

## European Space University for Earth and Humanity

*UNIVERSEH is an alliance of five European universities established to develop a new way of collaboration in the field of Space, within the "European Universities" initiative.*

*The alliance aims to create new higher education interactive experiences for the university community, teachers and students, and for the benefit of society as a whole. Such initiatives will enable broadminded, informed and conscientious European citizens to capture and create new knowledge and become smart actors of European innovation, valorisation and societal dissemination within the Space sector, from science, engineering, liberal arts to culture.*

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### D5.10: Report on networking and mentoring programs

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## Introduction

The beginning of UNIVERSEH during the pandemic, clearly impaired all presential interactions at all levels between members of the alliance, and has prevented the holding of meetings, events, and even the establishment of close relationships between the different actors of the partner institutions. Most proposed actions that were considered as adequate before the pandemic now appeared as over-ambitious. Still, several actions and events were organized to support staff and students within Work Package 5. This is documented below as:

- Workshops and related activities
- Practical experience in research and innovation
- Support to students' projects
- Mentoring program development

## Workshops and related activities

**New Space Venture Talks**, a series of in-person events in Luxembourg aimed at gathering professionals interested in discovering the current developments of the commercial space sector and exchanging on the related opportunities. The first event took place on April 29th, 2022. The event was a meeting point for professionals and students in Finance, Legal, Business, Engineering, Arts & Humanities, Healthcare, with an interest in commercial space ventures in terms of technological research, business investigations, and networking opportunities.

The event core topics were dedicated to: Space research in Luxembourg & Europe, Space mission design, Education, Entrepreneurial talents, and New Space. Experts, professionals, and students had the opportunity to meet at the Spuerkeess Bank premises, 19 Avenue de la Liberté, Luxembourg, to learn and exchange knowledge by listening to the following speakers:

- Since 1989, **Massimo Bandecchi** worked at the European Space Research and Technology Centre (ESTEC) in the Netherlands, covering different Systems Engineering roles and responsibilities. He is the founding father, was first team leader and manager of the ESA Concurrent Design Facility (CDF) which has been applied for the feasibility assessment and preliminary design of hundreds of potential future space

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missions. Massimo is author of several publications about Concurrent Engineering and has promoted its utilization across several industrial sectors and in Academia.

- **Loveneesh Rana** received his Ph.D. degree in Aerospace Engineering from the University of Texas, Arlington (UTA) in 2017. He has over seven years of experience in the advanced research facility, the Aerospace Vehicle Design (AVD) Lab at UTA, where he worked on developing state-of-the-art design synthesis solutions. At SnT, he is the Head of the CDF Lab and part of the SPASYS research group.
- **Eric Tschirhart** is full professor of physiology at the University of Luxembourg, special advisor to the rector, and coordinator of UNIVERSEH European University in Luxembourg.
- **Stephane Pallage** is the former Rector of the University of Luxembourg and gave a presentation on how to educate for space.

Our SpaceHack students, and Winning Team of the Space Technology Business Hackathon 2021, explained what it is like to Design a New Space Venture as a student.

The event was presented and moderated by Mr. Olivier Zephir, Business Advisor at Technoport Business Incubator. The video is available [here](#).

**Visit of an astronaut:** WP5 also organized a visit of Romanian cosmonaut Dumitru-Dorin Prunariu for an inspirational talk and round table for students in Luxembourg on Friday 13 May 2022. Prunariu is the former president of the Romanian Space Agency, former president of the Association of Space Explorers, former chairman of the UN Committee on the Peaceful Uses of Outer Space, and former vice-chair of the UN working group on the Space 2030 Agenda. He currently is the vice-president of the Asteroid Foundation and the chair of the Global Expert Group on Sustainable Lunar Activities (GEGSLA) within the Moon Village Association. Prunariu gave a presentation on his experience and on the future space programmes focused on the Moon, and participants had the opportunity to interact directly with the cosmonaut. This event helped to deepen insight into space-based activities and human spaceflight. The video is accessible [here](#).

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### **Cassini Hackaton**

AGH representatives of UNIVERSEH WP5 were members a jury in Cassini Hackaton, organized in Poland as a part of European Activity by Krakow Technology Park on 12-14 May 2022.

### **Series of seminars for AGHUST community under UNIVERSEH labelling**

Invited speakers were:

- Ahmed Saib Salih Zakaria (PhD student of Space Technology Center at AGH UST).
- Dr Roger Birkeland (Department of Electronic Systems of Faculty of Information Technology and Electrical Engineering, Norwegian University of Science and Technology).
- Artur Chmielewski (NASA) and Grzegorz Zwolinski (founder of SatRevolution Ltd.).
- Dr Michele Armano (European Space Research and Technology Centre (ESTEC), Noordwijk, The Netherlands).

### **Practical experience in research and innovation**

When operations of all in-person events were cancelled in year one, we tried (with limited success) to revive physical happenings through flagship events considering “Networking and mentoring programs”, such as Startech, developed in Toulouse, from an original idea of [WSL](#) in Belgium. The last edition took place in [Space Campus](#), Luleå University of Technology, Kiruna in October 2022. The full report is attached.

### **Support to students' projects**

The following initiatives could not take place or were updated:

- The PEPITE programme: it was not activated in Toulouse.

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- The “Wissensregion Düsseldorf, Science meets industry event “come & cooperate”; there was a leadership change, as well as other personnel change, and Wissensregion Düsseldorf indicated that it did not have the capacity, nor the resources, to hold this event anymore.
- The ActInSpace event, not operated in Toulouse, was replaced by UNIVERSEH-developed “[SpaceHack](#)” in collaboration with [Technoport SA](#) in Luxembourg.

### Students' Conference on Diversity & Inclusion Pre-event

On 21st April 2022, the pre-event for the Students' Conference on Diversity & Inclusion (see WP6 report) in Space Sector was co-organized by UNIVERSEH WP5. During this meeting, 40 participants from over 9 countries around the world, including UNIVERSEH consortium students, participated to several short lectures on diversity in competences and the cultural background among team members working in the Space Tech industry. The students were then randomly divided into teams to create their own posters reflecting their common but diverse interests in the space industry. The creation of the posters was supervised by mentors, who ensured the activity of participants and correct understanding of the content of the meeting. As a part of the event, a series of seven posters were created in Jamboard. The posters were presented within the social media of the conference. After the pre-event, a support group for participants was created on Facebook, where peer mentoring was continued, related to the participation of students in the following international conference in Krakow: [Students' Conference on Diversity and Inclusion in the Space Sector](#).

### Pedagogical development of a mentoring program for UNIVERSEH

At the application stage, the development of a mentoring program was proposed as a catalyst for helping students to acquire the knowledge of a professional environment, and to sensitize potential mentors to UNIVERSEH's unique scheme of European education. Acting as a colleague, an external teacher, and a guide to the real world, mentors can encourage and advise students by sharing their own experiences and knowledge of their profession. We also

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believe that a mentoring programme may help students identify their career path and thus maximize their employability.

From a general point of view, mentoring is a special partnership between two people based on a commitment to the mentoring process, common goals and expectations of the partnership, and reciprocated trust and respect. Mentoring is a “get & give” experience with the ambition of providing a rich and rewarding experience for both partners in a special context which is Space and New Space. When developing the programme, we believed that the following requirements are key for success.

#### *Mentee roles and responsibilities*

The development of a mentee depends on exploring career aspirations, strengths, and weaknesses; collaborating to reach a shared objective; implementing strategies; and evaluating along the endeavour. The mentor provides the guidance for the mentee to follow. We identified a few roles and responsibilities to help the mentee during the mentoring period:

- Assume responsibility for acquiring or improving skills and knowledge.
- Discuss the development.
- Plan with the mentor.
- Be open and honest on goals, expectations, challenges, and concerns if any.
- Actively listen and question.
- Participate to build a supportive and trusting environment.
- Seek advice, opinion, feedback, and direction from the mentor.
- Be open to constructive criticism and feedback, and promptly ask for it if needed.
- Consider the mentor's time and resources.
- Give feedback to the mentor on what is working, or not, with the mentoring relationship.

#### *Mentor roles and responsibilities*

The mentor provides the guidance for the mentee to follow. Sharing the wisdom and past experiences is what a mentee looks for. A few roles and responsibilities have been delineated to help with the process:

- Support the mentee's development of professional and interpersonal competencies through strategic questioning, goal setting, and planning.

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- Create a supportive and trusting environment.
- Stay accessible and engaged, actively listen and question during the program.
- Give feedback to the mentee on their goals, situations, plans, and ideas.
- Encourage the mentee by giving their genuine and positive reinforcement.
- Provide honest and kind corrective feedback.
- Share “lessons learned” from your own experience.
- Consider the mentee’s time and resources.

### Implementation of the mentoring program: “TOP5 UNIVERSEH”

The learning Management system [UNIVERSEH Moodle](#) is a key element in factualizing the mentoring program. Moodle is operational since September 2022, and it gradually integrates the different modules from UNIVERSEH’s teaching and learning components.

A mock-up program was developed in UNIVERSEH Moodle, as follows.

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#### *Introduction*

The mentoring program TOP5 UNIVERSEH, designed for the best students of the UNIVERSEH consortium universities, is planned to start on the academic year 202X/202X. This cyclical program is being organized by the European University UNIVERSEH alliance who will be represented by their best ‘TOP’ students. The aim of the program is to connect the most enterprising UNIVERSEH students with acknowledged entrepreneurs who have achieved success in the Space Tech Industry on the international arena. The program aims to prepare a handful of individuals (2-3 students per university), with one-to-one mentor-mentee meetings, and a several-day visit of the student to the mentor's country and company. Mentor-mentee pairs will be matched based on mentee’s application and description of cooperation opportunities prepared by mentors.

Two direct effects of the pilot program are foreseen:

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- providing the best European students in the Space Tech Industry with the possibility of self-development through intensive consulting on issues related to their individual career path.
- enabling the development of leading European companies with the Space Tech profile through cooperation with the best European students.

### *Content*

Mentorship programs provide an opportunity to democratise knowledge exchange between mentos and mentees. Through this process, participants can reach a deeper cognitive level of knowledge and understanding. Within this context, mentors provide their knowledge, expertise, and perspective to guide to mentees in areas where they wish to develop personally and professionally. Because of this, mentorship plans are goal driven and do not focus on grades or evaluations.

During the opening workshop, which will take place in Paris/Luxembourg [Month WW-XX], mentor-mentee groups and pairs create individual mentoring plans for the program based on the mentee's needs and goals. Mentors and mentees will work together on establishing skills and competences required to succeed in the program.

At the end of the program, a joint meeting summarizing the program will be held at the University of Luxembourg tentatively from April 14 to 16, 2023. Mentees and mentors will have the opportunity to present the results of their cooperation and share their experiences with other program participants. Further to this, the meeting will be ideally concomitant to UNIVERSEH SpaceHack.

### *Mentors*

Mentors are mainly recruited from board members or management of UNIVERSEH stakeholder companies; however, recruitment is open to all UNIVERSEH-aligned partners. The requirements to participate in the program as a mentor are: (i) running or being involved in an international company related to the Space Tech Industry, (ii) having previous experience as a mentor or holding a mentor certificate, (iii) a willingness and possibility to welcome the mentee - presenting the outline of the individual program's opportunities.

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### Mentees

The number of places available is determined based on the number of mentors available. Candidates (Master and PhD students) must apply by submitting a 3-minute video through the Incubators and Entrepreneurship Centres of their UNIVERSEH consortium universities. The video should capture, in an interesting and comprehensive way, the student's motivation and achievements in the Space Tech Industry, and touch on issues regarding the development path that the mentee candidate would like to develop as part of the program. Candidates recommended by Incubators will form a mentee group.

### Diversity and Inclusion

A particular emphasis will be placed on the participation of women in the program, both on the side of mentors and mentee (in this respect, the program will be supported by cooperation with the WP6 team).

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Annex: T5.10: UNIVERSEH Startech 22 Report

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Version: final

### Dissemination level

<b>PU</b>	Public	X
<b>CO</b>	Confidential, only for members of the consortium	

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Version	Date	Author	Partner	Summary of main changes
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## D5.10: UNIVERSEH Startech 22

### Report



## Table of contents

Objective of the UNIVERSEH Startech .....	3
Approach .....	3
Startech 22 .....	3
Communication .....	4
Application .....	4
Selection criteria .....	4
Participation and ECTS .....	4
Organisation and implementation .....	5
Organisers and presenters .....	5
Students .....	5
Logistics .....	6
Schedule .....	6
Content and results .....	8
Introduction .....	8
Teambuilding .....	8
Business model canvas and business models .....	9
Meeting with experts .....	9
Space Innovation Forum .....	10
Final pitch .....	11
Extracurricular activities .....	12
Evaluation of Startech 22 .....	12
Feedback from participants .....	12
Startech 22 Highlights video .....	15
Comparison with the feedback from Startech 21 .....	15
Evaluation of Startech 22 from the Mobility tool .....	16
Summary .....	17
Recommendation .....	<b>Fel! Bokmärket är inte definierat.</b>

## Objective of the UNIVERSEH Startech

Startech aims at coaching students towards the spirit of innovation. 20-25 selected students from all UNIVERSEH partners will be mixed to create five multidisciplinary teams with broad knowledge and competence. All teams will select an idea that uses Earth observation data (e.g. a new application to help to monitor the gas pollution in the seas).

The Startech program is designed as an intensive one-week experience; students should develop their idea into a marketable prototype/product/project. During the week, teams go through lectures, interact with business coaches and experts to build a set of crucial skills when creating new projects, new research directions or a new company. Lectures include creativity, business models, canvas, lean start-up, IP, pitching, etc. Throughout the process, students are accompanied by teachers and by several experts. At the end of the training, the students pitch their project in front of a jury.

The Startech program has been launched in Belgium in 2012, with the original idea to inspire and support students from engineering schools to test and grow their entrepreneurial skills. Josiane Mothe coordinator of the European project FabSpace 2.0, successfully transferred the Startech program for Earth Observation data-driven applications in 2019 and then adapted it for UNIVERSEH.

The first UNIVERSEH Startech event was performed in Toulouse, France October 4-8, 2021 with 20 students from the consortium, the second iteration was performed in Kiruna, Sweden October 10-14 2022.

## Approach

The Startech module aims at coaching students towards the spirit of innovation. Students are put in a leadership position where they have to act as a project manager to make their ideas a marketable prototype/product/project. All through the training, they develop a set of skills that are crucial when developing new projects, new research directions or a new company.

The students define projects and form groups that will last through the programme. Sessions with business coaches together with online lectures, business development workshops, or/and on-the-field assignments are provided, so students can expand their idea to reach a marketable prototype/project.

In groups, students choose an idea (e.g. a new application that uses Earth observation data to help monitoring the gas pollution in the seas). The students receive lectures on the different steps: creativity, business models, canvas, lean start up, IP, presentation, etc. There are 9 coaching sessions in total. The sessions are collective (peer-learning) and face-to-face in Kiruna and allow the exchange of experiences between the groups of students and the coaches. Sessions on specific concepts and important phases of the idea/product/project development are provided with the use of both videos and presentations. Throughout the process, students are accompanied by teachers and several experts. At the end of the training, the students pitch their project in front of a jury.

## Startech 22

The second UNIVERSEH Startech event was performed at Luleå University Space Campus in Kiruna Sweden. The event was run in parallel with the *Space Innovation Forum* (<https://www.ritspace.se/event/space-innovation-forum-4/>), which gave the Startech participants the possibility to interact with company representatives and researchers from the space sector.

Accommodation was provided in shared double rooms (shared with another student from home university) at Malmfältens Folkhögskola (<https://malmfaltensfolkhogskola.se>), which was booked by LTU and invoiced to the UNIVERSEH partner universities.

## Communication

The event was announced on the UNIVERSEH homepage, UNIVERSEH Moodle, LinkedIn, Facebook, and also at each university through the web, LinkedIn etc. Some examples below



Figure 1 Some of the examples of announcement of the Startech 22 program.  
From the left LUT webpage, UNIVERSEH web, Facebook post at LUT, Poster from HHU.

## Application

The event is open for all students at the UNIVERSEH partner universities (BSc, MSc and PhD programs). Applicants send in their application to a local contact person responsible for the selection of participants. About five students from each partner university will be invited to the Startech event.

Applicants for UNIVERSEH Startech send in:

- **Short CV** (1 p.)
- **Personal letter** (1 p.) How the Startech program is related to the candidate's main area of expertise, the topics the candidate is mostly interested in through this program and previous experience of similar programs.
- **Application video** (2 min.) Presentation of the candidate, competencies that could be valuable for developing earth observation data application, explanation how the program helps address the candidate's needs and achieve his or her goals.

## Selection criteria

Successful applicants will:

- be students from one of the partner universities
- bring relevant competencies and experiences to the team
- show capacity for openness and curiosity contributing to the training program
- be able to put the training program in perspective with their future career

The following criteria will be evaluated by the selection committee:

- Applicant's profile (30%)
- Competence and experience (40%)
- Motivation (30%)

## Participation and ECTS

There is no fee to participate in the UNIVERSEH Startech program and the program includes travel, lodging. Breakfast is included in the lodging, lunches and dinners are at participants' own expense. Two dinners will be free during the week.

A certificate of attendance will be provided, stating the total number of hours in case participants wish to transfer them into ECTS (up to the receiving university and program to acknowledge this).

## Organisation and implementation

### Organisers and presenters

The event was facilitated by 14 persons, organisers and presenters. The main organiser of the event Startech 22 in Kiruna was Peter Törlind, Associate Professor in Product Innovation (LTU), who also played a role of the lecturer and workshop facilitator during the event. Peter Törlind was assisted by Nina Lazarczyk-Bilal, PhD (LTU) and Justyna Topolska, PhD (AGH).

The introductory lecture about the space industry was given by René Laufer, Professor in Space Technology Systems (LTU), who also shared his knowledge with Startech participants as one of the experts. Other experts interviewed by the participants were Anna Öhrwall-Rönnbäck, Professor in Product Innovation (LTU), Bernd Weiss, PhD student, Product (LTU) and participant of Startech 21 as well as Didunoluwa Obilanade, PhD student (LTU).

The jury evaluating the Startech participants at the final pitching event was composed of four members, *i.e.* Joakim Norman (LTU Business), Johanna Johanna Bergström-Roos (RIT Space and LTU Business), René Laufer, and Peter Törlind.

The Startech 22 event was combined with the Space Innovation Forum where the participants had the opportunity to listen to such speakers as Luca del Monte, Head of Commercialization Department from the European Space Agency (ESA), Tomas Jonsson, Cassini team leader, Director General of the Defence Industry and Space (DEFIS, EU), Anna Rathsmann, General Director of the Swedish National Space Agency, and Ella Carlsson from Sweden's Defence Programme for Space.

Table 1 Organisers and presenters.

Peter Törlind	Associate Professor Product Innovation, LTU
Nina Lazarczyk-Bilal	PhD, Senior Research Engineer, Product Innovation, LTU
Justyna Topolska	PhD, Research and Teaching Assistant, Innovation Broker, AGH
René Laufer	Professor Space Technology Systems, LTU
Anna Öhrwall-Rönnbäck	Professor Product Innovation
Bernd Weiss	PhD student, Product Innovation, LTU (Startech 21 participant)
Didunoluwa Obilanade	PhD student, Product Innovation, LTU
Joakim Norman	Innovation manager, LTU Business
Olle Persson	Manager Space Excellence centre, LTU
Johanna Bergström-Roos	Manager RIT Space, LTU Business
Luca Del Monte	Head of Commercialization Department, ESA
Tomas Jonsson	Cassini team leader, Director General DEFIS, EU
Anna Rathsmann	General Director, Swedish National Space Agency
Ella Carlsson	Sweden's defence programme for space

### Students

Due to COVID-19 pandemic and other circumstances three students were not able to attend, and in the end 17 students attended the event (2 PhD, 7 M1, 7 M2 and 1 other).



*Table 2 Overview of students*

University of Toulouse	5 students
HHU	4 students
UNI-LU	3 students
AGH	3 students
LTU	2 students

Out of the 17 students 5 were female (29%), among the organisers and presenters 46% were female. Last year LTU had the highest number of students, this year unfortunately two students contracted COVID-19 just before the event and could not participate. Also, one student from AGH could not participate due to personal reasons.

## Logistics

Students were accommodated in double rooms (shared with another Startech participant) at Malmfältens Folkhögskola from Sunday to Saturday Oct 9-15. Travel was arranged by each home university. LTUs travel agency sent an invoice to each university after the event for the student accommodation.

## Schedule

An on-line kick-off was performed two weeks before the event with practical information about the event.

All students arrived one day before the event (Sunday Oct 9:th).

Most of the event activities took place at the Space Campus in Kiruna. Since part of the event was organised in collaboration with the Space Innovation Forum two days were held in a conference centre in Kiruna. The event started with teambuilding exercises and ended with the reflection and feedback session. Each day of the Startech event was carefully planned and the series of lectures and workshops were built upon the framework of the Business Model Canvas. The learning process was designed according to the philosophy of learning by doing, which means that participants gained new knowledge hands on experience.



Table 3 Startech 22 programme.

	10-Oct	11-Oct	12-Oct	13-Oct	14-Oct
	Monday	Tuesday	Wednesday	Thursday	Friday
08:00				Transport Space Innovation Forum	
08:30					
09:00	Transport to Space Campus	Transport to Space Campus	Transport to Space Campus	The commercialization of ESA Luca Del Monte, Head of Commercialization Department, ESA	Transport to Space Campus
09:30	Introduction Rules of the game	Customer - Peter	Identifying uncertainties	EU Cassini Space entrepreneurship initiative, Tomas Jonsson, Cassini team leader, Director General DERIS, EU	Preparation for Pitch
10:00	Entrepreneurship in space Prof. René Laufer	Presenting mission statement		Sweden's defence programme for space Dr/LtCol Ella Carlsson, Swedish Air Force	
10:30	Fika	Fika	Fika	Coffe and networking	Fika
11:00	Presentation Personal pitch	GIRON Demonstration	Interviews and meetings with experts	Transport to Space Campus	Pitching before jury
11:30		Preparing interviews		Cost and revenue structure	
12:00	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
12:30					
13:00	Teambuilding	Business models case study	Business models	Create elevator pitch	Reflection videos
13:30				Presentation Individual elevator pitch	
14:00	WHY? Focusing on the problem and need		Work on MS, Value Proposition and MVP	Pitching	The next step
14:30					
15:00	Fika	Fika	Fika	Fika	Fika
15:30	Value proposition	Minimum viable product and Prototyping	Status presentation MVP	Pitch preparation	Discussion, Conclusions & Evaluation
15:45				Women in space network presentation	
16:00	Market and customer segments	Status presentation Improv	Transport Space Innovation Forum	Transport Hostel	
16:30	Transport Hostel	Transport Hostel			
16:45					
17:00	Teamwork	Teamwork	Sweden in space Anna Rathsmann, GD, Swedish National Space Agency	Guided tour Space Campus	
17:30			Exhibition showcase and networking	Transport Hostel	
18:00	Teamwork				
18:30					
19:00					
19:30					
20:00	Dinner Space Innovation Forum				

LEGEND				
Lecture	External presentations	Presentation	Space Innovation forum	Teamwork

## Content and results

During the week materials from the presentations and workshops was uploaded to the Moodle portal for the course (<https://edu.universeh.eu>).

### Introduction

Introduction to the Startech 22 was given by Peter Törlind who discussed the rules of the games, which are based on the mutual agreement between the participants and the organisers. Participants commit to be fully involved in all the organised activities.

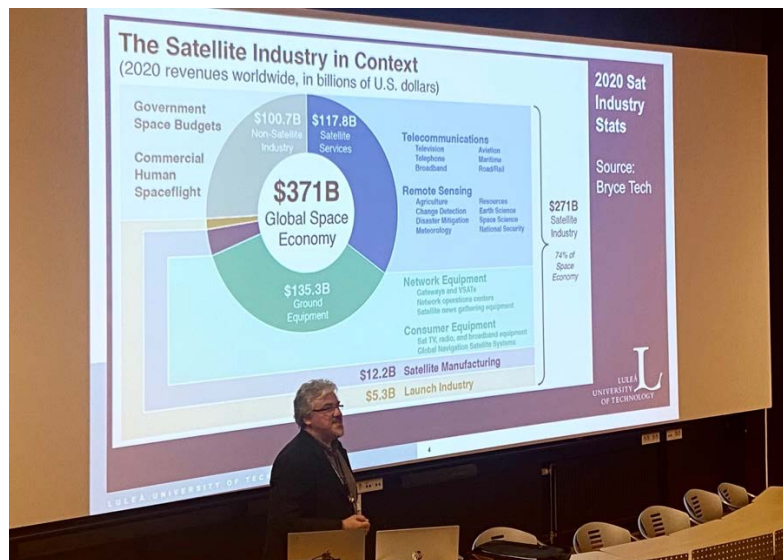


Figure 2 Professor René Laufer presents *Entrepreneurship in space*.

Since the main idea of Startech 22 was to guide students how to develop a business idea with the use of Earth observation data, one of the first lectures was dedicated to the topic of *Entrepreneurship in space* delivered by prof. René Laufer.

As students came from different countries and universities, they all made a personal pitch to introduce themselves to get to know each other a little bit better at the kick-off of the event.

### Teambuilding

Students were divided by the organisers into four international multidisciplinary teams with the aim to create as much heterogeneity as possible (culture, background, specialisation, gender).

Table 4 Overview over the composition of the teams

	Students	Universities	Specialisation
Team 1	4	4	Software engineering Biology, Physics
Team 2	4	3	Management, Biology, Finance, Software engineering
Team 3	5	5	Materials engineering, Medicine, Robotics, Aeronautical engineering, Management
Team 4	3	4	Project Management, AI, Business, Mechatronics



Figure 3 Teambuilding.

### **Business model canvas and business models**

In stage 1 participants learnt how to identify the problem, what a value proposition is, and how to define market and customer segments. In the beginning, students brainstormed how to find the right problem to solve. To make sure they identify the right problem, they had a task to create a customer quote illustrating the problem and a mission statement of the company providing the solution to the problem.

In stage 2 students created and presented the mission statement, prepared for the interviews with experts, and worked with a business model case study. The goal of the business model case study was to showcase to the students the steps in the process of developing the business model. Students also learnt about the Minimum Viable Product (MVP) and prototyping.

In stage 3 participants conducted interviews with experts and learnt about identifying uncertainties, and various types of business models.

In stage 4 students learnt about cost and revenue structure and practiced pitching to pitch their projects in front of a jury.

### **Meeting with experts**

From Startech 21 it was clear that the students needed to discuss their ideas with experts, so for this year a specific 'speed-dating' session was set up where students had the opportunity to meet experts from different areas like business and space technology.



Figure 4 Expert meeting with Professor René Laufer.

### Space Innovation Forum

To enhance the student's interaction with the space community it was decided to arrange the Startech event in collaboration with the Space Innovation Forum. Here students had the opportunity to attend lectures, and they had a chance to interact with business coaches and experts from the space industry, such as *Luca del Monte*, Head of the Commercialization Department, European Space Agency – ESA, *Anna Rathsmann*, Director General for Swedish National Space Agency and *Tomas S. Jonsson*, the Directorate-General for Space and Defence industry at European Commission.

Students also attended an exhibition and showcase where they had an opportunity to network and meet industrial partners, such as Swedish Space Cooperation, GKN Aerospace, ISAR Aerospace, Arctic Space Technology and Rocket Factory Augsburg.



Figure 5 Luca Del Monte (ESA) and Tomas Jonsson (EU) presents at the Space Innovation Forum.

Students had the opportunity to listen to *Dr/LtCol Ella Carlsson*, Swedish Air Force. In her presentation Women in Space Ella presented her journey from being a flight mechanic to studying a master's program in space technology to getting a doctorate in space science, working with the Mars project for NASA and to being responsible for Sweden's Defence Programme for Space.





Figure 6 Ella Carlsson presents the status for Sweden's Defence Programme for Space.

## Creating an elevator pitch

Students took part in the pitching workshop. They were provided with guidance on how to prepare a perfect pitch, and they immediately had a chance to practice the newly acquired knowledge by individually preparing one-minute presentations of their team projects and pitching them in front of all the participants. After all the students from the same team pitched their projects, they were given detailed feedback on what was good and what needed further improvement. The pitching workshop was the first exercise to help students generate ideas to pitch their projects at the final pitching event in front of a jury. After the workshop students had time to continue working in teams on their pitches.

## Final pitch

At the end of the event four teams pitched their results. Each team had five minutes to present their final project idea. After presenting each team received immediate feedback from the jury who eventually selected the winner team.

The first team presented Horus Protect. The project idea was to use satellite images to stop poachers from taking elephant tusks, which often leads to animals' death. The idea was to use satellite images to track the location of animals. Horus Protect was selected by the jury as the winner project in the pitching competition.



Figure 7 Horus Protect team pitching in front of the jury.

The second team presented The Water Saving Solution. The project idea was to use satellite images to detect as fast as possible the contamination of water to be able to stop spreading it further.



Figure 8 The Water Saving Solution team pitching in front of the jury

The third team presented SmokeSAT. The project idea was to use satellite images to monitor the type of smoke coming from the chimneys of private houses in order to identify the households contributing to air pollution. The Smoke SAT system would automatically send a fine to the address identified by the drones.



Figure 9 SmokeSAT team pitching in front of the jury

The last team presented Aurora Data. The project idea was to monitor the mine pollution and provide an early warning system to mitigate the risks of pollution.



Figure 10 Aurora Data team pitching in front of the jury.

## Extracurricular activities

After daily activities scheduled in the program students had time off to relax, socialise and explore Kiruna in late afternoon and evening. Students visited the old church in Kiruna and the Ice Hotel. On one of the last days all the participants with organisers went to a famous food street place in Kiruna with reindeer meat. Last but not least, one of the main attractions was chasing aurora lights late in the night.

## Evaluation of Startech 22

### Feedback from participants

A formal evaluation was performed at the end of the event in the form of anonymous feedback prepared by the organisers. Students were asked to fill out a survey composed of 23 questions

## Startech Experience Overall

2. What was your favorite part of the Startech 22 event?

- Networking (“networking and meeting interesting people”, “Have the opportunity to interact with people with different backgrounds”, (“Meet and work with other people from different countries and sectors”)
- Teamwork (“Working in groups”, “Team building exercises”)
- New Skills (“Pitching”)
- Free time (“Searching for aurora lights Climbing the mountain to see aurora”, “Eating moose in the street food”)
- Event Organization (“Space Innovation Forum” conference, “The way we were taken care of”, “Fika time”)

Lickert scale 1-5 (strongly disagree – Strongly agree)

- ## Teams

13 (17)





Figure 12 Student feedback on working in teams.

## Venue

Lickert scale 1-5 (strongly disagree – Strongly agree)

- Being in Kiruna was a great experience (4.7 out of 5)
- The Space campus was an excellent place for hosting Startech (4.7 out of 5)
- Food during the week was excellent (4.3 out of 5)
- The hostel was very convenient (3.2 out of 5)

## Summary

General feedback from students over the Startech experience

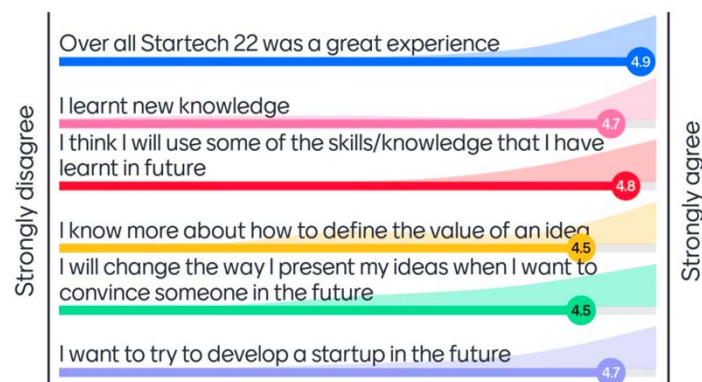


Figure 13 General feedback from students.

## Recommendations and suggestions for future Startech events

Would you recommend Startech to other students? (Out of the available response options - No, Probably, Definitely - all the 15 respondents answered "Definitely").

If you were to arrange Startech 23 what would you improve?

Students have the following suggestions:

- "Two weeks"
- "More time for the conception of idea"
- "Do fika even if it's not Sweden"
- "More space information, how sensors work, what is fusible, limit the Earth observation data only to free data source like Copernicus"

- “More learning about space”
- “More team building activities to get to know better other team members”
- “Observation of aurora lights in group”
- “Organize more group activities outside the classroom (visiting town, eating dinner)”
- “Even more detailed tour of the campus in Kiruna”
- “More meetings with experts and more focus on market sizing (space data market).”
- “More networking with companies, investors”
- “Extra event about the culture of the host country”
- “Better marketing of the event at the participating universities”

### Startech 22 Highlights video

In the end of the program short interviews were performed with students (unfortunately some of the students had to leave early so not all the students were involved).



Figure 14 Video from Startech 22 held in Kiruna.

### Comparison with the feedback from Startech 21

The comparison of feedback received from students attending Startech 22 and Startech 21 clearly indicates that the organisation of Startech has improved. Startech 22 organised in Kiruna received better feedback than Startech 21 held in Toulouse. Startech 22 received higher rating across all the questions included in the survey.

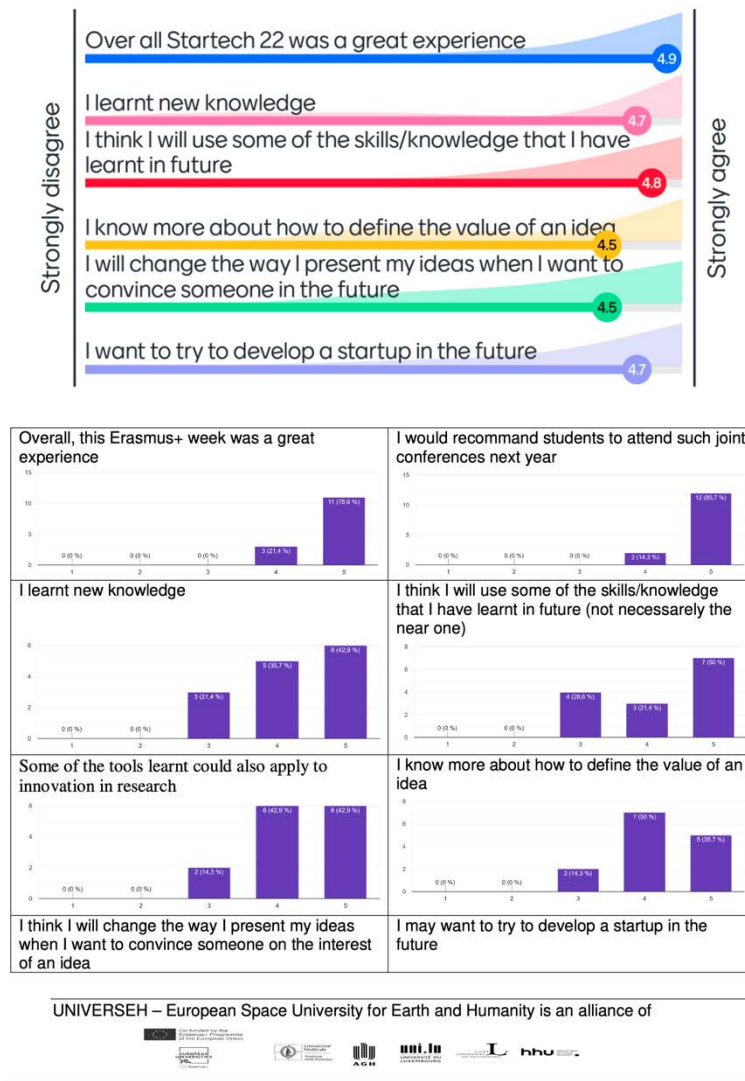


Figure 15 Comparison of feedback received during Startech 22 (1<sup>st</sup> image) and Startech 21 (2<sup>nd</sup> image).

## Evaluation of Startech 22 from the Moplat Mobility tool

In October 2022, the Startech Program took place at LTU in Kiruna. It brought together 17 students to develop an idea into a marketable project during an intensive week. Under academic supervision of Peter Törlind, Associate Professor in Product Innovation in the Department of Social Sciences, Technology and Arts, this year's project goals consisted of using earth observation data to have a positive impact on Earth through space. Unfortunately, only 4 out of 17 students evaluated their participation by submitting their evaluation to the mobility tool, which vividly displays the inter-institutional challenges preventing the tracking of valid, representative statistical data with regards to mobility. All four respondents are master students, all identify as male. All four respondents would recommend the Startech Program at LTU to a friend.

In terms of individual student perception, as most excellent was the quality of the speakers / professors / contributors followed by the quality of exchanges (with peers, colleagues, researchers) (75% excellent, 25% good) and the quality of activities offered (75% excellent, 25% adequate).

Appreciation was evaluated by the open-ended question no. 16 of the mobility tool asking "What did you enjoy the most? What was particularly great during your mobility?" and providing the following responses:

- “Working in multicultural and multidisciplinary teams”
- “Everybody was super helpful and friendly”
- “Exchange with experts and pitch structuring”
- “Learning new skills, gain new experiences, visiting talented people, finding new friends”

Obstacles were evaluated by the open-ended question no. 17 of the mobility tool asking “What did you enjoy the least? What was difficult or bothered you?” and providing the following responses:

- “Nothing but if I really have to find something I would say the hostel”
- “The buses and the not very descriptive bus plan in Kiruna”
- “Nothing”
- “The shared room”

One participant from TBS describes the Startech Program as an opportunity “*to create (such) a project in such a short time [that] was challenging but at the end of the week, during the pitch, all team members had a great feeling of satisfaction*”<sup>[1]</sup>.

## Summary

Startech aims at coaching students towards the spirit of innovation. 20-25 selected students from all UNIVERSEH partners are mixed to create five international multidisciplinary teams with broad knowledge and competence. All teams select an idea that uses Earth observation data (e.g. a new application to help monitor the gas pollution in the seas).

The Startech program is designed as an intensive one-week experience; students should develop their idea into a marketable prototype/product/project. During the week, teams go through lectures, interact with business coaches and experts to build a set of crucial skills when creating new projects, new research directions or a new company. Lectures include creativity, business models, canvas, lean start-up, IP, pitching, etc. Throughout the process, students are accompanied by teachers and by several experts. At the end of the training, the students pitch their project in front of a jury.

In Startech 22 the winner team was Horus Protect selected by the jury in the pitching competition. Their idea was to use satellite images to stop poachers from taking elephant tusks (which often leads to animals’ death) by using satellite images to track the location of animals.

## Recommendation

The Startech 22 event was a success and also appreciated by all students, so the recommendation is to continue with the event during 2023 and its planned to be performed in Krakow in October 2023. The team that has arranged the event 22 will continue to collaborate and arrange the event in 2023.