Newsletter, 1 June 2023

Dear Reader,

This Newsletter is intended for all SPS members, researchers, industries, students, interested specialists and physics friends. Feel free to share this Newsletter within your community, and follow this link if you want to add a person to our mailing list.

If you wish to give your contribution with news or suggestions, please do not hesitate to contact me at: margherita.boselli@cern.ch

Kind regards,

Margherita Boselli

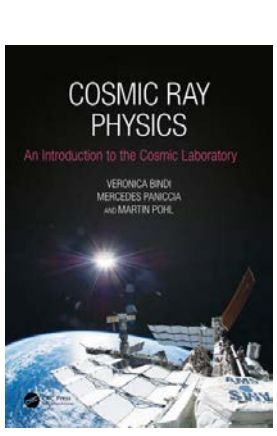
WHAT'S UP IN SWITZERLAND?

Young Physicist Forum 2023

The **2023 edition of the Young Physicists Forum** took place from May 5 to May 7 at the University of Bern. It was an exciting weekend where Bachelor's, Master's and PhD students from all around Switzerland gathered together to learn more about the contributions of physics in modern medicine. More information about the event will be available on the YPF website soon. Congratulations to the organizers, we are looking forward to the 2024 edition!

A new book on Cosmic Ray Physics

Veronica Bindi, Mercedes Paniccia and Martin Pohl, Professor at the University of Geneva, recently published the **book "Cosmic Ray Physics"**. This book documents the answers that cosmic ray physics can provide today, in the light of up-to-date experimental findings. It starts out with a brief history of this branch of physics, from early research on "air electricity" to today's precision experiments on ground, underground and in space.

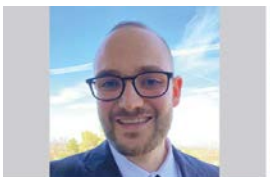


The book aims to be accessible for novice readers without in-depth knowledge of particle physics, without becoming boring for experts. To achieve this, technical information is concentrated in boxes accompanying the narrative flow. The same is true for detailed arguments requiring background physics knowledge or mathematical tools.

Citation: Veronica Bindi, Mercedes Paniccia, Martin Pohl, "Cosmic Ray Physics", 2023, CRC Press

2023 SCNAT Prix Schläfli

On May 23, SCNAT announced the winners of the **2023 edition of the** Schläfli prize. **Simone Bavera** for Astronomy, **Joël Bloch** for Biology, **Michelle Frei** for Chemistry and




Ariandni Afroditi Gerogatou for Geosciences were honoured with the prize for the scientific findings made in the context of their dissertations. The Prix Schläfli has been awarded since 1866 and it recognizes four significant discoveries made by young researchers at swiss universities.

Image: from top left Joël Bloch, Ariandni Afroditi Gerogatou, Michelle Frei, and Simone Bavera.

SCNAT 2022 Annual report

SCNAT published the 2022 Annual Report, a document summarising the topics and projects on which the Swiss Academy of Sciences focused in the past year.

One of SCNAT's priorities in 2022 was to promote the dialogue between science and politics. This objective led to the preparation of the document "Science Advice Network" and to the organization of the event "Science et Politique à table". Other important topics for the SCNAT were the interplay between renewable energy production, the landscape and biodiversity preservation, and the climate crisis. In this context, the report contains a double interview with Karin Ingold, head of ProClim, and Florian Altermatt, head of the Swiss Biodiversity Forum.

Link to the report

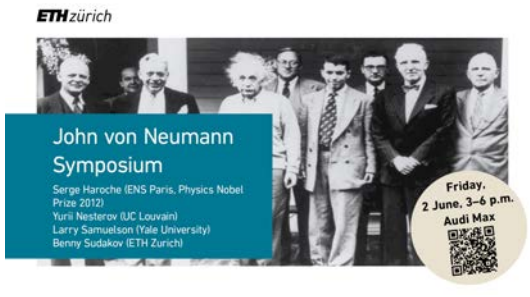
INSPIRE Master award

One of the main missions of the EPFL Center for Quantum Science and Engineering (QSE Center) is to attract excellent female students to the field of quantum science. To this end, the QSE Center together with ETH Zurich, NCCR Spin and NCCR Marvel is launching the **INSPIRE Quantum Master Awards**. These awards aim to attract and support excellent female students who will carry out their master's project in the research areas represented at the QSE Center.

The awardee will receive 8000 CHF payed directly to her. External applicants can receive up to an additional 2000 CHF to cover the travel expenses.

The next application deadline is **June 1, 2023**. More information can be found here.

John Von Neumann Symposium at ETH Zurich



To celebrate **John von Neumann** (1903 - 1957) who subscribed to ETH Zurich for a degree in chemical engineering 100 years ago, in 1923, ETH is organizing an afternoon of exciting talks in some of the domains von Neumann's pioneering work continues to be of great importance.

The symposium will take place on **Friday, June 2, 2023**, starting at **15h00** in the ETH Audimax. The program includes four talks by Serge Haroche (ENS Paris), Yurii Nesterov (UC Louvain), Larry Samuelson (Cowles Foundation at Yale University) and Benny Sudakov (from ETH Zurich). The scientific presentations will be followed by an aperitif. Registration is not required, but in the interest of matching space and aperitif to participants, it would be great if prospective participants could fill out this form.

Bell inequality violation with superconducting circuits

A group of researchers led by **Andreas Wallraff, Professor of Solid State Physics**

at ETH Zurich, has carried out a **loophole-free Bell test** to disprove the concept of “local causality” formulated by Albert Einstein in response to quantum mechanics. By showing that quantum mechanical objects that are far apart can be much more strongly correlated with each other than is possible in conventional systems, the researchers have provided further confirmation of quantum mechanics.

To do this, they built an impressive facility in the underground passages of the ETH campus. At each end is a cryostat containing a superconducting circuit. These two apparatuses are connected by a 30-metre-long tube whose interior is cooled to a temperature just above absolute zero. The reason for building such a large experiment was to have an apparatus where light would have taken longer to travel from one superconducting circuit to the other than the measurement time.

The results have been published on Nature on May, 10, 2023.

Image: A section of the 30-metre-long quantum connection between two superconducting circuits. Photograph ETH Zurich / Daniel Winkler.