

# Annual Report 2019



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This report is to be delivered to SCNAT and is thus structured along the SCNAT guidelines.

### SUMMARY

#### *Highlights of the Year*

The main highlight of 2019 was the [Annual CHIPP](#) meeting. This year it was held in Kandersteg, a village in the Bernese mountains, in the welcoming Victoria Hotel. For three days we scheduled presentations from the various experts in CHIPP to cover the three physics pillars: particle physics at the high-energy and intensity frontiers, astroparticle physics, and neutrino physics. The main goal was to cover the actual state of the field and the foreseen projects for the next 5-10 years. This material together with the Swiss Input to the European Strategy Update in Particle Physics (EPPSU) will be the base for the Swiss Roadmap drafting of next year. We had a very inspiring presentation of Jorgen D'Hondt on the EPPSU followed by an alive discussion between professors, students and representatives of the Swiss government. The [formal part](#) of the meeting hosted a session with reports of the activities of the various committees such as the European Committee for Future Accelerators, the International Particle Physics Outreach Group, the Astroparticle Physics European Consortium (APPEC) and the Nuclear Physics European Collaboration Committee (NuPECC). During this meeting CHIPP held the elections to cover the different roles in the association and to select the Swiss representatives in the international organizations.

In August, CHIPP participated to the annual meeting of the [Swiss Physical Society](#) at the Zurich University helping with the organization of parallel sessions for particle and astroparticle physics where many Particle Physics students presented their work. As part of the SPS award ceremony where all winners of the various SPS prizes were honoured and the [CHIPP prize](#) for the best 2019 PhD thesis work in particle physics was awarded to Michał Rawlik, scientist at the Swiss Federal Institute of Technology in Zurich (ETHZ). Michał receives the award for his doctoral thesis on the electric dipole moment of the neutron *"for his outstanding contribution to the improvement of experimental techniques aimed at detecting the Electric Dipole Moment of the neutron, and exploiting the consequences of such measurements in setting bounds on possible Axion fields"*.

The CHIPP PhD [Winter School](#) (20.01-25.01) was a very successful event organised by F. Canelli (University of Zurich) at Engelberg (CH). The school offered to the 62 young physicists participating an opportunity to learn about recent advances in elementary-particle physics from local and world-leading

researchers. The [school program](#) included lectures on accelerator and non-accelerator particle physics (detectors, LHC physics, neutrinos, astrophysics, flavor physics, future facilities) from an experimental and phenomenological perspective.

At the end of October a team of PSI physicists organized the very well established triannual conference, the [PSI2019](#) Workshop (21.10-24.10). The Workshop welcomed 198 participants that followed more than 60 talks. It focused on the physics at the low energy, high precision frontier without neglecting complementary approaches. It aimed at highlighting present activities and future developments providing an excellent opportunity to explore in situ these exciting topics. It will consist of plenary sessions, including invited introductory presentations to main topics, a poster session, social activities and the opportunity to visit PSI's on-site experimental facilities. Two satellite workshops were organized as part of PSI2019, the [Numu2019](#) and [EQLIPS](#) Workshops.

During 2019, the **CHIPP Executive Board** and the **CHIPP Board**, after the Swiss Input to the Strategy in December 2018, were very active in the preparation for the Open Symposium in Granada and for Drafting session of the European Strategy Update in the beginning of 2020. The CHIPP EB kept the **FLARE** Tables updated with the funding of experiments of the Swiss National Science Foundation (SNSF). The ECFA Mid-term Status Report of the Swiss Confederation was held the 15 November at CERN where the CHIPP activities were presented emphasizing the effort to follow the 2016 RECFA recommendations.

The **CHIPP outreach** activities continued supporting the thematic portal hosted on the SCNAT website, the multi-lingual "[particlephysics.ch](#)". Thanks to the SCNAT support, we could continue to keep this a lively page with 11 interviews given by B. Vogel, a professional journalist, and several other news articles and press releases in 2019.

An outstanding outreach event "[Scientifica 2019](#)" (Science fiction – science facts) attracted more than 30'000 visitors during 3 days at the University of Zurich and ETHZ between August 30 – September 2, a stand was devoted to Antimatter & Dark Matter.

CHIPP continues to cooperate with **CERN** in its outreach program, about 30 visits to CERN organized by Swiss Professors took place, not only for university students in physics and other disciplines, but also for children, high-school pupils, alumni, members of societies, the media, and the public at large, more than 75'000 people had the possibility to visit the experiments and CERN. This year was really exceptional for CERN, the [CERN Open Day](#) (14-15 September) called for the collaboration of many physicists and students from Swiss Institutes for guiding, logistic and organisation of stands. Several postdoc students participate in the event in "Ask the Expert" role.

CHIPP would like to highlight the very successful channel of communication set up from the University of Zurich: [Flavour at Zurich](#). In particular a new short film was realised: How Particle Physics Works: Episode II - [The New Analysis](#).

## **SECTORS OF COMPETENCE: NETWORKING AND DEVELOPMENT OF SCIENCE**

### **Publications**

### **Meetings, Workshops and Schools**

In 2019 CHIPP continued to work on its networking and educational goals and organized directly or through its members several meetings, schools and workshops. In chronological order:

- Zurich Phenomenology Workshop: Flavours: light, heavy and dark, January 9 – 11, 2019, Zurich (Baudis, Gehrmann, Isidori)
- 2nd Workstop/Thinkstart Theory for muon-electron scattering @ 10ppm February 4 – 7, 2019, Zurich
- Machine Learning for High Energy Physics, Zurich, February 4 – 5, 2019 <https://indico.cern.ch/e/ML4HEP> (Kilminster, Canelli, Arrestadt)
- Standard Model @ LHC, Zurich, April 23 – 26, 2019, <https://indico.cern.ch/event/760184> (Pozzorini, Mueller, Caneli, Serra, Grazzini, Isidori, Kilminster, Signer)
- GERDA Collaboration at UZH, June 24 – 26, 2019, (Baudis)
- SPS joint [annual meeting](#) 2019, August 26-30, 2019 - joint annual meeting of the Swiss Physical Society (SPS) and the Austrian Physical Society, (ÖPG).
- Next Frontiers in the Search for Dark Matter [Workshop](#), Firenze, August 26 – October 11, (Baudis)
- Mu3e Collaboration meeting at UZH, October 2 – 4, 2019, Zurich (Owen, Steinkamp, Serra)
- [PSI2019](#) (“Physics of fundamental Symmetries and Interactions”), 20-25 October 2019, PSI, (Kirch, Lauss, Ritt, Signer)

[EQLIPS2019](#) (“Exploring the Quantum Limit with Lasers and Ions in Penning Traps”), Satellite Workshop of PSI2019.

[NuMu2019](#) (“Synergies of neutrino nucleon/nucleus scattering and muon capture”), Satellite Workshop of PSI2019.

## INTERNATIONAL ACTIVITIES

### Scientific cooperation

Research in particle and astroparticle physics usually involves large infrastructures, which are the result of regional, national and worldwide collaborations. In order to cover the important intellectual and technological challenges, the amounts of human and financial resources required can no longer be provided by a single country. The table below shows a snapshot of the current international experimental collaborations involving CHIPP Board members.

Furthermore, smaller cooperation projects exist; many of them occur spontaneously – between groups working in the same field or requiring the same type of infrastructure – or in a coordinated way by CHIPP.

Project	Swiss institutes	CHIPP Board Members	Institutes worldwide
High-Energy particle physics			
<a href="#">ATLAS</a>	Bern, Geneva	Beck, Ereditato, Golling, Iacobucci, Mermod, Nessi, Sfyrta, Weber, Wu	218
<a href="#">CMS</a>	ETHZ, PSI, Zurich	Canelli, Dissertori, Grab, Kotlinski, Kilminster, Wallny	198
<a href="#">LHCb</a>	EPFL, Zurich	Bay, Nakada, Schneider, Serra, Shchutska	81
<a href="#">LHC Tier-2</a>	ETHZ, CSCS	Grab	> 200
HL-LHC	EPFL, PSI	Rivkin	55
CLIC	ETHZ, PSI	Rivkin	70
FCC	Bern, EPFL, ETHZ, Geneva, PSI	Blondel, Rivkin, Dissertori, Laine	134
Na64	ETHZ	Rubbia	8

Astroparticle physics			
<a href="#">AMS</a>	Geneva	Wu	63
<a href="#">ArDM</a>	ETHZ	Rubbia	7
<a href="#">CTA</a>	ETHZ, Geneva, Zurich	Biland, Montaruli, Canelli	210
<a href="#">DAMIC</a>	Zurich	Kilminster	10
<a href="#">DARWIN</a>	Bern, Zurich	Baudis	24
<a href="#">IceCube</a>	Geneva	Montaruli	50
<a href="#">MAGIC+FACT</a>	ETHZ	Biland	24-4
<a href="#">XENON</a>	Bern, Zurich	Baudis	27
Neutrino physics			
<a href="#">GERDA</a>	Zurich	Baudis	18
<a href="#">MICE</a>	Geneva	Blondel	28
<a href="#">NA61</a> / <a href="#">T2K</a> / <a href="#">HyperK</a>	Bern, ETHZ, Geneva	Blondel, Ereditato, Sanchez, Rubbia	33-63-75
<a href="#">SBN</a> (MicroBooNE)	Bern	Ereditato, Weber	34
<a href="#">SHiP</a>	EPFL, Geneva, Zurich	Bay, Blondel, Kilminster, Mermoud, Serra, Shaposhnikov	53
<a href="#">WA105 + DUNE</a>	Bern, ETHZ, Geneva	Blondel, Rubbia, Weber	21-175
High-precision and muon physics			
<a href="#">CREMA</a>	ETHZ, PSI	Hildebrandt, Kirch	9
<a href="#">GBAR</a>	ETHZ	Rubbia	18
<a href="#">MEG II</a>	PSI	Hildebrandt, Ritt	15
<a href="#">Mu3e</a>	ETHZ, Geneva, PSI, Zurich	Blondel, Dissertori, Grab, Hildebrandt, Kotlinski, Ritt, Wallny	8
<a href="#">nEDM/n2EDM</a>	ETHZ, PSI, Bern	Kirch, Lauss, Piegsa	15
<a href="#">PANDA</a>	Basel	Krusche	64

In parallel to these experimental collaborations and projects, Swiss theorists are involved in numerous international collaborations. The prominent ones, in which Swiss theory institutes are key players is

- The [LHC Higgs cross-section working group \(LHCHXSWG\)](#) created in 2010 to produce agreements on cross sections, branching ratios and pseudo-observables relevant to the Higgs boson: M. Spira (PSI) was involved in the LHC Higgs cross-section working group responsible for the [HDecay Manual](#).

At the University of Bern the work on the [review of lattice results](#) continues. It is related to pion, kaon, D- and B-meson physics with the aim of making them easily accessible to the particle physics community.

Prof. O. Schneider (EPFL) is convener of a sub-group of the Heavy Flavour Averaging Group ([HFLAV](#)). HFLAV is responsible for calculating world averages of measurements of beauty-hadron, charm-hadron and tau-lepton properties from current and past experiments and provides a comprehensive resource for the field in terms of web pages and full documentation of results.

One particular example of scientific collaboration and help at the service of the new arrivals in the LHCb experiment has been provided by the EPFL team that has built the [LHCb starterkit project](#) where the lessons from the dedicated Workshops and online tutorials are stored.



### Institutional collaboration (in alphabetical order):

Several CHIPP members are acting as official delegates to international organizations in 2019:

- **Hans Peter Beck** (U. Bern) has been the co-Chair of the International Particle Physics Outreach Group ([IPPOG](#)) since 2013, and he has been elected President of the Swiss Physical Society on the 22<sup>nd</sup> August 2017 for a period of two years. He represents Switzerland in the European Physical Society Council. He is the Swiss representative in IUPAP as of 1 January 2019.
- **Angela Benelli** (CHIPP) has been the Swiss member of the European Particle Physics Communication Network ([EPPCN](#)) since June 2017.
- **Laura Baudis** (UZH) is member of the [Dark Matter](#) advisory committee. She is the APPEC Scientific Advisory Committee chair.
- **Alain Blondel** (U. Geneva) is member of the International [Steering Committee](#) for the Hyper-Kamiokande project and member of the [FCC design](#) study coordination group.
- **Florencia Canelli** (UZH) has been a member of commission C11 of the International Union of Pure and Applied Physics ([IUPAP](#)) on particles and fields since Nov. 2014. She has been elected secretary of the IUPAP C11 Commission from 1 January 2018 for 4 years. She is a member of the Physics Advisory Committee of Fermilab, member of [LHCP](#) international advisory committee and member of the Dark Matter workshop advisory committee.
- **Günther Dissertori** (ETHZ) has been Chair-person of the International Advisory Committee for the [FCC](#) project since the beginning of 2017. He is chairman of the scientific policy committee of the INFN National Laboratory of Frascati. He is the Swiss scientific delegate to the [CERN Council](#) since January 2019 on mandate of the State Secretariat for Education, Research and Innovation (SERI).
- **Antonio Ereditato** (U. Bern) is the ad interim contact for the Swiss funding agencies ([SERI](#) & [SNSF](#)) for Swiss participation in the neutrino programme at Fermilab, USA.
- **K. Kirch** (ETHZ and PSI) is member of the Scientific Advisory Committee [SAC](#) of the European Spallation Source ESS in Lund/Sweden, is a member of the Hyper-Kamiokande [Advisory Committee](#) in Japan, is a member of the [Scientific Council](#) of the Excellence Cluster PRISMA in Mainz/Germany, is a member of the [Scientific Advisory Board](#) of the Stefan-Meyer-Institute in Vienna/Austria. Member of the European Strategy Group for [EPPSU](#).
- **Bernd Krusche** (U. Basel) continued his longstanding mandate as Swiss representative in the Nuclear Physics European Collaboration Committee ([NuPECC](#)).
- **Teresa Montaruli** (U. Geneva) has been the Swiss scientific delegate to the General Assembly of the Astroparticle Physics European Consortium ([APPEC](#)) since 2013. Teresa Montaruli has been nominated unanimously as chair of the APPEC General Assembly. She is also member of the LNGS [Scientific Advisory Committee](#). As APPEC Chair she is an invited Member of the European Strategy Group of [EPPSU](#).
- **Katharine Müller** (UZH) has been the Swiss representative in the [IPPOG](#) Collaboration since September 2017. She is in the organisation committee of the [SM@LHC Conference](#).
- **Tatsuya Nakada** (EPFL) is Chair of the Linear Collider Board [LCB](#) (subpanel of ICFA), is member of the NIKHEF Scientific Advisory Committee [SAC](#), is Chair of the [LNGS Scientific Advisory Committee](#), is Chair of the KEK Belle Program Advisory Committee. Swiss representative at the European Strategy Group of [EPPSU](#).
- **Stefan Ritt** (PSI) is president of the Nuclear and Plasma Sciences Society [NPSS](#) of IEEE
- **Leonid Rivkin** (EPFL and PSI) Strategy Secretariat Member of the European Strategy Update in Particle Physics in [EPPSU](#).
- **Olaf Steinkamp** (UZH) is a member of the [Kruger](#) International Advisory Committee.
- **Rainer Wallny** (ETHZ) is member of the Physics Advisory Committee of [DESY](#).
- **Xin Wu** (U. Geneva) was re-elected as CHIPP observer in the Swiss Commission on [Space Research](#) till December 2019.

- **Andrea Wulzer** is the chair of the CERN committee that organises the 5-week programme of lectures for the CERN Summer Students; in particular he organized the [2019 edition](#).

## COORDINATIVE TASKS

### Promotion of the next generation

One of the main objectives for CHIPP is to attract the young public to Physics and Astroparticle Physics. To achieve this goal more than 50 educational events like information days for BSc and MSc students, for pupils finishing high school and for high-school classes were organized, throughout Switzerland, involving more than 4000 young students.

More than 200 Swiss high-school pupils (at the Universities of Bern, Geneva, Zurich and the ETHZ) were invited to participate in the [International Masterclasses 'Hands on Particle Physics'](#), where over 13'000 Gymnasium level students in about 215 institutes over 52 countries can actually work with real data from the CERN Large Hadron Collider (LHC). The IceCube Masterclass was organised at the University of Geneva in March 2019 with about 60 participants from high schools.

Each institute has its own program towards young students and often organizes special events. For this year, one should mention in particular the following activities:

At the **University of Zurich** several events have been organized for high school students as the [Science Info Day](#), which takes place annually on a Saturday afternoon in March at Irchel Campus. High school students, their parents, and teachers learn about the degree programs offered by the Faculty of Science. In September, the [study information days](#), organised by UZH and ETH, provided an overview of the broad study program in Zurich. About 200 high-school students attended the lecture on the presentation for the physics major at UZH. Katharina Müller organised a series of 14 talks that were followed by 280 gymnasium students. An open day for children was organised for more than 30 children. Laura Baudis presented a series of 7 public lectures on Particle Physics to which more than 500 people attended.

**ETHZ** organized a series of eight special event days for 100 gymnasium high-school students in October and November, called [ETH-unterwegs](#). The students were invited to participate in some experiments and lectures. On the website are the programs for different schools.

Some [special days](#) for high-school classes were organized for visiting the Physics Department at ETHZ, in particular some ad-hoc days ( [Maturanden-tag](#)) for students in their last year of high school.

Activities for teachers are organized under the umbrella of the "[Didaktische Ausbildung](#)".

Several public lectures on Particle Physics were organized, one in the occasion of the development of the 200 CHF Banknote Günther Dissertori gave a special colloquium at PSI, another organized by Christoph Grab about the Discovery of the Higgs Boson.

ETHZ organised several visits to CERN, Günther Dissertori accompanied a group of VIPs/Donatoren, invited by ETH Foundation and representants from the Landesmuseums Zürich. Rainer Wallny organized a visit to CERN for the Kader des Bundes (L'Association des cadres de la Confédération) and two groups in the frame of "Studienstiftungen"

The **University of Bern** organized the [Physik am Freitag](#), which is a series of five talks to high-school students. One of these talks contains CHIPP specific topics: Florian Piegsa gave a talk on the measurement of the neutron EDM. Two "fresher days" were organized for cantonal gymnasias and for extra-cantonal gymnasias students with a total of 150 pupils guided through the physics department of the University of Bern. Three school classes visiting the LHEP with about 70 pupils total. HP Beck organized a [teacher's training](#) at CERN where talks, lectures, and visiting facilities at CERN for 15

teachers were organised. The experimental particle physics department participated to the [Nationaler Zukunftstag](#). An extraordinary successful event was organized by HP Beck in collaboration with the [Espace balloon](#) in Château-d'Oex: "[Pioneers of Cosmic Rays](#)".

The **EPFL** as every year organizes a big event for the beginning of the academic year, many professors and young students participated as staff for the 2019 EPFL [Open days](#) (14-15.9.2019): Ana Barbara Rodrigues Cavalcante, Aurelio Bay, Fred Blanc, Guido Haefeli, Lesya Shchutska, Lino Ferreira Lopes, Matthieu Marinangeli, Maria Elena Stramaglia, Marie Bachmayer, Michel de Cian, Olivier Schneider, Pietro Marino, Sara Celani, Serhii Cholak, Surapat Ek-In, Veronica Kirsebom.

Tara Nanut, an EPFL post-doc, was invited to speak at a Congress of Slovenian Physicists (4-5.7.2019), with open free access for physics students. The programme included a meet session with high school students who participated at the Physics Olympics, a LPHE [lab visits](#) was organised during the « Journée des gymnasiens, Physique EPFL ». Tara Nanut met also students from high schools and universities from Slovenia who visit CERN in a Q&A session "talk with a scientist who works at CERN". A visit of Brazilian high-school students at CERN was organised with a [round table discussion](#) moderated by Ana Barbara Rodrigues Cavalcante. Violaine Bellée talked and guided 38 high-school students during a school trip to CERN.

EPFL organised many visits to CERN during 2019, in particular we underline the visit for EPFL theorists, the visit at the CMS experiment for EPFL master students (15 participants), the visit at the LHCb experiment and at neutrino platform for EPFL bachelor students (90 participants) and the visit at CERN for Swissnex members (40 participants).

Particle physicists at **PSI** are routinely guiding visitors (~1000 per year) through the facilities and a science exhibition in the frame of the PSI-Forum. School classes are also coming with their teachers to visit the PSI school laboratory '[iLab](#)'. PSI was also involved in the very successful "[Nationaler Zukunftstag](#)" where pupils from the Swiss schools come to explore new professional horizons. A special effort is put in discovering jobs that are usually performed by the opposite gender.

We have regularly internships for interested secondary and gymnasium students. Usually they come for 2 weeks into particle physics, including our electronics development.

In **Geneva**, an information open day was held at the University for around 8000 pupils in the last year of high-school. During the three days [Stage boussole](#) several visits of the physics department and of the teaching classes were organized. A very successful series of events were organized by several researchers in the frame of the [Physiscope](#) where 180 physics shows were organized for many thousands of children.

**Basel University** organized a series of several [special events](#) high-school students and children during the full year 2018 and organized talks for the general public: "[Saturday Morning Physics](#)".

### **Information and coordination tasks supporting research and science**

[CHIPP's website](#) contains news, documents, minutes of all meetings, as well as the link to the complete membership database. The continuous dialogue between the institutes, which is enshrined in the [CHIPP Statutes and By-Laws](#), aims at having at hand in a timely and transparent manner the information about current and planned research activities. As in previous years, CHIPP took an active role in the biannual meetings of SCNAT's **Round Table International Organisations and Research Infrastructures**. The scope of this information forum is the exchange between the research fields involving with large international infrastructures. It accounts for the participation of Swiss groups in international research facilities and also comprises representatives of the SERI, SNSF, and "Swiss universities".



## Dialogue with society

The SCNAT offered a firm place with increased visibility among the other fields of science for both the CHIPP website and the more general Physics outreach website ('[particlephysics.ch](http://particlephysics.ch)'). The site was kept lively throughout 2019 with the addition of 11 interviews and other news articles. As approved by the CHIPP Board, the articles are authored by B. Vogel, a science journalist collaborating with CHIPP since many years. Dr. H. P. Beck (the University of Bern) was responsible for their scientific content and Angela Benelli inserted them on the SCNAT portal in Italian, in German and in English. CHIPP is grateful to SCNAT for supporting this activity as an important dialogue with the society.

During 2019 the CHIPP Twitter account [@CHIPP\\_news](https://twitter.com/CHIPP_news) has continuously spread physics news to increase the public awareness about science and publicized available jobs in academia and outside for physicists.

At the EPFL, G. Pietrzyk is in charge of the LHCb Experiment Twitter account: [@lhcbexperiment](https://twitter.com/lhcbexperiment) and the [LHCbExperiment](https://www.instagram.com/lhcbexperiment) Instagram Account with around 3500 and 13000 followers respectively. The University of Geneva has set the Particle Physics Twitter [@DPNC\\_Unige](https://twitter.com/DPNC_Unige). The Facebook site [Verflixtes Higgs](https://www.facebook.com/VerflixtesHiggs) continued to be fed by Dr. H. P. Beck.

With A. Benelli as the Swiss member in the European Particle Physics Communication Network (EPPCN), CHIPP continues its link between the CERN press office and the Swiss media, as well as with the communication offices of the institutes related to CHIPP. The contact has been established and a measure of the [media coverage of particle physics in Switzerland](#) is provided on-line.

CHIPP Members gave outreach talks and interviews on particle physics for high-school students, societies and the general public, we would like to mention some of them:

- BBC Crowd Science programme of BBC World Service: interview of Tara Nanut (EPFL) for [radio programme](#) and featuring in a [video clip](#)
- Interviews of Maria Vieites Diaz (EPFL) in regional [newspapers](#) and in the [national TV](#) in Spain.
- Talk by Maria Vieites Diaz (EPFL) at "[X Young Researchers Meeting](#)" to an audience of 80 people
- Interview to Laura Baudis: [Elusives Network](#) in the frame of «A day in the life of a physicist»: "I am involved in designing deep underground experiments"
- Interview to Laura Baudis in the Springer Nature: [Conversations with our Authors](#)
- G.Dissertori participated to a documentary on the Swiss television SRF in the Einstein program, on the [CMS experiment](#). He was interviewed in several magazines in particular in the Schweiz am Wochenende, NZZ, NZZaS and Beobachter magazines on the Higgs, the future of HEP, FCC and in the occasion of the release of the 200CHF Swiss bank notes.
- Several physicists involved in the CTA experiment participated to the [press conference](#) in Lugano the 4<sup>th</sup> June 2019.
- Adrian Bilan presented the MAGIC Press Conference and Reception by Armenian Minister of Education, Science, Culture and Sport, Yerevan (Armenia).
- A series of interviews and conferences were organised by the University of Geneva on the AMS experiment:
  - Conférence à Uni3 - Université des seniors de Genève Titre: Une analyse des rayons cosmiques qui traversent toute la galaxie: la physique dans l'espace avec l'expérience AMS, [video of the event](#) 15 Octobre 2019.
  - [Live webcast](#) for the 1st Spacewalk to replace the AMS02 Tracker cooling system streamed on ESA Web TV: interview and question& answers session with people following on social media, 15 Novembre 2019
  - [Live webcast](#) for the 3rd spacewalk for AMS, interview and question& answers session with people following on social media 2 December 2019

- An extraordinary successful event was organized by HP Beck in collaboration with the [Espace balloon](#) in Château-d'Oex: "[Pioneers of Cosmic Rays](#)".
- HP Beck was invited to Brazilian National Meeting on Nuclear Physics, Particles and Fields at Campos do Jordão, Brazil, 1-8 September 2109, to give a colloquium on effective outreach. Beck was invited to Tbilisi, Georgia, 23-27 October, to give a colloquium to students from different fields. He was interviewed in several magazines: in the [NZZ](#) on FCC and CLIC projects at CERN, in the [Freier Schweizer](#) and in NZZ am Sonntag.

### Gender issue & society

Several physicists from the EPFL participated to event designed to raise public awareness of gender issues in the scientific environment:

- Tara Nanut gave a talk at a private event of the Lombard Odier Foundation for their employees, of the series Open Gender Lunch Initiative, This event was then follow-up by an article on [Open Science](#).
- Violaine Bellée, Ana Barbara Rodrigues Cavalcante and Tara Nanut participated in the "Journée internationale des femmes et filles de science / [International Day of Women](#) and Girls in Science" (11-15 February 2019) through 5 [presentations](#) in primary schools in Geneva, as well as participation as moderator in girls-only masterclasses (120 participants)  
This campaign has been initiated by the United Nation to draw the attention of the international community to the serious gender gap that affects the science institutions. CHIPP has contributed to the campaign joining the CERN press office [Twitter](#) project #WomanInScience explaining the work by several women in the Swiss institutes.
- Ana Barbara Rodrigues Cavalcante participated in the 2019 "[Girls in ICT day](#)"

### Exhibitions

At the University of Zurich science museum started the preparation of a scale model of the CMS experiment by Prof. B. Kilminster.

The EPFL presented the LHCb detector and SciFi tracker project with prototypes of fibre modules, as well as cosmic ray tracker demo at "Salon des technologies et de l'innovation de Lausanne" (STIL), [Swiss Tech Convention Centre](#). The development and construction of a cloud chamber for outreach activities; the cloud chambers was shown at the 2019 EPFL Open Days and several other occasions.

A temporary [exposition](#) was organised with the collaboration of HP Beck (University Bern and Fribourg) at the Espace Baloon to connect the history of the discovery of cosmic rays, with the balloon flights of Gockel, Hess and Kolhörster, to discoveries made with cosmic rays on high altitude research stations as the Jungfrauoch, and leading to modern particle physics.