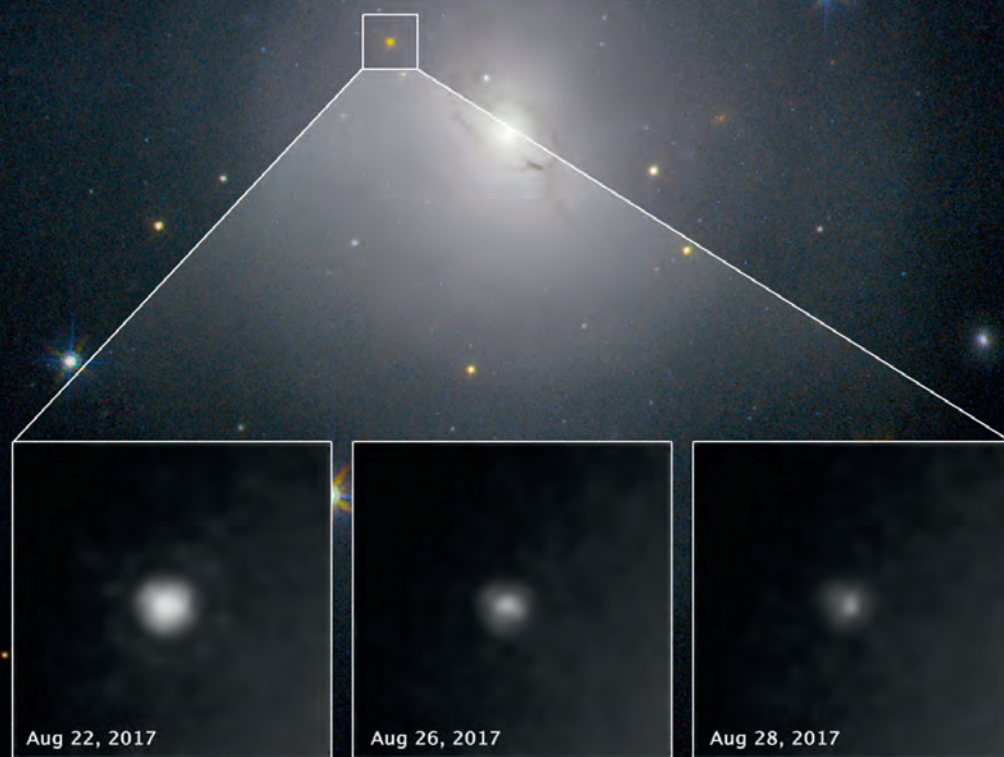




EXECUTIVE SUMMARY

2017



The galaxy NGC 4993 is located about 130 million light-years from Earth. On August 17, 2017, the Laser Interferometer Gravitational-Wave Observatory detected gravitational waves from a neutron star collision within this galaxy. The event also resulted in a flare of light called a kilonova, which is visible to the upper left of the galactic center in this Hubble Space Telescope image.

Acknowledgment:

A. Levan (U. Warwick), N. Tanvir (U. Leicester), and A. Fruchter and O. Fox (STScI)

Webpage: <http://hubblesite.org/image/4078/gallery>

© NASA and ESA



EXECUTIVE SUMMARY

2017

TABLE OF CONTENTS

5	INTRODUCTION
6	MISSION
7	MEMBERS
8	WORKING GROUPS - PLATFORM TO SHARE COMPETENCES
9	CERN - FROM HIGH ENERGY PHYSICS TO AEROSPACE
10	ASSOCIATION OF SPACE EXPLORER (ASE) VISITS GENEVA
11	PHONE CALL WITH THOMAS PESQUET
12	NATIONAL ACTIVITIES
14	INTERNATIONAL COLLABORATIONS
15	SPACE CAREERS EVENTS
17	NATIONAL TRAINEE PROGRAM
18	NTP EXPERIENCE IN PARIS
19	EDUCATION
24	PUBLIC ACTIVITIES
27	MEMBERS' WORDS

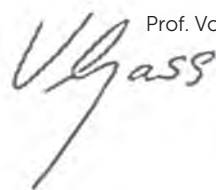
Dear members, partners and friends of the Swiss Space Center

Following the decisions of the ESA Conference at ministerial level in December 2016, as well as the implementation of the National Education, Research and Innovation Policy 2017-2020, this last year has been marked with numerous events and activities, which are summarized in the current document.

With the strengthening of our members' structure and the ever-increasing interest in the offered continuing education services, our staff is solicited all year around to provide excellence in supporting our members' needs. The space community, whether they are members of the Swiss Space Center or not, gathered for many different events: international visits, thematic workshops, industry days. Members can now show their activities and services in a brochure. The first edition was issued in March 2017, and was widely distributed physically and electronically.

A new working group activity was initiated in the domain of "Software for Operations", which emphasized looking at downstream needs of the space market. Outreach to the younger generations was also strengthened, and will serve to motivate a larger part of the general population to be and remain interested in Space as well as science and technology.

We value the trust given by each and every one of our members and partners and appreciate the exciting adventure you allow us to pursue with you. As an entire team, we thank you and look forward to a bright and challenging future.



Prof. Volker Gass, Director

*Tobias Bandi (ETHZ
Hub Manager),
Grégoire Bourban
(Deputy Director),
Volker Gass (Director),
Gilles Feusier (Head of
Technology and Science)*



MISSION

A Link Between Institutions, Academia and Industry

2017 marked the revision of the "Swiss Space Implementation Plan", one of Switzerland's informative instruments for the period 2018-2020. Aligned with this document, the Swiss Space Center's mission remains:

"To provide a service supporting institutions, academia and industry to access space missions and related applications, and promote interaction between these stakeholders."

Roles

- To network Swiss research institutions and industries on national and international levels, in establishing focused areas of excellence, internationally recognized for both space R&D and applications;
- To facilitate access to and implementation of space projects for Swiss research institutions and industries;
- To provide education and training;
- To promote public awareness of space.

Steering Committee

Tasked with the approval of new members, organization of working groups and preparation of the workplan, the members of the steering committee met regularly under the chairmanship of Prof. Markus Rothacher.

The Steering Committee is composed of the following representatives:

- Prof. Markus Rothacher (ETHZ), chairman
- Dr. Mickaël Thémans (EPFL)
- Dr. Urs Frei (SSO)
- Prof. Samuel Krucker (Academy representative)
- Dr. Antonia Neels (RTO representative)
- Mr. Urs Meier (Industry representative)
- Mr. Christian Schori (Industry representative)

MEMBERS

A Network in Expansion

In 2017, the Swiss Space Center welcomed four new industrial members (Synopta, MPS, Picterra, and Thales Alenia Space Switzerland), one academic institution (University of Zürich) and one RTO (EAWAG). Apart from the founding members, which constitute the BoD (SSO, EPFL, ETHZ), 32 members from

each region of Switzerland representing all the types of companies (large sized, medium and start-up), academies (Swiss Federal Institutes, Universities, Universities of Applied Sciences) and RTO (CSEM, EMPA, PMOD/WRC, EAWAG) are all part of the network (Figure 1).



Figure 1: Members of the Swiss Space Center (status December 2017)

A catalog of their competences entitled “Members’ Profiles” was edited in March 2017. It will be updated on a yearly basis with the addition of new members and new services of the existing members.

This document is available electronically on the SSC website, as well as a limited number of printed hardcopies, which are available upon request.

WORKING GROUPS – PLATFORM TO SHARE COMPETENCES

In addition to the existing working groups (Education, Miniaturization and Minor Micro-Systems (M3S), Earth Observation & Remote Sensing), a new working group was established in September 2017 addressing the theme of “Software for Operations”. Its objectives are to:

- Foster interaction between entities engaged in software development for space projects
- Provide a platform for developing joint activities, e.g. training, workshops, projects and other ventures
- Support spin-in/out of technologies, particularly from/to the IT domain, e.g. Fintech

Each member can send representatives to one or several of these working groups and additional working groups may be established at the request of SSC members, pending the approval of the Steering Committee.

During the year of 2017, two important events were organized by the Swiss Space Center following the request of this network. They are summarized below:

Earth Observation in Switzerland – Needs and Vision

Workshop for the Space Earth Observation and Remote Sensing Community in Switzerland

The members of SSC’s working group on Earth Observation and Remote Sensing initiated and organized a first gathering of the Swiss EO community that took place on 16 March 2017 in Berne.

The goal of the workshop was to bring Swiss Space Earth Observation and Remote Sensing (EO) together and discuss the needs and future vision of the different players.

73 participants joined the one-day workshop and discussed different EO-related topics. The participants represented several diverse entities: Swiss governmental institutions (6 representatives), international organizations (4), academia (6), RTO (4), industry with focus on up-stream market (9), industry with focus on down-stream market (14).

The morning session was structured into two panel discussions, which consisted of 8 and 6 guests on the podium, respectively. The two topics were 1) Where do the participants see Switzerland’s EO in 20 years? and 2) The relation and roles between (Swiss) EO and ESA. A professional speed networking followed the panel discussion where three times two participants met for 10 minutes in bilateral discussion. The afternoon was dedicated to smaller roundtable discussions, capturing and exchanging the various opinions expressed during the morning session. In addition, three additional topics were discussed: 3) Ideas/processes to build



a Swiss space EO project; 4) Development of a new (value-adding) service in EO with ICT; 5) Sentinel satellites and EU's Copernicus program.

Some main points of discussion during the day were:

- The EO landscape is very fragmented and needs more coordination and structure (focus on excellence) to foster and strengthen the EO landscape in Switzerland.
- A strong knowledge and competences for EO are available in Switzerland (up- to down-stream), however, the interaction inside the community is limited, and therefore also the awareness of the use and potential of EO data from satellites.
- Switzerland's main resources are data and knowledge; therefore, participation for Switzerland in the EU's Copernicus program needs to be carefully evaluated.

Roundtable on "COTS for Space Mechanisms"

In 2016 it was decided to replace the working group "High-Precision Mechanisms and Structures" with roundtables on specific related topics. The first one was organized on April 6th, 2017. It

gathered 20 participants on the topic of "COTS for Space Mechanisms".

The main conclusions drawn from this roundtable:

- There is no way around COTS (cost, planning, availability).
- It is not possible to use COTS as is. Mechanical COTS very often need to be adapted to the specific application.
- COTS require a large effort.
- One should not rush into a COTS approach with overly optimistic assumptions.
- Right ratio between "traditional space-grade" and COTS must be found.

Sharing qualification data on COTS (at least their references with minimal environmental requirements or perhaps the missions on which they are used) could help reduce development costs and enable use of already qualified products to new applications (increase of turnover).

For COTS companies' representatives, doing space projects allows them to keep valuable engineers in the company!

Panel discussion regarding "Swiss Strategy of Earth Observation: Where do we want to be 20 years from now?"

ASSOCIATION OF SPACE EXPLORER (ASE) VISITS GENEVA

From May 11-13 of 2017, Claude Nicollier welcomed eleven European astronauts in Geneva, Switzerland, for the annual meeting of the Association of Space Explorers (ASE) Europe¹.

Founded in 2012, the ASE unifies the efforts of astronauts and cosmonauts to reinforce international cooperation in the exploration and use of space for the good of mankind. Its purpose is to support European educators and students and to promote education in science, technology, engineering and mathematics. They promote and organize the establishment of regular and close contacts of Europeans within the Association and its international membership who are united by the experience of human orbital flight. They strive to better publicize and disseminate knowledge concerning the historic significance of man's entry into space and the European share in this venture.

the University of Geneva, where the students had the opportunity to discuss with the astronauts and learn more about their experience in space. On May 12th, the astronauts visited the observatory of Geneva, where Michel Mayor took them on a tour, which highlighted the discovery of exoplanets. After that, they went to see the CERN, where they met with Nobel Laureate Samuel C. C. Ting who presented the Alpha Magnetic Spectrometer (AMS-02), a state-of-the-art particle physics detector, which flew on STS-134 to the International Space Station ISS in 2011. After visiting the Antimatter Factory at CERN, the astronauts learned more about the UNOSAT program.

ASE Europe at the Observatory of Geneva (from left to right): Claude Nicollier, Ulf Merbold, Dorin Dimitru Prunariu, Klaus-Dietrich Flade, Helen Sharman, Franz Vieboeck, Michel Mayor, Reinhold Ewald, Ernst Messerschmied, Samantha Cristoforetti, Aleksandar Aleksandrov, Bertalan Farkas and Michel Tognini.

During their visit, the twelve European astronauts met with PhD students from

¹ For more information: http://www.space-explorers.org/index_europe.html



PHONE CALL WITH THOMAS PESQUET

What would you ask an astronaut if you had the chance? Young kids already know: "Do you miss your mom?", "Are there arguments among astronauts?" and "Are you going to celebrate your birthday with cake, candles and presents?"

That's how 60 young Swiss talked to Thomas Pesquet, the ESA astronaut (French citizen) currently on-board the International Space Station for a 6-month mission. This very special phone call connected the International Space Station with around 60 students and teachers from the Swiss states of Sion and Vaud. It was offered by the ARISS program and organized by the Swiss Space Center. Besides letting their voices be heard in space, kids have also learned about space in a few fun activities, such as: representing lunar phases with Oreo biscuits, reproducing the proportions of the solar system by means of a toilet-paper meter and deciding a menu and baggage for their trip to Mars.



Now they are definitely citizens of space!



NATIONAL ACTIVITIES

"Mesures de Positionnement" (MdP) Call 2016



Twelve studies were selected by the SERI/SSO at the end of an evaluation process implemented by the Swiss Space Center in 2016. These studies, which were carried out over 15 months from November 2016 to January 2018, aim to better position Swiss industrial and academic entities with respect to competition, particularly in the realm of ESA activities and other international programs such as the EU Research Framework Programs.

The main objectives of this Call for Proposals are to foster and promote Swiss technological and scientific competences that have a clear potential for space products and services/applications. More particularly, the Call for Proposals 2016 aims:

- to foster the development of innovative ideas and new products related to the space sector;
- to promote the collaboration between Swiss industrial and academic partners to obtain a more stable and better structured Swiss space landscape;
- to better position Swiss industry with regard to future European and world-wide activities, so as to be ready to submit competitive bids when the respective calls are published;
- to increase the technological maturity of ideas developed by academia and to promote competitive space products thanks to partnerships with industry.

A public event will be organized on February 13th, 2018 at EPFL where the consortium will have the opportunity to present their main achievements.

Call for Ideas 2017 - Third Edition



For the third time since 2013 and 2015, a Call for Ideas to Foster Low Technology Readiness Level (typically TRL 1-2; research and development studies related to space activities) was launched in March 2017. Out of nearly 20 high-quality proposals, 7 projects were short-listed in a very competitive selection process. The studies were funded with a maximum of 20'000 CHF for a duration of 6 months. During this time the pro-

ject teams studied their concepts from a space perspective and advanced on the maturity of the concepts for space applications. All projects were successfully concluded, and follow-up activities have been identified. With the second successful implementation of this project opportunity, the Call for Ideas has been consolidated and strengthened as an instrument to identify and boost space innovations in Switzerland.

Swiss Parabolic Flight Campaign - Symposium

On April 25th, with the support of the Swiss Space Center, Prof. Oliver Ulrich from the University of Zürich organized the first symposium on the Swiss Parabolic Flight Campaign which took place in October 2016 from Dübendorf airport. During this event, the project managers of the five selected studies under the Call for Experiment 2016 funded by the SERI/SSO, presented the developments toward flight embarkment and the results obtained. In addition,

representatives from SSO, DLR and NoveSpace highlighted the importance of such initiatives and the benefit for the science community and eventually the citizens. As guest of the day, Prof. Claude Nicollier introduced his own perception of gravity, sharing his experience as an ESA astronaut. More than 60 people attended this event, primarily from the science community, but also from space enthusiasts who participated in the flight as "tourists".



INTERNATIONAL COLLABORATIONS

UK-CH Bilateral Workshop on Space Technology

Additive Layer Manufacturing Technologies for Space Applications
31 January – 1 February 2017, Harwell Campus, UK

The Swiss Space Center and the Harwell Science and Technology Facilities Council (STFC) jointly organized a bilateral UK-CH workshop on Additive Layer Manufacturing (ALM) technologies for Space Applications. The roundtable workshop was organized with a limited number of invited ALM experts, both from UK and CH.

The one-and-a-half-day workshop was held on the Harwell Campus in UK from

January 31st to February 1st, 2017. The Harwell campus is a leading science, innovation, technology and business campus, located just south of Oxford. It hosts ESA's European Centre for Space Applications and Telecommunications (ECSAT), Rutherford Appleton Laboratory (RAL) Space as well as other research facilities.

The workshop consisted of visits to the facilities, networking events, as well as presentations and discussions about ALM technologies for space applications, with focus on materials, processes and production and their potential for space. Its objectives were to foster UK-CH space technology collaborations and strengthen relationships through networking.

Amongst the more than 30 participants, 10 represented Swiss entities (industry, academic, RTO and institutional).

The workshop was highly appreciated by the participants.



SPACE CAREERS EVENTS

Links and Possible Collaborations with Polish Space Actors

Representatives of Polish companies and research centers involved in space recently visited Switzerland and met with Swiss counterparts.

On November 7-8, representatives of Polish space companies and research centers visited Switzerland. The aim was to present the competences of both countries in order to stimulate cooperation, to identify common themes, discuss possible collaboration and create links.

For two days, the Polish delegation, composed of thirteen people from the Polish Space Agency, CBK, Sener, Syderal Polska, PCO among others, had the

opportunity to meet and get acquainted with several Swiss space players such as ETH Zürich, RUAG Space, CSEM, Almat-eck, Micos, Clemessy, EMPA, Synopta, and Thales Alenia Space.

This visit was organized jointly between the Swiss Space Center and the Polish Space Agency. Further bilateral activities are foreseen in 2018 with potential for a counter visit in Poland or workshops on specific topics.

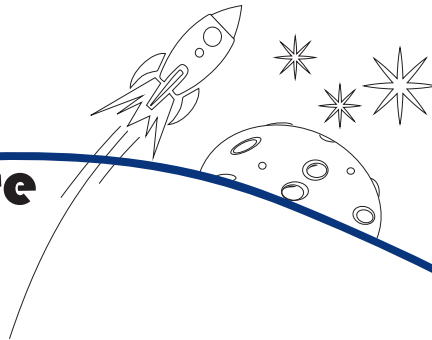


Roadshow, October 2017
Basel, Luzern, Lausanne



Swiss Space Center
Swiss Space Office
Swiss Space Agency
Swiss Space Foundation
Swiss Space Research Institute
Swiss Space Technology Center
Swiss Space University
Swiss Space Academy
Swiss Space Institute
Swiss Space Center

**Be a Star in
ESA's Universe**



Be a Star in ESA's Universe

The fact that a retirement wave will arrive in the upcoming years at ESA opens the opportunity for new careers in the space domain. Therefore, on behalf of the SSO, the Swiss Space Center and the ESA organized an interactive series of evenings in order to increase the visibility of Swiss space opportunities and advertise the career path for working in the space domain.

Usually organized with an academic entity as local host, four events were held during 2017, gathering more than 350 students and young professionals. More than 30 experts working in the space domain (ESA, the SSO the SSC, local industries, laboratories and research centers) shared their experience and answered the students' questions during the panel discussions and the networking aperitif.



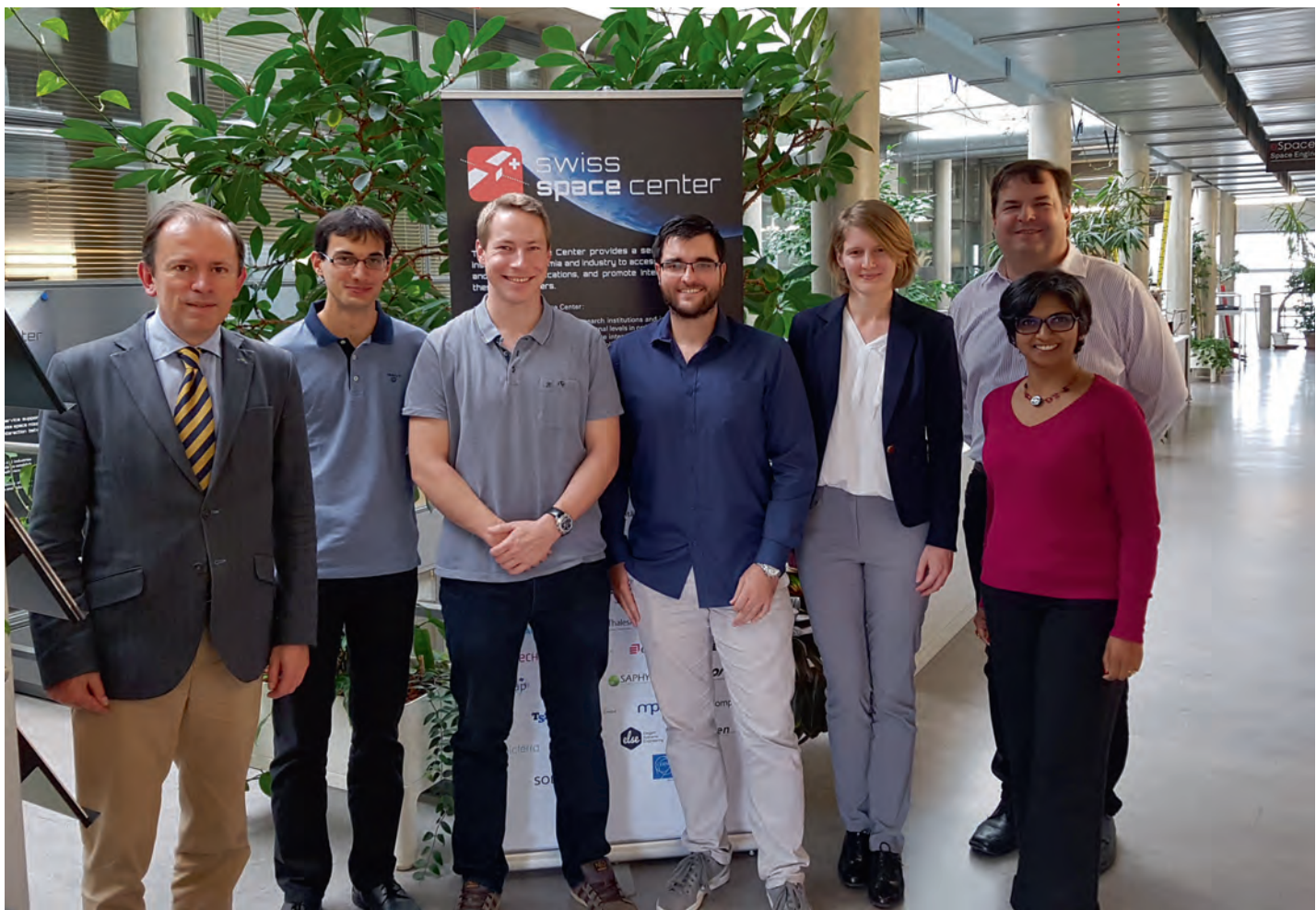
NATIONAL TRAINEE PROGRAM

Following the success of the three first calls in 2014 and 2015, eleven new positions were proposed to young graduates with Swiss citizenship. This special initiative aiming at increasing the number of Swiss staff at ESA is similar to other national trainee programs operating in Germany, Portugal and Belgium.

At the end of the process, four candidates were selected and began on December 1st:

- Corinne Hänggi, EAC in Germany
- Xavier Collaud, system engineering including CDF, ESTEC in the Netherlands
- Raphaël Valceschini, Characterization of High-Performance Time and Frequency Generation Systems, ESTEC in the Netherlands
- Lionel Métrailler, a radiation belt model for INTEGRAL, ESAC in Spain

*Fernando Maura – ESA
Raphaël Valceschini – NTP
Xavier Collaud – NTP
Lionel Métrailler – NTP
Corinne Hänggi – NTP
Volker Gass – SSC
Kamlesh Brocard – SSO*



NTP EXPERIENCE IN PARIS

"I'm confident that my future professional life will be in the space domain."

Scientific Assistant at the Swiss Space Center and specializing in launchers, Jean-Noël Pittet is currently based at the ESA HQ- Daumesnil in Paris. He explains what his tasks are...



I am working within the Future Launchers Preparatory Programme (FLPP). Our task is to prepare the technical and programmatic elements, including the acquisition of necessary technical capabilities, enabling the development of the best launch systems to respond to future European needs. More in detail, the selected technologies are brought to a maturity level sufficient to be integrated on a launcher development project.

My contribution is mainly focused on the practical application of the disposal regulations. Once the principal mission is finished, the launcher elements can no longer be abandoned just where they are. Therefore, several disposal processes are possible with as many different impacts on the launcher performance. Naturally, the challenge is to select the configuration with the minimal impact, both on the launcher operation and on the environment.

- **What are the most interesting tasks or events you participated in?**

While reviewing the current knowledge on the disposal practices, I got in contact with the people in charge of the early development of the previous

launchers or optimization of the current ones. It was not only the opportunity to listen to their stories firsthand, but also the chance to see my new proposals challenged by specialists with decades of experience. It is a great feeling to know that the best option will fly at some point in the future.

- **How will this experience be useful to your career?**

University studies can bring someone to a very high technical level in a particular domain. However, they do not teach how the space industry works and how to complete a project in this domain. In addition to the technical knowledge and the opportunity to expand my professional network, this NTP gives me this understanding of the spatial activities in Europe, and furthermore from the agency's point of view.

- **What are your projects for the future?**

I still have one more year to spend in Paris. What will follow is not defined yet; maybe I will stay in Europe, or go back to Switzerland. I'm confident that my future professional life will be in the space domain.

EDUCATION

Continuing Education

"Radiation Environment and Its Effects in EEE Components and Hardness Assurance for Space Applications"

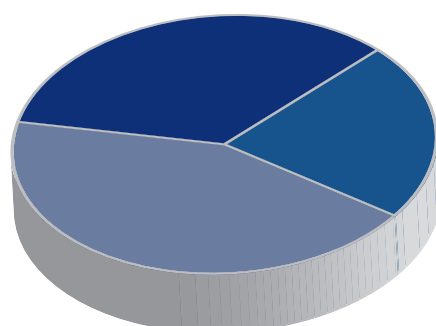


On May 9-10 more than 60 participants attended the continuing education class on "Radiation Environment and Its Effects in EEE Components and Hardness Assurance for Space Applications" organized jointly by the Swiss Space Center and the Knowledge Transfer Group from CERN. During these two days, four ESA experts presented the harsh and dynamic natural space radiation environment and the central role it plays in space project activities, as well as the engineering procedures to achieve the defined mission goals.

The program included a presentation of CERN experts on the characterization and the use of COTS components within their facilities. A tour of CERN radiation facilities concluded the lecture.

According to the follow-up survey sent by SSC, the participants evaluated this subject as highly relevant. The organization was assessed as good to very good. In terms of participants' affiliation,

Participants' affiliation



■ Academia ■ RTO ■ Industry



in addition to the ESA experts and the SSC staff, 22 PhD students from CERN and 32 professionals attended the entire program. These professionals were issued from academia, industry and RTO.

“Space Strategy and Business Model Innovation Workshop”

On Oct 17, 2017 the Swiss Space Center hosted a workshop for 15 participants from Swiss industry, academia and RTOs. The purpose of this one-day workshop on “Space Strategy and Business Model Innovation” was to provide participants with a thorough understanding of key market trends and the

implications on their business. The lecturer, Stefan Buckenmaier (Business Advisor at Swiss Space Center), provided insights into the Swiss, European and U.S. market, the main trends and mechanisms, as well as the ongoing disruption of the traditional space sector. Important developments in space, such as Space Tourism, 3D-printing, the commercialization of Low Earth Orbit (LEO) and space data intelligence were specifically addressed.

A session on corporate strategy introduced new ways of using world-class management tools in a space context. As the most successful companies in the world are actually business model innovators, this topic was the focus of the afternoon session. The participants learned to think and strategize in business models. The newly acquired know-how and tools were directly applied to a real-life case study by a Swiss space startup. In small groups the participants were challenged to design a business model that increases the company’s value capture while accelerating new customer acquisition.

The intense day was concluded by an aperitif that provided the participants with networking opportunities. In the post-workshop survey the participants expressed their satisfaction with the event and described the day as a “mind-opening event” and as a source for “new perspectives and ideas...”.

School Visits and Open Days

To raise awareness about space with the public, especially youth, the Swiss Space Center provides educational activities in a variety of contexts such as open days and class visits to the EPFL campus and the “TecDay” events, organized in schools all over Switzerland by the National Academy for the Promotion of Engineering Sciences and New Technologies (SATW²).

A particularly appreciated educational activity is engaging participants in the concern of space debris as both a scien-

tific and societal problem. The attached photo captures a typical moment of the activity, where school students face the challenge of a debris de-orbiting mission through maneuvering a drone toward its target. In 2017, more than 500 students from 7 secondary schools followed the module provided during the SATW TecDays.

² For more information: http://www.space-explorers.org/index_europe.html
http://www.satw.ch/index_EN





Claude Nicollier - Un Suisse dans l'espace

Upon the initiative of Lukas Vigietti, president of SwissApollo, 2 events occurred on November 3rd at the EPFL/STCC to celebrate the 25th anniversary of Claude's first mission in space:

- "Un après-midi spatial pour les jeunes"
- "Un Suisse dans l'espace", that took place in the evening

The afternoon event was meant to inspire middle school students to become the explorers of tomorrow. 53 classes from 23 different schools came from all over the Canton; 1062 students, aged 11 to 16, and 100 teachers. Official representation included Kamlesh Brocard of the SSO and Michel Tatti who is the personal collaborator of the head of the Department for Education and Culture at the Canton of Vaud. The one-hour presentation lead by Lukas Vigietti in-

cluded a talk with Claude Nicollier, French astronaut Jean-François Clervoy, Astrophysician Michel Mayor and Moonwalker Charlie Duke. The audience paid close attention and reacted with enthusiasm to the honor of having such legends on stage.

After the presentation, many children stayed to discover stands organized by Swissmem, Omega, the Swiss Space Center, the association of Swiss Pilots, Mobysa (Thymio educational robots). The Swiss Space Center distributed educational notebooks to the teachers and ESA promotional flyers and stickers.

Apart from transportation, this event was free of charge for the schools. The Swiss Space Center was involved in the logistics of the event.



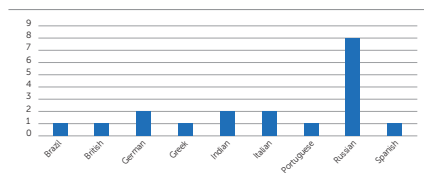
3rd Swiss Space Summer Camp at HES-SO Valais / Wallis

Swiss Space Summer Camp participants

After the successful 2016 edition organized at the University of Applied Sciences in Luzern, this third edition of the Swiss Space Summer Camp was held in Sion with the HES-SO Valais / Wallis. It took place between August 28th and September 1st with an additional day on EPFL campus in Lausanne for the Drone Days (Sept. 2nd). Nineteen master level students representing 9 nationalities and 3 continents followed the program, divided into three parts: lectures, project on radio communication for micro-satellite and social events.

The University of Applied Science – Western Switzerland (HES-SO) and the School of Engineering of the HES-SO Valais / Wallis sponsored this event and proposed the technical program: great event to promote Swiss competences and attract new talents from all over the world.

Count of nationality

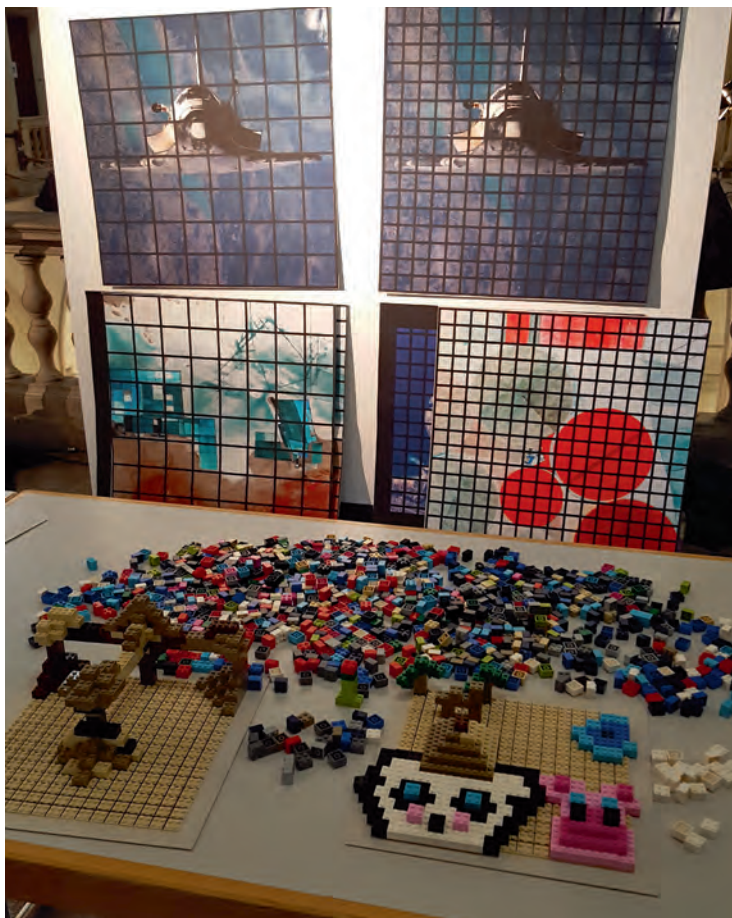


PUBLIC ACTIVITIES

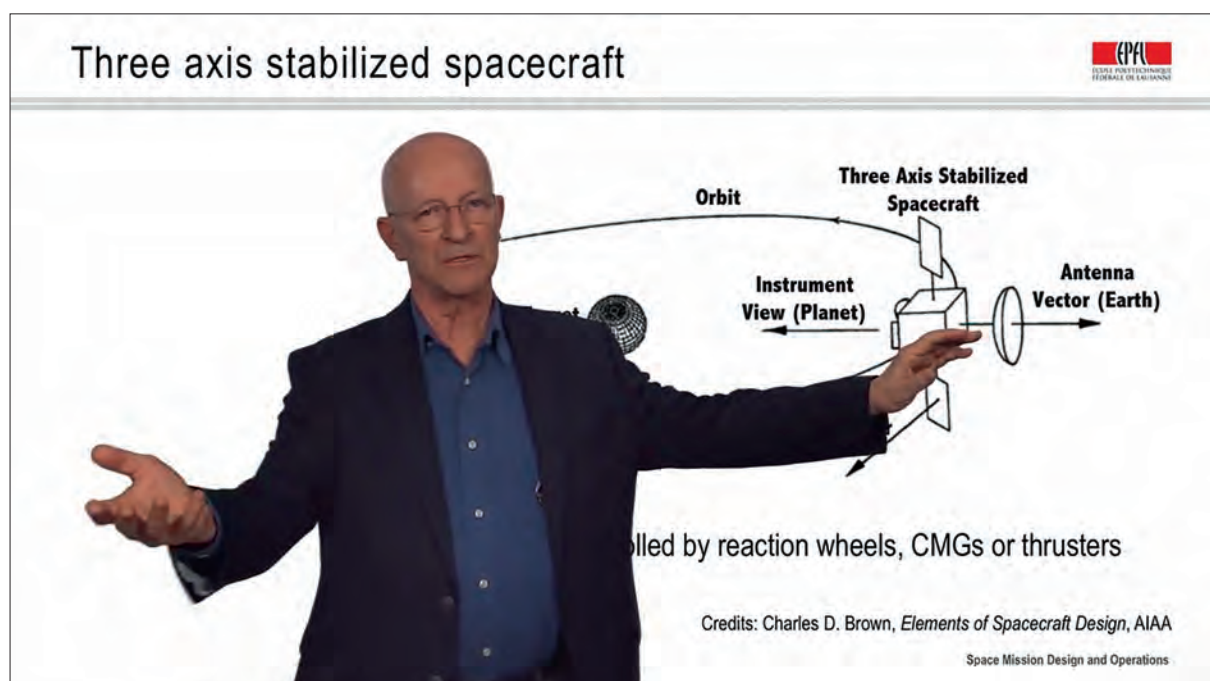


Scientifica 2017

The topic of this year's public event organized at ETH Zürich and the University of Zürich was "*What Data Can Reveal*". Several hundred participants went through the Swiss Space Center booth where Earth observation images were presented in order to address the problem of resolution. The young visitors had the opportunity to reconstruct images "pixel by pixel" using either Legos or felt squares. The activity was extremely successful. ESA "Paxi" stickers were distributed to promote the ESA kids' website.



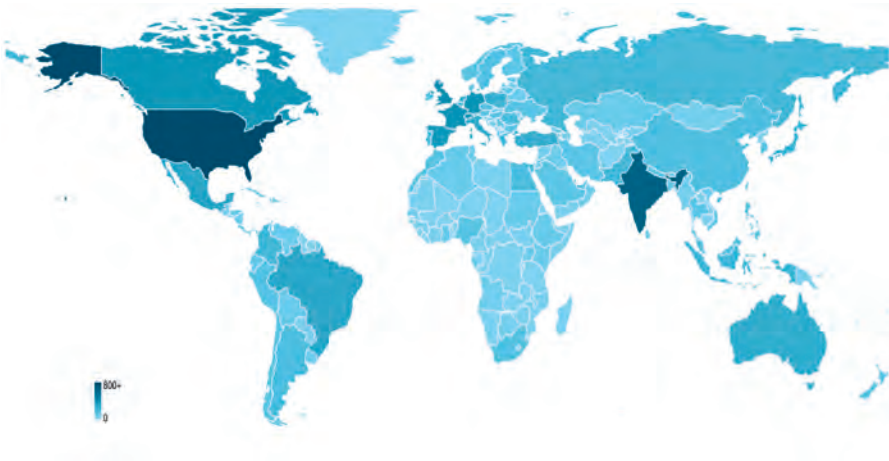
Massive Online Open Course on Space Mission Design and Operations



Claude Niccolier's Massive Online Open Course (MOOC) on Space Mission Design and Operations, which was issued for the first time last year, was updated in order to improve the learning experience for the students, to correct inaccuracies and to take into account the latest news related to space activities. New videos have been recorded and the content of the website was reorganized and re-worded.

The second 8-week edition of the course, released in February 2017, was,

like the first one, a great success. With respect to 2016, the number of registrations was lower, but with a much better targeted audience. From more than 4,200 enrolled students, about 200 successfully passed the exams. According to the survey and comments, the satisfaction level of the students was high. The course is indeed a unique way to get a comprehensive introduction to space missions and travels, with much information about the various aspects of space environment and constraints.



Claude Nicollier's MOOC also showcases Swiss expertise and knowledge. Students attending the course are coming from all around the world, from USA (20% of the students), India (13%), UK, France, Germany ... Only 5% of the students attending the course were coming from Switzerland.

Next edition will start by end of February 2018 and registration is free of charge on the www.edx.org platform.

Claude Nicollier

Claude Nicollier was a member of the first group of ESA astronauts selected in 1978. He joined Group 9 of NASA astronauts in 1980 for Space Shuttle training at the Johnson Space Center, Houston, Texas, where he was stationed until September 2005. From 1996 to 1998, he was Head of the Astronaut Office Robotics Branch. From 2000 on, he was a member of the Astronaut Office Extravehicular Activity Branch, while maintaining a position as Lead ESA Astronaut in Houston. Claude Nicollier is Honorary Professor of EPFL and joined the Swiss Space Center, supporting the Swiss space activities.

Reviews

A big thank you to everyone related to this course. Thank you Professor Claude Nicollier. And thank you to all the course staff. Your reply and help throughout has helped everyone in this discussion forum.

[...] The videos were really explicative, and the exercises were challenging but when I came to the forums I always saw good support from the Teaching Assistants. [...]

[...] I would like to express my appreciation and admiration for one of the best courses I ever followed on EDX or elsewhere, online and offline. The passion and enthusiasm conveyed by Prof. Nicollier is infectious. [...]

MEMBERS' WORDS

We will never forget what happened in 2017. What an amazing year this has been! Mentioned by many media outlets as one of the most promising new space start-up of 2017, Astrocast (formally known as ELSE) successfully raised more than 4 million CHF from a group of investors including Airbus Ventures, Investiere as well as many additional Swiss and internationally-based private investors. A strategic alliance was formed with the operator Thuraya as well as with a large European aerospace company. Numerous customers who showed great interest sent letters of intent totaling more than 1 million subscriptions for the future service. In addition, Astrocast was able to count on the full support of ESA (ARTES) to further develop its ambitious constellation project using Swiss-made nano-satellites. The company successfully completed the project's Critical Design Review in December at ECSAT. Two nano-satellites will be launched in summer 2018 to perform a demonstration mission in collaboration with our pilot customers.

Astrocast is an IoT network using nano-satellites. The space segment is designed to provide unlimited coverage all over the planet, with no geographical limitations. The nano-satellites will collect data from the customer's assets, which will be delivered to ground stations, then distributed for access by customers through a secure internet gateway. Astrocast is expected to serve numerous sectors including smart agriculture, automotive, transportation & logistics, utilities, maritime, oil and gas, among many others.

The company was founded in September 2014 by the team that developed the widely successful SwissCube, Switzerland's first satellite. The single-unit CubeSat is still operational today, eight years post launch and well after its life expectancy. Astrocast's management team includes a number of satellite and IoT veterans. Member of the SSC since 2015, the Astrocast team was very happy to benefit from this fruitful collaboration at different levels. Many thanks to the SSC!



Fabien Jordan
Founder & CEO
Astrocast

Being one of the most active research centres in space in Europe, CSEM activities in this domain have increased substantially in 2017. In partnership with Swiss industry and academia and European organisations, our portfolio of projects have been extended to other topics such as additive manufacturing and the deposition of microlenses for backside-illuminated imagers. ESA continues being our main source of funding, followed by the framework programmes of research and innovation of the European Commission and the CTI.

CSEM is member of the Swiss Space Center since 2006 when it was still called Space Center EPFL. We have seen the evolution of this institution over the years, being today a renowned space center in Switzerland, Europe and worldwide. Its dynamism organising events and trainings for professional people, promoting space to students

and Swiss companies and a long etcetera makes the SSC an essential actor in the development of space in Switzerland.

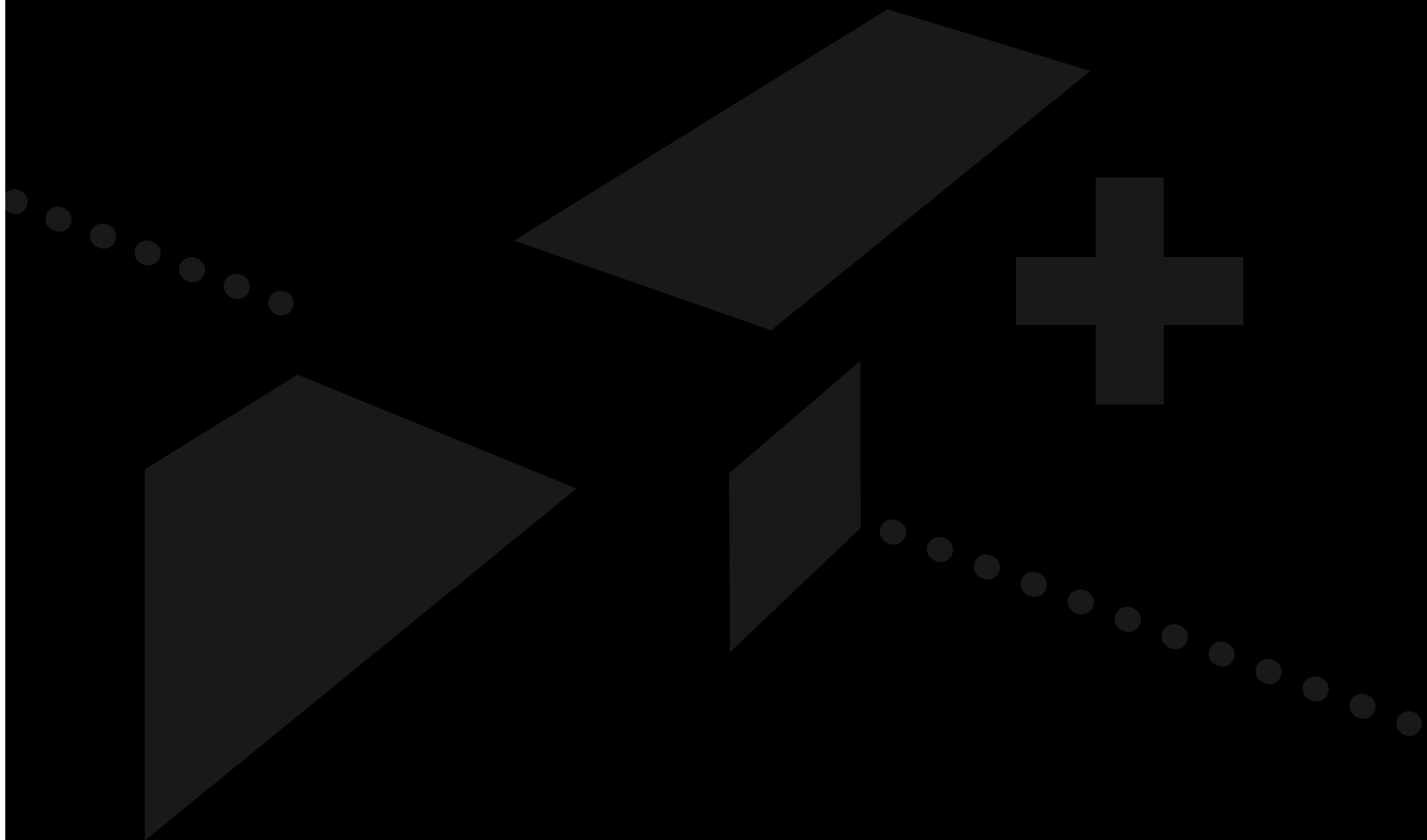
In 2017 many relevant activities were organised by the SSC, of which I would like to highlight:

- The meetings organised by the working groups' leaders, allowing to share competences and expertise in order to look for synergies and projects together.
- The networking opportunities, such as the organisation of meetings with companies from other countries like "Poland meets Switzerland" in ETHZ in November or the annual event in EPFL in December
- The organisation of the Space Career for Students events, in order to raise interest in space to young people from many different disciplines.

CSEM hopes to continue giving support to the SSC in the years to come.



Ana Maria Madrigal
Head of Space &
Aeronautics Programme,
CSEM



For more information
contact:

SWISS SPACE CENTER

EPFL

Station 13

1015 Lausanne

Tel.: +41 (0)21 693 69 48

ETH ZÜRICH

c/o Institute of Geodesy
and Photogrammetry

HIL C 61.3

Stefano-Franscini-Platz 5

CH-8093 Zürich

Tel.: +41 (0)44 633 30 56

www.spacecenter.ch

