



NEWSLETTER #1 **January 2024**



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Dear Reader,

I am glad to share with you Issue#1 of the ASTRAIOS Newsletter. The first year of the project has seen some exciting results already. We have put together a database of the current educational offer of space related curricula that covers all EU countries as well as the United Kingdom. This database will be available through our website very soon and will include the possibility to search for degree programmes by country, primary language, and list of courses covering Bachelor, Master and Postgraduate levels. The database is mapped into space related knowledge areas and knowledge domains, which were also used to develop a new European taxonomy of space knowledge (EU-TaSK). The taxonomy will be part of the greater European focus on the space skills landscape, and includes recommendations for the European Skills, Competences, Qualifications and Occupations (ESCO) classification dictionary.

Work has also started on analysing the current capabilities and future skills needs of the European space industry. This effort, together with the educational mapping done in the first year, will be combined into a comprehensive skills gap analysis this year.

Many more exciting activities await for us in the second year of the project. Work is starting on communication activities towards the promotion of space jobs and careers at European universities, and new educational material will be designed for the European flagship missions Copernicus and Galileo. Space skills acquisition analysis will be widened to cover the Environmental, Social, Governance (ESG) and equality, diversity and inclusion (EDI) aspects of the space sector. The project will likely gather more visibility in this coming year as well, with new results being presented at various European space events.

Stay tuned for more ASTRAIOS news in 2024!

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01.01.2023 36 months

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This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101082636

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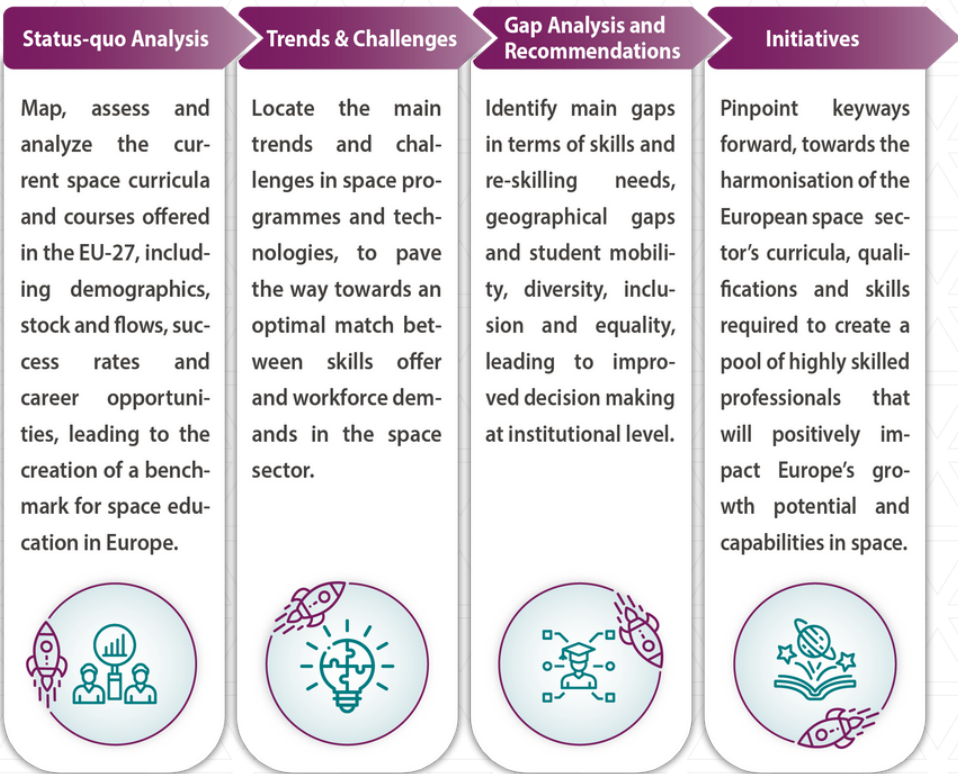
About ASTRAIOS

The advancement of the EU space sector is highly dependent on the availability of high educational standards, skilled professionals, and the ability for these professionals to upgrade and update their skills.

The ASTRAIOS project will foster innovation, increase EU competitiveness in the space sector and improve the dynamics of the space entrepreneurship ecosystems.

OUR WORKPLAN

EXPECTED RESULTS & IMPACTS



- A structured online database for searching and retrieval of the offered space education.
- Europe-wide space sector taxonomy of competencies and skills.
- Concrete recommendations for the harmonization of space curricula in the EU.
- New educational material for Copernicus and Galileo.
- Promotion of space studies and careers.
- Reduced friction on the space job market and bridged gap between finishing education and entering job employment.
- Improved public awareness of the European capabilities in the space sector.



Our Progress of One Year into the Project!

Status Quo Analysis

The competitiveness and innovation of the EU space sector depend on high educational standards and the availability of skilled professionals in the field, as well as the possibility for these professionals to enhance and update their skills through their careers so that they can adapt to changing circumstances.

Our team, led by our partners at the University of Twente, selected and analyzed the courses and educational standards of 140 Degree Programs (DPs) at Bachelor (26 DPs) and MSc (114 DPs) levels, 19 PhD programs, and 58 continuing education (CE) courses. Gathered DPs have been mapped across 28 knowledge domains (KDs) and 106 knowledge areas (KAs) identified in ASTRAIOS and across the different segments of the value chain of space activities relevant to the three space sectors: upstream, midstream, and downstream.

The analyzed DPs and courses are shared in a structured and curated **web catalogue** that allows users to search, and retrieve collected DPs and courses based on country, institution, language, space sector, KAs, KDs, or European Qualifications Framework (EQF) levels. The data collected by the project and stored in a Postgres relational was structured using LinkedData technology such as Resource Description Framework (RDF). It allowed instances (e.g., Courses, Degree Programs) and concepts (e.g., Knowledge Domain and Knowledge Areas), represented by nodes, to be related to one another by relationships, represented by arcs between the nodes.

Catalogue of space-related curricula and courses offered in EU-27 & UK in 2023

The information searchable on this catalogue reflects the 2023 status of investigated curricula and continuing education in the space sector. Please note that translations of degree programs and continuing education courses offered in languages other than English using the Google Translate API may introduce discrepancies, and the list of courses of the degree programs might not be exhaustive; users are encouraged to refer to the institutions' websites for comprehensive information on curricula and courses.

Browse through degree programmes and courses
search by country, institution, faculty language and many more

- Degree programmes**
Bachelor and Master's programmes
A collection of degree programmes in the space upstream, midstream and downstream sectors gathered by experts.
140 Degree programmes
- Degree programmes' courses**
Educational offerings of Degree Programmes
In-depth information on courses linked to the Master's and Bachelor's degree programmes.
3254 Courses
- PhD programmes**
Doctoral research and academic possibilities of an academic journey in the space sector. Learn more about the cutting-edge research, expert mentorship, and dedicated communities.
243 positions
- Continuing education courses**
Lifelong learning education
A tailored selection of courses designed to enhance knowledge and skills in the space sector.
58 Courses

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Conducting regular analysis of the educational capabilities in the space sector can assess the changes in the educational offerings and standards over time. The geographic coverage of the analyzed data should also be extended beyond EU-27 +UK.

The rapid evolution of the space sector, marked by the constant emergence of new businesses, models, and technologies, creates a complex landscape for education and training. Our team has also developed the European Taxonomy of Space Knowledge (EU-TaSK), which provides a unified vocabulary and structure for collecting, analysing and sharing space education information and data. It was developed to harmonise and compare data from different institutions and sources and covers the upstream, midstream, downstream, and supporting areas.

EU-TaSK is built on the knowledge domains and knowledge areas identified in the analysis of 140 space-related degrees across Europe, and aligned with SpaceCRAFT, EO Taxonomy, and PwC space value chain. EU-TaSK is also mapped to ESCO, and we identify that space systems engineering and other space-related engineering knowledge areas are currently missing from ESCO.

The current version of EU-TaSK is not a final product, as we expect that there will be further work to map EU-TaSK to other space-specific skills frameworks including the EO4GEO BoK and ESA Competencies Framework. We also expect that EU-TaSK will be updated in line with feedback from the space sector.

As the space industry continues to evolve, understanding the dynamics of the workforce is crucial for ensuring the growth of the sector is not constrained by a lack of access to talent. To do this, the space sector needs data to support informed decision making by space agencies, industry leaders, policymakers, and educational institutions.



To date, much of this data has been collected from surveys of companies and individuals. Checking deeper into the space sector’s workforce, our team, led by Space Skills Alliance, conducted exciting exercises, by adopting a new approach to data collection, providing an overview of the European space workforce using data collected from the LinkedIn Talent Insights tool.

Talent Insights collates data from the LinkedIn profiles of approximately 950 million people across the world, and over 120 million people across the European Union and United Kingdom. By analysing over 170,000 LinkedIn profiles, our team used the Talent Insights tool to analyse and create the largest dataset on the workforce of the European space sector. The analysis uncovers trends within this data, including the geography, educational background, skills, and flow of talent. Figure 1 depicts the number of people in the European space workforce by country, according to LinkedIn Talent Insights.

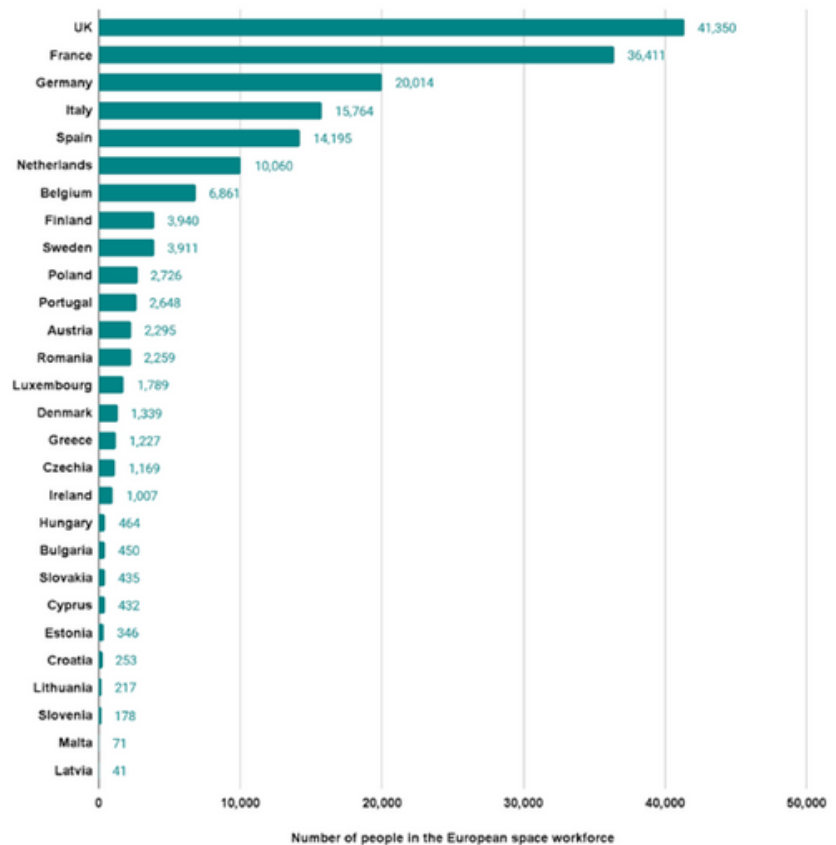


Figure 1:
Number of people in the European space workforce by country



Figure 2 shows the European space workforce by qualification level according to LinkedIn Talent Insights with no data available for Latvia and Malta.

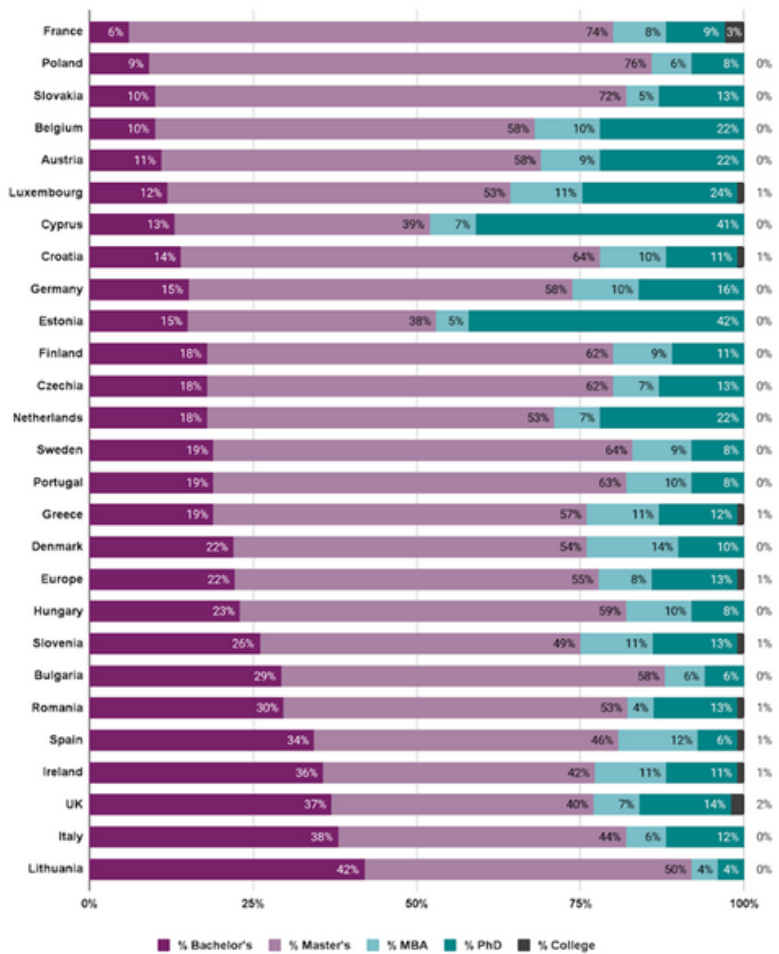


Figure 2:
European space workforce by qualification level

Data collected and presented at this stage of the project will be further used in other activities and future tasks within ASTRAIOS, with a focus on identifying skills gaps, geographic mobility of the workforce, and diversity of the space sector. Talent Insights data will allow us to monitor changes in relevant metrics, as well as conducting further analysis about the differences between the space workforce as a whole, and recent graduates entering the workforce for the first time. The gathered data can also be used by the wider sector to identify emerging skills challenges, characterise the typical space career pathway, and shape curricula.

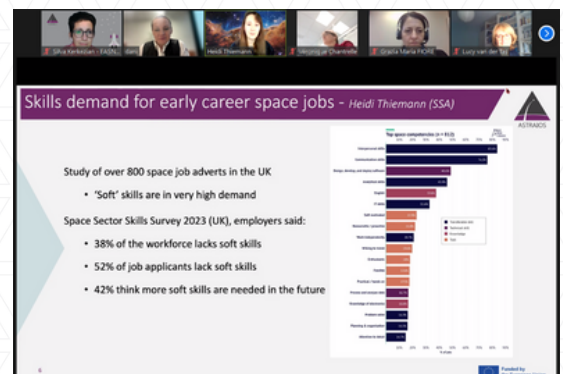


Trends and Challenges

During the second half of the year, our team, led by the [European Science Foundation](#), characterised the demand from the space industry by analysing current and future scientific capabilities and prioritisations in both national space programmes and science and technology roadmaps from the European Space Agency. Space sector services and business applications analysis emphasised domains pivotal to the European space industry's growth and longevity and was aimed at delivering an evaluation of prevailing trends, market shifts, and up-and-coming technologies.

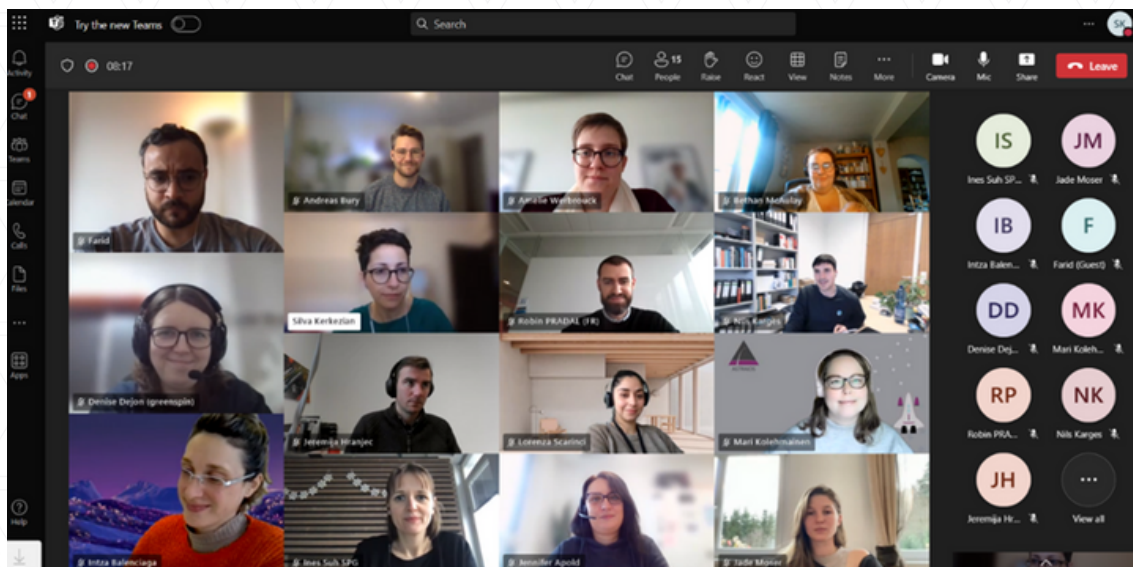
At the same time, we conducted a detailed [space industry survey](#) to gain insights into the European space ecosystem, focusing on applications, services, and supporting technologies. The survey was disseminated by partners through their channels, including SMEs and industry stakeholders, like [SME4SPACE](#), the Space Y network mobilised by [FDC](#), academia, and research centres. By engaging such stakeholders, we aimed to evaluate current space sector offerings, assess ongoing EU-facilitated programs, and identify future opportunities.

In addition to the technical skills, the consortium worked to enhance the career perspectives and employability of younger generations and their skills development via reflections on soft skills and new ways of working. To this end, an online workshop successfully organized by [our partners, the International Space University \(ISU\)](#), on November 27, 2023. The workshop was organized in the form of a focus group on an invitation-only basis and had a great response and participants were selected primarily by targeted recruitment positions from space companies: HeSpace, ESRIC, ESA, LSA, Leanspace, Maana Electric, Airbus, D-Orbit, Thales Alenia, and OHB. The discussions during the workshop revealed the importance of communication as the most rewarding skill and makes it possible to impact professional career success of individuals, teams and companies.






A capacity building process was also initiated through the Environmental, Social, Governance (ESG) Peer-to-Peer learning workshop to empower startups with ESG best practices and to enhance knowledge exchange for start-ups and scaleups on ESG best practices. ASTRAIOS team, led by AZO Anwendungszentrum GmbH Oberpfaffenhofen, organized the first remarkable workshop, which took place on December 11, 2023, and will serve as the basis for the future workshops planned to take place in 2024 and 2025. This will help ASTRAIOS implement a process of capacity building and networking to produce the book “Environmental, Social and Governance (ESG) best practices in the Space Entrepreneurship Ecosystem: Trends, Challenges and Opportunities”.



The insights from these analyses will be combined together during the first half of year 2 of ASTRAIOS to form a comprehensive, well-rounded perspective on the space industry’s “modus operandi” and will serve to share feedback, identify lessons learnt, new trends/evolution, foster innovation, and increase EU competitiveness in space. These will then be used to identify needs, priorities, and expectations from practitioners in terms of skills and education for the workforce, targeting the adequacy between curricula and sector needs for the future tasks in ASTRAIOS.




News and Events


 ASTRAIOS was highlighted in two news articles published in the EASN’s periodic newsletters in 2023. You may find the May Issue article [here](#) and the October issue article [here](#).

 The ASTRAIOS team participated in numerous renowned conferences, events, and summits during the past year. Namely, our consortium was represented in the [Munich New Space Summit](#), the [EU Space Week 2023](#), [74th International Astronautical Congress](#), the [Space Tech Expo Europe 2023](#), the [Defense and Security Equipment International event](#), the [UK Space Conference 2023](#), [EOcafe: Supplying the skills needed to achieve the goals of the EU Space Strategy](#), [Defence Space Conference London](#), [Space Comm Expo](#), [RAeS Aerodynamics Specialist Conference](#).



 The ASTRAIOS team will raise awareness about the ASTRAIOS web catalogue through a dedicated presentation of the portal during the upcoming [International Geoscience and Remote Sensing Symposium \(IGARSS\) 2024](#), which will take place in Athens, Greece from 7-12 July, 2024.



 Our Consortium will attend and participate in the upcoming [14th EASN International Conference: Innovation in Aviation & Space towards sustainability today & tomorrow](#), hosted by [EASN Association](#) and the Aristotle University of Thessaloniki. The conference will be held from October 8th to 11th, 2024, in the lively city of Thessaloniki, Greece, at the renowned Concert Hall of the city.





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