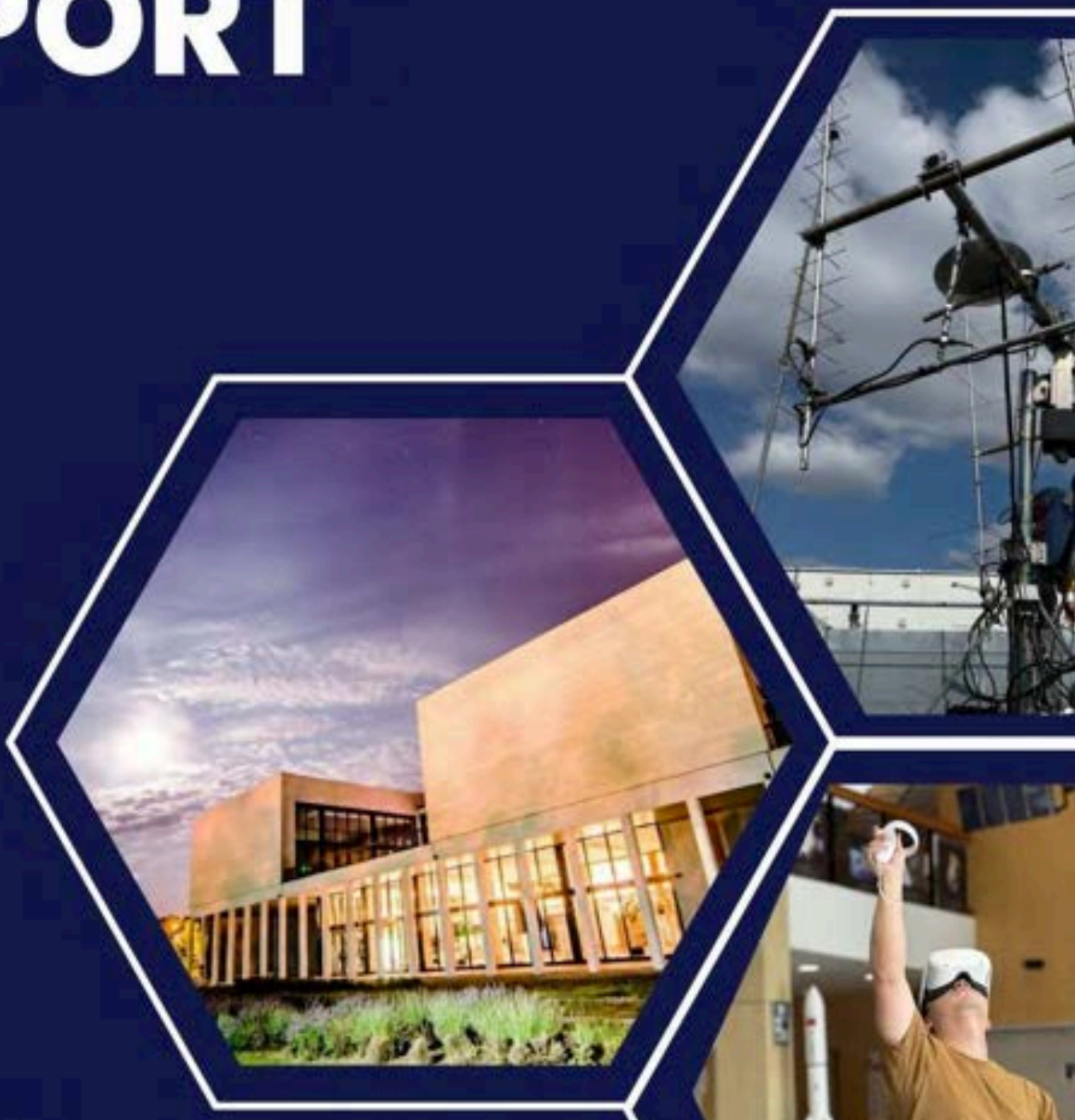
INTERNATIONAL® SPACE UNIVERSITY

Academic year
2024-2025

ANNUAL REPORT



International Space University
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Table of Contents

Introduction

In 1987, a trio of forward-thinking university students envisioned creating an institution focused on global cooperation, partnerships, and the open exchange of knowledge in the field of space exploration and development. Their idea was to build a space where individuals from all walks of life could come together, embracing cultural, philosophical, and professional diversity in an inclusive academic environment. Today, that vision has become reality: ISU has grown into a thriving institution with a network of over 6,000 alumni contributing to the global space sector across 112 countries.

Recent advancements in the global space economy, driven by groundbreaking entrepreneurship, increased private investment, and cutting-edge technologies, are creating a wealth of opportunities for exciting careers and ventures for ISU graduates. ISU prepares international postgraduate students and professionals to become a skilled workforce for the space industry, supporting space-based infrastructure and applications, ambitious exploration missions, and efforts to address global challenges.

The academic year 2024–2025 marked a pivotal chapter in the evolution of the International Space University (ISU), driven by the launch of its bold new strategic vision, *MOON SHOT 2030*. Under the leadership of President John Wensveen, this year has been defined by renewed energy, global engagement, and institutional transformation. MOON SHOT 2030 outlines ISU's roadmap for the decade ahead, focusing on academic innovation, international partnerships, entrepreneurship, alumni engagement, and long-term sustainability.

As this report reflects, 2024–2025 was not only a year of action and renewal, but the foundation for a decade of impact, uniting the global space community through education, innovation, and shared ambition.

ISU's founders : Todd B. Hawley, Robert D. Richards, Peter H. Diamandis

Executive Overview

From the President – Vision and Reflections

Now in its 38th year, the International Space University (ISU) stands at a pivotal moment in its journey. The 2024–25 academic year marked the beginning of a bold transformation under our new strategic framework, MOON SHOT 2030, a roadmap to position ISU as a financially self-sustaining and globally recognized leader in space education, innovation, and collaboration.

When I assumed the presidency on September 1, 2024, my initial approach was deliberate: stop, look, listen, learn — then act. Within my first 30 days, I focused on understanding ISU's people, culture, operations, and opportunities. By the 90-day mark, a draft strategic plan was in place, outlining a pathway toward institutional sustainability and growth.

MOON SHOT 2030 is built on three strategic pillars:

1. Revenue Diversification – expanding programs, events, and services to strengthen and stabilize ISU's financial base.

2. Philanthropic Support – cultivating donors and partners who share our vision and values.

3. Grants Acquisition – targeting funding for research, infrastructure, technology, and personnel to propel ISU into a new era of excellence.

The 2024–25 year was not without its challenges. To advance, ISU needed to modernize. We implemented new policies and procedures to improve efficiency and accountability, and identified the urgent need for an Enterprise Resource Platform (ERP) and Learning Management System (LMS). These systems will enable ISU to evolve into a data-informed institution where decisions are guided by real-time analytics, ensuring transparency, agility, and impact across all areas of operation.

As part of the ongoing transformation, ISU's leadership team expanded with the creation of the Chief Academic Officer, Chief Operating Officer, and Chief of Staff positions. This new structure establishes a strong foundation for organizational effectiveness and future growth. It enables ISU to focus on the creation of new units that will advance with their own operational strategies, each aligned with and supporting the greater institutional strategic plan.

Our global visibility grew substantially this year. ISU made a strong impression at international events such as the International Astronautical Congress (IAC25), the Global Spaceport Alliance Summit, SpaceCom, and the Space Symposium. IAC25 in Milan represented ISU's largest-ever alumni gathering, with more than 300 alumni participating — a testament to the strength and spirit of our global network. Record engagement across social media further strengthened ISU's brand and expanded our global reach.

A key area of focus was alumni engagement. During the year, ISU crossed north of 6,000 alumni worldwide — an extraordinary milestone that reflects nearly four decades of impact in the global space community. Building on this achievement, ISU began laying the groundwork for a formal alumni engagement model centered around time, talent, and treasure. This effort will serve as a cornerstone for our community-driven approach to sustainability and shared success.

Our collaborations continue to create meaningful impact. A highlight of the year was our partnership with Lenovo, through which ISU became one of a select group of institutions to test pilot the AI-powered ThinkPad X9 Aura Edition. ISU's feedback contributed to product refinement before market launch, showcasing our leadership in the intersection of space, innovation, and technology.

ISU hosted several on-campus events throughout the year — too many to note in this section — each contributing to our mission of advancing space education, research, and international collaboration. Among the highlights was the NATO Space Security Workshop, which brought together leaders from around the world through grant-supported programming.

ISU also strengthened its presence in the Greater Strasbourg community through the expansion of the ISU Incubator model, which focuses on supporting space startup companies. This initiative not only reinforces ISU's role as a hub for innovation and entrepreneurship but also deepens our engagement with regional stakeholders and the broader space ecosystem.

Our academic offerings also evolved: the Southern Hemisphere Space Studies Program (SHSSP), hosted in January 2025, set the stage for a new partnership structure with the newly created Adelaide University, beginning in January 2026. Meanwhile, the Space Studies Program (SSP25) in South Korea opened new pathways for collaboration and continuous improvement, culminating in the announcement that SSP26 will return to ISU's Central Campus in Strasbourg, France — a homecoming that promises to be a landmark event in summer 2026.

As I reflect on this year of transformation, I extend my deepest appreciation to our Board of Trustees, whose guidance and support have been instrumental in shaping ISU's strategic direction. I also wish to thank our dedicated employees, faculty, volunteers, alumni, partners, and supporters. Your unwavering commitment has been the foundation upon which we are building ISU's future.

Together, we are accelerating toward that future — one defined by innovation, collaboration, and the bold ambitions of MOON SHOT 2030.

Dr. John Wensveen
President, International Space University

Moonshot 2030 – ISU's Strategic Trajectory

Overview of Moonshot 2030

MOON SHOT 2030 is the strategic vision unveiled by ISU under its new leadership, aiming to position the university for leadership and influence in the evolving global space sector. The name evokes the historic notion of "moonshot" ambition : large-scale, bold objectives, but here applied to education, innovation, partnerships, and capacity building in space.

Key features of MOON SHOT 2030 include:

- A renewed emphasis on innovation, technology, and entrepreneurship as core pillars for ISU's future growth.
- A global fundraising strategy and the establishment of an endowment fund to support long-term sustainability and growth.
- Enhanced branding, marketing, communications, and outreach to expand ISU's impact, attract talent, alumni engagement, and more global visibility.
- Reorganization of ISU leadership roles to better deliver on academic, operational, and strategic goals.
- A focus on global engagement and partnerships, especially leveraging ISU's alumni, faculty, institutional alliances, and presence in different regions.

In essence, MOON SHOT 2030 is less a single technical mission and more a holistic university transformation agenda, setting the course for ISU to evolve in line with 2030-era challenges and opportunities in the New Space economy.

Milestones Achieved

Since the launch of the MOON SHOT 2030 strategic initiative, the International Space University (ISU) has made measurable progress toward its long-term vision. These initial milestones reflect ISU's commitment to institutional transformation, global engagement, and academic innovation. Key accomplishments to date demonstrate early momentum across financial, academic, and strategic domains, laying the foundation for the next phase of the initiative.

1. **Public Launch of the Strategy**
   The strategic plan was publicly announced in October 2024 by ISU President John Wensveen. That announcement set the stage, naming objectives, restructuring, and calls for community involvement.

2. **Fundraising / Endowment Push**
   On "Giving Tuesday" 2024, ISU launched its first ever endowment fund as part of the MOON SHOT 2030 campaign — a concrete financial initiative to underpin future ambitions.

3. **Strong Presence at IAC 2024 & Alumni Engagement**
   ISU had a high-profile presence at the 2024 International Astronautical Congress in Milan: more than 50 meetings, a major alumni gathering (over 300 alumni), and propagation of the MOON SHOT 2030 narrative. The visibility and alumni mobilization at IAC served both as promotion and engagement of ISU's future trajectory.

4. **Hosting of SSP 2026 at ISU Central Campus**
   As part of the vision, ISU confirmed that its flagship Space Studies Program (SSP) 2026 will be hosted at its central campus in Strasbourg, aligning the educational core of the institution with its strategic vision. This is a symbolic and practical step toward consolidating ISU's identity and infrastructure.

5. **Partnership Expansion in Asia / Japan**
   In July 2025, ISU conducted an outreach mission to Japan that culminated in formalizing partnerships (e.g. Hokkaido University, UNISEC Global) and discussions with JAXA, aligning with the MOON SHOT 2030 intent to deepen global footprint and collaboration.

These are early-stage accomplishments, foundational rather than fully realized. They signify movement, community engagement, institutional repositioning, and the scaffolding needed for more ambitious follow-through.

Next Steps in the Mission

To fully deliver on the objectives of MOON SHOT 2030, ISU has defined a clear set of strategic priorities and next steps. Building on the momentum already achieved, the following actions will drive the initiative forward and ensure its long-term impact:

Scaling Fundraising and Financial Sustainability
The newly launched endowment must be grown and maintained. ISU will need to secure major donors, grants, industry sponsorships, and philanthropic support to underwrite scholarship funds, faculty development, infrastructure, and program expansion.

Programmatic Innovation & Curriculum Modernization
To stay relevant in a fast-shifting space landscape, ISU must evolve its academic offerings: executive short courses, innovation-focused tracks, cross-disciplinary partnerships, and experimental pedagogies (e.g. entrepreneurship labs, incubators). MOON SHOT 2030 explicitly emphasizes research and grant initiatives.

Strengthening Global Hubs and Regional Presence
Building on the Japan mission, ISU may further expand regional nodes or alliances (e.g. Asia-Pacific hub), partner with local universities or agencies, and embed ISU education deeper into regional ecosystems.

Deeper Alumni & Network Engagement
Alumni are a critical resource for influence, fundraising, mentorship, and outreach. ISU will likely invest more in alumni mobilization, leveraging their networks in industry, space agencies, governments, and academia to amplify impact.

Visibility, Branding & Communications
The plan includes a stepped-up approach to branding, marketing, and communications. ISU will need to promote its identity, successes, opportunities, and role in the wider space ecosystem to attract students, partners, funders, and collaborators.

Sustain Momentum & Adapt
As the external space environment changes (new space actors, technologies, global shifts), ISU must stay agile: adapt strategies, revisit priorities, and ensure that MOON SHOT 2030 remains relevant rather than ossified.

Impact at a Glance

Summary and Key Figures

Program	Location	Total Participants
Executive Space Course – Tel Aviv	Tel Aviv, Israel	18
Executive Space Course - Strasbourg	ISU Central Campus, France	15
Advanced Studies	ISU Central Campus, France	5
Master of Space Studies (MSS25)	ISU Central Campus, France	38
Southern Hemisphere Space Studies Program	Adelaide, Australia	29
Space Studies Program	Ansan, South Korea	122

ISU's global programs continued to expand in reach and impact throughout the year, engaging participants across multiple continents.

The Executive Space Courses held in Tel Aviv and at ISU's Central Campus in Strasbourg provided professionals with targeted, high-intensity training in the evolving space sector. Advanced Studies and the Master of Space Studies (MSS25) cohort further strengthened ISU's academic foundation in France, nurturing the next generation of space leaders. International flagship programs also saw strong participation, with the Southern Hemisphere Space Studies Program in Adelaide bringing together 29 participants, and the Space Studies Program in Ansan, South Korea welcoming 122 participants from around the world.

Together, these programs underscore ISU's commitment to delivering accessible, high-quality space education worldwide.

Global Faculty

The International Space University (ISU) continues to uphold its reputation as a leading institution in space education through the strength and diversity of its global faculty. For the 2024–2025 academic year, ISU's faculty community comprised **164 distinguished members** representing a broad spectrum of academic disciplines, professional backgrounds, and nationalities. This dynamic network of educators and practitioners ensures that ISU's programs remain relevant, innovative, and aligned with the evolving needs of the global space sector.

The composition of the faculty for this academic year is as follows:

- **Faculty:** 74 members
- **Associate Faculty:** 43 members
- **Adjunct Faculty:** 16 members
- **Faculty Emeriti:** 27 members
- **Deans Emeriti:** 4 members

ISU's global faculty members are drawn from leading space agencies, research institutions, universities, and commercial space enterprises around the world. Their expertise spans a wide range of disciplines including space engineering, policy, business, law, human spaceflight, Earth observation, and satellite applications. Through their teaching, mentorship, and research collaboration, faculty members contribute to ISU's distinctive **interdisciplinary, international, and intercultural (3I)** approach—an educational philosophy that remains at the core of the university's mission.

During the 2024–2025 academic year, ISU faculty actively participated in curriculum development, joint research projects, and international outreach initiatives. Many also served as mentors for student-led space missions, start-up incubations, and interdisciplinary workshops, reinforcing the university's focus on experiential learning and global collaboration.

The collective achievements of ISU's faculty community highlight their dedication not only to academic excellence but also to the advancement of space knowledge for peaceful and sustainable exploration. Their ongoing engagement ensures that ISU remains a center of excellence and a key contributor to shaping the next generation of global space leaders.

For detailed faculty data and individual profiles, please refer to **Annex 1** of this report.

Alumni and Community

ISU Alumni Network

The International Space University (ISU) continues to foster a vibrant and globally connected alumni community, reflecting its commitment to lifelong engagement and collaboration among space professionals. During the 2024–2025 academic year, the ISU Alumni Association expanded its network and strengthened ties among graduates from all programs, including the Space Studies Program (SSP), Master of Space Studies (MSS), and Executive Space Courses.

As of 2025, the ISU alumni network includes more than 6,000 members representing over 112 nationalities, demonstrating the university's truly international reach. Alumni remain actively engaged in a wide range of roles across government space agencies, private aerospace companies, research institutions, and non-profit organizations. Many have also taken leadership positions in emerging space sectors, contributing to global efforts in satellite technology, space policy, human spaceflight, and sustainability in outer space.

Throughout the academic year, ISU organized a series of alumni-focused initiatives designed to enhance professional development and strengthen community bonds. Key highlights included the ISU Alumni Conference, which featured keynote addresses from distinguished graduates working in space exploration and commercial innovation, and a series of regional networking events held in Europe, North America, Asia, and Africa. These events provided platforms for knowledge sharing, career mentoring, and collaborative project development among alumni and current students.

There is also an expanded digital engagement through the ISU Alumni Portal, offering new tools for job postings, mentorship programs, and online discussions. This digital platform has become an essential resource for maintaining professional connections and fostering cross-disciplinary collaborations within the global space sector.

Looking ahead, ISU aims to further strengthen its alumni relations strategy by increasing alumni participation in university governance, enhancing mentorship opportunities, and promoting joint research initiatives between alumni and current students. The continued success of the ISU alumni network underscores the university's enduring mission—to prepare and connect space professionals capable of advancing humanity's presence in space through international cooperation and innovation.

Alumni Gathering : South Korea Conference

The 2025 Alumni Weekend brought together twelve ISU alumni and two accompanying family members. Participants traveled primarily from the United States, with additional representation from the Netherlands, Japan, the United Kingdom, Hungary, Romania, and Australia.

The weekend opened on Friday with a guided tour of Seoul, followed by attendance at the Culture Night event. Saturday's program featured a conference that welcomed an additional sixty participants and included presentations from representatives of Nara Space, Blue Origin, Odyssey Space Research, Indra Deimos, SpaceKind, and Tohoku University. An interactive networking session was facilitated by ISU faculty member Neta Vizel.

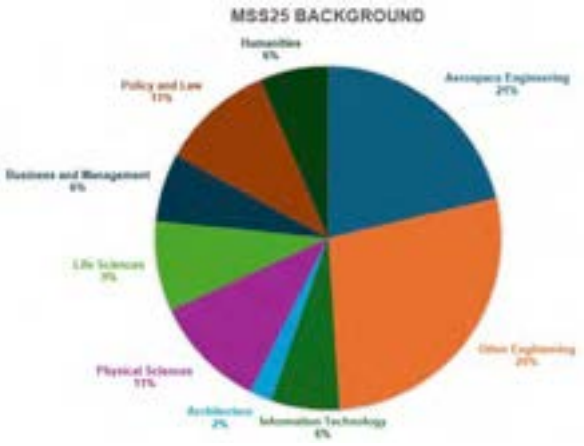
On Saturday evening, alumni joined the traditional Space Masquerade celebration, and the weekend concluded on Sunday with the spirited staff-and-alumni versus participants football match.

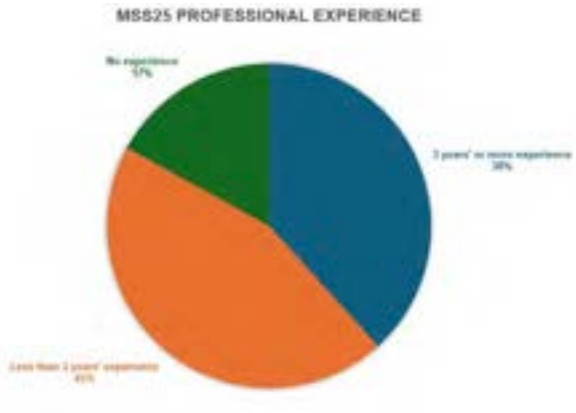
Welcome & Introduction by Thomas Mueller

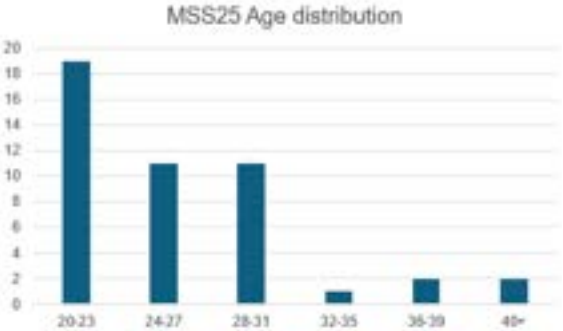
Programs

Master of Space Studies - MSS25

The Master of Space Studies (MSS25) cohort is a diverse and dynamic group. At the start of the academic year, the cohort included 38 students from 23 different countries, reflecting ISU's international spirit. With backgrounds spanning engineering, science, business, and policy, these students bring unique perspectives to space exploration and innovation. Their global origins foster a rich learning environment, encouraging cross-cultural collaboration and knowledge exchange. As they progressed through the program, they engaged in academic content, research activities, and hands-on projects, preparing them for leadership roles in the space sector.







MSS25 Cohort

The Master of Space Studies (MSS) program 2025, counted 33 full-time students and one modular student by the end of the academic year.

MSS25 Structure

The following figure depicts the MSc & MSS generic structure, as a 3 semesters program.

3 Interdisciplinary workshops were organized. Topics in 2024/2025 were:

- **Space Habitat for Human Exploration**
- **Design and construction of Space-exploration robots**
- **Space and Sustainability**

4 Advanced Studies were offered in the academic year 24/25. Students had to choose 2 of them:

- May 26 to June 6, 2025: **Astrobiology and Space Exploration** or **New Space Entrepreneurship**
- June 10 to 20, 2025: **Space OMICS** or **CubeSats**

MSS25 Activities

In the academic year 2024/2025, the following professional visits were organized:

September 2024 - Planetarium of Strasbourg, France

November 2025 - IRCAD, Strasbourg, France

February 2025 - SES, Satellite Communication Service Provider, Luxembourg

April 2025 - European Parliament in Strasbourg, France

May 2025 - Telespazio & ESOC in Darmstadt, Germany

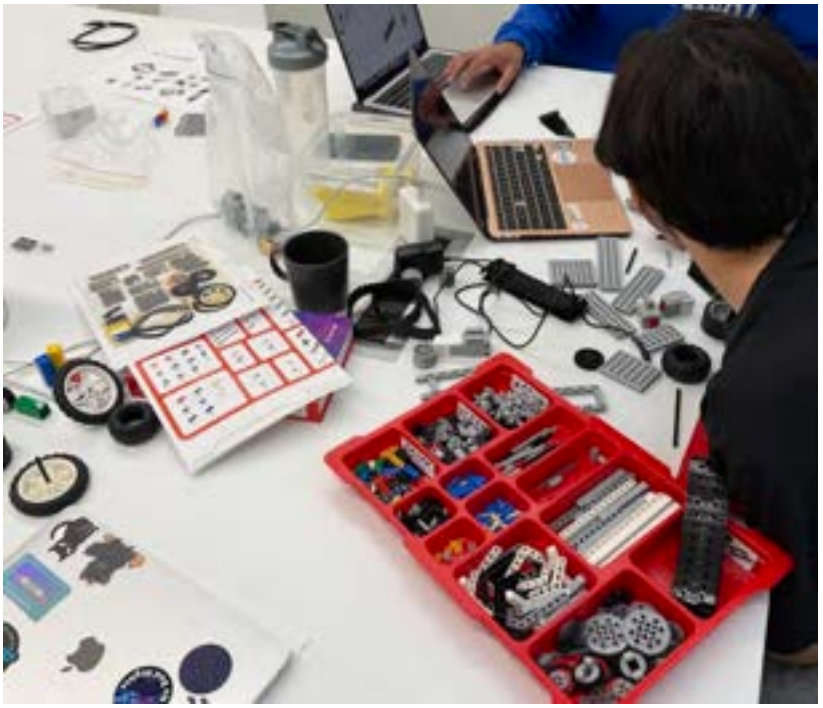
June 2025 - Ries Crater

Other MSS25 activities included :

October 2024: French-speaking Students helped to conduct activities during the national Fete de la science.

November 2024 : Panel on the topic of Diversity and Inclusion

November 2024: Annual Poster competition with guest judges

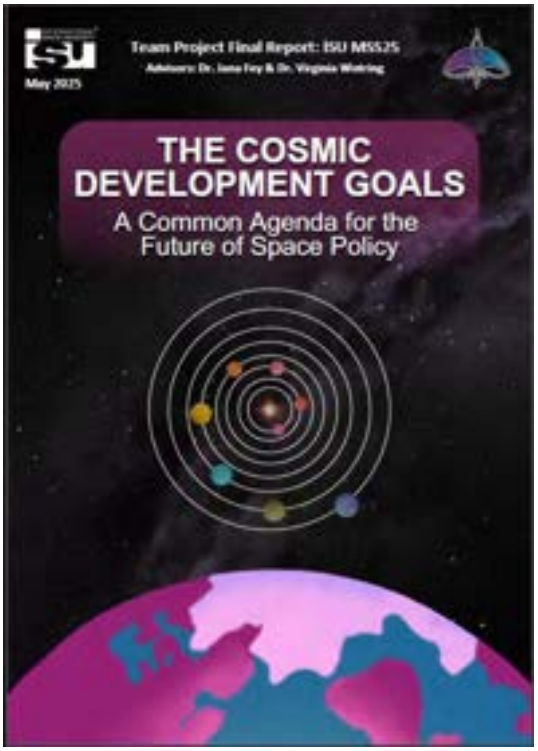


February 2025: Annual Lego Robotics Competition

MSS25 Team Projects

The MSS25 students had the choice between 2 Team projects during academic year 2024/2025:

- The Cosmic Development Goals: A Common Agenda for the Future of Space Policy
- FERTILE Mars: Resources and Opportunities



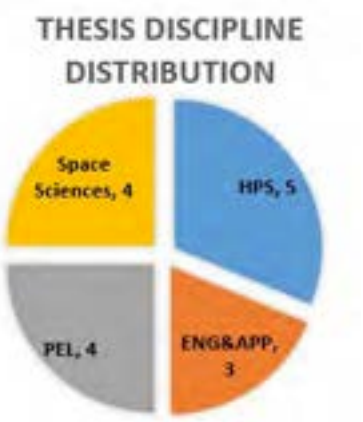
The projects culminated in a final report and presentation. The final reports are freely available on the ISU Library website. The presentations can be watched on the ISU YouTube Channel.

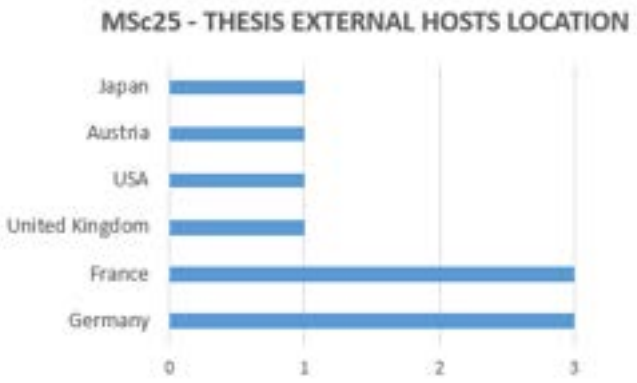
Students also presented at the International Astronautical Congress - IAC 2025 in Sydney.

MSc25 Master's Thesis

With the new format of the Master's programs, the previous Individual Project module has been replaced by the 6-month Master's Thesis: Students who have selected the MSc format will work on their Masters' Thesis during their 3rd semester (Sep. 2025 to Feb. 2026). As of October 2025, 16 Thesis proposals have been approved.

- 6 students are working on a Thesis directly with ISU supervisors, in addition to possible external supervisors who are well known of ISU Faculty.
- 10 students are working on a research project for another organization

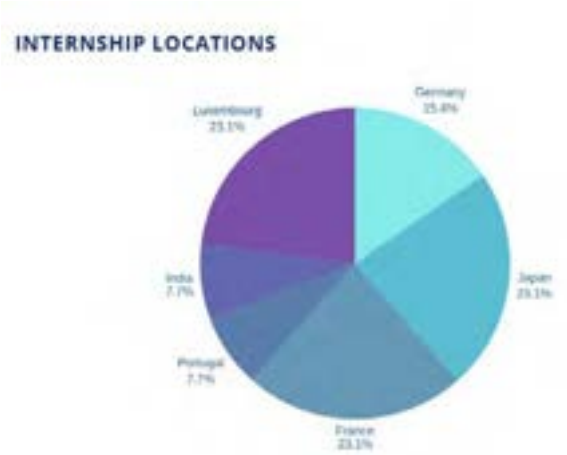


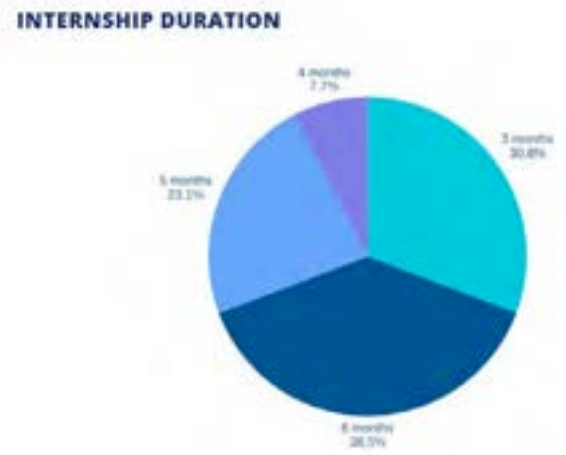


MSS25 Internships

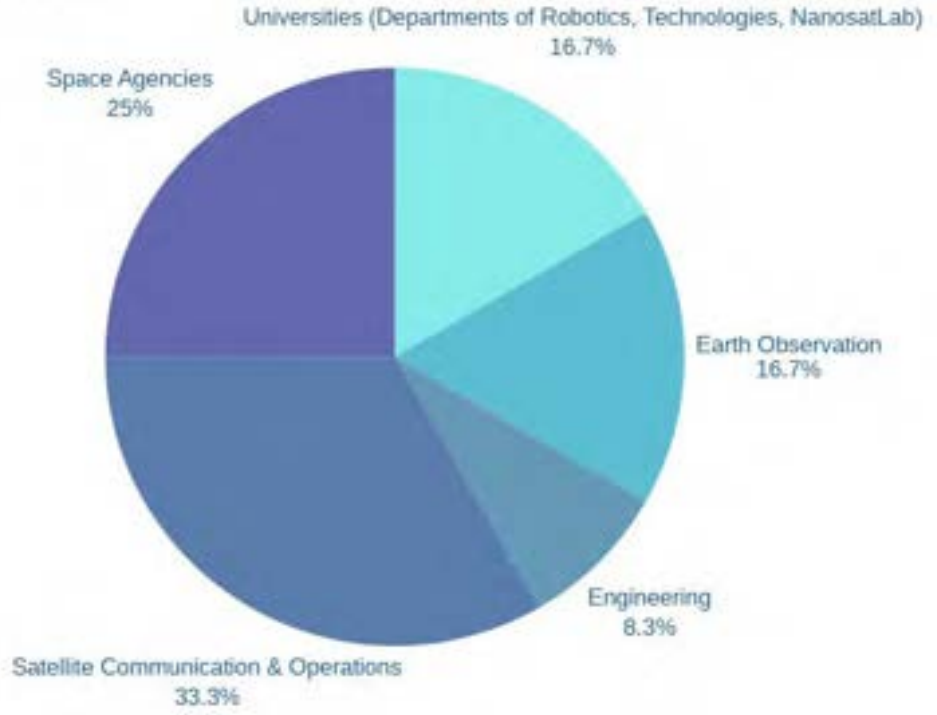
This year, among all the students who have completed the required modules to be eligible for an internship or thesis, only one has not yet secured an internship. He is currently pursuing a PhD at **Concordia University**, **Canada**, but remains open to potential internship opportunities.

Overall, this year, the average duration of internships tends toward six months.
The following graphs illustrate the duration, location, and type of internships completed by the MSS25 cohort.





HOST ORGANIZATIONS EXPERTISE FIELDS



Space Studies Program (SSP)

SSP25 Overview and Highlights

The International Space University's (ISU), Space Studies Program (SSP25), 37th edition, took place from **30 June to 2 August 2025**, in Ansan, Greater Seoul Area, South Korea. This prestigious eight-week intensive program was hosted at Hanyang University ERICA campus, in collaboration with the Korean Federation of Science and Technology Societies (KOFST).

A Record-Breaking Cohort

SSP25 welcomed **122 participants from 39 countries**, representing a diverse array of backgrounds, industries, and academic disciplines. The cohort included graduate students, young professionals, and experienced industry leaders, all united by their passion for space. The interdisciplinary nature of the program enabled participants to engage in a broad curriculum covering engineering, science, policy, business, and space applications, fostering a holistic understanding of the sector.

Figure 1- SSP25 Opening Ceremony

A Forward-Looking Space Environment

South Korea provided a dynamic and inspirational environment for SSP25. With its rapidly growing space sector and strong national commitment to innovation, participants had access to professional visits spanning nearly the entire Korean aerospace ecosystem — from Hanwha Systems (advanced defense and aerospace technologies) to Korea Aerospace

Research Institute (KARI), from Korea Astronomy and Space Science Institute (KASI) to Korea Institute of Geoscience and Mineral Resources (KIGAM), from Korea Aerospace Industries (KAI) to the Naro Space Center, among many others. These visits enabled first-hand engagement with experts, researchers, and pioneers driving South Korea's expanding role in space.

Fostering a Global Network

Beyond academics, SSP25 facilitated invaluable networking opportunities, allowing participants to connect with space leaders, entrepreneurs, and policymakers. Graduates joined **ISU's extensive alumni network of over 6,000 space professionals across 112 countries**, further strengthening their connections in the global space community.

SSP25 Staff Support Team

Cutting-Edge Curriculum and Hands-On Learning

SSP25 maintained ISU's commitment to interdisciplinary, international, and intercultural education, featuring core lectures, department activities, team projects, and workshops. Participants had the opportunity to work on real-world space challenges, collaborate with industry experts, and develop innovative solutions for the future of space exploration.

Key highlights of the curriculum included:

- Expert-led lectures by senior figures from NASA, ESA, KARI, private industry, and academia
- Hands-on workshops in mission design, robotics, space medicine, and space law
- Team projects addressing critical space-related issues, fostering teamwork and problem-solving skills

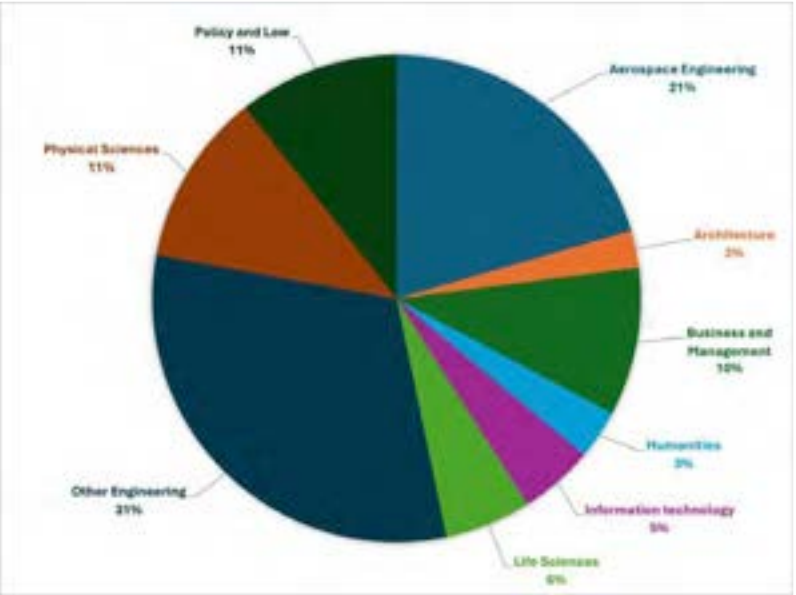
A Lasting Impact

The SSP25 program successfully upheld ISU's mission of advancing space education and professional development. Through a rigorous curriculum, real-world industry exposure, and unparalleled networking, participants gained the knowledge, skills, and global connections to contribute meaningfully to the future of space exploration. As ISU looks forward to SSP26, the legacy of SSP25 remains—a transformative experience empowering participants to become future leaders in the space sector.

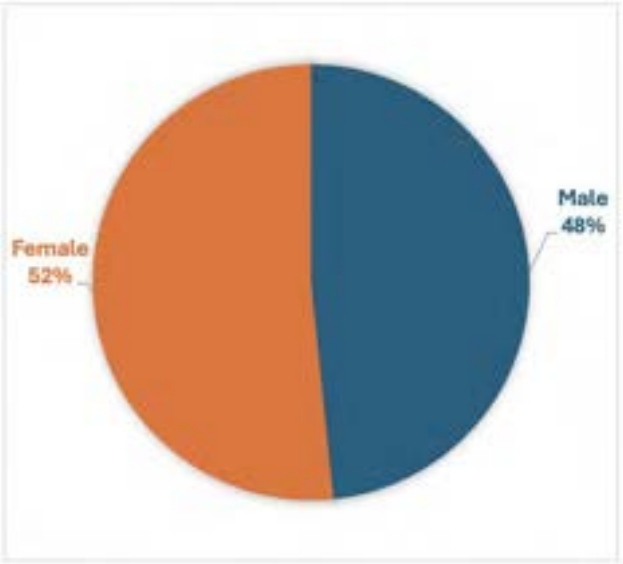
Participants

SSP25 brought together **122 participants from 39 countries**, showcasing the program's commitment to international and interdisciplinary collaboration. Participants came from a wide range of academic and professional backgrounds, creating a dynamic and inclusive environment. This diversity enriched discussions and activities, fostering innovation and cross-cultural exchange in space studies. SSP25 class statistics are provided below for your reference:

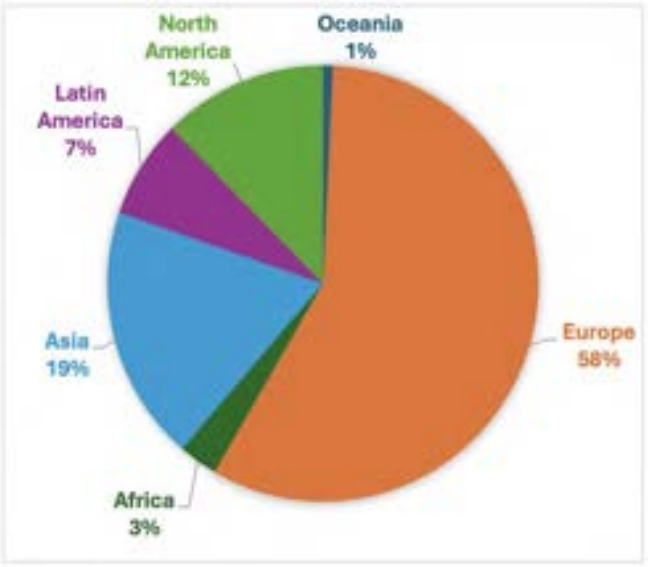
1. **BACKGROUND DISTRIBUTION**



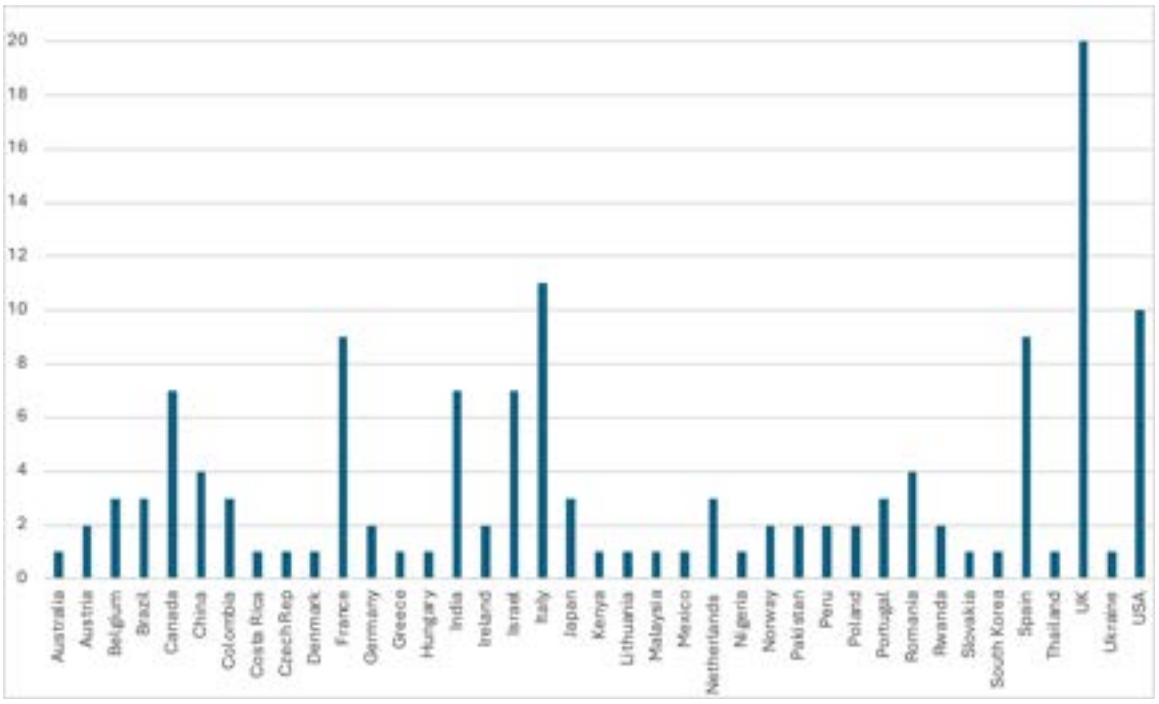
2. GENDER DISTRIBUTION



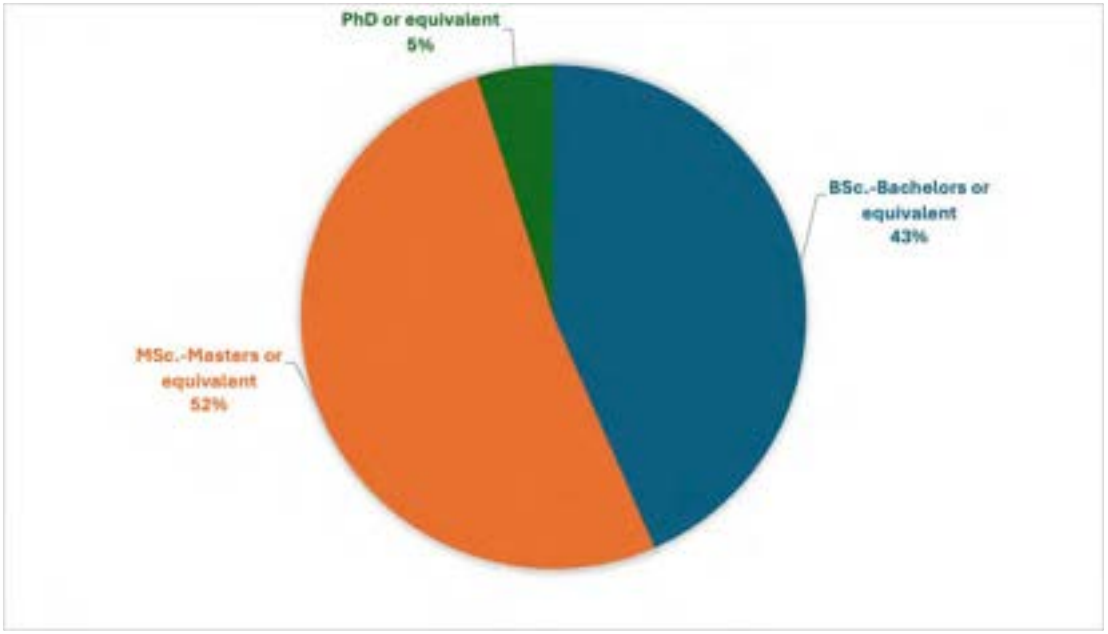
3. GEOGRAPHICAL ZONE



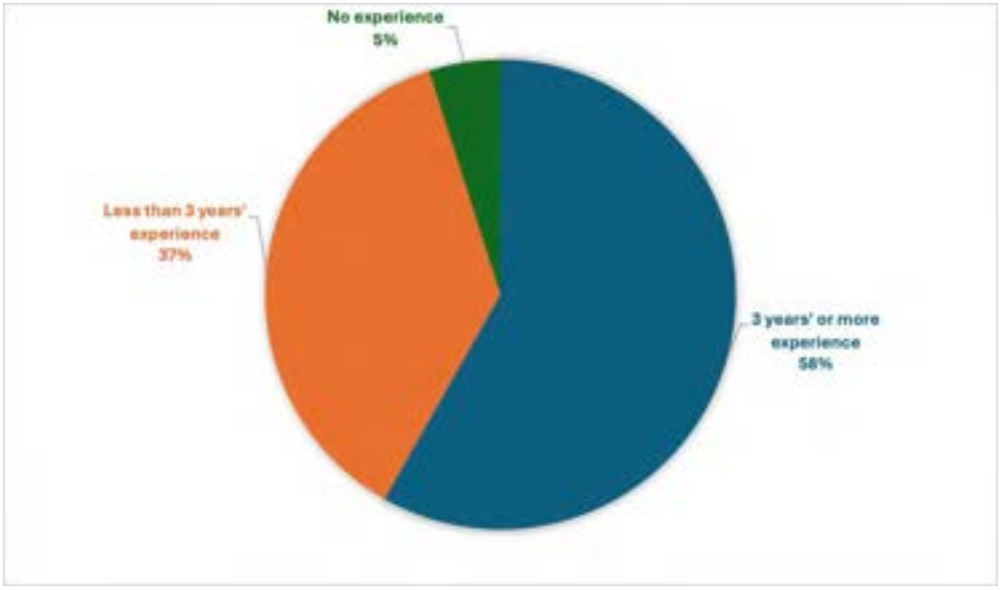
4. COUNTRY DISTRIBUTION



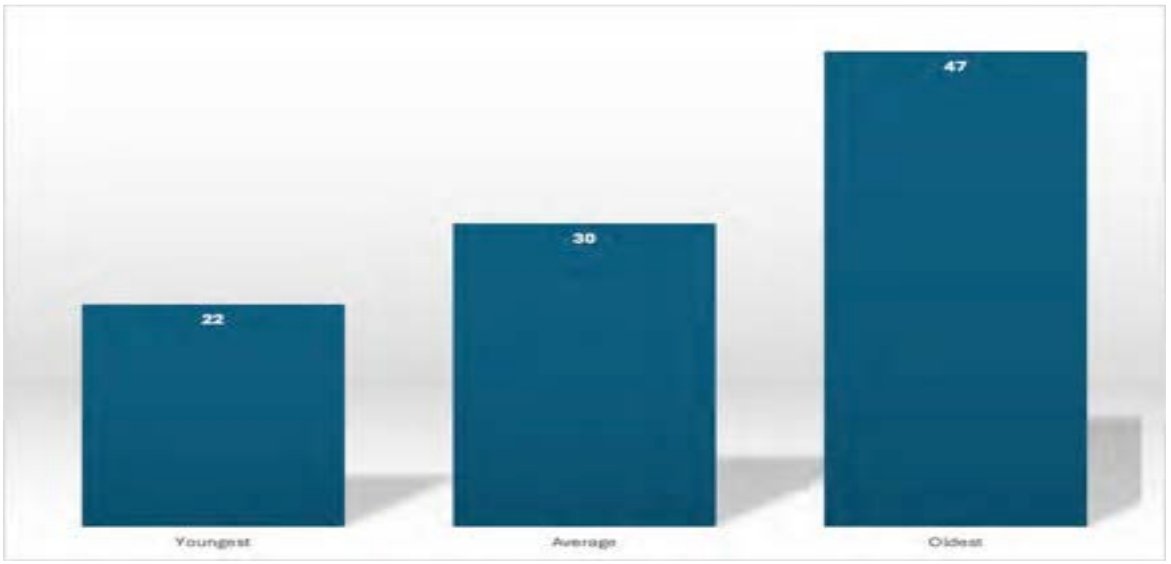
5. EDUCATIONAL DEGREE DISTRIBUTION



6. WORK EXPERIENCE



7. AGE



SSP25 Content and Focus

SSP25 offered an immersive and interdisciplinary curriculum blending academic theory with hands-on learning. The program included core lectures, department activities, workshops, team projects, distinguished lectures/panels, fireside chats, and professional visits, creating a dynamic learning environment that enabled participants to engage with experts, collaborate on real-world challenges, and specialize in areas of interest.

Core Lectures

The program began with 55 one-hour core lectures, covering space science, engineering, policy, law, business, and applications. Delivered by experts from academia, industry, and government, these lectures ensured that all participants gained a comprehensive understanding of the space sector, while encouraging exploration of interdisciplinary applications.

SSP25 Core Lectures

Department Activities

Participants then specialized in department activities, including robotics, life sciences, satellite applications, systems engineering, policy and law, among others. These sessions fostered active learning through discussions, experiments, and case studies relevant to participants' chosen fields. Fourteen 3.5-hour sessions plus additional departmental activities were organized specifically for each discipline, contributing to each participant dedicating 58 hours for the departmental activities.

Department Activities

Workshops

Workshops emphasized practical learning in mission planning, space habitat design, policy development, and other specialized topics. Facilitated by industry professionals and academic mentors, the workshops provided hands-on experience with real-world scenarios. Different workshops of 3.5-hour or 2.5-hour workshops were conducted, among which: 3 Fundamental Workshops (FWS) running in parallel, 17 Elective Workshops (EWS) running in parallel and divided in 3 sessions, 2 Theme-Day activities, 2 Rube Goldberg sessions and the Lego Robotics competition, contributing to each participant dedic**ating 27 hours for the workshop-based academic content.**

Team Projects

A highlight of SSP25 was the **team projects**, where participants collaborated on **large-scale interdisciplinary projects** addressing critical issues in the space sector. Each participant dedicated over **100 hours** of teamwork to research, analyze, manage, and present their projects. The three team projects studied during SSP25 are summarized below:

1. AI for Space Exploration – Edge Intelligence for Space Missions: AI for Resilient Power Systems and Crew Health

This project investigates how Artificial Intelligence (AI) can enhance human space exploration by improving both spacecraft operations and astronaut health monitoring. On the spacecraft side, AI is envisioned as a tool to predict and prevent system failures, ensuring missions run safely and efficiently. By continuously analyzing operational data, AI can alert crews to potential problems before they become critical, reducing risk and supporting smoother mission execution. On the human side, AI is designed to monitor astronauts' health in real time, particularly during spacewalks, which are among the most physically demanding and risky activities in space. By integrating multiple sensors and analyzing physiological data, AI could detect early signs of stress, cardiovascular issues, or other medical concerns, providing timely recommendations and guidance to the crew. Beyond the technical achievements, the research also examines the wider implications of using AI in space, including economic benefits, such as cost savings from preventing failures, and ethical and legal considerations, such as data privacy, human-machine trust, and responsible medical oversight. Overall, the project demonstrates the potential for AI to act as a reliable partner for astronauts, helping them operate more safely, make better decisions, and extend human presence deeper into space.

2. One Planet, One Problem – Use of Satellite Data for Climate Change Adaptation and Resilience Strategies: An Examination of Case Studies in Rwanda and South Korea

This project explores how space-based tools can help communities better adapt to climate change. In South Korea, the focus is on urban heat islands, where rising temperatures in cities like Seoul threaten public health and infrastructure. The project uses satellite imaging, ground sensors, and AI to map heat hotspots at the neighborhood level, combining physical data with population information to pinpoint vulnerable areas and improve early warning systems.

In Rwanda, the project addresses floods and landslides, which cause widespread loss of life, property, and economic disruption, especially in agricultural regions. By integrating satellite observations, GIS mapping, and local early-warning sensors, the project helps identify high-risk zones, optimize resource deployment, and support disaster preparedness. Community workshops and public education are also part of the effort, ensuring that local populations can respond effectively to climate hazards. Overall, the project demonstrates how combining space technology, data analysis, and community

engagement can create actionable solutions for climate resilience, providing both countries with tools to anticipate, adapt to, and recover from extreme weather events while offering insights applicable worldwide.

3. Sustainable Lunar Spaceports

This project investigates how to build and maintain sustainable infrastructure on the Moon, combining expertise in engineering, space science, human factors, policy, and law. The goal is to support both near-term lunar missions and a long-term, human-centered lunar presence. The team studied the design of a lunar spaceport and surrounding facilities, starting with initial Artemis and ILRS concepts and evolving toward a multifunctional hub. Short-term plans focus on a Launch and Landing Pad (LLP) at the de Gerlache Rim near the South Pole, chosen for its access to water ice. The design addresses lunar-specific challenges such as dust mitigation, phased construction, logistics, and communications, integrating existing proposals like NASA's LunaNet. Governance is included through a proposed international Lunar Council and Lunar Tribunal to ensure sustainable, collaborative development. The long-term vision extends to a multi-purpose spaceport supporting daily launches and landings, permanent settlements, and a robust communication and navigation system. Innovations include AI- and quantum-enabled traffic management, hybrid energy systems, and a human-centric design ensuring wellbeing on the Moon. Autonomous life-support systems, blockchain-based resource tracking, and smart contracts are proposed to manage operations efficiently. Economic models explore lunar tourism and commercial activity, contributing to a sustainable space economy. Overall, this interdisciplinary project demonstrates how engineering, policy, and human factors can work together to enable safe, sustainable, and economically viable lunar infrastructure—laying the foundation for humanity's long-term presence beyond Earth.

Professional Visits and Networking

SSP25 included visits to **space launch centers, research institutions, and private companies**, providing insights into the latest advancements. These visits, combined with networking opportunities, enabled participants to connect with **industry leaders, researchers, and fellow space enthusiasts**, forming invaluable professional relationships.

Southern Hemisphere Space Studies Program (SHSSP)

Overview

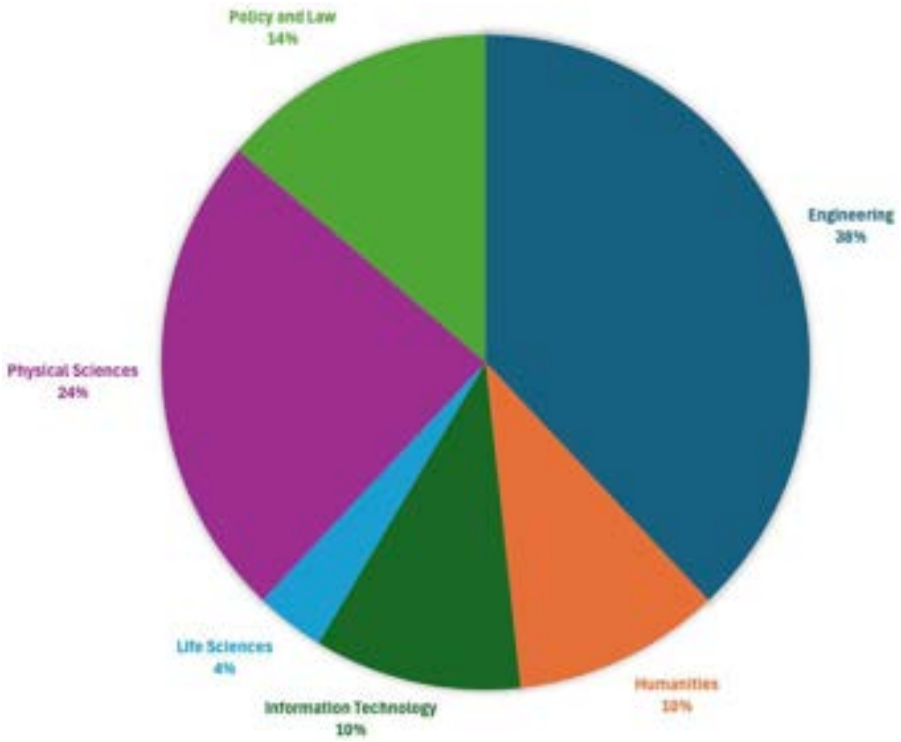
The Southern Hemisphere Space Studies Program (SHSSP25), 13th edition, was conducted onsite in Adelaide, Australia, at the University of South Australia's (UniSA) Mawson Lakes Campus from **13 January to 7 February 2025**. The program was delivered in partnership with UniSA, continuing ISU's tradition of building the global alumni network and strengthening international recognition from space agencies, industry, governmental institutions, and academia worldwide.

SHSSP25 Class Photo

Participants

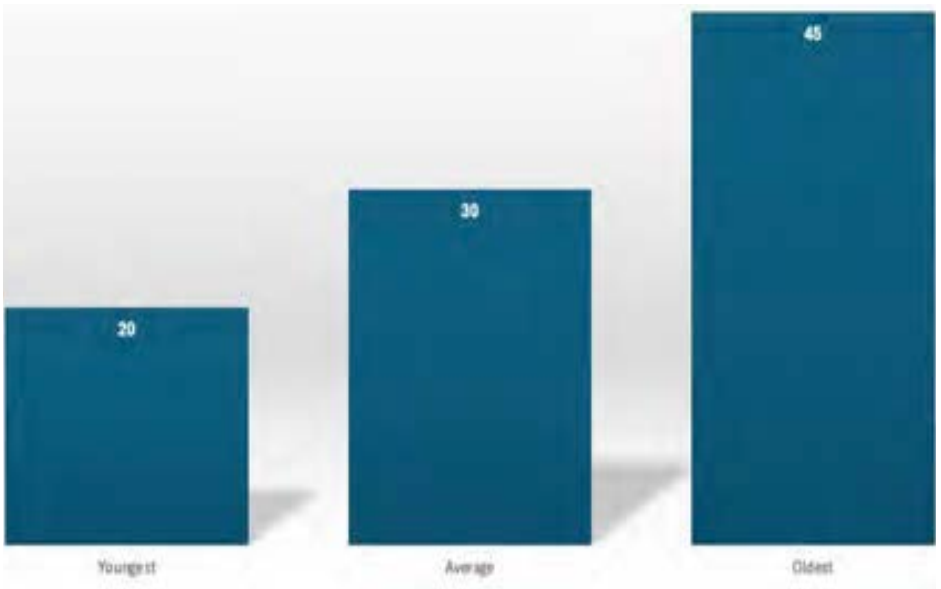
Modeled on the Northern Hemisphere Space Studies Program (SSP) and designed to complement it during the Southern Hemisphere summer, the four-week SHSSP25 attracted a diverse cohort of participants from both hemispheres and from various levels of experience. This year's program hosted **29 participants representing 12 countries**. SHSSP25 class statistics are provided below for your reference:

1. BACKGROUND DISTRIBUTION

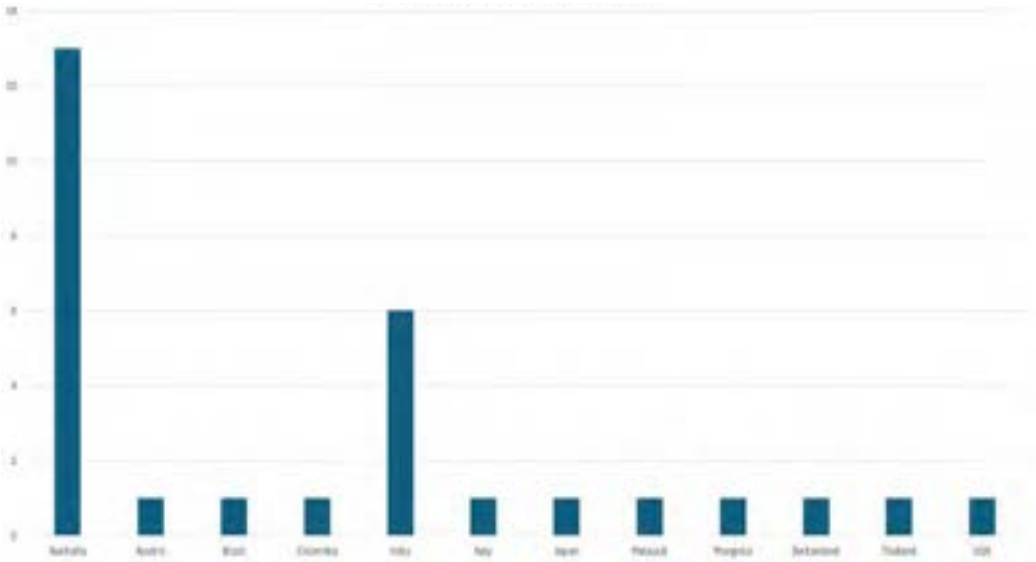


2. GENDER DISTRIBUTION

3. AGE DISTRIBUTION



4. COUNTRY DISTRIBUTION



All SHSSP25 participants received Certificates of Completion from ISU, as well as Executive Certificates from UniSA. In addition, participants are eligible to receive 50% credit upon admission to UniSA's Graduate Certificate in Space Studies.

SHSP25 Content and Focus

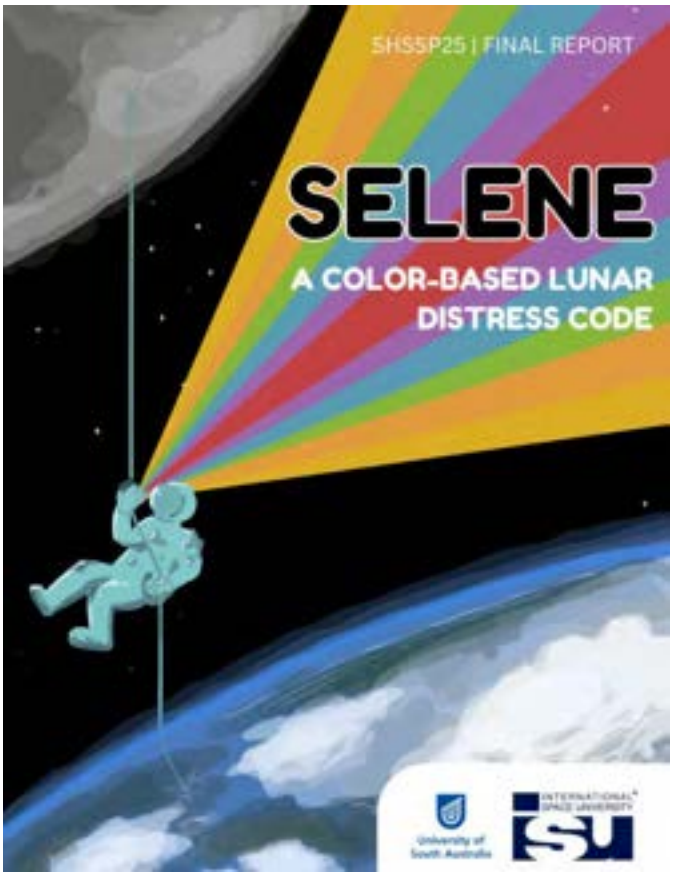
The academic structure of SHSSP25 followed ISU's classic three "I" approach — International, Intercultural, and Interdisciplinary:

- **Core Lectures (1/3 of program):** A total of **27 lectures** were delivered, covering global space activities with a focus on applications, services, and policy. These sessions provided a broad understanding of the role of space today, the status of our capacity to use it, and the future directions, opportunities, and challenges facing the space sector. Content was designed to be accessible to participants from a wide variety of academic and professional backgrounds.

- **Hands-on Workshops (1/3 of program):** Interactive sessions enabled participants to apply lecture content to practical activities, encouraging cross-disciplinary collaboration and problem-solving.

SHSSP25 Astronaut Panel

- **Team Project (1/3 of program):** Conducted in the final week, the team project allowed participants to work collectively on a significant space-related challenge, integrating knowledge gained throughout the program into a collaborative output. The details of this year's project is given below:



SELENE - A Color-Based Lunar Distress Code Lunar search and rescue (LunaSAR) is a new field largely emerging from NASA's Artemis campaign. It focuses on locating and rescuing astronauts in distress on the lunar surface. A crucial component of LunaSAR operations is effective distress messaging. This paper highlights two main challenges associated with distress messaging on the Moon: the lack of telecommunications infrastructure and the unprecedented nature of managing emergency situations in a lunar environment.

To address these challenges, this paper proposes the introduction of a **universal lunar distress code**. Such a code would provide a concise description of an emergency, allowing it to be reduced to a small communication payload that meets the technical constraints of distress messaging, while also being universally understood to rapidly mobilize an effective response.

As a proof of concept, this paper introduces the **System of Emergency Lunar Event Notification & Evacuation (SELENE)**, a color-coded lunar emergency protocol. The methodology behind the development of SELENE is described, along with testing and validation to ensure its cross-cultural usability.

The paper discusses both technical and legal aspects related to the effective implementation of the universal lunar distress code. On the technical side, it proposes a payload architecture and examines how this aligns with the requirements for telemetry, beacons, and satellite communication. On the legal side, it explores the regulatory and governance frameworks necessary to implement the code, as well as the potential risks associated with its adoption.

In conclusion, the authors offer recommendations for the further development of distress messaging within the LunaSAR context, including extending the universal lunar distress code for future interplanetary missions.

Overall, the four-week academic program of SHSSP25 was carefully structured to offer participants a comprehensive experience, combining a wide array of activities that integrated formal learning, professional networking, and hands-on practical engagement, with international instructors. The curriculum was designed not only to deliver interdisciplinary knowledge, but also to foster collaboration, critical thinking, and skills development within the areas of international and multicultural space environments.

SHSSP25 featured visits to major Space Centers and local hubs for innovation and entrepreneurship, including the Australian Discovery Center and the Innovation and Collaboration Center, including outdoor GIS – Geographic Information System hands-on activities and the traditional Model Rocket Launch competition. These visits provided participants with valuable insights into the latest space advancements, while highlighting local initiatives aimed at developing sustainable and globally scalable ventures.

Mt. Lofty, GIS workshop

Responsive Space Operations Centre, Australian Space Agency

SHSSP25 International Astronaut Panel

SHSSP25 Model Rocket Launch competition

Executive Space Course

Executive Space Course, Tel Aviv

The third edition of the Executive Space Course (ESC) took place in Tel Aviv, Israel, co-organized by the International Space University (ISU) and The Ramon Foundation, and graciously hosted by N.B.A Law. Designed primarily for professionals from Israel and the Eastern Mediterranean region, the course brought together 18 participants, including one from Germany, who joined the ISU alumni network upon completion.

The cohort represented a wide range of expertise across the Israeli and global space ecosystems, with participants from organizations such as Rafael, Moonshot, SPS, BSEL, BHAG Space, Tomer, B.A. Law, and Elbit.

Held from 17–22 November, the program featured a diverse lineup of speakers from academia, industry, and government. Notably, 52% of the speakers were ISU alumni, and 40% were women, underscoring ISU's commitment to diversity and inclusion in the space sector.

Opening and Keynote Sessions

The course opened with welcoming remarks from Mr. Uri Oron, Director General of the Israel Space Agency; Mr. Gil Doron, Managing Director of The Ramon Foundation; and Mr. Iftach Ramon, son of the late Colonel Ilan Ramon, Israel's first astronaut and member of the Columbia crew.

An introductory lecture was delivered by Dr. François Spiero, member of the ISU Academic Council and European Space Affairs Manager at the French Prime Minister's Office, followed by contributions from 25 distinguished lecturers and experts, coordinated by Mr. Ofer Lapid,

ISU Faculty member and Trustee.

Program Highlights

The week-long program blended academic sessions, interactive workshops, and networking events. A highlight of the course was an exclusive visit to Israel Aerospace Industries (IAI), where participants toured the company's facilities and gained firsthand insights into Israel's technological innovations in aerospace, satellite development, and defense systems.

Other activities included hands-on sessions, panel discussions, and an Icebreaker evening that marked the participants' official induction into the ISU alumni community. The program fostered professional exchange, collaboration, and lasting connections among participants and industry leaders.

Participant feedback reflected the program's success:

> "The organizers were amazing; they care deeply about the subject, and it shows."
> "I appreciated the diversity of the content and perspectives."

ISU extends its sincere appreciation to The Ramon Foundation, Mr. Ofer Lapid, and all contributors for their dedication in ensuring the success of the course. The ESC continues to fulfill ISU's mission of capacity building, knowledge transfer, and network development within the international space community, enabling professionals to expand their expertise and engage more deeply in the evolving global space sector.

Executive Space Course, Strasbourg

In celebration of the 38th anniversary of the International Space University (ISU), the Executive Space Course (ESC24) was successfully held at ISU's Central Campus in Strasbourg, France. This annual flagship program continues to embody ISU's mission to provide interdisciplinary space education to professionals worldwide. The 2024 edition welcomed 15 participants from 12 countries.

Participants came from a broad spectrum of organizations across the global space ecosystem, including established industry leaders, government agencies, academic institutions, and entrepreneurial ventures. Upon completion, the graduates joined the ISU alumni community, expanding the network of space professionals committed to advancing international cooperation in space activities.

The course benefited from the continued support of SES, a long-standing ISU partner, whose collaboration has been instrumental in sustaining ISU's executive education programs and capacity-building efforts. The program drew on the expertise of distinguished lecturers and industry leaders from both ISU and the wider space community.

A highlight of ESC24 was a keynote address by ESA astronaut Reinhold Ewald, who shared his experiences as a spaceflight veteran during a special evening event hosted at IRCAD. His talk provided valuable personal and professional insights into human spaceflight and the broader challenges of international space collaboration. ISU warmly acknowledges IRCAD for their generous hospitality and continued partnership in supporting ISU's educational mission.

The one-week course provided an immersive learning experience designed for both technical and non-technical professionals seeking to reskill or upskill in the dynamic space sector. The program offered a multidisciplinary overview of the space domain, combining academic rigor with real-world perspectives.

Throughout the week, participants explored a range of subjects encompassing satellite mission design, human spaceflight and life sciences, the NewSpace economy and financing models, space law and policy, sustainability, microgravity research, Earth observation, satellite navigation, space exploration, defense applications, and project management in complex space missions. A hands-on workshop on CubeSat development gave participants a practical understanding of mission design and small satellite technology.

Beyond the lectures and workshops, ESC24 also fostered meaningful networking opportunities, enabling participants to connect with ISU faculty, guest experts, and fellow professionals from around the world. The collaborative environment and interdisciplinary nature of the course reflected ISU's educational philosophy—encouraging knowledge exchange, creativity, and the building of international partnerships.

The Executive Space Course (ESC24) once again demonstrated ISU's central role in advancing global space education. By bringing together professionals from multiple disciplines and cultures, the course strengthened ISU's impact on the international space community, empowering participants to apply their newly acquired knowledge and networks to their respective organizations and career paths.

Advanced Studies

The Advanced Studies constitute a key component of ISU's Master programs—the Master of Science in Space Studies (MSc) and the Master in Space Studies (MSS)—and have been open to participation by all interested individuals since 2024. These specialized short courses are conducted onsite at ISU's Central Campus in Strasbourg, France, offering participants focused, in-depth exploration of selected topics within the interdisciplinary space domain.

In 2025, six students from five different countries participated in three distinct Advanced Studies programs: Astrobiology and Space Exploration, New Space Entrepreneurship, and CubeSat Development. Each program combined academic rigor with practical engagement, bringing together ISU faculty, international experts, and participants from diverse professional and educational backgrounds.

Astrobiology and Space Exploration

Led by Professor Hugh Hill, the 9th annual Astrobiology and Space Exploration program was held from 26 May to 6 June 2025, welcoming one participant. This course examined the origins, evolution, and potential distribution of life in the universe, integrating perspectives from biology, planetary science, and philosophy. It also connected these themes to the broader field of space exploration.

The program featured contributions from internationally recognized experts. Participants explored ongoing and upcoming missions in astrobiology and planetary science, such as the OSIRIS-REx asteroid sample return mission from Bennu.

The course combined lectures, debates, and interactive workshops with a field trip dedicated to the collection and analysis of magnetotactic bacteria from local ponds. Participants collaborated on a group "White Paper", the program's primary deliverable, synthesizing insights from their discussions. Previous editions of the course have produced papers on topics such as *The potential of the Canadian Arctic for Astrobiology Research* and *Artificial Intelligence (AI) as a Biomarker for the Astrobiology Community*.

New Space Entrepreneurship

The New Space Entrepreneurship program, led by Dr. Walter Peeters, was also conducted from 26 May to 6 June 2025 with one participant. Reflecting the expanding opportunities within the commercial space sector, the course was designed to help participants understand and apply key entrepreneurial principles in a space context.

Participants worked in small, interdisciplinary teams to develop business plans for innovative space application projects using the business canvas model. Under the mentorship of specialists from the equity financing and venture investment sectors, each team refined its proposal and presented it in a concise, ten-slide pitch format—simulating a real-world business plan competition.

A professional jury evaluated the final presentations, offering feedback and guidance on potential pathways toward implementation or incubation. The course provided participants

with valuable exposure to NewSpace market dynamics, financial feasibility assessment, and strategic innovation, equipping them to translate technical or conceptual ideas into viable commercial ventures.

CubeSat Development

From 10 to 20 June 2025, the CubeSat Development Advanced Study, led by Dr. Ramson Nyamukondiwa, welcomed four students. This intensive hands-on course offered participants a comprehensive experience in the design, development, and operation of small satellites, covering the full mission lifecycle—from concept definition and system design to assembly, integration, testing (AIT), and data analysis.

Participants engaged directly with CubeSat and PocketQube kits, simulating real-world mission conditions and constraints. The course emphasized practical learning, including sessions on subsystem integration, ground station operations, orbit simulations, and mission planning. By the conclusion of the workshop, each team had produced a functional satellite prototype, a mission operations plan, and a data analysis report.

This program bridged theory and practice, offering participants a realistic understanding of the technical, managerial, and operational challenges involved in small satellite missions. It also encouraged interdisciplinary teamwork and innovation, fostering the entrepreneurial mindset that characterizes ISU's approach to education.

The 2025 Advanced Studies series once again demonstrated ISU's commitment to hands-on, interdisciplinary, and globally connected learning. By bringing together participants and experts from across the world, these programs provided not only academic enrichment but also practical experience and professional networking opportunities. Each study reinforced ISU's mission to prepare future leaders and innovators for the challenges and opportunities of the rapidly evolving space sector.

Research and Innovation

Research and Publications

Prof. Hugh Hill – Space Science and Astrochemistry

Professor Hill has been a member of the ISU Resident Faculty since August, 2002, and holds research degrees in both Meteoritics (the study of meteorites and the early Solar System) and Astronomy, specializing in the interstellar medium (ISM). Over the last year, 2-3 Peer-Reviewed publications have emerged in the fields of Astrobiology and Astrochemistry. He is also a Reviewer for several scientific journals.

Professor Hill's recent research includes the first detection and characterization of ethylene glycol (EG) in astrochemical ices. This involved a 12-year collaboration with several MSS alumni, e.g. at PRL (India). The paper, "*Infrared spectroscopy reveals ethylene glycol is an anti-crystallizer in water mixed astrochemical ices*" used banal, terrestrial anti-freeze to explain why certain compounds in the Interstellar Medium (ISM) are not observed as ices. Specifically, EG, known as an anti-freeze for water on Earth is also known to be present in the ISM and both long- and short-term period comets. The ubiquitous EG might have an influence on the physico-chemical nature of other molecules, such as water, in a co-existence scenario within the cometary ices and icy mantles of cold dust in the ISM. The authors undertook a mid-infrared (MIR) spectroscopic study of the layered, and mixture, of EG and water in the astrochemical icy conditions in the laboratory starting from 10 K until sublimation. They found that the presence of EG can restrict the amorphous to crystalline phase change of water ice and can elevate the sublimation temperature of water molecules bonded with EG to the sublimation temperature of EG (230 K). This is about 50 K higher than the usually acknowledged water ice sublimation temperature. The authors have attributed these findings to the hydrogen bonding present between EG and water molecules. Hence, the presence of EG in water ice can introduce water into the reaction matrix on an icy mantle at higher temperatures than previously realized. They concluded that hydrogen bonding should be included in the cometary models and theory, especially for the comets where EG and water coexist.

Professor Hill is also supporting international colleagues in a Marie Skłodowska-Curie networks (Horizon Europe MSCA) Joint Ph.D. Program: ISU project: "*Not a laughing matter: Monitoring nitrous oxide (N_2O) temporal concentrations in the Rhine Valley and its relationship with other anthropogenic greenhouse gases*". Potential of €100,000 Ph.D. funding for three years for one Ph.D. student based at ISU Central Campus.

The interstellar medium (ISM) refers to most of the volume of the observable universe (that part of the cosmos 'between stars') and is essentially an ultra-high vacuum. However, molecules form here and, thereafter, are the basis of a new generation of stars formed in star

clusters (see photo above). An international team using IR spectroscopy, including ISU, recently discovered that liquids, as opposed to astrophysical ices, also exist in the ISM, in the form of compounds such as ethylene glycol (anti-freeze). Photo credit: NASA.

Figure: *Illustration of ISM molecular formation and star-cluster genesis (Credit: NASA)*

Dr. Goldman – ESA Euclid Mission

Dr. Goldman dedicated most of his research time in 2024/2025 to the ESA astronomy mission Euclid. The telescope was launched on 1 July 2023 and has started mapping about one third of the sky away from the Milky Way. The project is designed to explore the composition and evolution of the dark Universe, by obtaining unprecedented depth and spatial resolution for such a large area. Dr. Goldman, as a member of the Euclid Consortium since 2019, uses this data to search and study extremely cool dwarfs of the Solar neighborhood.

The first months of Euclid operations were dedicated to the commissioning and characterization of the instruments, and over the course of 2024/2025 the consortium produced and released a preliminary data release Q1 of about 60 sq.degrees.

After a long process due to the Euclid Consortium aimed to increase the visibility of the mission, three articles resulting from Early Release Observations images pre-dating the Q1 release and co-authored by Dr. Goldman were published in the European journal *Astronomy & Astrophysics* in May 2025. The first, led by Dr. Martín, revealed new candidates to be planetary-mass objects of just a few Jupiter masses. A second article, led by Dr. Massari, studied the globular clusters NGC 6254 (M10) and NGC 6397 to surface-brightness limit about 6 times fainter than in the literature. The third article, led by Dr. Cuillandre, described the data processing of these data, obtained in sky areas with a complex background constituted by the interstellar medium (see Fig.Gol1) or fields with a high density of stars, as opposed to the main survey area at high galactic latitudes and low stellar density.

More recently, in June, a study based on the near-infrared spectroscopy obtained by Euclid was accepted by *Monthly Notices of the Royal Astronomical Society*. Led by Dr. Bañados of MPIA in Heidelberg, the authors used the Euclid spectra to identify high-redshift quasars and ultracool dwarfs. Although the distances to these objects and their absolute luminosities differ by many orders of magnitudes, they may be confused in imaging data of Euclid and other surveys given their similar colors in some filter combinations. The article reports the discovers of a high-redshift quasar and one brown dwarf, demonstrating the capability of Euclid ’s slitless spectroscopy to foster these fields of research.

In May, Dr. Goldman has become lead of his Science Working Group, the Milky Way and Resolved Stellar Population group, after being deputy lead then co-lead.
In addition, Dr. Goldman is contributing to the publication to the internationally-renown Strasbourg Data Centre (CDS), the most used curator of astronomy data world-wide, of legacy photometric data obtained by the EROS microlensing survey (e.g. Blaineau et al., 2002, *A&A* 664, 106).
Dr. Goldman has continued the collaboration with former Year B student E.Gonzáles (MSS20) studying the polarization of ultra-cool dwarfs, with an article based on the Year B thesis being prepared for submission.

Fig.Gol1: Image of the Horsehead Nebula obtained by the Euclid telescope as part of the Early Released Observations, and analyzed in Martín et al. (2025).

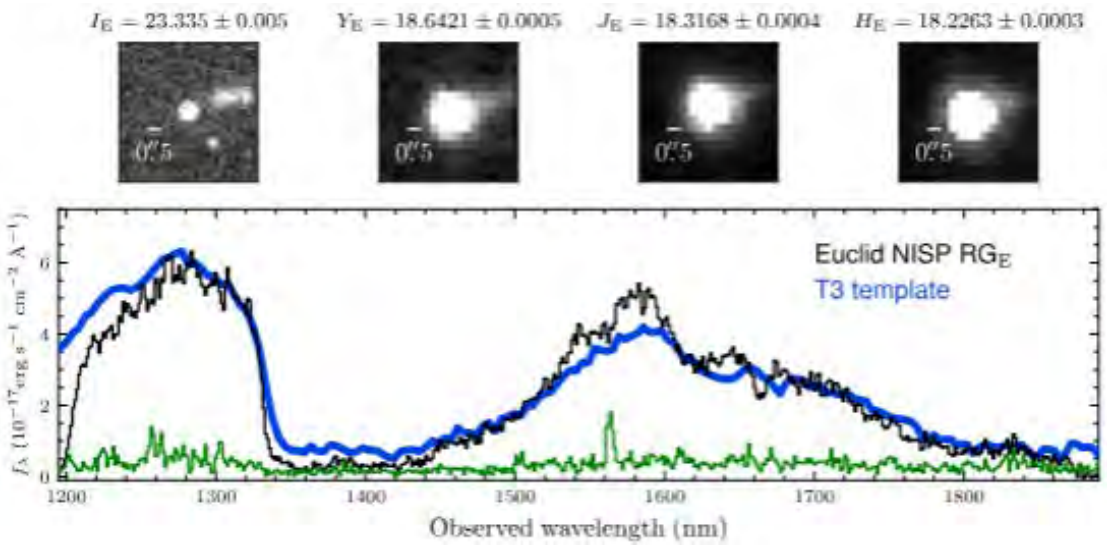


Fig. Gol2: Postage stamps of the T3 dwarf EUCL J002516.31−491618.5 discovered in the Bañados et al. (2025) article in the four Euclid filters. Bottom: Euclid NISP spectrum (black line and the uncertainties in green). The blue line shows a template of a T3 binary: 2MASS J12095613−1004008 (Burgasser et al. 2004; Dupuy & Liu 2012), matching very well the Euclid NISP spectrum of the newly discovered object. From Bañados et al. (2025).

Prof. Wotring – Space Life Sciences

Research continues in multiple life sciences areas in the Central Campus Space Life Sciences Laboratory. In Fall 2024, Dr. Wotring presented her research on the behavior of planarians in space analogs at the Milan IAF/IAA Space Life Sciences Symposium on "*Effects of a Sleep Aid Medication on Flatworm Behavior in Space Flight Analogs*" and "*Melatonin Action In Low Magnetic Field* " was presented at the International Congress of Aerospace Medicine in Portugal.

Space-related behavioral research has continued at Central Campus with Sarah Rogers, an undergraduate student from the Department of Medicinal Chemistry, Technological University Dublin. She studied the effects of caffeine, a drug relevant in space and on Earth, on the characteristic photophobic response in planarians. Her data showed a profound alteration in this reflex behavior when caffeine was given during circadian disruption in the animals' active period, but no behavioral alterations were seen when caffeine was administered during the inactive period or during normal circadian cycling. Ms. Rogers completed her research internship and has returned to complete her studies in Ireland. Experiments to determine the mechanism of action are continuing so that a manuscript can be completed.

Dr. Wotring mentored Jette Ritz, MS student at the Karolinska Institut, while she conducted *in silico* research examining spaceflight-associated differences in gene expression in mice. Dr. Willian da Silveira (University of Salford, UK) served as co-mentor on the project, which was presented at the IAC meeting in Milan. Her findings identified a set of genes whose expression pattern in low Earth orbit is different than it is on Earth, and also are important in the metabolic pathway of mission-relevant medications. Ms. Ritz successfully defended her Thesis "*A transcriptomic approach to understand pharmacogenetics of mice exposed to spaceflight conditions*" and has now begun PhD research in the Department of Pharmacology, Vrije Universiteit Brussel.

A project on medication stability in space-like conditions will begin shortly, partially-funded by CNES. This project will trial new methodology that could enable in-flight determination of medication safety and purity, in addition to testing the effects of storage on specific mission-relevant medications.

Funded projects:

Current

ISS National Laboratories Workforce Development Initiative Wotring (co-I) 2025-2026

Space Medical Education project will offer a short course to medical and graduate students in Cleveland, OH, USA, to introduce them to potential careers in space health and medicine. 100K Euro

Centre national d'études spatiales. APR 2023 Wotring (PI) 2024-2025

Stabilité des médicaments exposés à un analogue de rayonnement spatial This project will use Raman spectroscopy for measuring the stability of medications in space analog environments. 48K Euro

Dr. Ramson Nyamukondiwa – Space Engineering

Since September 2024, Dr. Nyamukondiwa focused his research on building prototype space system engineering models for CubeSats and planetary rovers. These prototypes have been successfully integrated into student training, enabling them to design and develop their own systems while gaining a hands-on understanding of space system development, from concept of operations to implementation. The images below illustrate several models developed by ISU students as a direct outcome of his research.

Figure1: Functional Prototype of CubeSats

Figure 2: Functional prototypes of planetary rovers

In addition to his work on space system prototypes, Dr. Nyamukondiwa has contributed to the restoration and operational improvement of the ISU UHF and VHF ground station. This effort enabled reliable satellite tracking and communication activities. His research has since expanded to focus on satellite tracking and operations using Software Defined Radio (SDR). The use of SDR is critical due to its flexibility, reconfigurability, and cost-effectiveness, allowing rapid adaptation to various mission profiles and frequency bands. This novel approach enhances educational opportunities by exposing students to cutting-edge satellite operations technology.

The images below show satellite tracking results and data captured from the METEOR-M2-3 satellite, covering parts of Europe including France, Italy, Spain, Germany, the UK, Ireland, the Netherlands, Luxembourg, and Belgium.

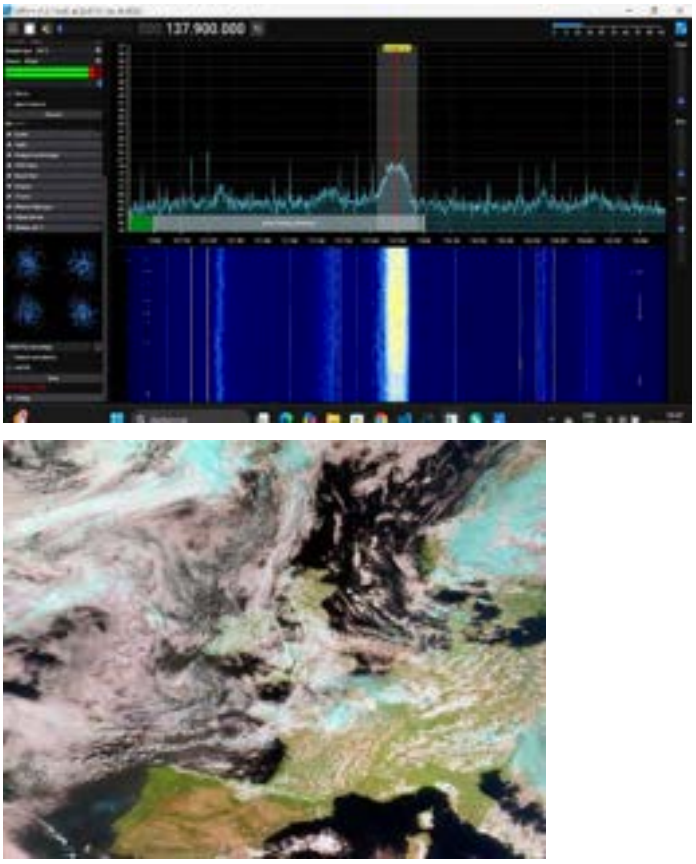


Figure 2: Data acquisition from Meteor satellites with SDR and the output image of some EU countries

A conference paper related to this work was presented at the IAC 2024 in Milan Italy. Looking forward, Dr. Nyamukondiwa intends to continue developing custom PCB boards for CubeSat and rover prototypes, with the goal of consolidating this work into a peer-reviewed publication.

Dr. Jana Fey, Mr. Géraud Gaillard, and Prof. Walter Peeters – Business & Entrepreneurship

ISU remains at the forefront of research on the New Space economy, including the related aspects such as space policy and entrepreneurship. Both have been amplified in the reporting period by activities thanks to the contributions of Dr. J. Fey, a postdoctoral researcher in space policy, and G. Gaillard, as a faculty member with specialization on entrepreneurship.

Similar to previous years, several participants of the ISU programs produced research papers on different New Space applications and policy related items, with the aim to present the findings at conferences and symposia, in particular at IAC. Specific topics to be mentioned

here are the use of VLEO (Very Low Earth Orbits) in view of new markets, the relation between New Space and space development in Africa and New Space in the context of sustainability for exploration programs.

Besides these papers, the program was further refined to stimulate New Space and entrepreneurship with revised workshops, both intended to stimulate research as well as intended to motivate interested ISU participants in proposing start-up activities in incubators.

Peer reviewed papers published, resulting from this research, cover the role of New Space in the evolution of the space economy, stressing the paradigm shift aspects (1) and the evolution of the space policy from governmental objectives towards private goals (2). As part of this evolution, it is generally accepted that small launchers (see e.g. figure A) will play a paramount role in this.

Fig. A : Artist impression of a new small launcher in the New Space economy (in (1) courtesy RFA)

A policy oriented paper (3) was presented by ISU at IAC 2024 and published in the proceedings of the conference, stressing the role of general policy over the last decades and the resulting effect on space endeavors and space programs, flowing over national prestige to commercialization and privatization.

Special attention has been given during the reporting period on research in the field of the sustainability of space exploration. Indeed, previously mentioned papers highlighted the paradigm shift and the fact that, with decreasing public funding, a shift can be predicted towards more private funding, also in space exploration. Whereas this can be applauded from a progress related point of view, a balance is needed between profitability of such private involvement and sustainable development goals. Research on this topic was

stimulated by a grant to ISU and ad interim resulted in a publication (4), as well as in the results of the Team Project on Cosmic Development goals.

The aforementioned publication suggests a number of measures and incremental steps, as shown in fig. B

Fig. B : Proposed policy framework for sustainable space exploration (in (4))

Further publications in this specific field are under preparation or submitted for publication and are under review. This is in particular the case for a paper on new forms of Public-Private-Partnership (PPP) and papers accepted for presentation at IAC2025, amongst others from the ISU researcher Dr. A. Trur.

European Projects

ASTRAIOS Project

ISU has participated in the ASTRAIOS project from August 2024 to September 2025, funded by the European Union. The project aims to map current space-related education across Europe and assess future skills requirements. During the reporting period, ISU contributed to several initiatives. Staff members John Wensveen, Jay Gaillard, Andrew Neuburger, Andres de Almeida, and Aurélie Trur filmed short educational videos as a proof of concept for a Massive Open Online Course (MOOC), showcasing ISU's expertise in space education.

ISU also compiled collected data into a comprehensive report assessing the state of space education in Europe, identifying gaps, skills requirements, and workforce expectations. In addition, a mentoring program was designed to pair participants based on similar profiles in a mentor/mentee format. Each pair participated in three to four one-on-one sessions guided by consortium instructions, with feedback used to evaluate the program's scalability and potential impact on European space education.

Figures:

- First page of ASTRAIOS MOOC report
- Partial survey results on Equality, Diversity, and Inclusion
- Number of registered participants after seven days of open registration

The ASTRAIOS project has strengthened ISU's role in European space education research, workforce development, and innovative educational approaches.

More details available under the section **Global Engagement**.

TERRA Project

The TERRA project, a new ISU consortium initiative, focuses on Earth observation using Copernicus technologies to monitor emergency and climate-change events. During the reporting period, the team initiated marketing and communication efforts to raise project visibility within the space community. Project leadership transitioned from Jay Gaillard to Anwar Sounny-Slitine, an ISU faculty expert in Earth observation.

ISU Start-Up Incubator – Building the Space Economy

Start-Up Progress and Success Stories

The International Space University (ISU) Incubator continues to play a vital role in fostering innovation and entrepreneurship within the space sector. By connecting academic excellence with regional industry clusters and the global New Space economy, it provides a unique environment where visionary ideas can grow into impactful ventures. In 2025, the Incubator reinforced this mission by supporting startups from concept to commercialization through tailored mentoring, strategic guidance, and international collaboration opportunities, empowering them to succeed in an increasingly competitive global ecosystem.

ISU Pre-Incubation Pipeline

As a reminder, the three-month pre-incubation period provides startups with initial reception, project pre-evaluation, and orientation. Participants receive guidance in drafting business plans and pitch decks and are supported with administrative procedures for company formation. Notable pre-incubation projects include:

- **OrbitResQ** – Winner of the CASSINI Hackathon, OrbitResQ is an integrated software and hardware platform designed to enhance disaster response for first responders. Leveraging satellite data, historical disaster records, and AI-driven routing, the platform enables real-time triage, evacuation planning, and hospital capacity monitoring. Tested in a simulated Turkey–Syria earthquake scenario, OrbitResQ significantly improved emergency response speed and efficiency. The team is preparing for full incubation post-MSS internships while engaging with the local ecosystem for further collaboration.

- **K-Air Drone** – Second-place winner at the CASSINI Hackathon, K-Air Drone is developing autonomous VTOL drones for secure medical deliveries of vaccines, blood units, and organs. Through collaboration with Télécom Physique Strasbourg, student teams work on technical requirements, virtual prototypes, and real-time monitoring platforms, laying the groundwork for future funding and the onboarding of a technical cofounder.

- **Gravion Microgravity** – Focused on advanced materials, Gravion Microgravity is developing a self-healing composite system with AI diagnostics and digital twins. This innovation enables structures such as UAVs and space platforms to detect damage, predict failures, and perform autonomous repairs, enhancing structural lifespan and operational readiness.

ISU Incubation Pipeline

Startups progressing to the incubation phase benefit from long-term support of up to three years, including personalized consultations, R&D guidance, and business development support, including fundraising preparation. This phase attracts ventures developing cutting-edge technologies with strong commercial potential.

Highlighted incubation projects in 2025 include:

- **ATMOS Space Cargo** – A European leader in space-return services for life-science experiments, ATMOS provides cost-efficient and reliable transport solutions for sectors such as stem cells, organoids, and protein crystallization. Supported by ESA, the European Innovation Council, and a network of industrial and academic partners, the company is establishing the infrastructure for global space-return capabilities while maintaining strong European roots.

- **MySat Kit** – Offering hands-on access to space science, MySat Kit enables users to assemble satellite-inspired modules equipped with sensors, Wi-Fi, and solar panels. Designed for students, educators, and tech enthusiasts, the kits foster practical learning in electronics, programming, and space exploration, serving as a gateway to STEM careers.

Startup Showcases and Competitions

The ISU Incubator actively engages startups in events and programs that amplify their visibility and accelerate growth:

- **ISU Incubator & Astraios Boot Camp** – A three-day European Space Boot Camp provided intensive workshops, pitch sessions, and networking opportunities for students and early-career professionals. The event enabled startups to showcase their solutions and engage with industry representatives, strengthening the incubator's role as a collaborative innovation hub.

- **CASSINI Hackathon: Space for Healthcare** – Co-organized with Alsace Digitale, this European hackathon connected space technologies with healthcare innovation. OrbitResQ and K-Air Drone emerged as leading projects, both progressing toward incubation and post-hackathon mentorship.

- **ISU Business Plan Competition** – As part of the Master of Space Studies program, this competition allowed interdisciplinary student teams to develop viable business plans for space applications. Notable outcomes include disaster response applications, urban gardening platforms, and environmental tourism tools, reinforcing the pipeline from classroom projects to startups.

- **PIB Health in Space** – Themed events on Health in Space highlighted the synergy between space technologies and healthcare innovation, featuring startup pitches from SpacePharma, Akrivision, and OrbitResQ. These initiatives strengthened regional entrepreneurial ecosystems and promoted high-impact innovation.

- **Booster Camp du Réseau Entreprendre** – In partnership with Réseau Entreprendre Alsace, the Incubator provided personalized mentoring, strategic workshops, and networking opportunities, helping startups refine growth strategies and accelerate market readiness.

The ISU Incubator's 2025 activities reflect a robust ecosystem for startup growth, from pre-incubation to fully supported ventures. By combining hands-on mentorship, competitive events, and international collaborations, the incubator continues to produce impactful startups that advance space technology, healthcare innovation, and sustainable solutions while reinforcing Strasbourg as a dynamic hub for entrepreneurial excellence.

Conferences

The International Space University (ISU) Incubator continued to strengthen its global and regional partnerships throughout 2025, leveraging conferences, events, and collaborative initiatives to expand its network, showcase innovation, and support the growth of space-based startups. Participation in high-profile European and regional activities has allowed the Incubator to position itself as a bridge between academic research, industry expertise, and entrepreneurial development.

ISU Incubator on Stage at the European Parliament

On 13–14 June 2025, Andrés De Almeida, ISU Incubator Manager, represented the Incubator at the European Youth Event (EYE2025) held at the European Parliament in Strasbourg. As a panelist in the session titled *"From Satellites to Startups: Innovation, Security and Defence,"* he engaged with experts from industry, academia, and European institutions to discuss key themes such as Innovative Solutions and Real-World Challenges, and the role of Space for Security and Defence.

The session attracted approximately 120 participants, predominantly young attendees, fostering a dynamic exchange of ideas through questions and discussion. Moderated by a representative from the European Commission, the panel emphasized how Europe's space capabilities can drive innovation, enhance security, and inspire future generations of entrepreneurs. For the ISU Incubator, participation in this event enhanced its visibility, highlighted its role in supporting space-based startups, and reinforced its mission to connect academic expertise, industrial innovation, and societal impact.

COMET MAT : AERIADES, CNES and the ISU Incubator join forces

The COMET MAT, the Space Club AERIADES, and the International Space University in Strasbourg jointly hosted a thematic event on metallic additive manufacturing, focusing on materials processes and life cycle analysis. The in-person seminar took place in Strasbourg Illkirch-Graffenstaden on 30 September and 1 October.

Participation was solid, including remote involvement from CNES Toulouse. In total, 71 people registered, with 48 attendees on 30 September, 41 on 1 October, and 20 no-shows. While logistics were affected by these last-minute absences, exchanges remained productive and well-aligned with sector needs.

The event provided a forum for sharing research projects and industrial activities across the sector. Over the two days, participants explored a wide range of topics, including the optimization and finishing of additive manufacturing processes, strategies for qualifying metallic additive manufactured parts, the recycling and reuse of powders, the environmental assessment of additive manufacturing processes, the modelling and production of architected metallic materials, and the repair of components using metallic additive manufacturing techniques.

The seminar created valuable opportunities for dialogue between experts, researchers, and industry representatives, and helped strengthen the regional ecosystem's engagement with advanced manufacturing solutions for space applications.

Showcasing Innovation at SpaceTech Expo Europe 2025

In November 2025, the ISU Incubator will participate in SpaceTech Expo Europe, one of Europe's premier space technology events. Represented by Andrés De Almeida, the Incubator will showcase its initiatives in space entrepreneurship, while ISU President Dr. John Wensveen will contribute as a keynote speaker and moderator for the session *"Addressing the White Elephant: Trading with the United States and Navigating Export Controls."*

ISU will share booth S27, Hall 6, in partnership with Aériades, the aerospace, space, and defense cluster of the Grand Est region. This collaboration strengthens ISU's visibility within the industrial network and offers a cost-effective presence at the expo. The participation will enable the Incubator to connect with industry leaders, present incubated projects in areas such as health in space and data services, and engage alumni and mentors. Expected outcomes include an expanded startup pipeline, concrete partnership opportunities, and reinforced brand positioning within the European NewSpace ecosystem.

New Partnerships

Strengthening Regional Ecosystems: ESA BIC Nord France Collaboration

In 2025, ISU initiated a strategic transition from ESA BIC Sud France to ESA BIC Nord France to strengthen its regional presence and align with the Grand Est region's innovation dynamics. A formal partnership signed in October 2025 establishes a collaborative framework supporting the emergence and growth of innovative entrepreneurial projects, whether directly incubated by ISU or aligned with ESA BIC Nord France's strategic focus areas.

This partnership positions ISU to foster deeper collaboration with regional stakeholders, expand support to startups, and actively contribute to the Grand Est space innovation ecosystem.

Collaboration with QFC and Alsace Digitale

The ISU Incubator also deepened its integration with the regional innovation landscape through partnerships with QFC (via SEMIA) and Alsace Digitale. QFC has supported over 500 projects since 1999, providing methodological guidance that enhances startup maturity. ISU's engagement alongside QFC strengthens pathways for space technology transfer, facilitates cross-sector application of space data, and supports the development of new entrepreneurial ventures in the region.

Alsace Digitale, a key promoter of digital innovation in Grand Est, has partnered with ISU to co-organize events such as the CASSINI Hackathon: Space for Healthcare and the upcoming Aquathon. These initiatives unite space, digital, and healthcare stakeholders to develop practical solutions using space technologies, fostering regional innovation and entrepreneurship.

From Ideas to Prototypes: Collaboration with Fabéon

Fabéon, a leading regional FabLab and makerspace located at the Strasbourg Innovation Park, provides entrepreneurs and innovators with access to advanced prototyping tools, manufacturing equipment, and a collaborative ecosystem focused on experimentation and technological development. Fabéon's facilities enable the design, testing, and rapid prototyping of technology-driven projects, making it an essential partner for startups developing physical products.

The ISU Incubator has collaborated with Fabéon on multiple initiatives and is now moving toward a more formal partnership. This collaboration allows ISU startups and project leaders to prototype space-related technologies, experiment with hardware solutions, and gain hands-on experience with cutting-edge fabrication techniques. By leveraging Fabéon's resources, the Incubator enhances its support for early-stage product development, fosters practical innovation, and cultivates technical excellence within the regional space and innovation ecosystem.

Incubator Visibility and Expansion

Throughout 2025, the ISU Incubator has strengthened its visibility and expanded its presence both within the regional innovation ecosystem and among the student entrepreneurship community. By actively engaging in events, pitch sessions, and collaborative initiatives, the Incubator has reinforced its role as a key facilitator of space-focused innovation and entrepreneurship.

Fostering Student Entrepreneurship with Pépite ETENA

The ISU Incubator has actively contributed to student entrepreneurship through ongoing collaboration with Pépite ETENA (Université de Strasbourg). Throughout 2025, ISU representatives participated in multiple *IdeaPitch* sessions, where students present a 10-minute pitch followed by a 30-minute discussion with a jury of entrepreneurship experts.

During these sessions, the Incubator's team offers guidance drawn from extensive experience supporting space-related and technology-intensive startups. This interaction allows the Incubator to assess which student projects align with its mission and identify promising teams for potential incubation. By participating in these events, the ISU Incubator has strengthened its outreach to the next generation of innovators, reinforced the connection between academic entrepreneurship and specialized incubation support, and created early-stage pathways for collaboration with student-led initiatives.

Strengthening Regional Presence at 360 Grand Est

The *360 Grand Est* event in Strasbourg, hosted by the Parc d'Innovation d'Illkirch Graffenstaden, provided an important platform to showcase the activities of the ISU Incubator. The event allowed the team to present its space-focused entrepreneurship programs to a broad audience and highlight how the Incubator supports innovative projects in the space sector.

Beyond visibility, the event offered a unique opportunity to reconnect with the Grand Est regional innovation ecosystem. The Incubator engaged alongside partners such as Fabéon, ESBS, and the Parc d'Innovation, while strengthening ties with the City and Eurometropolis of Strasbourg. Participation in 360 Grand Est underscored the strength and dynamism of the regional network, reaffirming the shared ambition to drive innovation and entrepreneurship in the Grand Est region.

Showcasing Startups at Factory by Paddock Academy

In 2025, the ISU Incubator participated in *Factory 2025*, an event organized by partner Paddock Academy at the Halle des Houblons in Haguenau. Positioned in the heart of the Startup Village, the Incubator presented its services and provided a platform for two of its startups—*MySat Kit* and *SpacePharma*—to showcase their innovative solutions.

Both startups engaged with an enthusiastic audience, demonstrating the relevance and appeal of space technologies in the broader innovation ecosystem. The event offered the ISU Incubator an effective venue to highlight its role in advancing space entrepreneurship and

strengthen its connections within the Grand Est regional network. This participation reinforced the Incubator's commitment to promoting the space sector and fostering the growth of local entrepreneurial initiatives.

Expanding Reach and Impact

Through its active participation in student entrepreneurship programs, regional events, and prototyping initiatives, the ISU Incubator has significantly expanded its visibility in 2025. These efforts not only showcase the Incubator's capabilities and successes but also build lasting connections across academic, industrial, and regional innovation networks. By combining outreach, collaboration, and practical support, the Incubator continues to reinforce its mission: fostering innovation, enabling entrepreneurship, and strengthening the space ecosystem at both regional and international levels.

Learning Resources

The ISU Library remains essential to the MSS students and SSP participants. By adapting to online learning and digital resources and Library products, managing resources strategically, supporting research, fostering community engagement, and contributing to sustainability, the Library strengthens ISU's competitiveness and global standing.

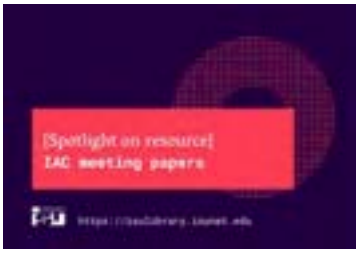



Library website: https://isulibrary.isunet.edu
Library Instagram: https://www.instagram.com/libraryisu/?hl=en
Library LinkedIn: https://www.linkedin.com/company/105482790

Enhancing the student experience and creating and inclusive Library

The Library has continued to play an important role in shaping the ISU student journey by fostering belonging and supporting learning. We delivered both in-person, online orientation sessions and training for the MSS students and SSP participants, and targeted support on research tools, citation management, and advanced search strategies.





In alignment with ISU's mission to prepare students for leadership in addressing global challenges and innovation in the space sector, the Library curated collections on equity, gender, and climate change, as well as on current topics in the space sector. Through physical book displays and online guides, we provided students with accessible entry points into complex debates, encouraging informed discussion and deeper research engagement.

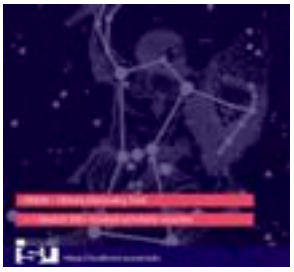

Managing resources, supporting research and innovation

To maintain academic quality and support research, we continued to refine and strengthen our collections and digital infrastructure.
Our unique space collection was kept up-to-date, with new titles. We privileged eBooks and other digital resources to prepare for online courses.
The Library integrated new tools (like AI search) into ORION, our discovery platform, making it easier to access full-text content both on and off campus. We developed several online guides to inform students about AI tools in an academic environment (guidelines for the use of AI tools, how to acknowledge the generative AI and how to cite generative AI).

We began exploring options for alumni access to selected databases, supporting lifelong learning.

The Library supports ISU's and the international research agenda by curating and disseminating knowledge on various topics based on ISU's curricula. We launched a bi-monthly "Focused On" media (which lists books and journal articles on a specific narrow

topic) and “Research spotlight” (a bi-monthly selection of the most recent scholarly journal articles published on a selection of topics).
That knowledge is accessible publicly on the Library website and LinkedIn, where the public can subscribe to the RSS feeds.



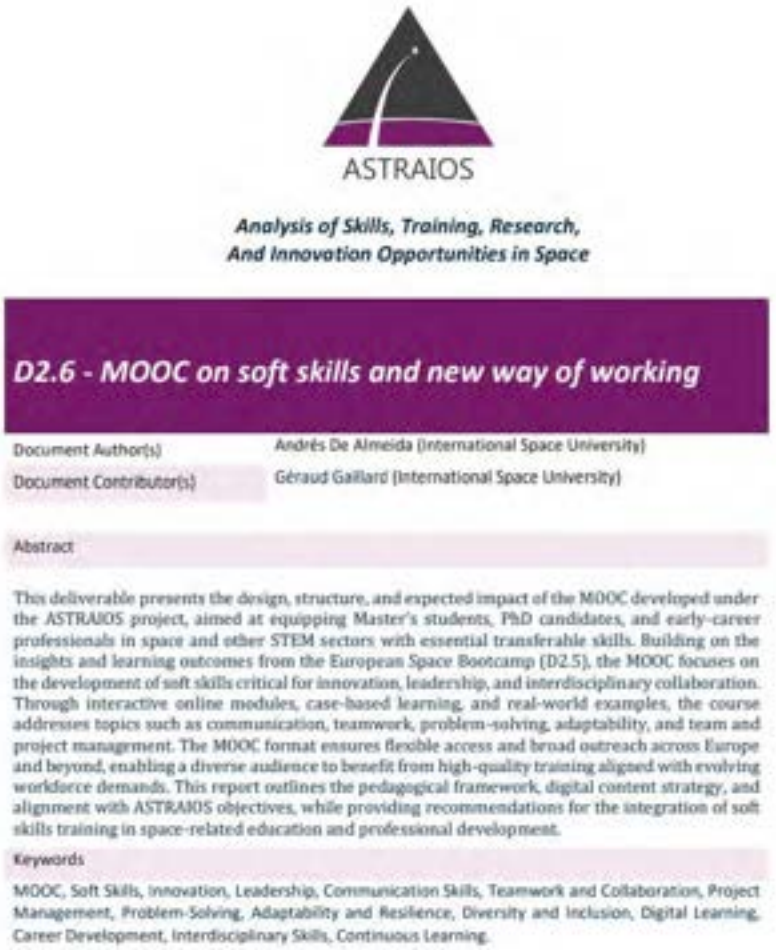
Global Engagement

Astraios Project

From August 2024 to September 2025, ISU has mainly been involved in the grant Astraios, that is funded by the European Union. The purpose of this grant is to conduct a mapping of the existing space related education across Europe, and project future demand and required skills. This project is conducted among a European consortium and is currently in its final stage as it will formally end on December 31st, 2025.

Over the past academic year, ISU has been involved on the following research actions:

- Filming of short education videos as proof of concept for a Massive Open Online Course (MOOC) that mobilized ISU staff (John Wensveen, Jay Gaillard, Andrew Neuburger, Andres de Almeida, and Aurelie Trur) that was broadcasted through the consortium channels.



ASTRAIOS

Analysis of Skills, Training, Research, And Innovation Opportunities in Space

D2.6 - MOOC on soft skills and new way of working

Document Author(s)	Andrés De Almeida (International Space University)
Document Contributor(s)	Géraud Gaillard (International Space University)

Abstract

This deliverable presents the design, structure, and expected impact of the MOOC developed under the ASTRAIOS project, aimed at equipping Master's students, PhD candidates, and early-career professionals in space and other STEM sectors with essential transferable skills. Building on the insights and learning outcomes from the European Space Bootcamp (D2.5), the MOOC focuses on the development of soft skills critical for innovation, leadership, and interdisciplinary collaboration. Through interactive online modules, case-based learning, and real-world examples, the course addresses topics such as communication, teamwork, problem-solving, adaptability, and team and project management. The MOOC format ensures flexible access and broad outreach across Europe and beyond, enabling a diverse audience to benefit from high-quality training aligned with evolving workforce demands. This report outlines the pedagogical framework, digital content strategy, and alignment with ASTRAIOS objectives, while providing recommendations for the integration of soft skills training in space-related education and professional development.

Keywords

MOOC, Soft Skills, Innovation, Leadership, Communication Skills, Teamwork and Collaboration, Project Management, Problem-Solving, Adaptability and Resilience, Diversity and Inclusion, Digital Learning, Career Development, Interdisciplinary Skills, Continuous Learning.

Fig A. First page of Astraios report on produced MOOCs.

- Completion and consolidation of data collection into a situation report describing the current state of the situation in space education in Europe, identifying the gaps, skills needed and expectation of the current work force.

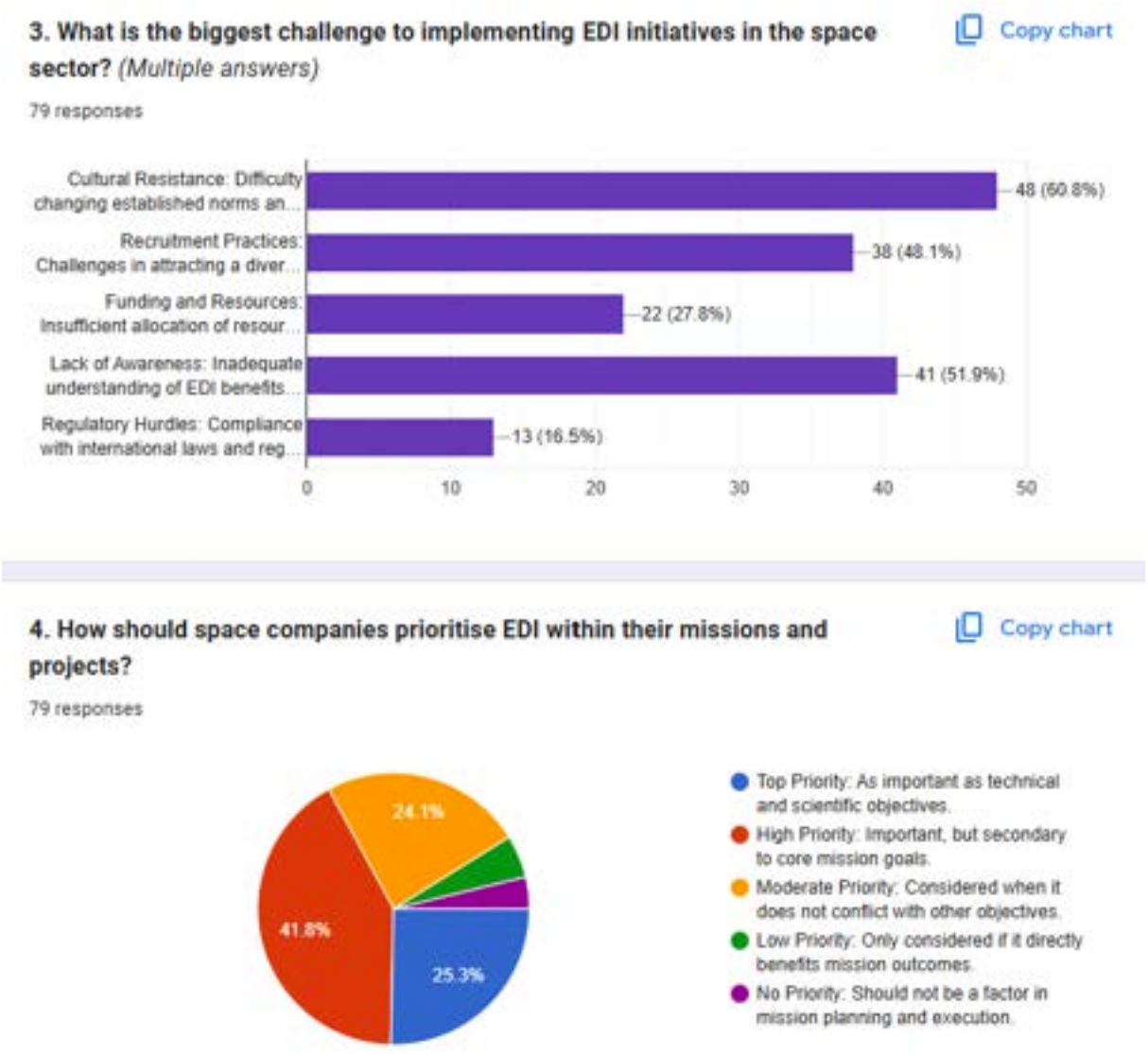


Fig B. Partial survey results on Equality, Diversity and Inclusion.

- Design of a mentoring program intended to pair people with similar profiles based on a mentor/mentee approach, willing to engage into three to four one-on-one mentoring sessions following guidelines determined by the consortium. The final objective is for the pairs of mentor/mentee to provide their feedback about what they have learned during these one-on-one sessions to determine if this can be replicated at a larger scale and contribute to Astraios project objectives, i.e. fulfilling educational needs of the European spce sector.

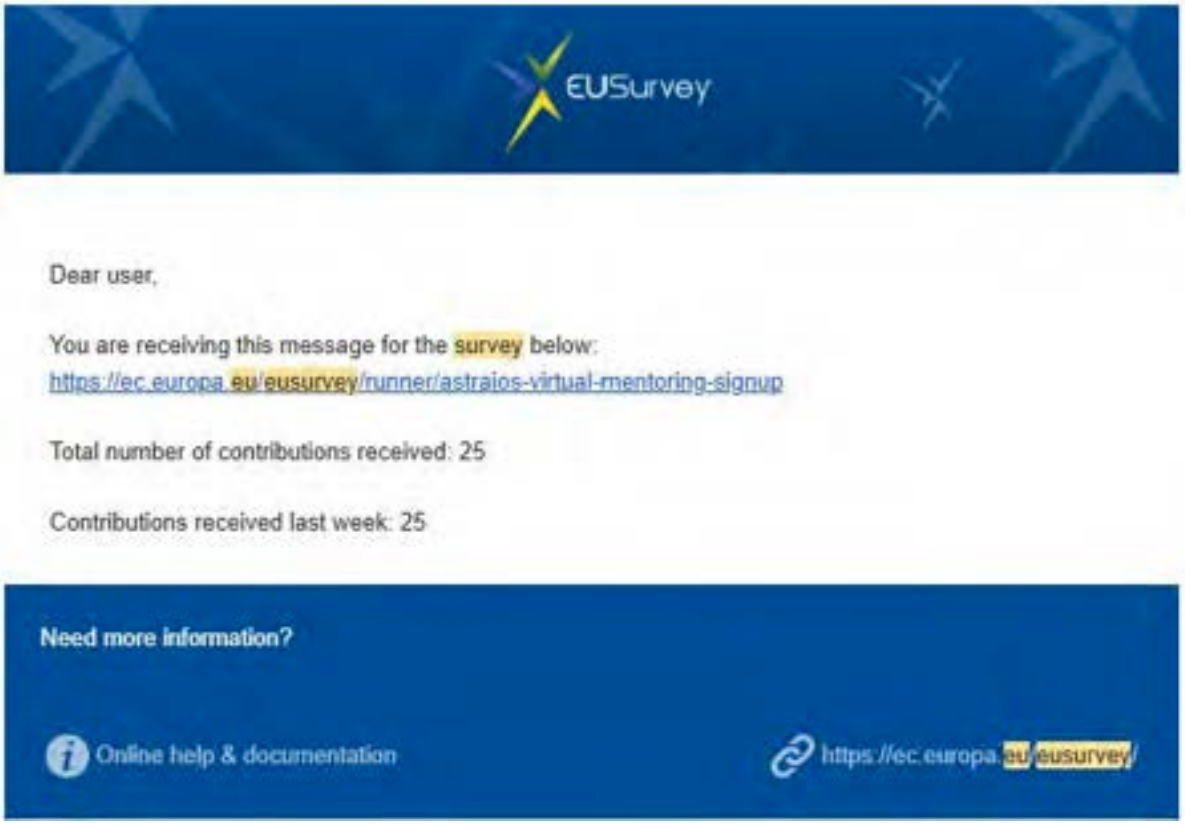


Fig C. Number of registered participants after 7 open registration days.

John Templeton Foundation Grant – Impact and Insights

Duration: September 2023 to June 2026

In the John Templeton Foundation-funded project entitled “Cooperation of the Future of Space Exploration” ISU, with partner George Washington University (GWU, Washington, D.C.), continued research, publication, as well as organization of workshops and outreach events.

The project addresses three topics:

1. What is the impact of space policy on international relations?
2. Which type of governance will be applied to future exploration?
3. How can we encourage the stronger support of society for future space exploration missions?

In order to facilitate this research and under the funding of the grant, the second postdoctoral researcher, Dr. Aurélie Trur (SSP 2005, MSM 2006) was hired in the reporting period to cover topic 3 and will continue until the end of the project in June 2026.

Organization of the first workshop at GWU 3-5 December 2024

The event was organized by the first doctoral researcher, Dr. Jana Fey, and gathered a multi-disciplinary group of experts in the space field. During the “International Cooperation in Deep Space” workshop there were keynotes, plenaries, and panels as well as breakout sessions and discussions. The workshop facilitated interdisciplinary conversations regarding cooperation and highlighted interesting insights for the first grant research question on space policy, including geopolitical issues in deep space human missions, the role of emerging space countries, legal frameworks, and ethical considerations regarding exploration and long-term settlements.

Figure 2: Expert Workshop 1 Templeton Team ISU/GWU

In accordance with the ethical aims of the Foundation, an Ethical Advisory Committee (EAC) has been providing advice and feedback on the grant's research activities, discussions and reports. The report of the workshop held in December 2024 is available from the ISU Library website: https://isulibrary.isunet.edu/doc_num.php?explnum_id=2325

Figure SEQ Figure * ARABIC 3: Expert Workshop 1 Report

The ISU Templeton team and GWU collaborators attended the International Astronautical Congress in Milan in October of 2024, the largest annual gathering of the space community. The paper below was presented by Dr Fey :

- Fey, J., W. Peeters, N. Peter. "A New Scramble for the Moon? The Geo(politics) of International Cooperation in Space Exploration" Paper IAC-24- E3.2.1.x87650, presented at the 75th International Astronautical Congress (IAC), Milan, Italy, 14-18 October 2024, Paris: International Astronautical Federation (IAF).

Dr. Wotring and Dr. Fey promoted conducted some outreach activities to the general public at Germany's largest science fiction convention in May.

Figure 4: Comic Fair Stand

Project Masters 2025: TP Cosmic Development Goals (CDG)

Figure 5: Final Presentation

The ISU 2025 Master class completed their grant dedicated Team Project: (TP) “Space governance and the applicability of the Sustainable Development Goals to space policy” supervised by Dr. Wotring and Dr. Fey, after delivering an interim review in February 2025 and a final presentation in June 2025.
The final presentation of the project can be accessed via the following link: https://www.youtube.com/watch?v=j7v6Ks7zysQ.

Their TP is available at the ISU library:
https://isulibrary.isunet.edu/doc_num.php?explnum_id=2343

As part of the data collection and research work, Dr. Trur validated and attended several trainings covering ethics in space exploration, including a workshop at John Hopkins University’s Center for International Studies (JHU-SAIS) and is preparing a survey for astronauts’ inputs.

Annex 1: Faculty List

Click on the link below for a complete list of our esteemed faculty members: Central Campus Faculty Member, Faculty, Adjunct Faculty, and Associate Faculty. Discover the diverse expertise that fuels the success of our institution: Link to ISU Faculty list [1].

[1] https://www.isunet.edu/faculty/

Annex 2: Research

Publications

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Wotring, V., Cadiou, H.: *Effects of a sleep aid medication on flatworm behavior in space flight analogs*, Paper presented at IAC24, Paper ID 90245

MUJUNI, Edgar; MENGU, Cho; NYAMUKONDIWA, Ramson. *Ground Station Network Architecture for Scheduled Remote Operations of Birds Bus CubeSats in Partner Countries.* Paper presented at **IAC 2024**, Paper ID 81847.

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Submitted:

Journal: The American Journal of Cardiology
Title: Anticoagulants for the Prevention and Treatment of Venous Thromboembolism in Humans Exposed to Microgravity: A Systematic Review
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Journal: Reproductive BioMedicine Online
Title: Reproductive Biomedicine in Space: Implications for Gametogenesis, Fertility, and Ethical Considerations in the Era of Commercial Spaceflight
Giles Anthony Palmer, Begum Aydogan Mathyk, PhD; Jeffrey A Jones, MD; Blair Taylor Stocks, PhD; Paul Root Wolpe, PhD; Virginia Wotring, PhD; Christopher E Mason, PhD; Jacques Cohen, PhD; Fathi Karouia, PhD

Journal: npj Microgravity
Title: Integrative focus on the space exposome-integrome: physiological challenges

and practical limits of countermeasures beyond low Earth orbit
Damian M. Bailey, Dieter Blottner, Hanns-Christian Gunga, Stefan Schneider, Virginia Wotring, Sarah Baatout, Marco Durante, Rik H. G. Olde Engberink, Nandu Goswami, Martina Heer, Anna-Maria Liphardt, Monica Monici, Francesco Pagnini, Claudia Stern, Jan-Bernd Stukenborg , Tobias Weber, Laurence Vico, Olivier White, Angelique van Ombergen and Alexander Choukér *

Proposal submitted in response to ISS National Lab Research Announcement (NLRA) 2025-6: “Leveraging the ISS National Lab for STEM Education and Workforce Development” – an extension of **Space Medical Education** (above) requested by the funder. The funding program was eliminated before proposal reviews began.

To the HORIZON Marie Slodowska Curie Doctoral Network opportunity: "**SPACE-NAM: next generation life sciences in space research using new approach methodologies**" with a large team of European space life science investigators.