



# The International Space University Goes Online

## The first Interactive Space Program tackles pandemics from space

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The current global pandemic has resulted in many changes to how we live and work. One of the casualties is the International Space University's (ISU) annual Space Studies Program (SSP), which was cancelled for 2020. In its place the ISU built a new program in a very short space of time, operating entirely online, and thus the Interactive Space Program (ISP) was born. Stichting Space Professionals Foundation (SSPF) ensured that the Dutch space sector was very well represented in this program, by providing support for many eager and energetic participants.

In order to brighten up the pre-mission training, a meet-and-greet was arranged that gave us the opportunity to meet our fellow SSPF participants in real life. Such an event is normally taken for granted, but was a real privilege given the current circumstances. Early in July, around 10 of us met up in Leiden together with Gerard Blaauw and Pieter van Beekhuizen from SSPF, and via a video call also with Tanja Masson-Zwaan (the first of many Zoom calls). We spent the evening getting to know each other and speculating what ISP would be like, as well as looking ahead to SSP21. All in all, it was a joyful evening where we got a taste of what it is like to be part of the space community connected to ISU. This is how our journey began.

### Expedition Patch

Since the beginnings of human space-

flights, the creation of a mission patch has become a persistent and enlightening tradition. A patch, an emblem worn by astronauts and other personnel affiliated with the flight, is the embodiment of the ideas of the individual mission. Expedition ISP20 was no different, and developed its own patch with the designing team coming entirely from our crew. The ISP20 patch depicts Mars, Earth with the International Space Station, and the Moon. They symbolise the current and future human habitats and the workplace of the ISP20 crew. The patch includes a compass and a rocket orbit, illustrating humankind's eternal thirst for discovery and space exploration. In the foreground, an astronaut holds the Rod of Asclepius, a symbol of healing and medicine. This together represents humanity and the use of space technology for health benefits.

### Pre-flight training

Just like astronauts who undergo a long and complex training process before their flight, we went through an extensive and rigorous preparation campaign. The pre-expedition program consisted of 11 meetings, briefings, and training sessions. The Group Dynamics workshop, Advanced Communication Skills workshop, Design Thinking workshop, and Communication training were included to familiarise crew members with teamworking strategies, problem identification and problem-solving techniques, as well as with methods of critical thinking. We learned to understand and make the best use of group dynamics while being fully aware of the differences within the team, and the benefits these can bring. In space missions, a good team spirit is the key to the success of the entire expedition. ESA astronaut Paolo Nespoli shared his experience of

preparing and accomplishing difficult objectives as a team while dealing with unexpected situations, emergencies, and mistakes. All ISP20 crew members successfully completed the pre-flight training, were well prepared and certified ready for flight.

### ISP20 Expedition Launch

The Expedition Launch was scheduled on Monday 20 July 2020 at 11:00 UTC and crew members' families, friends and anyone interested could follow it live as it streamed on YouTube. Gökтуğ Karacalıođlu, the ISP20 Expedition Director, and Juan de Dalmau, the President of the ISU, opened the ceremony and presented guests. The ISP20 team was greeted by many distinguished participants, including Philippe Portelli, the Head of Higher Education and Research from Eurometropolis of Strasbourg, Dr. Christian Sallaberger, the Chairman of the ISU Board of Trustees, and Prof. Pascale Ehrenfreund, ISU Chancellor. To inspire the crew before the flight, saxophonist Philippe Geiss presented his beautiful compositions *Infinity* and *Nebo*.

Prior to their very first flight from Baikonur Cosmodrome in Kazakhstan, it is tradition that cosmonauts and astronauts plant a tree. The ISU honoured this tradition and filled their Cosmos Auditorium with a plant for each of us ISP20 crew members. This was a wonderful way to feel included at the ISU central campus, in spite of the relative remoteness and isolation we were all experiencing.

Finally, the final countdown started. We were to be virtually launched through space and time. The program was themed to the vantage point of permanent off-Earth settlements in the year 2120, to look back on the pandemic of today. Ten seconds to lift-off. Nine, eight, seven, six, five, four, three, two, one. Lift off! A fascinating endeavour is ahead!

### Academics

The academic side of the program consisted of several types of activities; workshops and daily seminars. The schedule ran daily from 07:30-17:00UTC, which was convenient for those of us in Europe. The daily seminars are lectures on a wide range of space-related topics. These seminars do not go into great depth, rather they aim to give all of the participants a broad knowledge of all space related



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topics. All crewmembers attended these sessions at the same time, except for the crewmembers whose time zone made this difficult; they were able to access recordings later. The sessions were given by experts at the pinnacle of their field, who were always ready to answer all our questions. In the online setting, questions were asked through a separate website, while the crew used the Zoom chat to share their own stories on the topics.

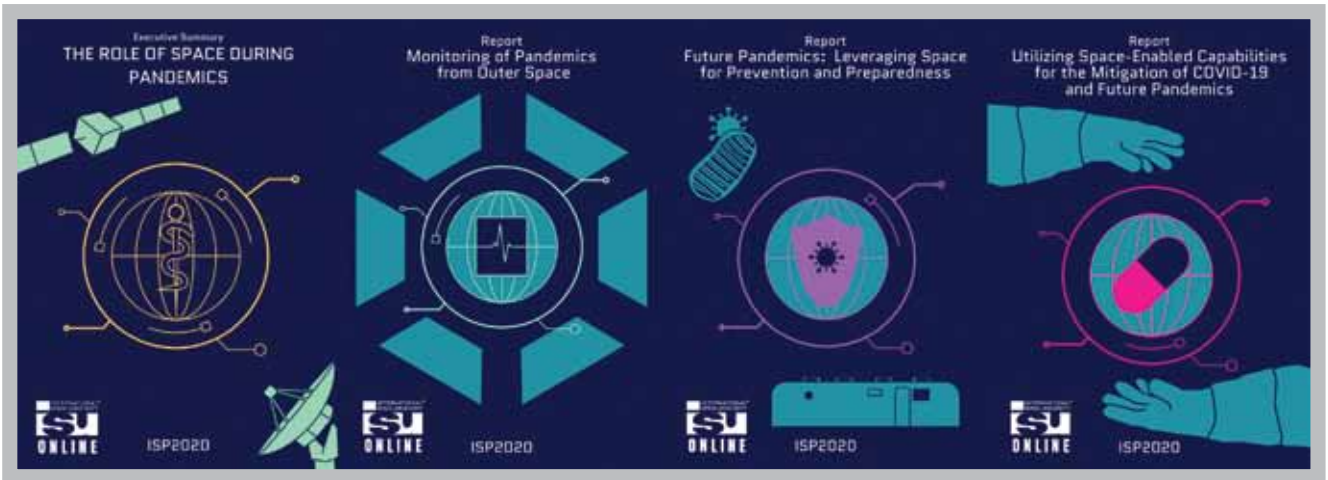
The interactive workshops gave the participants the opportunity to work more in-depth and hands-on with the different subjects. These workshops featured smaller groups of around 20 participants, and they were all very memorable. The humanitarian workshops specifically come to mind, where art and space were combined. These workshops could get quite emotional, even online we dared to open up and share our feelings because the officers (Kerrie Dougherty and Nahum Romero Zamora) were able to

create such a safe environment. Other workshops, such as those on policy and law, presented by Tanja Masson-Zwaan and Dimitra Stefoudi, went substantially more in-depth and invited other experts. These could get quite intense, so it was a good thing there was a break every hour, sometimes with musical support from DJ Kyran.

### Mentorship, Coaching and Crew Talks

Up to four times a week we had the opportunity to attend mentorship sessions. A wide range of people, including ISU alumni and spaceflight icons, volunteered their time to meet with ISP crewmembers for an hour in very small groups and talk about any topic or questions. These sessions were truly one of the highlights of the ISP, a unique and valuable experience. The conversations were in-depth and often took surprising turns. These sessions not only connected us directly with ex-





Reporting



The Re-entry

## Stichting Space Professionals Foundation

The International Space University (ISU), one of the world's leading institutions of space focused higher education, offers several programs annually dedicated to the development of space for peaceful purposes. In July 2020, the first Interactive Space Program took place online, allowing 86 space enthusiasts from across 30 countries to communicate and work together, to perform research, and form a big space family. Crew members were launched to space with a mission objective to investigate and make recommendations on how space technologies can help in monitoring, mitigation, preparedness, and prevention of future pandemics on Earth. The authors, who participated in the program due to generous financial support by the Stichting Space Professionals Foundation (SSPF), share their unique experience in this article. For more information on SSPF and their funding opportunities, see <https://www.sspf.nl>. For details on upcoming ISU programs please visit <https://www.isunet.edu>.



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parts, but also with each other. When the final mentorship session ended, none of us really wanted to leave. The mentorship sessions will always be fondly remembered by the crewmembers.

Throughout the program we were also aided by a coach. This coach helped participants keep track of their own goals. They also helped us cope with the stress and answered any questions we had. The coaches formed an integral part in helping us understand what we can bring to the space community. These coaches were our rocks in this great ISP20 experiment.

Every week a moment was also chosen for the crew to share their experience. In these crew talks the crew members shared their own passions and projects. With overwhelming enthusiasm, we learned about sci-fi and space elevators, about space procurement and heavy ion collisions, and about anthropology in space and how we could kill a transistor. These talks were both a fun and academic social event.

### The Team Mission

In contrast to the previous SSP programs, ISP20 did not use the familiar Team Project (TP) structure. Instead, all crewmembers were brought together into a single Team Mission (TM). The very topical theme for this was "Innovative Approaches of utilising space for the monitoring, and mitigation of the COVID-19 crisis and for the preparedness and prevention of future pandemics". We had the exciting opportunity to explore cutting edge research related to a very real and present global event, and present the meaningful and valuable insights we gained along the way.

## Habitats

The TM was divided into three sub-groups. In keeping with the 2120 theme, these were referred to as habitats. We had a facility in Earth orbit, and human bases on both the Moon and Mars. Our Mission Operation Centre remained firmly on the Earth, running from ISU headquarters in Strasbourg, France. These three habitats were assigned a different thematic approach to investigate the TM. The lunar habitat was tasked with preparedness and prevention of pandemics, Earth orbit focused on space-based monitoring, and the Martians tackled questions regarding pandemic mitigation.

## Research

With a very short amount of time available, the work had to be hastily divided amongst the team-members. Each habitat was self-managing, determined their own internal structure, and chose how to interpret and scope their part of the TM. There were some people allocated to provide external input, but these were largely used for technical and requirement parsing. This intra-team dynamics part of the program was a remarkable learning process, fully embracing the ISU's interdisciplinary, international, and intercultural facets. There were many complicated interactions, however, that lead to some exceptional outputs.

## Reporting

The written deliverables for the program consisted of a Final Report and an Executive Summary. For the report itself, each habitat was limited to 16 pages only. These are titled "Future Pandemics: Leveraging Space for Prevention and Preparedness" from the Moon team, "Monitoring of Pandemics from Outer Space" by Earth Orbit, and "Utilizing space-enabled capabilities for the mitigation of COVID-19 and future pandemics" from Mars. All three of these documents are publicly available on the ISU library website (<https://isulibrary.isunet.edu/>).

An 8-page executive summary was also compiled for all three habitats combined. This provides a high-level and aesthetically pleasant overview of the major outcomes. It was produced by a skilled inter-habitat task force, and is also available on the ISU library website.



Expedition Patch

## The Re-entry

The TM was wrapped up on the 20th of August and our re-entry to Earth was scheduled for a day later. The day started with a showing of our mission documentaries, which replaced the traditional presentations at the end of TPs. Each of the three habitats created a twenty-minute video summarising their TM report with their key points and recommendations. These were all put together in an hour-long documentary that was broadcast live on YouTube. This allowed people to tune in from all over the world: staff, students, alumni and space enthusiasts alike, all watched when the crew outlined how space technologies can be utilised during pandemics.

After the successful showing of the documentary, the re-entry sequence was initiated. The YouTube live stream ended, and the crew members returned for the last time to the place they were so familiar with: Zoom. Even though we were all stuck behind our computer screen somewhere, the ISU staff did an amazing effort in creating a very real graduation ceremony. First, a video showed a miniature space craft landing on the grounds of the ISU Campus in Strasbourg. After speeches by Göktuğ Karacalıoğlu, Pascale Ehrenfreund, Juan de Dalmau and ISP20 class speaker Bruno Reynaud, the crew 'emerged' one by one from a spacecraft situated at the ISU's Campus. The face of each of the crew members was projected on the hatch as they got their certificates handed over. The real surprise came at the end, when two crew members emerged from the actual hatch as they were already in Strasbourg to start the master's program.

After the graduation ceremony there were more speeches from the staff members,

some amazing video compilations were shown, tears were shed, and to finish it all off a DJ made sure ISP ended in a proper party. As the DJ spotlighted the dancing crew members and took the last song requests, the realisation came that this really was the end of ISP20: an incredibly intense, surprising and amazing experience in which we forged a new generation of ISU alumni without having ever met in person.

## Adjusting to Gravity

The real shock came the day after ISP ended. There was no one to give Zumba classes at 7.30UTC, no daily planning conference where the activities of the day were discussed in detail and no daily seminars to attend, no workshops to participate in, no team mission work to catch up on and no habitat challenge to compete in. After five weeks of complete immersion in a wondrous, hectic online world, the crew had to adjust back to life on Earth. For some that meant getting straight back to their jobs or their studies, whereas others had the chance to take a much-needed break. But even though the program ended, our connection was still there. Being used to communicating online, the WhatsApp group is still flooded with messages daily; there have been several in-person meetups and the first crew talks and mentorships sessions have already happened. Also, several crew members have given talks on the topic at conferences, at their universities or elsewhere. ISP might have ended, but the crew is still making their mark by spreading the important lessons learnt during the five weeks.

## The Future

ISU has officially announced that the Southern Hemisphere Space Studies Program (SHSSP) will be held online in January 2021. Next year's SSP, where almost half of the ISP's crew members are hoping to meet in person, for now is scheduled to happen partly in Granada, Spain, partly in Strasbourg, France and partly virtual. Yet, no one knows what the future will bring and what the possibilities are. But what we do know is that ISU and the ISP20 crew have shown perseverance in times of insecurity and have found creative solutions to unexpected problems. One could say that ISP20 was more like a human space mission than ever before and this is definitely worth repeating.