (ISSA) at the University of Malta was set up in 2014 by various members of faculty with Sciences, Engineering, and ICT backgrounds. The Institute engages in research ranging from software development and instrumentation for radio telescopes to antenna design and placement optimisation. At present, 8 students (1 female and 7 male) are enrolled in Masters and PhD programmes at the Institute. Since the Institute's inception it has produced a total of 9 graduates from Masters or Doctorate level programmes[10].

Compared to the total student population at the University of Malta, which stood at 11,117 during the 2019/20 scholastic year, the amount of students enrolled at the ISSA is relatively miniscule. However, one must also note that unlike other dedicated sectors (such as law or engineering), the space sector is potentially wider and could embrace graduates with heterogeneous skill-sets. These skill-sets may include as proficiency

[10] University of Malta, "Number of Students who completed awards by Faculty / Institute / Centre / School and Course" 2014-2015 till 2019- 2020. https://www.um.edu.mt/about/facts/numbers/graduates

in mathematics, statistics, physics, AI and software development to name but a few. When viewed from this broader perspective, Malta has produced a steady stream of graduates in various related and complimentary fields.

Between 2015 and 2019 Malta has produced around 21,700 graduates[11] with a tertiary level of education[12]. These have included around 1,800 graduates in engineering, manufacturing, or construction-related disciplines, around 1,600 graduates in ICT-related disciplines, and around 1,100 graduates in disciplines related to the natural sciences, mathematics, and statistics.

Nevertheless, additional efforts are required in this area to promote increased interest in STEM education even from an early age as the number of graduates in these fields declined by 15% between 2015 and 2019[13] and similarly, space-related educational activities have also declined substantially since 2017[14].

To this end, Government has already invested in the Esplora Interactive Science Centre as a way of promoting interest in science and technology amongst children and families.

1.3.4 SPACE RESEARCH & INNOVATION

Similarly to the aforementioned situation with space economy data for economic contribution measurement, data on space research and innovation is sparse. Focusing on space-related research between 2017 and 2019, local researchers submitted five research proposals for Horizon 2020 funds and 16 proposals for funding from the Space Research Fund (SRF). Five of the proposals to the SRF were subsequently awarded research funding. The proposals submitted to the SRF involved eight Small and Medium Enterprises (SMEs) either as the main proponent or as a partner to the main proponent[15].

Over 2018 and 2019, a total of €1.2 million in funding was allocated to space-related activities and R&D. These funds include €0.5 million for SRF projects, €80,000 for projects financed by the MCST-CNES Bilateral Fund and €0.62 million in public funds allocated to space-related R&D[16].

From a broader perspective, between 2016 and 2018, total expenditure on R&D activities in Malta increased from €58.7 million to €74.6 million, consistently amounting to around 0.6% of GDP. During 2018, 63% of this expenditure originated from local businesses, 36% from higher education institutions and the remainder from Government entities (other

[11] Source: NSO, "Graduates: 2019", 2021. https://nso.gov.mt/en/News_Releases/Documents/2021/04/News2021_067.pdf
[12] Tertiary education refers to qualifications meeting an International Standard Classification of Education (ISCED) Level 5 to 8.
[13] Source: NSO, "Graduates: 2019", 2021. https://nso.gov.mt/en/News_Releases/Documents/2021/04/News2021_067.pdf
[14] The Malta Council for Science and Technology, 2019, "National Space Monitoring Report 2019". http://mcst.gov.mt/wp- content/uploads/2021/03/National-Space-Monitoring-Report-2019.pdf
[15] Ibid.
[16] National Space Monitoring Report 2019

than higher education institutions)[17]. While the above gives a view of the overall level and make-up of local R&D spend and is not necessarily related to space research, it can also be ancillary to it given the wide applications of space technologies and space data.

Most of the R&D activities in Malta can be categorised as basic research which accounted for 52% of total R&D spending in 2018. Applied research comprised 33% of total spending followed by experimental development which made up the remaining 14%. Business organisations were responsible for around a third of all basic research spending and nearly all applied research and experimental development spending. Higher education institutions were responsible for the majority of basic research spending[18].

The most common fields of R&D activity are engineering and technology (accounted for 42% of spending in 2018) and the natural sciences (accounted for 27% of spending in 2018). In both cases the bulk of spending was carried out by business organisations[19]. While most existing R&D activities are unlikely to be related to space activities, the focus on engineering and scientific research suggests an existing pool of local talent and potential for development of innovative technologies which could be ancillary to the space industry.

Government allocates R&D funding to a broad range of different topics. As of 2018, funds have begun to be allocated specifically to the exploration and exploitation of space with €308,000 (equivalent to 1% of Government's R&D budget) allocated to this type of research[20].

Several space-related research projects have been, or are currently being, carried out by Maltese researchers. Most of these projects have been funded through the MCST's Space Research Fund while some others have received funding from alternative sources including bilateral funding from the MCST and CNES.

Most projects utilise a combination of satellite data (most frequently the Sentinel satellites launched as part of the ESA's Copernicus programme) and deep learning algorithms to monitor various environmental phenomena and develop innovative solutions to challenges in other areas. Some of the areas likely to benefit from the work carried out by Maltese space-related research include:

- Improved monitoring of agricultural conditions.
- Enhanced marine safety, particularly regarding divers and search & rescue operations.
- Development of improved water resource monitoring.
- Improved monitoring of water conditions and marine habitats.

[17] Source: NSO, "Research and Development in Malta: 2016-2018"
[18] Ibid.
[19] Ibid.
[20] Ibid.

- Development of predictive coastal erosion tools.
- Analysis of the benefits of modern construction techniques.
- Improved monitoring and prediction of weather patterns allowing for better proactive efforts by public health officials.

In addition to the above, local researchers are also active in upstream areas of the space industry with one notable project seeking to develop innovative techniques to design miniature electronic components for satellites which are more resilient to the harsh conditions found in orbit.

1.3.5 CURRENT ASSOCIATIONS, PARTNERSHIPS, AND COLLABORATIONS

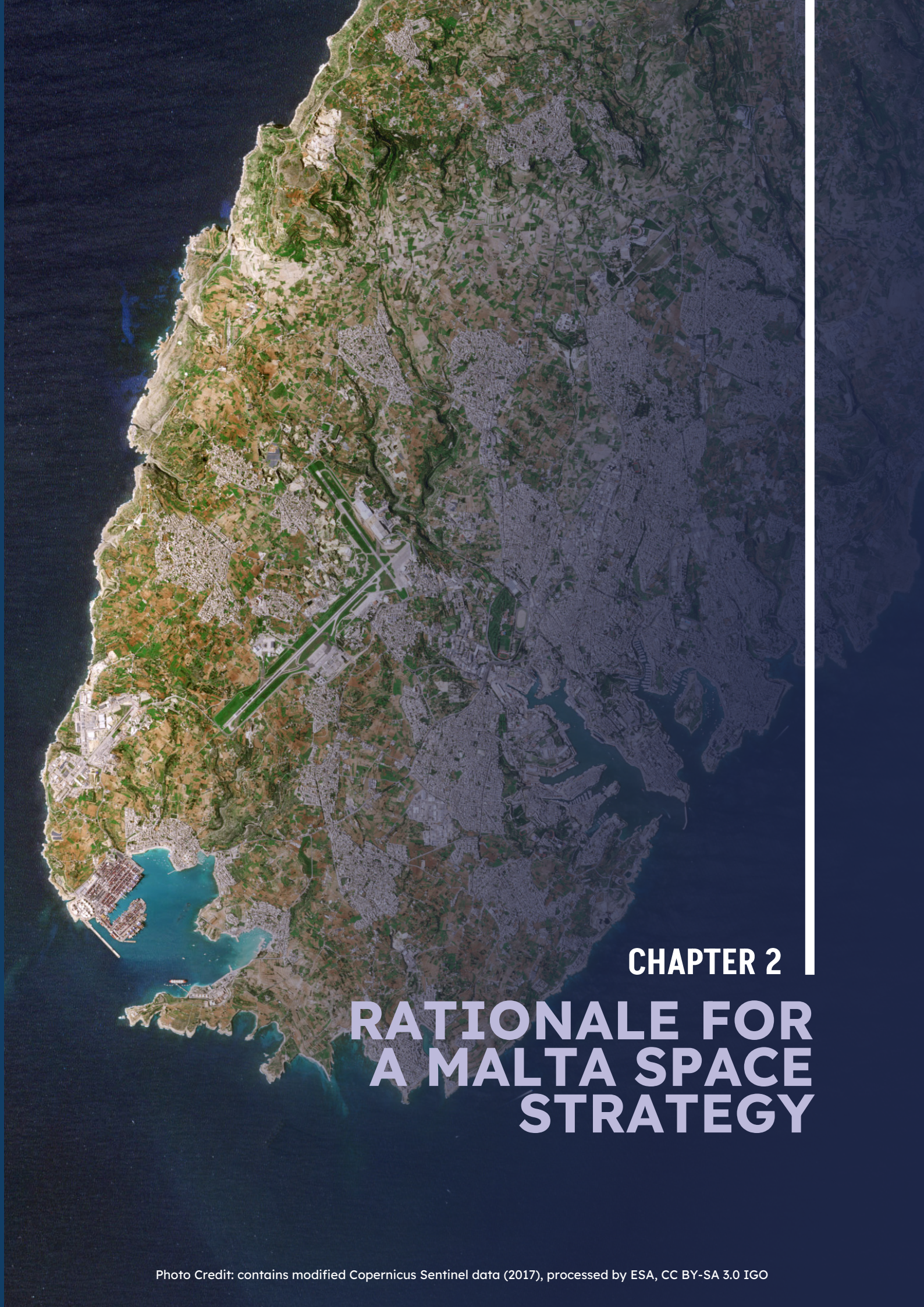
Malta is already an active participant in the space sector through association, partnership, or collaboration with a few key international organisations. These include:

- EURISY - The MCST is a member of EURISY[21], a non-profit association of space organisations which promotes increased collaboration between public institutions, businesses, and academia.
- SCO - The MCST is also a member of the Space Climate Observatory (SCO)[22], an international initiative striving to assess and monitor the impacts of climate change while aiding decision-makers prepare and adapt to the effects of climate change.

In addition to the above, as part of the country's way forward, Malta will also consider forging new partnerships. These may include:

- ESA – MCST is already in discussions with ESA to agree on a formal partnership route which could see Malta's evolving space sector benefit from such collaboration.
- Network of European Regions Using Space Technologies (NEREUS), an association of European regions which explores the benefits of utilising space technologies for the benefit of their citizens.

[21] www.eurisy.eu
[22] www.spaceclimateobservatory.org



CHAPTER 2

RATIONALE FOR A MALTA SPACE STRATEGY

Photo Credit: contains modified Copernicus Sentinel data (2017), processed by ESA, CC BY-SA 3.0 IGO

2.1 EVOLVING EU 'NEW SPACE' MARKET

Through the Member States, the European Union (EU), the European Space Agency (ESA) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), Europe has achieved many successes in space with breakthrough technologies and exploration missions. These include EU space projects such as:

- Copernicus: Europe's Earth observation system.
- Galileo: the satellite navigation and geo-positioning system.
- ESA's exploration missions such as Rosetta or BepiColombo.
- Finally, unique Earth observation and meteorology capabilities such as Meteosat.

Between 2014 and 2020, the EU alone invested over €12 billion in space activities and Europe currently boasts the second largest public space budget in the world with programmes and facilities spanning several different European countries[23].

The international space context is in rapid flux: competition is increasing; new entrants are bringing novel challenges and fresh ambitions pertaining to space; space activities are becoming increasingly commercial with a greater degree of private sector involvement and major technological shifts are disrupting traditional industrial and business models in the sector, reducing the cost of accessing and using space. The combination of space data with digital technologies and other sources of data opens many business opportunities for all Member States.

Within this changing context, the Space Strategy for Europe[24] supported by the Commission's current Multi-annual Financial Framework (MFF) for the period 2021 – 2027, lay out the EU's approach to 'New Space'[25]. These include a dedicated Space Programme for a total of €16 billion[26]; space research addressed by Horizon Europe – the next Union Framework Programme for Research and Innovation[27]; and space

[23]"The future of the European space sector". European Investment Bank. 2019. https://www.eib.org/attachments/thematic/future_of_european_space_sector_en.pdf
[24]"Space Strategy for Europe", COM (2016) 705 final. 2016. European Commission. https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/COM-2016-705-F1-EN-MAIN.PDF
[25] 'New Space': represents the evolution of the space sector into a new era, characterised by competition between private companies rather than nations. The new space race was heralded by the emergence of a commercial space industry and has opened previously unexplored avenues to growth and innovation. The role of space has become more apparent as an enabling infrastructure for the digitisation of industries, as a basis for new business services, and as an area of economic growth, a trend recognised by governments across the globe. As defined within "The future of the European space sector". European Investment Bank. 2019. https://www.eib.org/attachments/thematic/future_of_european_space_sector_en.pdf
[26] "EU Space Programme, EU budget: a EUR 16 billion Space Programme to boost EU space leadership beyond 2020". European Commission. 2018. https://ec.europa.eu/growth/content/eu-budget-%E2%82%AC16-billion-space-programme-boost-eu-space-leadership-beyond- 2020_en
[27] The ninth framework programme to succeed Horizon 2020, Horizon Europe, with a budget of EUR 95.5 billion is the largest ever research and innovation funding programme. It is designed around three pillars: excellent science, global challenges and European industrial competitiveness, and innovative Europe. https://ec.europa.eu/info/horizon-europe_en

investments addressed by the InvestEU programme[28]. Further, with access to finance remaining a critical challenge to space entrepreneurship in Europe, the EU Space Programme, for the first time proposes specific provisions to support the emergence of a 'European New Space'. Indeed, smart financing for space is at the heart of the EU's Space Programme and will rely on synergies among all the EU programmes as well as between European and national levels. This smart financing approach will support the European space ecosystem, including Malta, to extend financing support for entrepreneurs beyond the research phase all the way to market deployment. This novel approach will also see an increase in risk appetite, supporting the funding of higher-risk projects which are vital to the future of European space. In turn, this will help local space players to attract and retain talent within the local space ecosystem.

Within the international space sector, there are a wealth of opportunities for agile countries such as Malta to capitalise upon by exploiting current research, existing industry capabilities and commercial knowledge to create new, high-growth business opportunities. The opportunities are developing in both commercial upstream and predominantly in the downstream and space-derived sectors and through technology transfer into and out of related sectors such as the aviation, maritime, and medical sectors. The meaningful change indicated by New Space is that private industry is becoming the leading player and significant investor in a sector that was once dominated by, or indeed restricted to, government programmes.

In recognition of the growing opportunities alongside the increasing capabilities of Maltese industry, Malta's Draft Smart Specialisation Strategy 2021 – 2027[29] identifies the space sector as a new area of opportunity for Malta.

To capitalise on the prospects presented by the evolving international space sector, those emerging from the European New Space, Malta must follow a coordinated and focused strategy to enable research and industry to grasp new opportunities, build on strengths, and cultivate both national and international awareness of our potential space capabilities.

[28] Building on its predecessor the European Fund for Strategic Investments (EFSI) which mobilised funds for research and innovation, InvestEU will cater for the financing needs of space companies and projects. It will bring together, under one roof, the EFSI and 13 other EU financial instruments. Consisting of three building blocks, the: InvestEU Fund, InvestEU Advisory Hub, and InvestEU Portal, the InvestEU Programme will trigger more than €372 billion in investment over the period 2021-27 with the aim to give an additional boost to sustainable investment, innovation and job creation in Europe. https://europa.eu/investeu/home_en

[29] "Malta's Smart Specialisation Strategy 2021 - 2027". Malta Council for Science & Technology. 2020. http://mcst.gov.mt/wp-content/uploads/2020/10/Malta-RIS3-2021-2027_DRAFT-PUBLIC-CONSULTATION-Oct2020.pdf

2.2 NOTABLE JURISDICTIONAL INITIATIVES

KEY JURISDICTIONAL INITIATIVES

Countries which have embarked on the mission to cultivate a local space industry did so through their national government's initiative in taking a number of key steps to entice private enterprises into investing in this industry. Normally, two dimensions shape the foundation of a space sector within a country: 1) a space governance structure[30] and 2) national priorities and capabilities in the sector[31].

For example, those countries which are full member states of the ESAband which have a National Space or Innovation Strategy/Policy in place all have an implementing entity that carries out the national space interests[32]. The majority of these entities are Agencies, set up by the national authorities to oversee the implementation of their space/innovation plan and to coordinate with international bodies in accessing funds and collaborating on projects.[33]

SUCCESSES

The successes of national space authorities range from the setting up of international 'hubs' for both research and local commerce to the attraction of foreign direct investment. Through a mix of 1) attractive legislative frameworks and 2) well-developed infrastructure, national space agencies have managed to grow their local space industry and attract anchor tenants to headquarter in their country.

BEST PRACTICES

With regards to best practices implemented, this is dependent on the specific needs of the country. Certain countries invested heavily in their human capital by forming education partnerships whilst others focused on building the economic sector first. In the initial stages, most countries also adopted a mixed approach to the space industry, having a blend of economic and regulatory elements aimed at building the two together rather than apart. Interestingly, some countries also took a staged approach in opening their public space entity.

ESA RELATIONSHIP

There are currently 31 countries involved with the ESA on some level[34]. With 22 full Member

[30] D. Sagath, C. Vasko, E. van Burg, C. Giannopapa, 2019. 'Development of national space governance and policy trends in member states of the European Space Agency', Acta Astonautica, 165, 43-53.
[31] H R Hertzfeld, M Fouquin, 2004. 'Project on The Commercialisation of Space end The Development of Space Infrastructure: The Role of Public and Private Actors', Organisation for Economic Co-operation and Development
[32] D. Sagath, A. Papadimitriou, M. Andriaensen, C. Giannopapa, 2018. 'Space Strategy and governance of ESA small member states', Acta Astonautica, 142, 112-120 states of the European Space Agency', Acta Astonautica, 165, 43-53.
[33] A. M. Schaffer, 2008. 'What do nations want from international collaboration for space exploration?', Space Policy, 24, 2, 95-103
[34] ESA, "Member States & Cooperating States", [Accessed on 9/06/21]. <http://www.esa.int/About_Us/Corporate_news/Member_States_Cooperating_States>

States, 6 Cooperating States and 3 Associate Members, the ESA has quickly transformed into a key player in the international space economy. Integrating with the ESA can take on various forms. The first step that most of the current Member States find themselves in is the signing of a Framework Agreement, which is a statement of intent towards becoming a full member of the Agency. Following a 5-year period, a decision is taken to sign a European Cooperating State (ECS) Agreement by the state. The ECS Agreement exists to engage and prepare a country's space economy for a successful accession to the ESA Convention. Through the ECS Agreement, countries can participate in ESA activities and are provided with guidelines on how to undertake certain investments in the space sector. Along with the ECS, there is also a dedicated Plan for the European Cooperating State (PECS) drawn up. The purpose of the PECS route is for the integration of non-member states to participate in ESA projects. Following another 5-year period whereby the country would be involved on various programmes and projects whilst also undertaking certain initiatives in their national landscape, the ESA Council would meet and following a majority vote, the country would be given an Associate Member State status[35]. Currently, Latvia, Lithuania and Slovenia have this status, while Malta, Bulgaria, Cyprus, Croatia and Slovakia have Cooperation Agreements in place.[36] An associate member of the ESA has similar privileges to full members, specifically in having opportunities for participation in optional programmes but without the full commitments, responsibilities, and obligations of full members. The final step to becoming a full member of the ESA is the Accession Agreement to the ESA Convention which is brought about as a direct request from the respective country's central government. Following this acceptance, the ESA becomes more involved in assisting the new Member State in implementing certain initiatives through the Industrial Incentive Scheme (IIS) and Transition Period mechanism[37].

GOVERNANCE

In connection with governance, there is an increasing need to structure the country-level governance in a way that maximises the growth of the space economy. Within this context, it is noted that the scope and role of space agencies is evolving to better match an ever- increasing downstream reach of space and associated value chains.

Two key shifts emerge in models of governance, transitioning: 1) from a sole focus on tech and space-object development and procurement to governance structures seeking to facilitate market development, market needs and economic rationalisation; and 2) towards a more distributed governance model whereby: a) other ministries and agencies with a broader or non-space sectorial scope take up some role in the space economy; and b) tighter coordination at country level is achieved.

[35] D. Sagath, C. Vasko, E. van Burg, C. Giannopapa, 2019. 'Development of national space governance and policy trends in member states of the European Space Agency', Acta Astonautica, 165, 43-53.
[36] ESA, "Member States & Cooperating States", [Accessed on 9/06/21]. <http://www.esa.int/About_Us/Corporate_news/Member_States_Cooperating_States>
[37] D. Sagath, C. Vasko, E. van Burg, C. Giannopapa, 2019. 'Development of national space governance and policy trends in member states of the European Space Agency', Acta Astonautica, 165, 43-53.

2.3 SPACE INDUSTRY AND ITS RELEVANCE FOR MALTA'S WIDER ECONOMY

Government investment in space-related economic activities has complex economic outcomes, ranging from revenue generation and increased competitiveness in the global space industry, to productivity and efficiency gains in diverse sectors, to broader socio- economic impacts which ultimately enrich the lives of end-users.

The Organisation for Economic Cooperation and Development (OECD) groups economic impacts from institutional space investments into:

- New products and services.
- Productivity/efficiency gains in diverse economic sectors and
- Cost avoidance (e.g. costs avoided, and lives saved as a result of weather forecasts and crisis management for instance)[38].

Selected national assessments of economic returns published by the OECD measuring economic activity resulting from a given level of government expenditure on space initiatives in various years shows the multiplier effect for every EUR1 invested. The following examples are noteworthy: Belgium 1:1.4 (2010), Denmark 1:3.7 up to 4.5 (2008), Ireland 1:3.63 (2012), Norway 1: 4.75 (2013), Portugal 1:2 (2011), and UK 1:1.91 (2010)[39].

Such studies use well-established input-output models (such as IMPLAN[40]) and measure economic impacts of policy changes, industrial or infrastructural developments and other economic events. Generally, all government spending has positive transactional impacts covering direct, indirect, and induced impacts.

Beyond measurable economic impacts, space investments spur broader socio-economic impacts including:

- The improvement of scientific knowledge.
- Innovations and technology transfers between sectors that stimulate the economy.
- Enablement of services that we rely on daily such as weather forecasting, satellite-based media, and location services, to name but a few.
- Advancement of overall national space capabilities.
- Science, Technology, Engineering and Maths (STEM) education and inspiration for the future generation of STEM professionals, academics, and students; and
- Policy impacts relating to foreign and national security policy and goals.

[38] Organisation of Economic Cooperation and Development (OECD), "Space Economy at a Glance 2014". 2014. https://www.oecd- ilibrary.org/economics/the-space-economy-at-a-glance-2014_9789264217294-en
[39] Ibid.
[40] IMPLAN: Economic Impact Analysis for Planning. https://www.implan.com/

The literature confirms that positive effects from space investment are not exclusive to the space sector. As outlined in the OECD's Space Economy in Figures Report, a multitude of downstream societal benefits were observed across 77 publications on space-related investments reviewed by the OECD. Commercial revenue was the most cited benefit throughout the literature, followed by employment, productivity/ efficiency gains, social welfare, macroeconomic benefits, cost-savings, cost avoidance, new contracts, reputation and inspiration respectively. Both commercial revenue and employment recorded more benefits for non-space sectors than for the space sector itself as a result of space investment.

The impact of Space technology transfers is another aspect of Space investment which offers socioeconomic benefits to broader society. Technology transfer can be defined as 'the process through which a technology originated in one sector finds an application in another sector'[41]. Technology transfers and their commercialisation (TTC) encourages the commercial use of advanced technologies in society. From a space technology perspective, the aim of TTC is to ensure that benefits from advanced technologies are reaped by both the space sector as well as non-space sectors. The ESA is constantly tracking instances of successful technology transfers emanating from space technologies. Some recent examples of TCC include Smart Earth monitoring by commercial airlines, infrared nanosatellites used to detect and map wildfires, and improved drone technology through the development of compact high- performance antennas[42].

Space technology transfers have resulted in several direct societal benefits including increased productivity and employment. Other socioeconomic effects include the stimulation of innovation in business and commerce, increased returns from public investment in research and development and increases in economic growth[43]. As Malta reaches levels of near-full employment[44], Government is now focusing on pursuing an economic smart specialisation strategy, fostering quality jobs, improving productivity, and building economic resilience. Investment in space significantly supports the aim of Government's economic vision and policies, which is to secure sustainable economic success for Malta through employment in sustainable and well-paid jobs. Fundamentally, engagement with the international space industry and the development of predominantly downstream and space- derived competencies go hand-in-hand with high value-added, sustainable careers.

Furthermore, certain skills developed for the space sector are interchangeable with earth- bound domains such as software development, data analytics, communications technologies, nano engineering and materials, advanced manufacturing, business management and law amongst others.

[41] OECD. 2019. The Space Economy in Figures: How Space Contributes to the Global Economy.
[42] ESA (2021), ESA Technology Transfer Programme website, http://www.esa.int/Our_Activities/Technology/TTP2
[43] Karen V., Chiara V., A systematic review of the Space technology transfer literature: Research synthesis and emerging gaps, Space Policy, Volume 30, Issue 2, 2014, Pages 98-114, ISSN 0265-9646. https://doi.org/10.1016/j.spacepol.2014.04.003
[44] During the COVID period, the labour market scenarios and dynamics are constantly changing and are highly dependent on the policy measures being adopted at a national level.

Thus, the development of these capabilities will also support future skills needs across a range of future-oriented sectors. In addition, the development and growth of activity in the space sector may have a ripple effect onto the productivity and innovation of Maltese Small and Medium Enterprises (SMEs). Significantly, engagement with the global space market will empower the Maltese workforce to react and adapt to future technological and transformational demands and changes.

The space sector, however, is not without its risks – both within the upstream and downstream sectors. While risks within the former are the most widely acknowledged thanks in no part to media coverage, it must also be acknowledged that downstream applications also present risks, even if different in nature. These include, to name a single example, privacy concerns from satellite data (such as GPS tracking). Mitigation and management of these risks such as through application licensing or certification and bespoke insurance products, has the potential to present Malta with an opportunity.

The Strategy and its implementation will impact and be informed by seven primary stakeholder groups, in addition to the general public, as outlined below. Key stakeholder insights drawn from stakeholder engagement are set out in Appendix 1.

STAKEHOLDER GROUPS	DESCRIPTION
Relevant Government entities	Public sector entities that contribute to the development and achievement of Government's policies, visions, regulations and strategies within their domains.
Relevant international Government entities	Foreign space agencies and international governance bodies that facilitate a growing role for Malta in the international space industry.
Local space industry stakeholders	Companies and individuals that could directly contribute to the economic growth of the Maltese space sector.
Local non-space industry stakeholder	Companies that have (and could have) the potential to benefit from space sector development thereby growing the overall Maltese economy.
International companies in Malta	International space and/or aerospace companies with active operations in Malta that could enable Malta's space sector growth.
Research centres and academia	Research centres and academic institutions that are important in driving space research and innovation and preparing the next generation of space experts.
Relevant civil society organisations	Civil society organizations that contribute to increased interest in space among the wider population and support in basic space science development.

Drawing from the findings of the stakeholder engagement process, a number of strategic decisions were taken to identify the required key strategic actions to realise Malta's vision and goals for space by 2027.

Photo Credit: ESA/CNES/Arianespace/Optique video du CSG - S Martin

CHAPTER 3

BACKGROUND ON THE REGULATORY FRAMEWORK – A SPACE PERSPECTIVE

The key to the success of the space sector is the creation of a legal framework and environment based on rules which are certain and undisputable. In view of rapid technology advances, legislation would not be able to crystallise the needs of an industry in a one-fit-for- all set of rules. The legislation adopted by Malta would need to integrate so-called self- updating or self-adapting provisions.

It is therefore important that the Maltese legislator implements a flexible set of rules capable of self-adaptation to the ever-evolving technological advancements and commercial scenarios. Self-adaption means the possibility of a regulatory authority to amend implementing rules and guidelines itself in a timely manner and when the need arises by avoiding the lengthy procedures of parliamentary approval.

3.1 THE CORPUS IURIS SPATIALIS

Space Law is often associated with the five international treaties (see below) and 5 sets of principles regulating outer space developed under the auspices of the United Nations.

Such principles delve into aspects concerning:

- Non-appropriation of Outer Space by any State,
- Control of arms,
- Freedom of exploration,
- Liability for damage caused by space objects,
- Safety and rescue of spacecraft and astronauts,
- Preventing harmful interference with space activities and the environment,
- Notification and registration of space activities, scientific investigation and
- The exploitation of natural resources in outer space and the settlement of disputes.

These, together with UN resolutions, form the so-called Corpus Iuris Spatialis[45] also categorised as public international law. With the increase of activities of private individuals and the interest in space commercialisation, the status of private individuals and entities has been questioned repeatedly over the last decades. Space commercialisation has therefore required the intervention of States to legislate and incorporate aspects not dealt by public international space law[46].

Ratification of international treaties regulating space law represents an important milestone in enhancing Malta's reputation for both space activities authorization and supervision, allowing the space industry in Malta to grow and diversify its activities also

[45] Dissertation "Developing a legal infrastructure for a Maltese Space Industry: A Legal Analysis" – Dr Gabriella Mifsud – University of Malta, May 2020
[46] Dissertation "Outer Space and International Law in the 21st Century: A Need For Reform? – Dr Thomas Mallia – University of Malta, June 2017

through the intervention of players from the private sphere.

Having a legal framework based on internationally accepted standards and principles will contribute towards the creation of a safe and attractive environment for operators, investors, and entrepreneurs and will therefore represent a valuable instrument for the creation of a vibrant and dynamic space sector in Malta.

As aforementioned, ratifying international treaties is not sufficient on its own because treaties to date do not cater for the role of players from the private sector in a substantive manner[47]. Until such treaties are amended, countries should regulate this sector themselves to make up for legislative lacunae.

3.2 RATIFIED CONVENTIONS

So far Malta ratified the two below mentioned conventions:

- The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and Other Celestial Bodies (the "Outer Space Treaty")[48]. The Outer Space Treaty defines principles further supported in the subsequent treaties part of the Corpus Iuris Spatialis touching on aspects of international and State responsibility and liability, and assumptions of equality and international cooperation amongst its members[49]; and
- The Convention on International Liability for Damage Caused by Space Objects (the "Liability Convention")[50]. The Liability Convention regulates aspects linked with damages caused to both property and persons by space activities[51].

Malta is still to implement such conventions into its laws.

Malta signed but did not ratify:

- The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the "Rescue Convention")[52]. The Rescue Agreement deals with mishaps occurring in the territories or under the jurisdiction of the State parties, together with aspects concerning the return of space objects and space personnel[53].

[47] Ibid page 4.
[48] (Adopted 27 January 1967) 610 UNTS 205.
[49] Ibid page 2.
[50] (Adopted 9 October 1973) 961 UNTS 187.
[51] Ibid page 2.
[52] (Adopted 22 April 1968) 672 UNTS 119.
[53] Ibid page 2.

On the other hand, Malta did not sign:

- The Convention on Registration of Objects Launched into Outer Space (the "Registration Convention")[54] and
- The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the "Moon Convention")[55]. The Moon Convention has not proved to be a successful convention in view of military benefits that would have to be conceded in the face of the treaty[56].

Since the remaining two conventions are not fundamental for Malta's entry into the space industry, Malta could decide not to ratify same. If the need is felt, Malta could implement these in an autonomous manner into its laws. With respect to the registration of space objects, other jurisdictions which haven't ratified the Registration Convention are still aligned to facilitate operators to fulfil the requirements of such convention.

3.3 REQUIREMENTS UNDER THE REGISTRATION AND LIABILITY CONVENTION

At the outset, it is pertinent to note that objects launched into space do not require registration with any international organisation. Registration is a mere administrative act requiring first and foremost skilled labour ready to implement international standards.The Registration Convention provides for the registration of space objects within national and the international space registries[57]. A State is also free to register its space objects without having ratified the Registration Convention[58] while still being able to assert its rights under article VIII of the Outer Space Treaty.

A country wishing to launch and operate satellites (irrespective of their size), should satisfy a number of requirements:

- It must notify and record the radio frequencies used by a satellite at the International Telecommunications Union (ITU).
- Take in consideration space debris and traffic mitigation measures with respect to the design and operation of a satellite.
- Register such satellite with the Secretary-General of the United Nations.

Although the term 'State of Registry' means a launching State on whose Registry a space object is carried, a satellite mission may still make use of "foreign" launch services. Where more than one State could be involved in the mission, the Registration

[54] (Adopted 15 September 1976) 1023 UNTS 15.
[55] (Adopted 5 December 1979) 1023 UNTS 15.
[56] Ibid page 3.
[57] Ibid page 41.
[58] UNGA Resolution 1721B245

Convention requires that the involved States jointly determine which of them should be the State of Registry. As is customary practice, States providing launch services do not register satellites launched on behalf of other States.

Notwithstanding the above, it is to be noted that in accordance with Article I of the Liability Convention, the State from which the object is launched or procured to be launched (which can therefore be different from the State of registration) is absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft flight.

The element of liability and responsibility deriving from the ratification of such treaties is evident and manifest. Treaties are clear in establishing who is responsible for damages arising from the launch of space objects. The Liability Convention attributes responsibility to the "launching state" or the State which "procures the launch". Although the rules appear clear, it is not as simple to apply or at least predict how they would be applied in practice.

International treaties were drafted during the sixties and seventies of the previous century. During such time, space exploration was in the hands of two jurisdictions, the USA, and the Soviet Union, both acting and intervening in such ambit through their space agencies from their own territories. They would not launch space objects from third countries, nor delegate such function to private entities. If one were to consider the role of such two countries within the UN, one could easily understand why the Corpus Iuris Spatialis was drafted with a State- centric approach. Therefore, the only scenario on which the Corpus Iuris Spatialis was based on was that of a State authorising the launch of an object from its own territory (**Scenario 1**).

In the meantime, the world and economies evolved, and the duopoly of space came to an end in favour of multiple players with the below scenarios:

Scenario 2: National / Public Space Agencies of State A authorising launches happening from State B;
Scenario 3: Private Entities authorised by State A to launch object from State A;
Scenario 4: Private Entities authorised by State A to launch object from State B

The Corpus Iuris Spatialis does not cater for the last two scenarios and various others which might arise in the coming years. In such instances, determining the liable State might not be plain-sailing and so it becomes of paramount importance to establish with a degree of certainty the extent of the exposure of a given State.

Indeed, while in Scenarios 1 and 3 it is clear which would be the liable State, under Scenario 4, two States should be considered responsible. Issues concerning the extent of liability are to be considered together. In addition, one needs to understand whether the State providing the territory for the launch will be willing to take responsibility also for the time the object subsequently is located in outer space and vice-versa whether a State procuring the launch is willing to be responsible also for the period of time the object spends reaching outer space.

3.4 MALTA – A CREDITOR FRIENDLY JURISDICTION FOR START UPS

Jurisdictions which have recently regulated space law activities have done so to encourage and stimulate space commercial activities and also fill those gaps present within the Corpus Iuris Spatialis.

Such rules must not only focus on the registration of space objects but look at these objects from different perspective, that of other owner seeking financing to its activities, that of the credit institution willing to finance such activities and that of the third parties wishing to "operate" such assets. Mobile equipment such as a satellite are of high value and particular economic significance. In addition to this, they are highly movable by their very nature, and they may keep crossing national borders or operate outside sovereign territory during their lifetime. This movable nature may cause legal uncertainties with respect:

- to security interests created on a cross-border space equipment through asset-based financing; and
- which domestic law shall apply to regulate the security interest is questionable.

Rules governing financing are fundamental to start-ups which, notwithstanding the high value of their ideas, might not have immediate access to large resources. Therefore, having in place rules meant to protect creditors and their interests is fundamental to allow new players enter the market and sustain their growth. Although the Berlin Protocol might not be seen as necessary within the context of solid and well-established players (i.e. telecoms entities) which have access to funding through traditional forms of security, the Berlin Protocol could represent a game changer in the context of start-ups.

The Berlin Protocol aims at harmonizing and unifying the rules of national laws on the subject of asset-backed finance for mobile space equipment by extending the benefits of the Convention on International Interests in Mobile Equipment to "space objects".

Such ventures are full of risks and uncertainty and, consequently, their financing is currently still prohibitively expensive. A uniform set of rules governing the creation, perfection, and enforcement of international interests in space objects, such as satellites, increases the level of transparency and predictability for financiers, thereby making financing more widely available to a greater number of players in the commercial space sector at a much lower cost.

3.5 ENVIRONMENTAL SOCIAL GOVERNANCE MEASURES

Although Malta will realistically not be launching space objects in the near future, it must consider the environmental impact that its intervention in such area might create and also think at measures and initiatives to be adopted in order to mitigate its impact onto the space environment.

Sustainable Space (Debris) management considerations are not just an environmental related topic but also a matter that touches other aspects such as liability and reputation of any private entity deciding to invest in Malta.

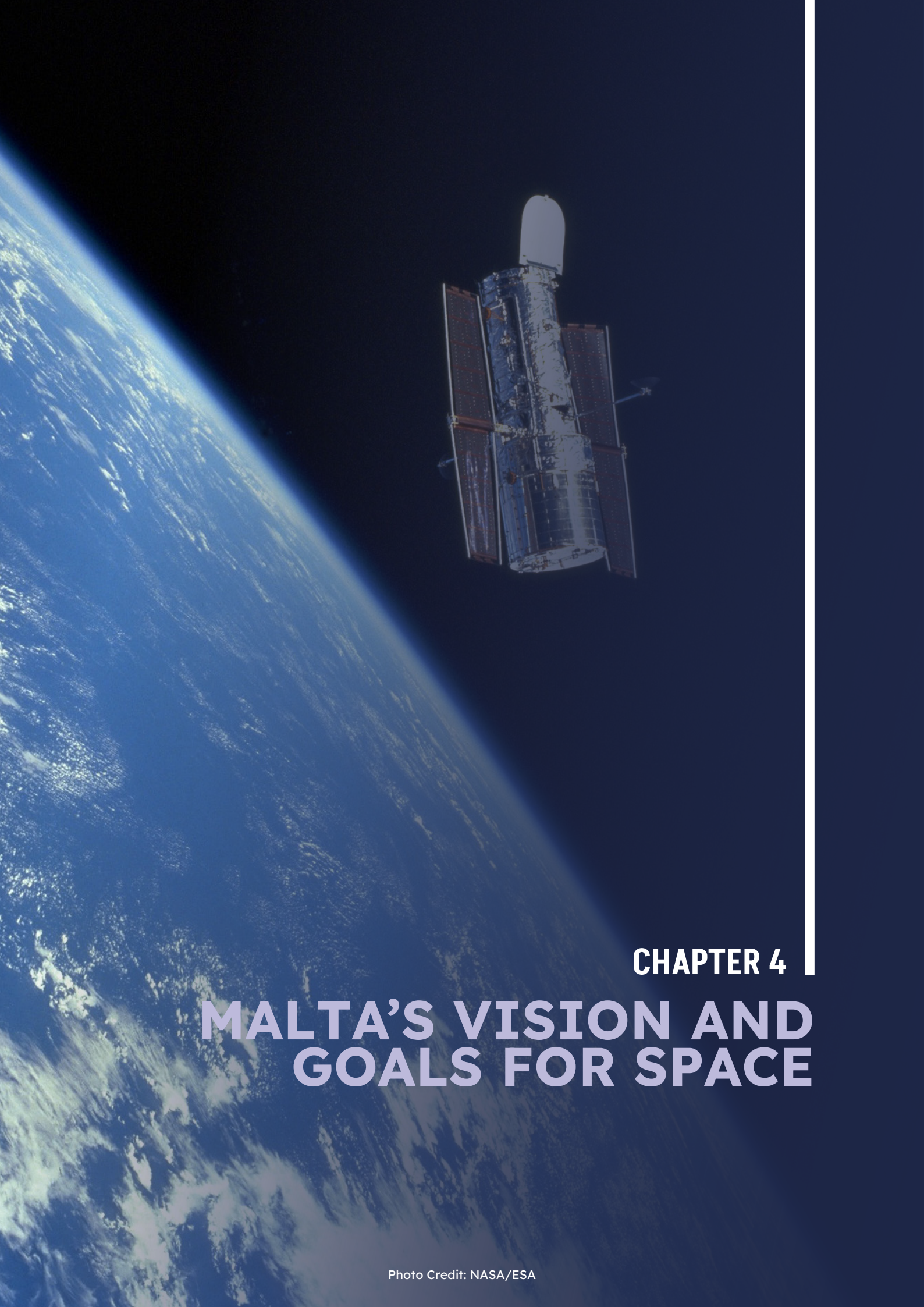
As above mentioned, when an object is launched into space or any other related activity is carried out (also in terms of terrestrial operations) the state of registration under the Liability Convention is responsible for damages this may cause also in the outer space. Although not expressly mentioned in the text of the Liability Convention, the interpretation of such liability might eventually and realistically extend also to the period of time when the object is not being used anymore. The abandonment of an object in space cannot be considered as a long- term sustainable decision by States to discharge themselves from any possible responsibility and liability.

In addition to this one might consider reputational damages that might arise in the future for damages caused by an object falling under the jurisdiction of Malta. Environmental damages involving Maltese flagged ships led the Malta shipping authorities to upgrade its standards. Such examples should be considered as a 'learnt lesson' meant to encourage Malta to adopt long term sustainable environmental measures as from inception stages.

Apart from environmental and reputational targets one must also bear in mind that although credit institutions are not yet sensible to such topics, they might become so in the near future by providing financing only to entities connected with jurisdictions that enacted long term measures such as sustainable space (debris and traffic) management mitigation provisions. If one wants to draw another parallel with the shipping sector, in the last 10 years growing concern towards ship recycling matters led banks to subject their loans to the satisfaction of stringent international requirements in terms of ship recycling.

Therefore, Malta must be ready as from such infant stages to introduce measures and mechanisms meant to protect the space environment either by abiding voluntarily to internationally approved resolutions and adopted practices or promoting its own rules.

Having in place Environmental Social Governance measures must not be only a formal goal but one of real substance meant to prove and testimony Malta's commitments in such area.



CHAPTER 4

MALTA'S VISION AND GOALS FOR SPACE

Photo Credit: NASA/ESA

4.1 VISION

This Strategy is concerned with the space industry and space activities of Malta during the period 2021 – 2027, and this includes governmental (non-military), commercial and scientific space activities executed by bodies operating in the public and private sectors, academic institutions, and R&I-focused entities.

The Strategy considers the objectives, ambitions, and priorities of other sectoral, national and EU strategies. The vision, goals, pillars, and strategic actions which will enable the implementation of the Strategy will also contribute to the achievement of the ambitions and priorities of these other strategies.

Accordingly, from a planning perspective, the Strategy considers and reflects the current EU long-term budget (also known as Multiannual Financial Framework – MFF) programming period which runs from 2021 to 2027. MFF 2021 – 2027 includes a dedicated Space programme for a total of EUR 16 billion[59], space research addressed by Horizon Europe, and space investments addressed by the Invest EU programme.

The Government's vision for the space sector is that by 2027 Malta will have made tangible progress towards an economically sustainable and internationally respected space sector, delivering quality careers for the economy of the future.

Companies will be enabled to harness new opportunities offered by Europe's New Space, predominantly in the downstream and space-derived sectors and will be supported by an appropriate and responsive governance structure.

Companies will thus be increasingly engaged in technology transfer, in and out of the space market, driving sustainable business, offering long-term quality careers, and providing innovative solutions for the needs of both the space and complementary markets.

Entrepreneurs, businesses, researchers, students, and citizens of all ages across Malta will have a greater level of awareness of Malta's space opportunities, capabilities, and involvement in international space fora.

Malta's involvement in space will foster a growing interest in Science, Technology, Engineering and Maths (STEM) education and provide greater visibility of hi-tech careers that the space and related sectors could offer.

Malta will excel in skills development in emerging areas, including data analytics supported by a space data platform, providing access to large space data sets. The

[59] "EU Space Programme, EU budget: a EUR 16 billion Space Programme to boost EU space leadership beyond 2020". European Commission. 2018. https://ec.europa.eu/growth/content/eu-budget-%E2%82%AC16-billion-space-programme-boost-eu-space-leadership-beyond- 2020_en

Maltese Government will be a first consumer of this talent, utilising space data to its furthermost potential to improve the lives of its citizens including for example in the domains of urban planning, rural and agricultural land administration, environmental monitoring and protection, meteorological services, emergency services, and border and coastal security services[60].

To realise this vision, we must:

- Recognise space technology as a key technology
- Remove any regulatory barriers that could stand in the way of space enabled growth
- Make better use of space solutions across our policy landscape

4.2 STRATEGIC ALIGNMENT AND COHERENCE

The national space strategy aims at supporting the establishment of Malta's economic vision as articulated by several national policy documents including Digital Malta, AI Strategy Malta, the National Research and Innovation Strategy 2020 and others. The national space strategy also further complements the overall direction and growth intentions for the local economy as supported by successive Government Budget documents.

In particular, the Strategy considers the objectives and priorities of a number of EU, national and other sectoral strategies. The key strategic actions which will enable the implementation of the Strategy will also contribute to the achievement of the ambitions and priorities of these (pan) national and sectoral strategies.

Starting from the Space Strategy for Europe, which was launched in October 2016, it can be noted that two of its four strategic aims – that of bringing tangible benefits to European citizens and companies, and to foster a competitive and innovative European space sector – dovetail elegantly with what the Malta Space Strategy is aiming for. In particular, maximising the benefits of space for society and the economy through the uptake of space services and data and through meeting new user needs; along with fostering a competitive and innovative space sector through supporting skill development, and research and innovation, and through fostering entrepreneurship, lies at the core of this strategy.

This space strategy is also aligned with the thrusts of 'Improving further the quality of life', 'Incentivising economic growth', and 'Strengthening the infrastructure', as presented in the Budget 2021 Document. Of particular relevance to the Space sector is the

[60] The Malta Council for Science and Technology, 2017, "Malta National Space Policy 2017", pp 15-17. [online] Available at: <http://mcst.gov.mt/wp-content/uploads/2017/04/The-Malta-National-Space-Policy-2017.pdf>

"country's vision in the technological field [which] must include research and innovation and incorporate the adoption of innovative and future-oriented technologies…". From a funding perspective, Government is also committed to continue fuelling economic growth through various schemes which include funds for Research and Development.

The space strategy also ties in with the National Post Pandemic Strategy, specifically with Government's stated aims of "cultivating the development of new niches, clusters and sectors," "Assist and guide businesses and the public sector to leverage digital technologies," "Refocus education to give precedence to skills development … with a strong STEM and digital underpinning", and "Channel government resources and mainstream policy to drive innovation".

In terms of alignment and coherence with sectorial strategies, this strategy is congruent to a number of strategy documents: it considers ICT as the enabler for downstream 'Smart Space Applications' as outlined in Malta's Draft Research and Innovation Smart Specialisation Strategy 2021 – 2027; it embraces the overarching vision of building and sustaining an enabling framework for R&I which is critical for knowledge and innovation-driven economies (National Research and Innovation Strategy 2020); and it fully endorses the 'Strategic Innovation' Policy Development Pillar laid out in the Framework for the Education Strategy for Malta 2014-2024, which emphasizes the importance of the Quadruple Helix in relation to the interplay between education, industry, society and the public sector.

Below, the interplay between the Space Strategy and other relevant strategies is outlined in a matrix tabulation. The goals mentioned below are defined in section 4.3.

Malta Space Strategy 2022-2027																
Strategy Alignment	A1: Lay the foundations for the development of a vibrant space ecosystem	A2: Support companies, start-ups and SMEs	A3: Create new employment opportunities	A4: Establish space-related enterprises in Malta	A5: Gather statistics on space industry	B6: Increase Government R&D spending	B7: Increase number of researchers engaged in space-related R&D activities	B8: Develop international collaborations	C9: Engage in capacity building initiatives and programmes	C10: Seek to import and attract talent within the space industry	C11: Instil a deep appreciation of space from early education	D12: Increase awareness of benefits arising from space-derived activities	E13: Improve the regulatory and legislative framework			
Space strategy for Europe																
Maximising the benefits of space for society and the EU Economy	D	I	I	I		I	I				D	D	I			
Fostering a globally competitive and innovative European Space Sector	D	D	D	D		D	D	I	D	D			I			
European Green Deal																
Transform the EU into a resource-efficient and competitive economy	D	D	D	D		D	D	I	D	D			I			
Protect the health and well-being of citizens from environment-related risks	I					D	D									
Budget 2021																
Improving further the quality of life	D		D			I	I		D		I	I				

Malta Space Strategy 2022-2027	A1: Lay the foundations for the development of a vibrant space ecosystem	A2: Support companies, start-ups and SMEs	A3: Create new employment opportunities	A4: Establish space-related enterprises in Malta	A5: Gather statistics on space industry	B6: Increase Government R&D spending	B7: Increase number of researchers engaged in space-related R&D activities	B8: Develop international collaborations	C9: Engage in capacity building initiatives and programmes	C10: Seek to import and attract talent within the space industry	C11: Instil a deep appreciation of space from early education	D12: Increase awareness of benefits arising from space-derived activities	E13: Improve the regulatory and legislative framework
Strategy Alignment													
Incentivising economic growth	D	D	D	D		D	D	I	D	D			I
Strengthening Infrastructure	D				D	D							
Digital Malta (National Digital Strategy 2014-2020)													
Foster a strong, competitive, ICT-enabled and export-oriented industry, able to compete globally	D	D	D	D		D	D	I	D	D			I
Sustaining business and innovation	I	D		D		I	I			I			
Contributing to economic growth	D	D	D	D		D	D	I	D	D			I
A.I. Strategy Malta													
Generate investment and position the country as a hub for AI application	D	I	I	D					I	I			D
Improve citizens' experiences, expand access	D	I	I	I		I	I				D	D	I

Malta Space Strategy 2022-2027																		
Strategy Alignment	A1: Lay the foundations for the development of a vibrant space ecosystem	A2: Support companies, start-ups and SMEs	A3: Create new employment opportunities	A4: Establish space-related enterprises in Malta	A5: Gather statistics on space industry	B6: Increase Government R&D spending	B7: Increase number of researchers engaged in space-related R&D activities	B8: Develop international collaborations	C9: Engage in capacity building initiatives and programmes	C10: Seek to import and attract talent within the space industry	C11: Instil a deep appreciation of space from early education	D12: Increase awareness of benefits arising from space-derived activities	E13: Improve the regulatory and legislative framework					
to public services, and directly improve well-being																		
National Research and Innovation Strategy 2020																		
Embedding research and innovation at the heart of the Maltese economy to spur knowledge-driven and value-added growth						D	D	I										
A comprehensive R&I support ecosystem						D	D	I										
Smart, flexible specialisation - focus resources on niche areas				D		D	D	I	D	D								
Malta's Research and Innovation Smart Specialisation Strategy 2021 - 2027 (Draft)																		
Channelling of public and private investments in carefully selected priority areas	D					D												

Malta Space Strategy 2022-2027																
Strategy Alignment	A1: Lay the foundations for the development of a vibrant space ecosystem	A2: Support companies, start-ups and SMEs	A3: Create new employment opportunities	A4: Establish space-related enterprises in Malta	A5: Gather statistics on space industry	B6: Increase Government R&D spending	B7: Increase number of researchers engaged in space-related R&D activities	B8: Develop international collaborations	C9: Engage in capacity building initiatives and programmes	C10: Seek to import and attract talent within the space industry	C11: Instil a deep appreciation of space from early education	D12: Increase awareness of benefits arising from space-derived activities	E13: Improve the regulatory and legislative framework			
To recalibrate Malta's priorities in line with economic developments as well as national challenges.	D															
Framework for the Education Strategy for Malta 2014-2024																
To develop a society which is competitive in a global economy driven by information, knowledge and innovation							D		D	D						

Legend: D - Direct; I - Indirect

4.3 STRATEGIC GOALS

To achieve Malta's vision, a number of thematic goals have been laid out. These goals cover the relevant themes which we believe are necessary for the successful achievement of the space strategy vision: a) achieving sustainable economic growth through space activities; b) supporting the research community; c) developing human capital; d) Enhancing societal well- being; and e) improving the regulatory and legislative framework. A number of KPIs are associated with each thematic goal.

A) ACHIEVING SUSTAINABLE ECONOMIC GROWTH THROUGH SPACE ACTIVITIES

1. Lay the foundations for the development of a vibrant space industry and ecosystem in Malta with the potential to contribute to economic growth and job creation.
   a. KPI: Creation of a baseline for space sector economic contribution in Malta. This should include a clear definition of NACE categories comprising the space sector, and the quantification of economic output constituents for the sector.
   b. KPI: Achieve a CAGR of 10-12.5% with respect to GVA contribution from the space sector.

2. Government is to support businesses (start-ups, spin-offs, SMEs) operating in the space industry through various schemes, grants, and other initiatives. Government will also support companies operating in non-space markets to integrate any space-based capabilities into their commercial service offerings (e.g., financial services, transport services, health, civil/geotechnical engineering, etc.).
   a. KPI: Achieve at least an 80% absorption rate of funds being made available to space sector entities.

3. Create new employment opportunities in emerging niche economic sectors within the wider space industry.
   a. KPI: Creation of a baseline for space sector employment FTEs.
   b. KPI: Achieve a CAGR of 10-12.5% with respect to space sector employment FTEs.

4. See the establishment of several space-related enterprises in Malta by 2027
   a. KPI: Creation of a baseline for space sector enterprises.
   b. Based on such a baseline, create a realistic target for number of space-related enterprises to be established per year.

5. Initiate a process of collating and publishing key statistics and indicators related to the
space industry.
   a. a. See KPIs 1a, 3a, 4a, 7a, 10a

B) SUPPORTING THE RESEARCH COMMUNITY

6. Government commits to increase R&D funds being allocated to space research and activities.

a. a. KPI: Increase the budget for space related R&D, starting from an annual budget of €1.5m by 2024.

7. Increase number of researchers involved in space-related R&D activities.

a. KPI: Creation of a baseline for the number of researchers engaged in the space sector.
b. KPI: Triple the number of researchers at local academic institutions by 2027.

8. Develop international collaborations between Maltese businesses or research institutions
and foreign businesses or research institutions by 2027.

a. KPI: Successfully achieve at least 10 collaborations of substance within the space sector by 2027.

C) DEVELOPING HUMAN CAPITAL

9. Engage in capacity building initiatives and programmes for the space industry and related industries.

a. KPI: Triple the number of students enrolled at the Institute of Space Sciences and Astronomy by 2027 to 24 students.
b. KPI: Based on the space industry needs, create a number of modules/credits within existing tertiary level courses (MQF Level 5 upwards) focused on different aspects of space applications with a view to achieve a satisfactory level of student enrolment.
c. KPI: Successfully roll-out an upskilling programme across the public sector to train civil servants and public officials in the use and interpretation of space-derived data.

10. Through various schemes and initiatives, seek to import and attract talent within the space industry.

a. KPI: Creation of a baseline for space sector employment FTEs.
b. KPI: Achieve a CAGR of 10-12% with respect to space sector employment FTEs.
c. KPI: Monitor number of VISAs issued for space sector professionals in relation to growth in employment within the space sector.

11. Instil a deep appreciation of space (and of related STEM subjects) from early education
through the development and rolling out of specialised space-related events and short courses.

a. KPI: Achieve a statistically significant increase in perceptions and attitudes towards STEM subjects amongst students in secondary education, through the use of surveys (to be carried out as from a pre-determined year for baselining, and every other year thereafter to monitor progress).

D) ENHANCING SOCIETAL WELL-BEING

12. Increase awareness of the benefits arising from space-derived activities (with emphasis on Malta's space activities) across the public, private, and wider general public.

a. KPI: Achieve a statistically significant increase in awareness of the benefits of space derived activities across public entities, private enterprises, and the general public, through the use of surveys.

E) IMPROVING THE REGULATORY AND LEGISLATIVE FRAMEWORK

13. Create a legal framework meant:

a. To implement and give full legal force to the international treaties signed in this ambit.[61]
b. To establish a Regulatory Authority competent for space activities in Malta. Such Regulatory Authority will oversee the drafting and updating of rules regulating space activities and be responsible for the issuance of licences in line with the relevant body of international space law, without prejudice to any other applicable international, EU and national law.

[61] Space Law Treaties (UNOOSA)

CHAPTER 5
SPACE STRATEGY

Photo Credit: NASA, ESA/Hubble and the Hubble Heritage Team

5.1 STRATEGY PILLARS

Malta's vision and goals for space are underpinned by five strategy pillars as outlined in the table below. These pillars are enabled by the key strategic actions articulated under Section 6.

The five pillars are symbiotic in nature and enhance one another when considered in conjunction. Hence, they should not be interpreted as being implemented sequentially, but rather in parallel. At a more granular level, a timeline of key strategic actions per pillar is provided in Appendix 2 'Strategy Rollout' outlining how certain key action points which are considered 'quick wins' should be prioritised with a view of building the foundations for sustainable growth within the space sector.

Malta's investment in space is rooted in the potential for increased user uptake and commercial exploitation. To successfully execute and deliver the vision and goals underpinning the five pillars of this strategy, Malta needs to build from, and promote, its existing unique selling points to the wider space industry as seen below:

- Pool of talented, skilled, and flexible professionals, available at a globally competitive price, which can support the space industry itself, and which are active in various sectors making use of space-derived data.
- Favourable tax environment which can benefit space-related enterprises.
- As an Island, the potential for a diverse application of downstream activities making it an attractive location for the space industry.
- Strategic location within the Mediterranean, offering businesses access to the EU single market while remaining in close proximity to other major markets like the Middle East and Africa.

FIVE PILLARS UNDERPIN MALTA'S SPACE STRATEGY

1. FDI and space business attraction	The strategic actions aim to support the development of an agile and sustainable space sector through FDI, fiscal incentives to attract economic actors, home-grown investment, and EU funding. This would aim to create the necessary demand to support the future development of a potential Malta 'Space Hub' that would act as an entrepreneurial support centre for relevant, key enterprises particularly with regard to supporting their capacity building.
2. Space innovation	The strategic actions aim to support the development of space research activities in upstream, downstream and space-derived applications, concentrating on potential long-term user needs in the public and private sectors.
3.Development of human capital	The strategic actions aim to attract and develop talent through local academic entities, with relevant skills for space and complementary industries, in line with the country's vision for the development of a space sector and an economy focused on smart specialisation.
4. International regulatory compliance	The strategic actions aim to support the development of a legal framework for the registration of space objects and the exploration and use of space resources. They also aim to develop strong international linkages to promote Malta internationally as a space-friendly jurisdiction.
5. Emerging technologies	The strategic actions aim to support the development of research opportunities and commercial applications resulting from the interweaving of space and emerging technologies, and the collaboration of advanced multidisciplinary science and leading-edge engineering.

CHAPTER 6

STRATEGIC ACTIONS

Photo Credit: ESA - S. Corvaja

6.1 STRATEGIC ACTIONS TO BE UNDERTAKEN UNDER PILLAR 1 – FDI AND SPACE BUSINESS ATTRACTION

Strategic Actions which fall under the Pillar of FDI and Space Business Attraction aim to provide Government-led strategic investments with a view to advance and foster a resilient and sustainable space ecosystem and industry in Malta. Fundamentally, Malta's investment in space is to support innovative businesses and researchers to develop skills enabling the exploitation and use of data generated from space-based infrastructures and the use of downstream applications, leading to increased exports, sales and quality employment. These contributing factors would be expected to create a favourable ecosystem in Malta capable of attracting space activity.

GOALS IMPACTED BY STRATEGIC ACTIONS PROPOSED UNDER PILLAR 1

1	Lay the foundations for the development of a vibrant space industry and ecosystem in Malta with the potential to contribute to economic growth and job creation.
2	Government is to support businesses (start-ups, spin-offs, SMEs) operating in the space industry through various schemes, grants, and other initiatives. Government will also support companies operating in non-space markets to integrate any space-based capabilities into their commercial service offerings (e.g., financial services, transport services, health, civil/geotechnical engineering, etc.).
3	Create new employment opportunities in emerging niche economic sectors within the wider space industry.
4	See the establishment of a number of space-related enterprises in Malta by 2027.
5	Initiate a process of collating and publishing key statistics and indicators related to the space industry such as economic output and employment.
8	Develop international collaborations between Maltese businesses or research institutions and foreign businesses or research institutions by 2027.
9	Engage in capacity building initiatives and programmes for the space industry and related industries.

To achieve Malta's vision to grow the number of space-focused companies, key strategic actions will include:

6.1.1 ASSESSING THE FEASIBILITY OF A DEDICATED SPACE HUB

The space industry is an economic eco-system which thrives on collaboration between academia and business, particularly because just like other industries within the knowledge economy, it is heavily driven by research and the generation of intellectual capital.

To this extent, Government believes that a setup which brings together industry, the research community, and the public sector under one 'roof' should be explored and assessed. This setup, which can take many forms, may have the following objectives:

- It would act as a business incubator – these are specialised workspaces aimed at supporting start-up businesses, spin-offs, and SMEs through the provision of facilities, external expert advisors, entrepreneurial and administrative support and other assistance.
- It would seek to accelerate growth through the formation of a Space Cluster where ideas and space-related technologies are shared with the wider industry.
- It would provide a platform for the development of state-of-the-art facilities to aid research carried out by both academia and the business community. Subsidised access to these facilities could be provided as a means of supporting the sector.
- It would act as a single port-of-call for the dissemination and promotion of the space sector, providing information on funding opportunities, collaborative and internationalisation opportunities, vacancies within the industry, and other general information which could enhance national capabilities or be of interest to operators in this field.
- It would take an active role in bringing together various players from private sector, public sector, and academia, through the organisation of networking events, seminars, hackathons, and upskilling courses, amongst other initiatives.

A Space Hub can take many forms – it can be a dedicated physical workspace where the space community can come together to work independently and collaboratively; it can be an extension of an existing incubation centre or technology hub with entities within the space industry umbrella forming part of the wider business community; or it can also exist virtually with the space industry community being linked via a dedicated web-based portal providing information on upcoming networking events, courses, funding opportunities, collaboration avenues with possibilities of virtual interaction (such as through discussion forums). The hub can also provide support by offering data processing service activities and dedicated training workshops which can assist Government Institutions and researchers to collate and process freely accessible space data.

From an entrepreneurial perspective, the hub can offer support to start-ups, other enterprises and researchers by keeping them well informed of innovative funding solutions. The space hub could also help link local businesses and academia with external experts able to share experience and knowledge both with regard to space-related activities and also other areas such as business development. The space hub can also potentially explore the opportunity for providing UK space businesses affected by Brexit with relocation options which enable them to continue operations within the EU.

In terms of space-dedicated research, the Space Hub can potentially be oriented towards a few key research areas to ensure that specialisation is built around Malta's unique selling points and that such specialisation is nurtured and developed. In this respect, the hub can be used to support ongoing space research in Malta and also create synergies with potential space research endeavours, particularly as the scope of research would likely widen due to increasing international public and private interest as well as potential incrementing investments by emerging private players in the space industry.

By way of example, local research is already carried out in the following areas, which areas could benefit greatly from the potential synergies created within the Hub:

- the study of topographical patterns through Copernicus Sentinel-2 satellites.
- satellite data fusion and imaging resolution enhancement for coastal areas.
- studying the behaviour of traditional, modified and modern roofs using Earth Observation data.
- computing climatology and operational high-resolution chlorophyll-a and total suspend matter product from satellite data.
- using remote sensing to detect and monitor rock tilting and motion which may be precursors to hazardous coastal landslides; and
- developing a Water Resource Management platform that can be used to estimate irrigation water consumption of particular crops at country level through the improvement of resolution for Sentinel-2 optical images.

A potential Space Hub could act as a point of liaison where a multitude of industries can come together and build partnerships with the common goal of sharing knowledge and improving efficiencies. Such a setup would encourage a vibrant and dynamic space ecosystem that facilitates technology transfer from space sector to non-space sectors. The Hub would provide opportunities for synergies between the space sector and wider industry (technology, agriculture, robotics, transportation, communication etc). Allowing businesses access to the Space Hub at subsidised rates would drive innovation by offering technological capabilities that might otherwise be unavailable to them due to costs or physical space restrictions. Enabling firms' access to high-end equipment like HPCs (within the Space Hub or other local Innovation Hubs) could have a multitude of benefits for the Space Sector and other related activities. The Space Hub could also be used to showcase Maltese capabilities to attract international investors and businesses.

Prior to investing in such a hub, Government will analyse the potential demand for the use of the hub and carry out an assessment of the overall financial and economic feasibility of a dedicated Space Hub. The detailed demand analysis will shed light on the extent and type of use of the hub, including greater insight into the specialised space-related areas which the Hub will cater for. Government will also consider alternative options, such as expanding the resources and capabilities available at existing business incubation centres and technology hubs in order to cater for the needs of enterprises within the space industry or introducing the concept of the Space Hub as a pilot study at first.

The feasibility study in relation to the Space Hub must also look at and consider different mechanisms of attracting venture capitalists to form a fundamental part of the operation of the space hub, such as by making participation in the Space Hub a key requirement to qualifying for incentives and benefits or through providing direct access to academics and homegrown talent. The Space Hub must ultimately be positioned to giving them the opportunity to identify new opportunities within the industry while at the same time giving businesses seeking funding a curated list of venture capitalists who are already familiar with the sector.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.1.1 (a) Carry out a detailed cost benefit analysis related to establishing a Hub for the local space industry ('Space Hub'). The cost benefit analysis is to consider different setups and different areas of focus to ensure that the Hub is fit for purpose.	Q1 2025	MEYR, MCST and Malta Enterprise	National funds
6.1.1 (b) Proceed in line with the findings of 6.1.1 (a), potentially developing a new Space Hub or expanding the capacity at existing incubators/centres to support the Space Industry.	Depends on findings from 6.1.1 (a)	MCST, MEYR	National funds
6.1.1 (c) Through dedicated workshops, presentations and meetings, link up with existing national Hubs and incubation centres to drive collaboration across different fields and sectors.	Q4 2025	MCST, MEYR	National funds
6.1.1 (d) Link up with other international Space Hubs with a view to collaborate on cross-border projects and share knowledge and ideas.	Q4 2025	MCST, MEYR	National funds

6.1.2 MALTA TO ENGAGE IN DISCUSSIONS WITH THE EUROPEAN SPACE AGENCY IN ORDER TO CONSIDER THE BEST 'PARTNERSHIP' ROUTE.

The Government should position itself as an enabler for Space technology and innovation by leveraging Malta's relationship with the ESA. Developing and maintaining a strong relationship with the ESA is essential to ensure that Maltese businesses and research institutions are given the opportunity to access the infrastructure and capabilities of the agency. Investment in the ESA will ensure continued support for innovative companies and researchers to develop cutting-edge technologies for commercialisation in the global space market. This may also lead to the creation of valuable business linkages between Malta and other associated Space organisations. ESA support can drive innovation resulting in high performance space technologies that can be utilised by non-space industries including agriculture, robotics, technology, maritime etc.

Full membership of ESA is reserved to nations which have a mature and developed space industry. Malta could consider other partnership models which could see it benefit from expanding its scientific and industrial base. In particular, Malta could consider participating in ESA's Plan for European Cooperating States (PECS). The PECS Programme is a five-year plan which allows enrolled countries to participate in ESA procurements and activities, mostly in research and development with the aim of developing expertise within the space industry. Countries participating in ESA's PECS Programme would provide an annual monetary contribution with the intention of allocating such funds to local industry/academia via open calls. PECS countries can also benefit from participation of the Young Graduate Trainee Scheme where a number of positions at ESA could become available to Maltese students. Furthermore, participating in the PECS prepares countries for possible future Associate membership through industrial development, research and education and outreach activities.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.1.2 (a) Initiate process and discussions to negotiate a potential PECS route through the signing of a Framework Agreement with ESA.	Q4 2022	MCST	National funds
6.1.2 (b) Subject to successful negotiation with ESA as documented in 6.1.2 (a) above, establish appropriate active communication channels to ensure that the Maltese business and research community is well- informed in a timely manner on the various ESA Programmes and initiatives which they can participate in.	Q4 2023	MCST	National funds
6.1.2 (c) Subject to successful negotiation with ESA as documented in 6.1.2 (a) above create a register of ESA Programmes, initiatives and opportunities, and integrate this with the Malta Space website/portal to enable easy access for private sector, public sector and academia.	Q4 2023	MCST	National funds

6.1.3 ENHANCE INTERNATIONAL AWARENESS OF THE SPACE-RELATED RESEARCH AND ACTIVITIES, AND BOOST VISIBILITY OF INTERNATIONAL OPPORTUNITIES FOR MALTESE BUSINESSES AND RESEARCHERS

The nascent quality of the Space Industry in Malta means that local investment is limited or unavailable, which infers that foreign investment is essential for the development of the Island's Space Industry. The Government, MCST and Malta Enterprise should aim to promote and attract foreign investment from the international Space Sector. Malta should use its strategic advantages: EU market access; human capital; and the Government's progressive stance on technology; to attract foreign companies and in particular to seek to attract a few large anchor companies which could serve as a centre of gravity from an FDI perspective. FDI could include a range of possibilities including the establishment of new facilities by international space companies in Malta, capital funding for Maltese enterprises resulting in job creation and growth of the space sector and partnerships with Maltese research institutes through shared research and innovation.

As space is a predominately export driven market, it is important that Malta actively builds international relationships and promotes its advantages to global markets.

Malta could increase its international presence by:

- Leveraging Government's political, diplomatic and trade networks and linkages to promote Malta to an international audience (and promote space capabilities as these are built up over time).
- Growing Malta's international profile in connection with space and increasingly seek to influence the space agenda at international fora.
- Encourage relevant local enterprises as well as researchers in relevant fields, to participate in high-profile international projects likely to garner significant attention both amongst industry insiders as well as the general public; and
- Promoting local space companies through the development of an online directory.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.1.3 (a) Embark on Space Roadshows to attract / encourage foreign companies to set up in Malta, and to link up Maltese Businesses with foreign export markets.	Q2 2024	MCST, Malta Enterprise, Trade Malta, Tech MT	National funds
6.1.3 (b) Promote attendance at space trade events, exhibitions and conferences/seminars to show-case space related capabilities.	Q2 2024	MCST, Malta Enterprise	National funds
6.1.3 (c) As a result of 6.1.3 (a) and (b), seek to promote and form stronger international collaborations with foreign businesses and academics with a view to obtain significant experience in internationally relevant initiatives.	Q2 2024	Malta Enterprise, Trade Malta	National funds
6.1.3 (d) Establish, for the purposes of facilitating data collection, a formal definition of which economic activities constitute part of the Space Industry, as well as a registry of all entities involved in each such activity.	Q4 2023	NSO	National funds
6.1.3 (e) Initiate a process to capture space industry statistics either through the collection of space industry statistics by the NSO, or via the commissioning of a multi-annual industry report.	Q4 2023	NSO	National funds
6.1.3 (f) Gradually build an online directory of businesses engaged in space-related activities to promote Malta's growing space industry to the international space market.	Q3 2024	MCST, Malta Enterprise	National funds

6.1.4 SUPPORT AND ENCOURAGE COLLABORATION ACROSS INDUSTRIES AND JURISDICTIONS

While public investment and support are likely to be important elements in the early days of Malta's space industry, trade between different private sector entities is critical to the long- term flourishing of the sector. As such, Government is committed to support the sector through the organisation of regular industry events such as conferences, roadshows, and networking events. The aim of such events will be to promote Malta as a jurisdiction of choice for investors and businesses, as well as to provide a platform for local businesses and researchers searching for partners and clients within the industry.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.1.4 (a) MCST, in collaboration with Malta Enterprise, will hold regular workshops, networking opportunities and events for industry players and academics.	Q3 2024	MCST, Malta Enterprise	National funds
6.1.4 (b) Hold a biennial event in Malta, inviting international speakers and international companies, to encourage cross-jurisdictional collaboration and sharing of ideas.	Q4 2024	MEYR, MCST, Malta Enterprise	National funds
6.1.4 (c) Government to consider financing Malta's participation within a prospective Horizon Europe Space R&D Partnership, to be launched in 2023.	Q1 2024	MFE, MEYR, MCST	National funds
6.1.4 (d) Encourage further bilateral collaboration between MCST and international space agencies, and other space actors (for example EURISY and the Space Climate Observatory), to improve cooperation and development of opportunities for Maltese entities and professionals.	Q1 2024	MCST	National funds

6.1.5 SET UP A DEDICATED AND INTEGRATED ONLINE SPACE INFORMATION PORTAL

Government will develop and maintain a dedicated and integration information portal covering all Space-related activities and programmes,thus actingas a single pointof reference for any entity (private or public) that wishes to understand the level of space engagement across industry, research and the skills domains in Malta.

The dedicated website will make opportunities, schemes and initiatives related to space increasingly visible to the public and industry. It will clearly map out the space governance structure in Malta, providing information on commercial activity, signposting supports available to industry and researchers, amongst others. The website will also feature the five strategy pillars outlined in Section 5.1, with a number of relevant initiatives or local themes presented under the respective pillar. For example, any training or educational activities which are aimed at developing the relevant skills will be presented under 'Development of human capital'.

Thewebsitewillfurtherprovide up to date information inconnection withinternational opportunities such as EU Horizon Europe calls, EU Space Programmes and ESA open calls. It will also point to financing support available for Space initiatives and industry, including for example the Space Research Fund.
In targeting the international space sector,it is of utmost importance that national and international stakeholders can access this information with ease. Further, increasing the profile of space nationally will support the objective of growing awareness of Maltese engagement in space and its potential nationally.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.1.5 (a) Integrate all Space-related information onto an existing governmental portal.	Q2 2024	Government	National funds

6.1.6 SET UP A RESPONSIVE GOVERNANCE STRUCTURE

In setting up an appropriate and responsive governance structure, Malta will implement a decentralised governance model based on shared coordination among several ministries connected public entities and relevant authorities recognising the diverse nature of space and its role in developing sustainable economic growth and innovation.

A Space Advisory Group will be established to guide and support the implementation of the Strategy. The Space Advisory Group will be tasked with making recommendations on the implementation of the non-regulatory key strategic actions, and to monitor performance using the identified KPIs. The Space Advisory Group will be composed of Government entities responsible in accordance with their respective institutional mandates and competences for the implementation of the non-regulatory strategic actions proposed within the Strategy. The Space Advisory Group should be able to avail itself of extended support by a network of expert working groups (to be set up per area of expertise within the wider space sector) with a view towards consolidating existing technical expertise on the space sector and industry. In turn, the operational implementation and effective roll-out of the non-regulatory initiatives of the Space Strategy will be undertaken by the Malta Council for Science and Technology (MCST) as the responsible entity which responds to the Minister responsible for the research and innovation portfolio.

The Space Advisory Group will be chaired by an appointed individual and would report on the overall progress of the Strategy to the Minister with responsibility for research and innovation. The Space Advisory Group will have the responsibility for strategic advisory activities and the necessary coordination across the relevant government services for the implementation of the Space Strategy, with the effective operational roll-out of the non- regulatory initiatives of the Space Strategy to be assigned to the Malta Council for Science and Technology (MCST).

As Malta's space industry develops, the role of the Space Advisory Group could be reviewed and the optimal governance structure to meet the needs of Malta's space industry will be re- examined should the need arise.

The role of the Space Advisory Group will include:

1. EFFECTIVE STEWARDSHIP OF THE SPACE SECTOR:

- In collaboration with and support of relevant stakeholders, lead the development, implementation and monitoring of the Malta Space Strategy.
- Translate the Strategy, into a series of on-going activities, projects and initiatives of national priority, all within a comprehensive and unified national space Strategy.

- Coordination and oversight of the implementation of the Strategy.
- Performance evaluation of the implementation of the Strategy and
- Reconsider the appropriate governance structure as Malta's engagement with the space sector moves forward.

2. ACTIVE STAKEHOLDER INVOLVEMENT AND COORDINATION:

- Raising awareness among stakeholders about the Space Strategy.
- Raising awareness across the public sector, business community and the wider public of the potential value and use of space enabled technologies and applications.
- Coordinating and allocating specific tasks and roles to stakeholders related to the activities, projects and initiatives set out in the space Strategy.
- Consideration and recommendation of initiatives for Malta's space industry, based on business needs and potential opportunities as they emerge.
- Identify and manage global collaboration opportunities and major regional and international events that help position Malta as a jurisdiction of choice in space and
- Coordinate Malta space policy positions across the national competent bodies.

3. RISK MANAGEMENT DURING STRATEGY ROLLOUT:

- Identification of tactical and strategic risks that might ensue throughout the course of the implementation of the Strategy and
- Implement procedures to mitigate any identified risks.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE	KPI
6.1.6 (a) Set up the Space Advisory Group.	Q2 2024	Government	National funds	Space Advisory Group officially set up and convened with clear and formal terms of reference.

6.2 STRATEGIC ACTIONS TO BE UNDERTAKEN UNDER PILLAR 2 – SPACE INNOVATION

Strategic Actions which fall under the Pillar of Space Innovation aim to a) support development of space-related R&I activities being undertaken by academic institutions and other entities in both the public and private sector and b) support in the creation of a sustainable space ecosystem. The ultimate objective of such support is to facilitate the development of upstream, downstream and space-derived activities through the use of several instruments and funding opportunities. This will contribute towards the creation and development of innovative businesses and commercial applications in and around the space sector.

GOALS IMPACTED BY STRATEGIC ACTIONS PROPOSED UNDER PILLAR 2

1	Lay the foundations for the development of a vibrant space industry and ecosystem in Malta with the potential to contribute to economic growth and job creation.
2	Government is to support businesses (start-ups, spin-offs, SMEs) operating in the space industry through various schemes, grants, and other initiatives. Government will also support companies operating in non-space markets to integrate any space- based capabilities into their commercial service offerings (e.g., financial services, transport services, health, civil/geotechnical engineering, etc.).
4	See the establishment of a number of space-related enterprises in Malta by 2027.
6	Government commits to increase R&D funds being allocated to space research and activities.
7	Increase number of researchers involved in space-related R&D activities.
8	Develop international collaborations between Maltese businesses or research institutions and foreign businesses or research institutions by 2027.
9	Engage in capacity building initiatives and programmes for the space industry, and related industries.
11	Instil a deep appreciation of space (and of related STEM subjects) from early education through the development and rolling out of specialised space-related events and short courses.

To achieve Malta's vision to grow the number of space-focused companies, key strategic actions will include:

6.2.1 SUPPORTING START-UPS AND SMES IN THE SPACE SECTOR

Start-ups and SMEs in space-related fields will be supported through various initiatives, such as dedicated funding and schemes.

Through its various bodies, Government will explore launching new schemes aimed at supporting the establishment and growth of space-related enterprises. This funding will support entrepreneurs in their journey to establish a business, secure financing, and build a presence in both local and international markets. The scheme can stand as a joint initiative with other incubators and centres, such as the TakeOff Business Incubator, Knowledge Transfer Office and the Centre for Entrepreneurship and Business Incubation (CEBI) at the University of Malta providing additional support and expertise to entrepreneurs, start-ups and SMEs. The scheme can adopt a two-pronged funding approach enabling academics to apply for 'proof of concept' funds which will enable them to bring an innovative concept developed within the University of Malta one step closer to commercialisation, while entrepreneurs outside of academia can apply for funds which will enable them to bring their independent technology or knowledge-based start-up one step closer to investment or their first customer.

Apart from this, it is pertinent to point out that existing schemes do not preclude entities operating within or around the space sector to apply and take advantage of such opportunities.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.2.1 (a) Launch a scheme (or expand an existing scheme) dedicated towards space start-ups and SMEs, covering advisory support (business planning), financing support (linkage with financing institutions and/or Malta Development Bank), and provision of funding for start-ups and SMEs.	Q4 2024	Malta Enterprise/ MDB	National funds
6.2.1 (b) Maximise potential of existing local and EU-wide schemes, incentives, funds and financing options: Launch a one-stop-shop space- dedicated portal [link with Malta Space website], where start-ups and SMEs active in the space industry can get support and advice with respect to what schemes or funds they can tap into.	Q4 2024	Government	National funds

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.2.1 (c) Support businesses and researchers in their application for funding via third party contractor or a central office for the coordination of funds, to ensure that ideas/applications are well-developed and complete, thus increasing the chances of approval.	Q4 2024	MEYR with support from MCA, Malta Enterprise and MCST	National funds

6.2.2 SUPPORTING SPACE RESEARCH AND DEVELOPMENT IN THE SPACE SECTOR

Commercial applications of space-related technologies are the result of close cooperation between business interests and cutting-edge research. Supporting the growth of a Maltese space industry therefore requires not only supporting research and business interests separately, but also providing mechanisms to facilitate cooperation of such interests.

Enhancing existing Government programmes which have already made an impact on Malta's Space industry is essential for Malta to achieve its strategic goals. As it stands, funding instruments such as the Space Research Fund, the Fusion Research Excellence Programme and Malta Enterprise's Research and Development scheme have been driving opportunities for space research in Malta. It is essential that Malta continues to build and develop these funds to ensure that start-ups and SMEs continue to have access to local funding. These funds give Maltese businesses and institutions the opportunities to explore different technologies and innovations whether it's through funding business plans, financing feasibility projects or providing consultancy services.

Further to this, Government shall also launch initiatives aimed at supporting collaboration between academia and private enterprise within the space sector. Such support shall take the form of grants and funding schemes administered by the MCST with the aim of promoting research beyond those areas already funded through existing Space Research funds. Through such a scheme, the Government hopes to bring together entrepreneurs and academics and develop new commercial applications for space-related technologies.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.2.2 (a) Understand Space R&D needs of SMEs by carrying out a regular survey of SMEs to discover the overall desire to engage in Space R&D and barriers preventing SMEs from engaging in additional Space R&D. Based on results, introduce specific measures to address key issues.	Q3 2023	MCST	National funds
6.2.2 (b) After consultation with past end-users of the SRF, and after negotiation with ESA on the best partnership route, launch a revamped MCST Space R&I Funding Scheme (or consider widening the existing Space Research Fund), potentially targeting research areas and downstream applications outside the scope of the existing Space Research Fund, to support collaboration between industry players and academia on joint research projects. A revamped Space R&I Fund could be possibly incorporated within the PECS agreement with the European Space Agency.	Q2 2024	MCST	National funds

6.2.3 MALTESE GOVERNMENT TO BECOME AN EARLY ADOPTER OF SPACE APPLICATIONS

The Maltese Government will undertake a review of the various responsibilities of public sector organisations in order to determine which entities could potentially benefit from the application of space-related services. In this way, Government hopes to improve the overall effectiveness of certain public sector functions while also being an early driver of demand for the local space industry. The following are just a few areas where space-based technology can help facilitate Government's responsibilities:

- The EU's Earth observation programme Copernicus is able to provide a vast array of freely available data and measurements to service providers and public authorities. The Maltese Government anticipates being able to utilise this data to:

- Monitor air quality and climate trends thereby enabling more informed environmental and public health decision making.
- Monitor marine data to enable better protection of marine resources and provision of more effective marine safety services; and
- Monitor trends in land coverage and usage, allow for more informed decisions related to the natural and built environments as well as better utilisation of Malta's limited natural resources.

- The EU's Galileo system provides accurate satellite-based navigation information. Such information can be utilised by public officials such as civil protection and customs officials to effectively carry out their duties. This data may also serve to strengthen Malta's search and rescue capabilities, aid Government's response to other emergencies or crises, and engage in better border and maritime surveillance.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.2.3 (a) Launch a review of all public sector organisations to determine which entities can best benefit from space-related services.	Q1 2024	MEYR/MCST with support from ERA and PA	N/A
6.2.3 (b) Acquire and implement space-related services and technologies as identified through public sector review.	Q3 2026	Government, Servizz.gov, Tech MT, PA, ERA	National funds
6.2.3 (c) Government plans to put collaboration with industry and academia at the forefront of any Government investment in space research projects.	Ongoing	Across Line Ministries	N/A

6.2.4 FACILITATING NEW FORMS OF INVESTMENT

Government presently supports R&D efforts through the provision of funding to projects covering a broad range of different topics. As of 2018, funds have begun to be allocated specifically to the exploration and exploitation of space.

Furthermore, the Space Research Fund 2021 offers an opportunity for private enterprises to advance their engagement with space. The fund has been specifically developed to bolster growth in the Space Sector and offers financial support for research, development, and innovations in the downstream Earth Observation (EO) sector to tackle societal challenges in Malta. Other funds such as FUSION programme and Research and Development 2020 Fund are open to a variety of research fields which also include space-related activities.

Additional to the above, Government can make available the necessary resources to support eligible entities that wish to apply for grants or prizes offered by the European Union Agency for the Space Programme (EUSPA). In the past, this agency (under the name European Global Navigation Satellite Systems Agency and European GNSS Supervisory Authority) managed the Galileo Exploitation 2021 Grant Plan and the EGNOS Grant Plan 2021. Government will also explore how it can leverage its relationship with EUSPA (and with other space agencies through bilateral agreements) so that space derived data (such as high-resolution satellite imagery) can be made available to local researchers, public bodies and other institutions with a view to further research or to enhance space data applications.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.2.4 (a) Adjust the total budget allocated to space-related R&D activities in line with industry requirements.	Ongoing	MEYR, with support from MCA, Malta Enterprise and MCST	National funds
6.2.4 (b) Support and encourage the space business sector through a range of national funds to continue to be made available	Ongoing	MEYR, with support from MCA, Malta Enterprise and MCST	National funds
6.2.4 (c) Establish resources to aid entities wishing to apply for grants and prizes managed by the EUSPA.	Q4 2024	MEYR, with support from MCA, Malta Enterprise and MCST	National funds

6.3 STRATEGIC ACTIONS TO BE UNDERTAKEN UNDER PILLAR 3 – DEVELOP AND ATTRACT SKILLED HUMAN CAPITAL

The strategic actions proposed as part of this pillar aim to continue developing a skilled workforce to meet the space sector's needs and enable the growth of this industry in Malta. In this regard, Government's vision is to nurture a local pool of talent which is readily accessible by innovative businesses and researchers to support space-related activities, therefore ensuring the long-term sustainability and competitiveness of a local space industry. In developing the necessary human capital and facilitating access to the range of multidisciplinary skills required, Government will adopt a two-pronged approach through a) building relevant educational programmes across the educational spectrum; and b) industry upskilling.

GOALS IMPACTED BY STRATEGIC ACTIONS PROPOSED UNDER PILLAR 3

3	Create new employment opportunities in emerging niche economic sectors within the wider space industry.
8	Develop international collaborations between Maltese businesses or research institutions and foreign businesses or research institutions by 2027.
9	Engage in capacity building initiatives and programmes for the space industry and related industries.
10	Through various schemes and initiatives seek to import and attract talent within the space industry
11	Instil a deep appreciation of space (and of related STEM subjects) from early education through the development and rolling out of specialised space-related events and short courses.
12	Increase awareness of the benefits arising from space-derived activities (with emphasis on Malta's space activities) across the public, private, and wider general public;

To achieve Malta's vision to develop Malta's human capital, key strategic actions will include:

6.3.1 IDENTIFYING EDUCATION AND TRAINING OPPORTUNITIES TO MEET INDUSTRY NEEDS

Prior to delivering on the strategic actions laid out below, it is essential that the Maltese Government determines whether current education pathways meet the needs of the Space Industry. Therefore, there is a need for the identification of areas where education and training meet or fall short of the industry needs. Identifying skills shortages is important to ensure that all skills gaps are met in the future. Government should work with industry and educational and vocational training providers to establish the currency of existing Space education and training pathways while also identifying opportunities to enhance them. Going forward it is essential that continuous assessments of the industry are carried out to ensure that industry developments, including emerging technologies are monitored to attract new workers to emerging roles.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.3.1 (a) Carry out a detailed Workforce Planning exercise, considering the existing currency of educational pathways and how these meet industry needs.	Q3 2024	MEYR, MFE, UoM and MCAST	National funds
6.3.1 (b) Facilitate ongoing assessments of industry developments, including emerging technologies to ensure that new and in-demand talent is available for emerging roles	Ongoing	MEYR, MFE, UoM and MCAST	National funds
6.3.1 (c) Build awareness around educational, skilling, upskilling and reskilling programmes to meet industry identified needs with a view to increase uptake of such programmes.	Q4 2023	MEYR, UoM and MCAST	National funds

6.3.2 NURTURE A PIPELINE OF GRADUATES AND POST-GRADUATES TO SUPPORT THE SPACE SECTOR

It is imperative that Malta continues to foster interest in Science, Technology, Engineering and Maths (STEM) subject areas and specialised education programmes to provide a pipeline of talented graduates to progress Malta's future space and related capabilities. This will be achieved by investment in space related education programmes at all levels, including taught and research graduate levels, to ensure the economy has the necessary availability of skilled people to take advantage of the growing opportunities presented by the emerging space sector.

SPACE EDUCATION AT THE UNIVERSITY OF MALTA

The University of Malta currently offers post-graduate qualifications in space related fields, namely Research Masters and Ph.D. programmes, as well as a taught Master of Science in Space Sciences and Astronomy offered through the ISSA. Recognising the importance of the specialised skills and cutting-edge knowledge developed through these dedicated programmes, there will be a continued investment in such courses. Furthermore, a scholarship programme will be offered to drive their uptake. This scholarship will be modelled on existing programmes such as those currently offered to students interested in pursuing higher education in the field of Artificial Intelligence. The latter scheme offers scholarships to the amount of €100,000 with each applicant being eligible to a maximum €10,000 per student. The proposed scholarship fund could see a similar approach adopted for prospective Space Science students.

The University of Malta will also consider the roll-out of new space related modules that coincide with emerging technologies like cyber-security and space regulation. Making such modules available to students in other courses outside of Space education through elective options would promote and encourage space learning for students studying subjects which complement but are not necessarily directly related to space studies. Continuing to create educational courses and opportunities in the Space field will enable Malta to promote itself as a quality destination for Space education by making the programmes available through the Erasmus scheme and other international student schemes.

Another programme available to Maltese students is the European Masters Course in Aeronautics and Space Technology (EUMAS) through the EU's Erasmus programme. This is an EU sponsored course under the umbrella of the EC/DG Culture Erasmus Mundus Programme for students from Europe and abroad. The programme encourages cross-collaboration among European Universities.

It is essential that Malta acknowledges the link between development of human capital, FDI and space business attraction. As such, the development of courses and modules

in space sciences, along with encouraging the uptake of such courses, must be met in parallel with the generation of employment and career opportunities but also with the provision of the necessary support in helping build entrepreneurial skills.

SPACE EDUCATION PROGRAMME FOR YOUNG STUDENTS

To raise awareness of the Space Sector in primary, middle, secondary, and post-secondary schools, MCST is being supported by the ESA to pursue a Space Education Programme that supports local schools to participate in ESA related activities. This initiative sees that teacher training and kits are provided free of charge to a selected number of schools. Some of the initiatives of the Space Education Programme have included satellite simulations (CanSat) and code writing activities (AstroPi). Malta should continue to build on and promote educational initiatives to young leaners so as to stimulate demand for the uptake of University Space programmes as they progress to third-level education.

Awareness of the benefits and opportunities related to the Space Sector can be provided through educational platforms such as the Esplora Interactive Science Centre, which among other, aims to engage kindergarten, primary and secondary school students with STEM subjects. Student Engagement could address current misconceptions of Space by integrating the practical capabilities of the Space Sector (GPS, Earth Observations, Communications Satellites etc) with the aim of giving young students a 21st century view of Space in our daily lives. Increased collaboration among local science centres, the ESA and other technical units would significantly improve outreach capabilities. Similar to the Space Education Programme, Esplora can stimulate and drive interest in the Space Sector at a junior level, thus increasing demand for Space related courses at tertiary level.

As it stands, primary educators may have limited scientific backgrounds, which may limit the effectiveness of STEM education to younger students. It is important that teachers are provided with the appropriate CPD, tools and training to ensure that interest in STEM subjects, including Space, is promoted and taught at a junior level. It is important that international agencies and local facilities like Esplora coordinate with kindergarten and primary educators to ensure that knowledge gaps in the STEM field are filled so that young students are given every opportunity to explore these subjects later in their academic and professional careers.

INCREASING AWARENESS OF OPPORTUNITIES AND CAREER PROSPECTS

Government understands the importance of supporting theoretical content with practical experience, particularly to enable and facilitate transition from theory to applications which can generate tangible benefits. As such, Government commits to work together with the private sector to create additional training and education programmes which merge academic and practical aspects, thereby giving students further opportunities to gain experience as they study while allowing the private sector to benefit from the enthusiasm and creativity of a young workforce. Apart from investing in additional programmes, increasing awareness of such opportunities and promoting career

prospects through all levels of education are also of crucial importance in increasing the uptake of such education programmes.

Alongside this initiative is the Copernicus Academy network which Government can connect with in the short-term as membership is available to non-ESA countries. The Copernicus Academy connects research and academic institutions with the private sector to facilitate collaborative research and develop educational material for consumption by students, researchers and entrepreneurs. The Academy aims to develop suitable skill sets which are required to utilise Copernicus data while raising awareness of the associated downstream applications, a sector which Malta is already active in, to a certain extent. Once a suitable local entity is selected as the coordinating body for the Copernicus Academy, Malta can benefit from the various education programmes offered by the network across all levels of education.

Malta could also explore the appropriate model for potential membership within the European Southern Observatory (ESO), depending on the suitability of the ESO product offer in relation to the maturity of the local Space eco-system. The ESO is the foremost intergovernmental astronomy organisation in Europe with state-of-the-art research facilities for astronomers and astrophysicists. ESO Membership may result in benefits such as access to traineeships and research opportunities in the field of engineering.

Malta's future success in the space market will be underpinned by the capabilities of our graduates. As such it shall be important to raise awareness of space related education and careers in order to develop the required skills in Malta's graduates and future workforce.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.3.2 (a) University of Malta will consider the design and roll-out of space related modules/electives for courses outside the ISSA, with a view to encourage research and interest in the space industry from related fields.	Q4 2024	University of Malta	N/A
6.3.2 (b) Government will consider providing students who decide to enrol in the ISSA courses (and in space related modules/credits) with fiscal incentives during their studies.	Q4 2024	MEYR/UoM	National funds
6.3.2 (c) Facilitate and increase awareness of existing space education opportunities available to Maltese students by removing blockers and subsequently, increasing	Q4 2022	MEYR/UoM	National funds

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.3.2 (d) Provide educators with CPD to ensure they have the tools to effectively communicate about space.	Q2 2024	MEYR/UoM	National funds
6.3.2 (e) Connect with the Copernicus Academy and engage with the education programmes offered by the network.	Q4 2022	MEYR/UoM	N/A
6.3.2 (f) Government plans to offer scholarship programmes for top students willing to enrol in space related courses offered by international Universities.	Q2 2024	MEYR/ University of Malta	National funds

6.3.3 ENABLE UPSKILLING TO SUPPORT INDUSTRY DEMANDS OF SPACE-RELATED ENTERPRISES

In order to meet the skills needs of the space sector, the Ministry for Education and Employment will consult with industry to agree on skills shortages and develop a detailed Skills Needs Assessment (SNA). The SNA will support the development of space-focused courses and programmes by relevant training and education providers. On the other hand, this exercise will also serve to highlight the areas in which Malta is strong (such as software development, engineering, etc.) with a view to attract space sector businesses to Malta.

Government recognises that people are at the heart of every industry and that success in development a Space industry in Malta is dependent upon supporting the training and development of the labour force. As such Government is committed to addressing the skills gaps which surface through the SNA exercise by:

- continued investment in existing traineeships such as the ESA Traineeship Scheme offered by the MCST. In collaboration with the ESA, this traineeship provides opportunities for applied training in space-related areas at the Agency's various establishments.
- investment in new tailored programmes which offer funded opportunities for students and academics to undertake post-graduate or post-doctorate research in collaboration with industry partners. These tailored programmes may also take the form of student placements, giving candidates the opportunity to develop a career in space through applied learning and industry exposure; and

- leveraging existing upskilling programmes and associated awareness campaigns made available to Malta through ESA membership and Copernicus Academy network involvement to support the development of a local pool of talent. These structures would open the door to various upskilling opportunities which involve tailored skills programmes, industry partnerships, internships and applied training courses.

Further to actions to address skills gaps identified through the SNA exercise, Government shall also encourage the private sector to invest in further training and education for their staff. This will be achieved through measures such as grants, scholarships, or fiscal incentives aimed at alleviating the financial burden associated with training and education. In the case of promoting training and education in specific areas deemed to be of exceptional priority, Government will also consider measures which result in a net financial gain for eligible participants.

REWARD RECOGNITION

Further, Government believes that Malta's rising stars deserve reward and recognition for their efforts. For this reason, a scheme will be launched to provide top performing STEM graduates and researchers with a platform to present the results of their research. Such a scheme promises to provide exposure and recognition to top local talent, supporting businesses, educational institutions, and the local industry as a whole. Showcasing notable achievements would also foster a local scientific culture, drive awareness of the space sector and inspire young students to engage with STEM subjects and pursue a career in space. Such an initiative could see young scientists sponsored or hired by private sector companies.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.3.3 (a) The Ministry for Education and the Ministry responsible for the Employment portfolio to consult with industry to agree skills shortages and develop a detailed Skills Needs Assessment (SNA) to support the development of space-focused courses/ programmes by relevant training and education providers.	Q4 2023	MEYR/MFE	N/A
6.3.3 (b) Launch a reward recognition scheme where top performing STEM graduates and researchers are rewarded for their research.	Q4 2023	MEYR, University of Malta and MCAST	N/A

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.3.3 (c) Promote awareness of international programmes available to local space companies to support knowledge development and transfer.	Ongoing	MEYR, MCST, University of Malta	National Funds
6.3.3 (d) Encourage the private sector to invest in further training and education for their staff.	Ongoing	MEYR, MCST	N/A

6.3.4 DEVELOPMENT OF SCHEMES AIMED AT ATTRACTING SKILLED HUMAN CAPITAL TO MALTA

Malta can attract highly skilled talent for Space active and related industries by facilitating pathways to the Maltese Space sector through financial incentives and work permits/visas for highly skilled labour. Attracting foreign talent is essential for Malta's Space Strategy as it will enable the emerging Space Industry to benefit from increased collaboration and research opportunities as well as technology transfers emanating from experienced Space professionals who come to Malta. Given that Malta's Space Sector is in its infancy, attracting foreign talent is also essential to meet labour shortfalls in the field while the industry grows.

Attracting major international players from the Space Sector to Malta would play a major role in attracting highly skilled labour. Such a case would help solidify Malta as a legitimate hub for Space enterprises. This can be achieved by offering fiscal incentives such as tax credits and subsidies to established foreign companies. Encouraging innovative and forward-thinking companies to set up in Malta will subsequently attract highly skilled labour from abroad.

Malta can give further support by offering highly skilled space sector professionals specialised work permits/visas that streamline the administrative process. Malta can consider offering relocation expenses for top researchers, engineers, astrophysicists, and astronomers provided they agree to participate in local projects or provide some amount of lecturing time.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.3.4 (a) Offer fiscal incentives via tax credits/ subsidies to enterprises in the Space sector to set-up in Malta.	Q2 2024	Government	National funds
6.3.4 (b) Offer highly skilled labour in the Space field specialised visas to attract them to Malta.	Q4 2024	Government/ Identity Malta	National funds

6.4 STRATEGIC ACTIONS TO BE UNDERTAKEN UNDER PILLAR 4 – INTERNATIONAL REGULATORY COMPLIANCE

GOALS IMPACTED BY STRATEGIC ACTIONS PROPOSED UNDER PILLAR 4

1	Lay the foundations for the development of a vibrant space industry and ecosystem in Malta with the potential to contribute to economic growth and job creation.
3	Create new employment opportunities in emerging niche economic sectors within the wider space industry.

6.4.1 TREATY IMPLEMENTATION

Following the ratification of the Outer Space Treaty and the Liability Convention, Malta will transpose such into its legislative framework in order for said conventions to be in force and applicable. Such transposition will be achieved as follows: given the broad nature of the principles included therein, Malta will transpose the Outer Space Treaty in a principal act of law regulating space objects (see section 2 below). In turn, Malta will also transpose the Liability Convention in a similar standalone fashion by means of subsidiary legislation to the said act, The Malta Space Activities Act, after having carried out a detailed regulatory impact assessment. Such subsidiary legislation will replicate principles under the Liability Convention, granting powers to the Regulatory Authority to regulate aspects concerning the Convention's implementation, such as setting the coverage amount of a mandatory insurance policy and entering into agreements with launching States.

Transposition of such treaties will be carried out through the adaptation of the principles and rules modelled on the goals of the Maltese space law strategy in line with international practices and needs. Implementation must define and crystallise Malta's position and that of its licensed operators vis-à-vis the liability element, in particular with respect to all those aspects having a pure commercial nature which are not adequately analysed in the Liability Convention.

At present, Malta will postpone ratifying the Moon Convention because it does not represent a prerequisite for the commencement of space activities. On the other hand, Malta will consider ratifying the Registration Convention because USA financiers might require compliance with said Convention as a conditional precedent to the approval of a facility and the registration of an object with the registry created under such convention. Entities involved in space activities in the US might prefer to register space objects in jurisdictions which are also a signatory to the Registration Convention. For this reason, Malta will also consider the ratification of such convention and its implementation.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.1 (a) Implementing the Outer Space Treaty through the Malta Space Act. 6.4.1 (b) Subject to the results of a detailed regulatory impact assessment, implement the Liability Convention through: ■ Subsidiary legislation to the principal Act; ■ Guidelines and rules issued thereunder regulating aspects concerning the amount of insurance coverage, the validity of insurance policies, etc; and ■ Provision for apportioning risks among launching States and States procuring a launch.	Q4 2023	Government	National Funds

6.4.2 LOCAL LEGISLATION: THE MALTA SPACE ACTIVITIES ACT, EMPOWERING SUBSIDIARY LEGISLATION AND RELATED GUIDELINES

Malta will introduce a principal Act of Law to regulate:

- The registration of space objects under a Maltese register, which register must distinguish between owners, lessors, lessees and operators of space objects together; with
- Licensing requirements for operators and/or entrepreneurs (including leasing of space objects and/or licences) to carry out space activities under the Maltese flag (the Malta Space Activities Act, or the Act).

Enacting a law regulating space objects and related licensable activities in line with the relevant body of international space law, without prejudice to any other applicable international, EU and national law, will be key to demonstrate at a global level Malta's commitment towards the protection of space objects and stakeholders with an interest in the relevant objects (be they for instance financiers, lessors, lessees, or operators). In this sense, the law will regulate all relevant aspects of space activity generated by the presence of a space object, including the process leading to the issuance of licences and post-launch monitoring of applicants.

Such rules will be aimed at creating and protecting Malta's brand in the space sector, through the definition and protection of the highest standards in terms of safety and abidance to internationals rules as they evolve. Such aim will be achieved by encapsulating and implementing principles found in international treaties and relevant international standards in terms of safety and long term environmental and traffic management sustainability. The definition of space object will mirror the one adopted in the Berlin Protocol. The rules will provide for the regulation of interest and security registration (see section on Financing) and will be sufficiently broad so as to cater as much as possible for technological advances.

The Malta Space Activities Act will regulate the following: the registration of space objects by a Maltese or non-Maltese person, compliance with international environmental standards in terms of design and re-use following a first lifetime, licensing of entities owning or operating space objects, as well as the relevant entities' governance standards for ongoing monitoring.

While, the Act will be a principles-centred piece of legislation, encapsulating the principles supporting the space industry as envisaged by Malta, the Regulatory Authority created through the Act will be empowered to implement rules and guidelines fleshing out such principles and ensuring that they remain valid and effective by updating them as required to consider the industry's needs and pertinent technological advances. The Regulatory Authority will play a fundamental role in protecting Malta's space interests

by providing a smooth and seamless licensing process in compliance with stringent internationally standards and parameters.

The Act will envisage one main general licence with minimum requirements applicable to any relevant activity subsequently carried out, regulating the licence holder, subjecting same to fit and proper as well as financial requirements (sentence may require reformatting). Such a main licence will be extendable to cover related activities (communication, R&D, medical care, etc.) and will not be dependent upon the number of space objects in scope. Specifically, it will not be tied to each satellite operated by the licensee because it will govern all pertinent activities performed by said licensee.

Malta will consider thoroughly assessing the companies in question and setting up a rating system. The rating system would ensure that a higher ranking corresponds to optimal sustainable operations (i.e. registration of multipurpose satellites). This would then translate into lower insurance premiums and lower fees. The fees charged under the Act will be based on the nature of the activities, their associated risk and ultimately their rating. Space activities falling outside of scope of the Act (i.e. non-commercial space activities such as projects focused exclusively on educational programmes) could be pursued without the need of a licence and therefore of a mandatory insurance policy. Licences granted under the Act will be without prejudice to any other authorisations required for operating space objects or any service, however so described or regulated by other laws, be they national or otherwise. In this sense, a licence granted under the Act will not supersede or replace obligations emanating from other laws and regulated by other authorities, domestic or in another State.

Malta will facilitate the licensing process through the introduction of Space Cell Companies (See section 4 below).

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.2 (a) Enacting the Malta Space Activities Act to: ■ Transpose the Outer Space Treaty; ■ Introduce the concept of a General Licence; and ■ Introduce supplemental sectorial licences based on the activity carried out (R&D, environmental and climate change activities, communications, etc.). The Act will be concise, similar to the model adopted in Luxembourg and the Isle of Man, with principles in the Act being elaborated upon by means of	Q4 2023	Government and the designated Regulatory Authority (to be set up)	National Funds

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
interpretative Guidelines and rules issued by the Regulatory Authority and based on the activity carried out.			
6.4.2. (b) Publishing Subsidiary Legislation on: ■ Liability ■ Insurance Requirements ■ Sustainable Space Management Activities (Debris and Traffic Management Activities)	Q4 2023	Government and the designated Regulatory Authority (to be set up)	National Funds

6.4.3 CREATING AN EFFECTIVELY EMPOWERED AND AGILE REGULATORY AUTHORITY

The Regulatory Authority will be empowered by the Act to implement the objective therein set and the promulgation of regulations and issue of guidelines from time to time.

Such authority shall be responsible for the registration of space objects, securities and other interests, licensing of space activities and ongoing monitoring of licensed entities. The role and importance of the Regulatory Authority will expand in an organic manner such that its role and functions are expected to increase in time based on the requirements of operators and Malta's commitments vis-à-vis international standards and requirements as emanating from the UN treaty. The Regulatory Authority will play a key role in suggesting relevant amendments to the law and promoting the introduction of new measures following from its monitoring of and participation in international developments, in concurrence with other relevant national entities as may apply.

The functions of the Regulatory Authority will be supported by a Registrar General, and a Legal & Policy Department supporting same.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.3 (a) Designating a Regulatory Authority under the Malta Space Activities Act.	Q4 2023	Government	National Funds

6.4.4 SPACE CELL COMPANIES

Agility will be provided for by enabling segregation of assets and liabilities and thus of risks undertaken by an operator in various spheres, enabling investors to find comfort that their exposure would be limited to the activity they would have invested in, not all other activities which a licensee might be authorised to undertake. In other words, regulations will enable entities in this sector to be set up under a cell company structure. Cell companies provide the benefit of separating the patrimony of each cell from that of the other cell or cells and will enable entities to operate as efficiently as possible under a general licence coupled with a licence per activity (as explained in the section 2 above) granted to the company's cells. Moreover, through cells it will be possible to have security registration over one or more assets held by one or more cells within the same company, without the need to setting-up a new special purpose vehicle (SPV) for each transaction.

Key to the success of the space industry is the ability to grant and approve licences in a timely manner, in all events in less than a year. Malta will introduce a legal framework where one main licence would be granted and extendable to other activities based on the fulfilment of additional criteria, thereby rendering the process as efficient as possible.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.4 (a) Promulgating Space Cell Companies Rules. This may be subject to the outcome of a feasibility study meant to justify extension of the "cell companies" concepts, also to space related entities, by assessing the applicability of provisions similar to Article 84(a) or Article 84(e) of the Companies Act.	Q4 2023	Government	National Funds

6.4.5 RECOGNISED TREATY PARTNERS

Irrespective of whether its role in a given scenario would be as the State which would have registered a space object or to having granted a license to the latter's operator, Malta will be considered as a State "procuring" a launch for the purposes of the Liability Convention. In the former case, liability would be less extensive in view of Malta's role as "procuring State" under the Liability Convention.

In order to manage its risk as a launch State, Malta would enter into bilateral agreements with the relevant launching State (the "Recognised Jurisdiction") in order to apportion liability and avoid disputes. Once signatory to such bilateral agreements, Malta could opt to authorise operators to launch only from any of such recognised treaty partners.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.5 (a) Publishing Subsidiary Legislation to transpose the Liability Convention, together with rules and guidelines regulating insurance policies and related requirements. 6.4.5 (b) Entering into bilateral agreements with other launching States.	Q2 2024 Ongoing	Government	National Funds

6.4.6 STATE RECOVERY MECHANISMS

Malta will couple its bilateral agreements with instruments permitting the State to recover any amount paid from the operator itself by means of guarantees, insurance policies, pledge of bank accounts etc. In order to attract operators, Malta will follow the Belgian and Australian models by introducing the concept of a limited or capped liability, where a private operator would be liable only up to a certain maximum amount. More specifically, as part of any authorisation process, Malta will first set out to understand the risks connected with the operation of each and every space object, with a view towards providing a cap for insurance cover demanded of an operator. For instance, where the launching facility is already protected by an insurance policy covering the period of time from launch up until the object reaches extra-terrestrial orbit, the insurance policy demanded by Malta would be limited to cover risks while the object is in orbit. Like the UK before it, Malta will reduce the insurance cover based on the activity carried out and therefore the risks involved with each activity, thus providing flexibility to the Regulatory Authority to take into account the specifics surrounding each operation.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.6 (a) Introducing Rules and Guidelines specific to insurance policies	Q2 2024	Government	National Funds

6.4.7 MORTGAGE AND SECURITY REGISTRATION OVER SPACE OBJECTS AND LICENCES

With a view towards providing a comprehensive legal framework, Malta will introduce rules aimed at making operators function within its legal framework attractive to financiers. Malta will ensure such attractiveness by enhancing legal predictability in financing transactions involving space objects and space activities. This will be achieved by making it permissible and possible for the parties to come to a security agreement, a conditional sale, or a leasing agreement with the aim of creating autonomous interests on the equipment. Interests capable of registration would extend to security agreements, title registration agreements and leasing contracts. Registration could be extended to rights connected with the exploitation of IP.

A register of securities would benefit Malta in the following ways:

- Facilitating the acquisition and financing of space objects through the creation of an interest which would be validly enforceable
- Furnishing creditors with a range of basic default and insolvency-related remedies to provide timely relief pending final determination of a claim on the merits
- Creating an electronic registry for the registration of international interests, giving notice to third parties, and enabling a creditor to preserve its prior rank against subsequently registered interests unregistered interests, and other creditors in the instance of the debtor's insolvency.

Similar rules in the shipping and aviation spheres have proven to be fundamental in attracting major players to our jurisdiction, where credit institutions made their financing conditional to the registration of SPVs and assets under Maltese law. While registration of a security in shipping is based solely on a national register, the aviation model is based on a dual system consisting of a national register of securities and interests, as well as an international one (located in Ireland) created through the Cape Town Convention on International Interests in Mobile Equipment. The advantage of an international registry is that security therein created could be validly enforced through the various Contracting States.

Incidentally, the Cape Town Convention has a dedicated protocol for space assets. The protocol is not yet in force due to limited ratification to date, in that it transpires that several jurisdictions do not see the benefit of annexing the Berlin Protocol to the Cape Town Convention. Such a position might be because established operators can easily obtain financing by making recourse to traditional forms of securities (pledge of shares, pledge of bank accounts, etc) with financiers not requiring security over the space asset itself.

Although the Berlin Protocol could constitute an additional valid tool for Malta to become known on the international scene as a creditor-friendly jurisdiction, the limited number of ratifying States and thus the uncertainty around the future date of its entry into force, make it sensible in the interim for Malta to set up its own register of securities, in parallel with the creation of a register for space objects. In addition to the above recent literature analysing such Protocol shows that it is largely flawed, vague and would not be of benefit to either the creditors nor the debtors in terms of space assets and financing. Therefore, Malta should take in consideration such deficiencies in order to introduce a mechanism which is able to satisfy the industry needs.

A Maltese register of securities over space objects and activities would be able to exploit its full potential only where both the space object and the owner of such asset would be registered in Malta and subject to its jurisdiction. Such an interim move by Malta would not constitute an obstacle for financiers or owners of space objects, as long as the relevant security is validly perfected and enforceable in Malta and said position holds even where the object is leased to third party operators based outside Malta, as long as such are made party to the security registration for notification purposes.

Malta will introduce alternative mechanisms meant to protect stakeholders' interest in case of default of an operator. This should be done through adequate insurance policies allowing the continuation and preservation of operations in case of default and bankruptcy on the part of an operator. Such policies must in fact allow licence holders to continue their operation until their activities and assets are safely transferred to another party without the need to de- orbit or decommission such assets.

Malta will enhance its position by making it possible for securities to be granted by pledging the licence issued by the Regulatory Authority and the ITU rights granted to a particular entity by Maltese authorities to carry out missions and operations in outer space. In the light of the limited number of ITU related frequency and orbital rights assigned to Malta, the value of such assets could be relatively high.

The relevant rules and provisions will replicate their equivalent in the Berlin Protocol as closely as possible, such that if, Malta were to decide to ratify it in the future, the Protocol's implementation would call for only minor amendments to the then existing laws.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.7 (a) Publishing Subsidiary Legislation under the Malta Space Activities Act for the registration of interests over space objects registered in Malta. The register could enable the Regulatory Authority to act as escrow agent with respect to Tracking and Telemetry & Control Encrypted Codes.	Q2 2024	Government	National Funds
6.4.7 (b) Amendments to the Code of Organisation and Civil Procedure (Chapter 12 of the Laws of Malta) in order to regulate matters concerning ranking of creditors and enforcement of rights. This is subject to the outcome of a feasibility study meant to justify the regulation of securities of space objects and related activities.	Q2 2024	Government (MFJ)	National Funds

6.4.8 SUSTAINABLE MANAGEMENT ACTIVITIES

Although environmental issues concerning space to date have not yet attracted attention, initiatives meant to tackle such aspects are occupying the highest ranks of the global space agenda at present. Apart from environmental hazards, space debris also presents a serious threat to the safety of other objects rotating in outer and lower space orbits and an obstacle to new missions due to abandoned objects potentially occupying orbit capacity essential to other missions. In June 2006, UNCOPUOS introduced the definition of Space Traffic Management (STM) as the set of technical and regulatory provisions for promoting safe access into outer space, operations in outer space and return from outer space to Earth free from physical or radio-frequency interference[62]. Sustainable (debris and traffic) management aspects are intrinsically connected with each other and thus should be tackled holistically and in a uniform manner by all states and private entities involved in space activities.

[62] Council of the European Union – 17.05.2021 – 8616/21 Policy Debate Document Competitiveness Council - Internal Market, Industry, Research and Space - 28 May 2021

The introduction of STM measures by countries like the United States of America led to an increased pressure on Europe to adopt similar initiatives meant to address future operational risks in an already increasingly congested space environment. Recently the European Space Agency commissioned the world's first space debris removal programme called ClearSpace[1]; this will be the first space mission aimed at removing items of debris from orbit. It is planned for launch in 2025, with several similar or related projects being considered around the globe.

In 2018 UNCOPUOS' Scientific and Technical Subcommittee adopted 21 Guidelines for the Long-Term Sustainability of the Outer Space Activities (LTS). Such non-binding instrument includes a voluntary set of rules aimed at improving longer-term sustainability also by means of the regulation of STM measures. To date said guidelines did not attract international consensus, especially since they were not able to deal with issues connected with the globalization and diversification of space activities.

In order to be effective, an STM framework requires action at multiple levels including:

- Research and technical activities including Space Situational Awareness capabilities development.
- Capacity building.
- Regulatory level including standardisation.
- Operational and security measures, and
- The involvement of multiple actors.

The establishment of a Maltese space jurisdiction would have to take into account the latest international (UNCOPUOS) and EU developments in the domain of Space Traffic Management. Such considerations will be referred to not only during the initial stages of the licensing process but also throughout the lifetime of the space object until its activity comes to an end, at which point it will be expected that ways and means would have been envisaged for providing for the space object to leave orbit, re-enter safely within the terrestrial atmosphere and be disposed of safely. Maltese rules will be aligned with the ones eventually adopted at a European level and meant to be launched in 2022[63]. Such alignment will ensure the required level of uniformity at least at a European regional level thereby simplifying operators' compliance with international rules.

Another manner for Malta to prove its commitment to the industry with a long term sustainable environmental vision will be its granting public recognition and reward entities adopting policies addressing ESG issues. As part of its ESG targets Malta must facilitate through economic incentives those operators and licence holders promoting the registration of multipurpose satellites.

[63] European Commission Action Plan on synergies between civil, defence and space industries in February 2021

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.8 (a) Introducing space environmental protection and sustainable (debris) management in the Malta Space Activities Act.	Q2 2024	Government Competent Authority	National Funds
6.4.8 (b) Promulgate specific guidelines, amended on a regular basis, to capture the most recent standards on sustainable (debris) management.	Q2 2024	Competent Authority	National Funds
6.4.8 (c) Introducing penalties for the breach of environmental related issues.	Q2 2024	Competent Authority	National Funds
6.4.8 (d) Introducing a reward mechanism for entities adopting ESG policies.	Q2 2024	Competent Authority	National Funds

6.4.9 FISCAL INCENTIVES

Malta has a general tax system attractive for foreign investment which could be applied to any space venture licensed in Malta. In addition, Malta could, subject to EU State Aid limitations and the Fundamental Freedoms, introduce rules:

- Facilitating the process and related cost of importation of space objects;
- Extending the so-called Highly Qualified Rules to attract human capital; and
- Allowing for the accelerated tax depreciation of space objects to take into consideration the particular nature of space objects and their inherently fast depreciation.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.9 (a) Introducing and amending relevant fiscal rules.	Q2 2024	Government	National Funds

6.4.10 ARBITRATION CENTRE

With the growth of commercial space law across jurisdictions, the need for clear and consistent interpretative rules will become evident, in turn calling for appropriate venues with judges and arbitrators specialised in the sector and with a deep understanding of the subject- matter.

Malta could set up an arbitration forum focused exclusively on disputes related to space objects and generally on controversies arising in the space industry, offering an alternative to dispute resolutions under the Liability Convention. Such forum could make use of the structure of the current arbitration centre in Malta, proposing a list of arbitrators from the world over with a clear and undisputed competence in the sector at an international level and with an undisputable academic track record in such sphere. In order to access the Malta Arbitration Centre, agreements would have to subject their dispute settlement jurisdiction to the laws of Malta.

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.4.10 (a) Creating a specialised arbitration centre.	Q2 2024	Government/MFJ	National Funds

6.5 STRATEGIC ACTIONS TO BE UNDERTAKEN UNDER PILLAR 5 – EMERGING TECHNOLOGY

The Space sector's close links to the wider innovation sector presents an opportunity for Malta to build on lessons learned from past initiatives in the Emerging Technologies field with further potential in creating synergies with other niche specialisations to create a unique selling point. This pillar also presents a particular opportunity to Malta as it drives the focus away from traditional applications which require the use of natural resources which Malta inherently lacks, towards areas which Malta is best positioned to exploit.

This pillar contains Strategic Actions which intend to a) build on the foundations and lessons learned from Malta's recent experience in pioneering the use of Emerging Technologies; b) Facilitate, promote and incentivise the use of space data for the development of innovative applications that benefit citizens; and c) focus on creating synergies between the different niches by identifying the space sector as a specific smart specialisation.

GOALS IMPACTED BY STRATEGIC ACTIONS PROPOSED UNDER PILLAR 5

1	Lay the foundations for the development of a vibrant space industry and ecosystem in Malta with the potential to contribute to economic growth and job creation.
3	Create new employment opportunities in emerging niche economic sectors within the wider space industry.
11	Instil a deep appreciation of space (and of related STEM subjects) from early education through the development and rolling out of specialised space-related events and short courses.

6.5.1 FOCUS ON SPACE DERIVED DATA

The increase in availability of data derived from satellites presents an opportunity for Malta to leverage its existing, established and thriving technology ecosystem (such as through software development businesses) that contributes almost 9% to GDP[64] to provide new solutions that can benefit a number of sectors as well as the everyday citizen. Exploiting this from a downstream standpoint presents significantly lower barriers to entry than a similar focus on the upstream sector with the latter generally requiring a greater level of upfront investment. Therefore, the focus on the downstream sector should facilitate joint innovation in both the space sector and related technology sectors. However, with a dramatic reduction in the costs traditionally associated with the upstream sector (such as in launching of satellites) experienced in the past few years, the upstream sector presents its own opportunities for Malta. Other than encouraging and incentivising existing businesses in the technology manufacturing sector to further diversify and focus on the space sector, this also requires further bolstering and long-term sustainable commitment in acknowledging and retaining the significant hidden local talent that is already on the island, while encouraging new researchers to explore novel ways of capturing data from satellites or using data to improve operation of satellite itself (such as debris detection).

[64] WATCH: Malta's technology sector contributes almost 9% to GDP, says Tech.mt's CEO (whoswho.mt)

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.5.1 (a) Set up a space data register where space datasets can be housed and located for use by researchers and industry.	Q4 2024	MITA/NSO/Data Governance Council	EU funds (if available) National funds
6.5.1 (b) Incentivise through financing, promotional or otherwise, the innovative development of applications that benefit the citizen.	Q4 2026	MEYR, Servizz.gov, TECH MT	EU funds (if available) National funds
6.5.1 (c) Increase uptake of use of space-derived data within public sector, for government to become a primary user.	Q412027	Government	National funds
6.5.1 (d) Create synergies with data focused projects (such as Innovation Hubs and Academic Institutions) that make available state of the art infrastructure for analysis of Big Data.	Q4 2024	MEYR/MEFL/MCST/ MDIA	National funds EU funds (if available)
6.5.1 (e) Consider the creation of a dedicated funding programme to stimulate an increase in basic research in the space sector, so that the upstream sector (in which basic research is more predominant), may also be propelled forward. This can be done under the Space Research Fund (SRF) or the future PECS agreement with the ESA or else under an existing research programme.	Q4 2024	MCST	National funds
6.5.1 (f) Create partnerships at government level with foreign governments and private entities that own and can provide space-derived data for use by Malta-based entities at subsidised cost.	Q4 2027	MEYR	National funds EU funds (if available)

6.5.2 ENSURING SYNERGIES BETWEEN THE SPACE SECTOR AND MALTA'S SMART SPECIALISATION STRATEGY

Due to the link between the space and technology sector, any future plans in the exploitation of space need to consider the technological aspect. In keeping with the EU's strategy for 2021- 2027, Malta has also identified technology as a key economic pillar with various initiatives having been undertaken over the past decade. Government acknowledges that the potential uses of space are highly dependent on technology, particularly emerging technologies that Malta focused on such as Artificial Intelligence, Internet-of-Things, High Performance Computing and Blockchain. This would make the establishing of a native space industry ineffective without uptake from these other industries. Space presents an industry that can exploit these emerging technologies and creating an advanced niche through the creation of a win-win scenario for the island that can help further diversify the economy.

Malta's Research and Innovation Smart Specialisation Strategy (RIS3 2021-2027)[65] defines key thematic areas such as Smart Space Applications as a horizontal application enabled by digital technologies that seeks to exploit the potential of both digital and space in the process of EO and Value-Added Services, not just for the private industry but also within the public sector. Such data is already available through EU programmes that Malta already has access to such as Copernicus and Galileo. While the Draft RIS3 strategy outlines Digital Technologies as a key thematic area in its own right, digital technologies (including Emerging Technologies) provide the opportunity for space-related solutions to have applications across other thematic areas such as Sustainable Use of Resources for Climate Change Mitigation and Adaptation (such as through more accurate monitoring and subsequent modelling), and Marine and Maritime Technologies (such as through Environmental Marine Protection and Surveillance)[66].

[65] Malta's Research and Innovation Smart Specialisation Strategy (RIS3) 2021-2027 – Draft for Public Consultation (gov.mt)
[66] ESA - Why is space relevant for maritime issues?

KEY ACTIONS	EXPECTED COMPLETION DATE	RESPONSIBILITY	FUNDING SOURCE
6.5.2 (a) Foster cross-ministerial collaboration through joint projects in promoting homegrown space projects that align with Malta's Digital Strategy.	Q2 2024	Government/MEYR/ MEFL	National Funds
6.5.2 (b) Promote projects that use Malta as a successful launching pad for space-related applications.	Q4 2026	MCST, Tech MT	National Funds
6.5.2 (c) Include Smart Space applications as an innovation enabler within the cross- cutting digital technology domain, through synergies with the Smart Specialisation Strategy, focusing on the exploitation of space-derived data in the downstream sector.	Q3 2023	MCST	National Funds
6.5.2 (d) Increase and promote the availability of elective modules at tertiary level STEM courses, while incentivising their uptake.	Q3 2024	MEYR, University of Malta, MCAST	National Funds

CHAPTER 7

WAY FORWARD

Photo Credit: ESA/Hubble & NASA, J. Dalcanton, Dark Energy Survey/DOE/FNAL/NOIRLab/NSF/AURA; CC BY 4.0 Acknowledgement: L. Shatz

7 WAY FORWARD

The Strategy has identified actions, responsible owners, rollout sequencing, funding sources, and KPIs to measure and monitor implementation progress towards achieve Malta's vision by 2027. Heightened coordination across Government will be key to roll out the Strategy and to raise awareness of the opportunities presented by space.

The Space Advisory Group with its envisaged remit as laid out in Section 6.1.6 will drive the rollout of the Strategy. The Space Advisory Group, leveraging expert advice and support from Expert Working Groups will be entrusted with the strategic oversight to implement the key strategic actions, and monitor performance using the identified KPIs.

The Space Advisory Group will also recommend changes to the Strategy, as the needs may arise, to ensure Malta's vision for Space remains relevant. In turn, the Malta Council for Science and Technology (MCST) would be the assigned implementing entity for the effective roll-out of the pertinent non-regulatory initiatives announced within the Space Strategy.

The Space Advisory Group will report, by way of fulfilment of its envisaged strategic and oversight role, on the progress of the implementation of the Strategy to the Minister with responsibility for research and innovation, and to MCST as the implementing entity for the non-regulatory action lines.

APPENDICES

Photo Credit: ESA–Stephane Corvaja, 2016

APPENDIX 1 – CONSULTATIONS KEY FEEDBACK

Motivated by the increasing opportunities presented by European New Space, the Ministry for Equality and Research (MFER) conducted stakeholder and public consultations during 2021 to inform the development of the Malta Space Strategy.

The consultation processes, which obtained the views of R&I institutions, academia, relevant Government entities, local company representatives, development agencies, international bodies, relevant civil society organisations, other appropriate organisations and individuals and the wider general public have informed the articulation of this Strategy.

Broadly, the consultation processes found that:

- Malta's Space Strategy must be flexible and agile to adjust to the developing international commercial market.
- The availability of key space-related skills, including STEM, law, and business will be a vital factor for the future development of space in Malta.
- Awareness of the opportunities presented by space and Malta's activities in space is limited. The Malta Space Strategy should strive to increase this awareness across the private sector, public sector and the wider general public.
- Malta's Space Strategy must put emphasis on broad national action with a view to promulgate an economically sustainable and internationally respected space sector, delivering quality careers for the economy of the future.
- It is important to recognise the interdependence between upstream and downstream applications, technology and commercial opportunities.
- Malta's investment through ESA is among the lowest of all Member States and is significantly disproportionate with the opportunity that is available. Exploring types of partnerships with ESA is thus considered vital.
- Malta's space initiatives and governance should be internationally benchmarked against countries with national attributes and space objectives similar to Malta.
- Several private organisations, representative bodies and expert individuals observe the requisite for greater levels of coordination between public entities in connection with the conceptualisation and rollout of space activities and initiatives.

The feedback and insights drawn from the consultation processes supported the identification and development of a number of initiatives and actions to realise Malta's vision and goals for space by 2027.

APPENDIX 2 – STRATEGY ROLLOUT

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
Q4 2022	6.1.2 (a) Initiate process and discussions to negotiate a potential PECS route through the signing of a Framework Agreement with ESA.	MCST
Q4 2022	6.3.2 (e) Connect with the Copernicus Academy and engage with the education programmes offered by the network.	MEYR, MCST, Planning Authority (PA)
Q1 2023	6.1.6 (a) Set up the Space Advisory Group.	MEYR, MCST
Q3 2023	6.2.2 (a) Understand the Space R&D needs of SMEs by carrying out a regular survey of SMEs to discover the overall desire to engage in Space R&D, and barriers preventing SMEs from engaging in additional R&D. Based on results, introduce specific measures to address key issues. 6.5.2 (c) Include Smart Space applications as an innovation enabler within the cross- cutting digital technology domain, through synergies with the Smart Specialisation Strategy, focusing on the exploitation of space-derived data in the downstream sector.	MCST MCST
Q4 2024	6.3.2 (a) University of Malta will consider the design and roll-out of space related modules/electives for courses outside the ISSA, with a view to encourage research and interest in the space industry from related fields. 6.4.6 (a) Introducing Rules and Guidelines specific to insurance policies.	University of Malta Government/Competent Authority
Q4 2023	6.1.2 (b) Establish appropriate active communication channels to ensure that the Maltese business and research community is well-informed in a timely manner on the various ESA Programmes and initiatives which they can participate in. 6.1.2 (c) Create a register of ESA Programmes, initiatives and opportunities, and integrate this with the Malta Space website/portal to enable easy access for private sector, public sector, and academia. 6.1.3 (d) Establish, for the purposes of facilitating data collection, a formal definition of which economic activities constitute part of the Space Industry, as well as a registry of all entities involved in each such activity.	MCST MCST NSO

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
Q4 2023	6.1.3 (e) Initiate a process to capture space industry statistics either through the collection of space industry statistics by the NSO, or via the commissioning of a multi-annual industry report.	NSO
	6.3.1 (c) Build awareness around educational, skilling, upskilling and reskilling programmes to meet industry identified needs with a view to increase uptake of such programmes.	MEYR, University of Malta and MCAST
	6.3.2 (c) Facilitate and increase awareness of existing space education opportunities available to Maltese students by removing blockers and subsequently, increasing demand for space-related education in Malta.	MEYR (UoM and MCAST)
	6.3.3 (a) The Ministry for Education and the Ministry of Finance and Employment are to consult with industry to agree skills shortages and develop a detailed Skills Needs Assessment (SNA) to support the development of space-focused courses/programmes by relevant training and education providers.	MEYR/MFE
	6.3.3 (b) Launch a reward recognition scheme where top performing STEM graduates and researchers are rewarded for their research.	MEYR/UoM/MCAST
	6.4.1 (a) Implementing the UN Outer Space Treaty.	Competent Authority
	6.4.1 (b) Implementing the Liability Convention.	Competent Authority
	6.4.2 (a) Enacting the Malta Space Activities Act.	Government
	6.4.3 (a) Designating the Regulatory Authority under the Malta Space Activities Act.	Government
	6.4.2 (b) Publishing Subsidiary Legislation on Liability, Insurance Requirements, Sustainable Space Management Activities.	Competent Authority
	6.4.4 (a) Promulgating Space Cell Companies Rules.	Competent Authority
Q2 2024	6.1.3 (a) Embark on Space Roadshows to attract / encourage foreign companies to set up in Malta, and to link up Maltese businesses with foreign export markets.	MCST/Malta Enterprise/ Trade Malta/Tech MT
	6.1.3 (b) Promote attendance at space trade events, exhibitions and conferences/seminars to show-case space related capabilities.	MCST/Malta Enterprise

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
Q2 2024	6.1.3 (c) As a result of 6.1.3 (a) and (b), seek to promote and form stronger international collaborations with foreign businesses and academics with a view to obtain significant experience in internationally relevant initiatives.	Malta Enterprise/Trade Malta
	6.1.5 (a) Integrate all dedicated Space- related information onto an existing governmental portal.	Government/MCST
	6.2.2 (b) After consultation with past end- users of the SRF, launch a revamped MCST Space R&I Funding Scheme (or consider widening the existing Space Research Fund), potentially targeting research areas and downstream applications outside the scope of the existing Space Research Fund, to support collaboration between industry players and academia on joint research projects. A revamped Space R&I Fund could be possibly incorporated within the PECS agreement with the European Space Agency.	MCST
	6.3.2 (b) Government will consider providing students who decide to enrol in the ISSA courses with fiscal incentives during their studies.	MEYR/UoM
	6.3.2 (d) Provide educators with CPD to ensure they have the tools to effectively communicate about space.	MEYR
	6.3.2 (f) Government plans to offer scholarship programmes for top students willing to enrol in space related courses offered by international Universities.	MEYR
	6.3.4 (a) Offer fiscal incentives via tax credits/ subsidies to enterprises in the Space Sector to setup in Malta.	Government/Malta Enterprise
	6.4.5 (a) Publishing Subsidiary Legislation to transpose the Liability Convention, together with rules and guidelines regulating insurance policies and related requirements.	Government
	6.4.7 (a) Publishing Subsidiary Legislation under the Malta Space Activities Act for the registration of interests over space objects registered in Malta.	Government

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
	6.4.7 (b) Amendments to the Code of Organisation and Civil Procedure (Chapter 12 of the Laws of Malta) in order to regulate matters concerning ranking of creditors and enforcement of rights.	Government/MFJ
	6.4.8 (a) Introducing space environmental protection and sustainable (debris) management in the Malta Space Activities Act.	Government/Competent Authority
	6.4.8 (b) Promulgate specific guidelines, amended on a regular basis, to capture the most recent standards on sustainable space (debris) management.	Government/Competent Authority
	6.4.8 (c) Introducing penalties for the breach of environmental related issues.	Government/Competent Authority
	6.4.8 (d) Introducing a reward mechanism for entities adopting ESG, policies	Government/Competent Authority
	6.4.9 (a) Introducing and amending relevant fiscal rules.	Government/Malta Enterprise
	6.4.10 (a) Creating a specialised arbitration centre.	Government/MFJ
	6.5.2 (a) Foster cross-ministerial collaboration through joint projects in promoting homegrown space projects that align with Malta's Digital Strategy.	Government/MEYR/ MEFL
Q3 2024	6.1.3 (f) Gradually build an online directory of businesses engaged in space- related activities to promote Malta's growing space industry to the international space market.	MCST, Malta Enterprise
	6.1.4 (a) MCST, in collaboration with Malta Enterprise, will hold regular workshops, networking opportunities and events for industry players and academics.	MCST, Malta Enterprise
	6.3.1 (a) Carry out a detailed Workforce Planning exercise, considering the existing currency of educational pathways and how these meet industry needs.	MEYR, MFE, UoM and MCAST

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
Q3 2024	6.5.2 (d) Increase and promote the availability of elective modules at tertiary level STEM courses, while incentivising their uptake.	MEYR, University of Malta, MCAST
Q4 2024	6.1.4 (b) Hold a biennial event in Malta, inviting international speakers and international companies, to encourage cross-jurisdictional collaboration and sharing of ideas.	MEYR, MCST, Malta Enterprise
	6.2.1 (a) Launch a scheme (or expand an existing scheme) dedicated towards space start-ups and SMEs, covering advisory support (business planning), financing support (linkage with financing institutions and/or Malta Development Bank), and provision of funding for start-ups and SMEs.	Malta Enterprise/MDB
	6.2.1 (b) Maximise potential of existing local and EU-wide schemes, incentives, funds and financing options: Launch a one-stop-shop space-dedicated portal [link with Malta Space website], where start-ups and SMEs active in the space industry can get support and advice with respect to what schemes or funds they can tap into.	Government
	6.2.1 (c) Support businesses and researchers in their application for funding via third party contractor(s) or a central office for the coordination of funds, to ensure that ideas/applications are well-developed and complete, thus increasing the chances of approval.	MEYR with support from MCA, Malta Enterprise and MCST
	6.2.4 (c) Establish resources to aid entities wishing to apply for grants and prizes managed by the EUSPA.	Government
	6.5.1 (a) Set up a space data register where space datasets can be housed and located for use by researchers and industry.	MITA/NSO
	6.3.4 (b) Offer highly skilled labour in the Space field specialised visas to attract them to Malta.	Government/Identity Malta
Q1 2024	6.1.4 (c) Government to consider financing Malta's participation within a prospective Horizon Europe Space R&D Partnership, to be launched in 2023.	MEYR/MCST

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
Q1 2024	6.1.4 (d) Encourage further bilateral collaboration between MCST and international space agencies, and other space actors (for example EURISY and the Space Climate Observatory), to improve cooperation and development of opportunities for Maltese entities and professionals. 6.2.3 (a) Launch a review of all public sector organisations to determine which entities can best benefit from space- related services.	MCST MEYR/MCST with support from ERA and PA
Q4 2024	6.5.1 (e) Consider the creation of a dedicated funding programme to stimulate an increase in basic research in the space sector, so that the upstream sector (in which basic research is more predominant), may also be propelled forward. This can be done under the Space Research Fund (SRF) or the future PECS agreement with the ESA or else by amending an existing research programme. 6.5.1 (d) Create synergies with data focused projects (such as Digital Innovation Hubs and Academic Institutions) that make available state of the art infrastructure for analysis of Big Data.	MCST MEYR/MEFL/MCST/ MDIA
Q1 2025 Q4 2025	6.1.1 (a) Carry out a detailed cost benefit analysis related to establishing a Hub for the local space industry ('Space Hub'). The cost benefit analysis is to consider different setups and different areas of focus to ensure that the Hub is fit for purpose. 6.1.1 (d) Link up with other international Space Hubs with a view to collaborate on cross-border projects and share knowledge and ideas. 6.1.1 (c) Through dedicated workshops, presentations and meetings, link up with existing incubation centres to drive collaboration across different fields and sectors.	MEYR, MCST and Malta Enterprise MCST/MEYR/Malta Enterprise/Competent Authority MEYR/MCST
Q3 2026	6.5.1 (b) Incentivise through financing, promotional or otherwise, the innovative development of applications that benefit the everyday citizen. 6.2.3 (b) Acquire and implement space- related services and technologies as identified through public sector review.	Government, Servizz.gov, Tech.mt, Planning Authority, ERA

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
Q4 2026	6.5.2 (b) Promote projects that use Malta as a successful launching pad for space- related applications.	MCST, Tech MT
Q1 2027	6.5.1 (c) Increase uptake of use of space- derived data within public sector, for government to become a primary user. 6.5.1 (f) Create partnerships at government level with foreign governments and private entities that own and can provide space-derived data for use by Malta-based entities at subsidised cost.	Government Government

2022 – 2026

The key actions to be rolled out during this period include those as listed in the table above. Furthermore, this rollout period will be critical for measuring progress and impact against the defined KPIs. To this effect, the Space Advisory Group will report to the Minister with responsibility for Research and Innovation, recommending any required changes to the Strategy, annually.

2027

A thorough review of the Strategy in 2027 will determine any significant changes required to
the Strategy to ensure Malta's continued success in space.

DATA GATHERING ACTIVITIES

It is to be noted that the gathering of intelligence on the industry itself, and on its various needs, is a pre-requisite for effective and efficient implementation. In this section, the strategy presents a list of data gathering activities which support the various strategic action points.

EXPECTED COMPLETION DATE	ACTION	RESPONSIBILITY
Q4 2023	6.1.3 (d) Establish, for the purposes of facilitating data collection, a formal definition of which economic activities constitute part of the Space Industry, as well as a registry of all entities involved in each such activity. 6.1.3 (e) Initiate a process to capture space industry statistics either through the collection of space industry statistics by the NSO, or via the commissioning of a multi- annual industry report.	NSO NSO
Q2 2023	6.2.2 (a) Understand R&D needs of SMEs by carrying out a regular survey of SMEs to discover the overall desire to engage in R&D, and barriers preventing SMEs from engaging in additional R&D. Based on results, introduce specific measures to address key issues.	MCST
Q4 2023	6.1.2 (c) Create a register of ESA Programmes, initiatives and opportunities, and integrate this with the Malta Space website/portal to enable easy access for private sector, public sector, and academia. 6.3.3 (a) The Ministry for Education the Ministry for Finance and Employment are to consult with industry to agree skills shortages and develop a detailed Skills Needs Assessment (SNA) to support the development of space-focused courses/programmes by relevant training and education providers.	MCST MEYR, MFE
Q3 2024	6.1.3 (f) Gradually build an online directory of businesses engaged in space-related activities to promote Malta's growing space industry to the international space market. 6.3.1 (a) Carry out a detailed Workforce Planning exercise, considering the existing currency of educational pathways and how these meet industry needs.	MCST MEYR, MFE, UoM and MCAST
Q4 2024	6.5.1 (a) Set up a space data register where space datasets can be housed and located for use by researchers and industry.	MITA, NSO, Data Governance Council
Q1 2025	6.1.1 (a) Carry out a detailed cost benefit analysis related to establishing a Hub for the local space industry ('Space Hub'). The cost benefit analysis is to consider different setups and different areas of focus to ensure that the Hub is fit for purpose. 6.2.3 (a) Launch a review of all public sector organisations to determine which entities can best benefit from space-related services.	MEYR, MCST and Malta Enterprise MEYR, MCST

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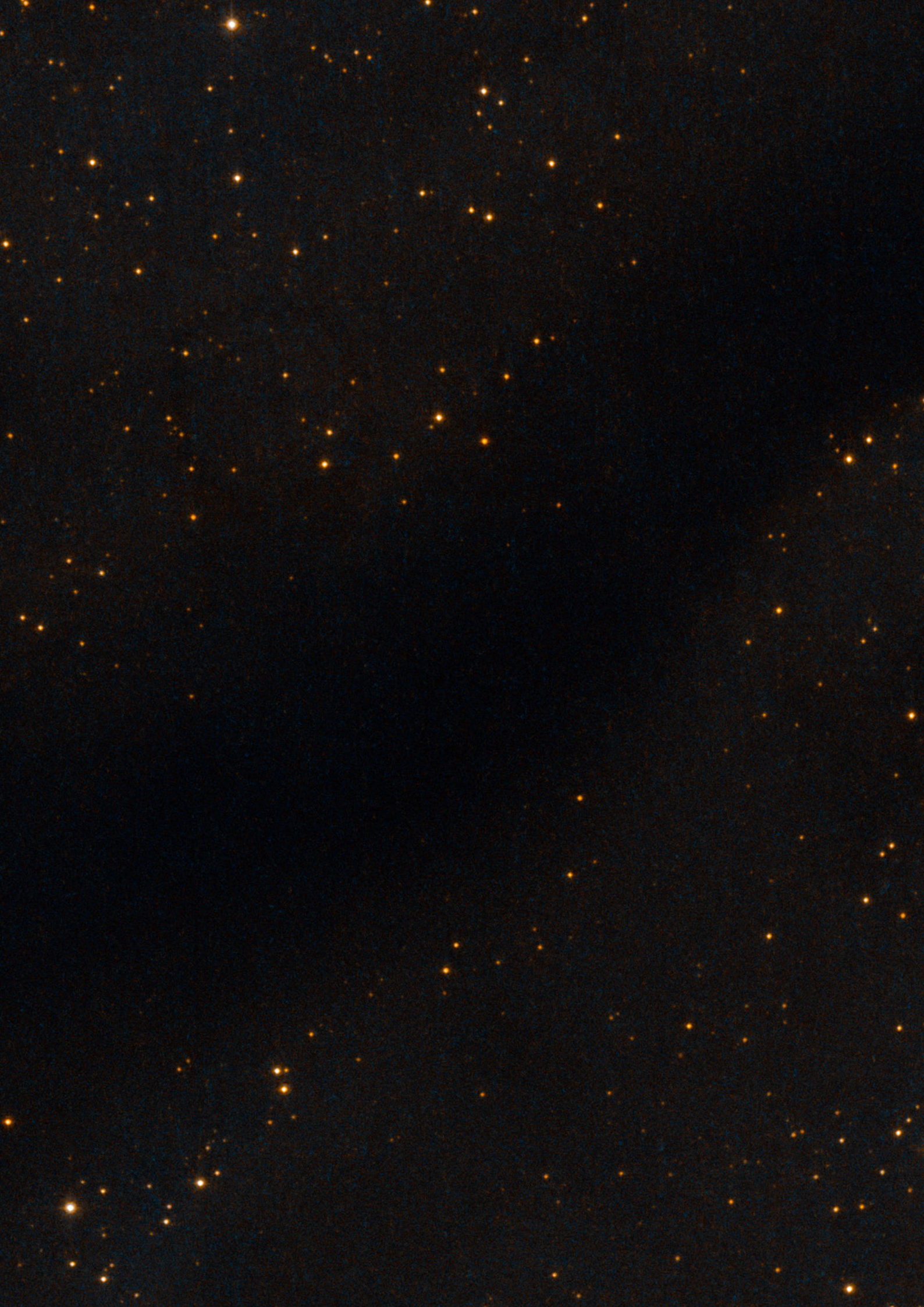


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