swiss physical society

Newsletter, 29 January 2021

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?

Publication and distribution of SPS-Communications Nr. 63

The Nr. 63 SPS-Communications journal has been distributed to the SPS-members this week. Among different interesting articles included in this edition of the SPS-Communications, you may enjoy reading about the relationship between politics and science during the Covid-19 pandemics, about a motor that fits into a 1 nm^3 cube, and about the work of the researchers awarded with the last year Nobel prize in Physics.

All the editions of the SPS-Communications from 1999 on can be downloaded from the dedicated section of the SPS website.

Online Science Shows run by CERN S'Cool lab

CERN S'Cool lab offers interactive online science shows for school classes who can participate both from their classroom and from home. There are two shows currently available: "It's Just a Phase" and "Superconductors take off". "It's Just a Phase" is a show where participants will discover the states of matters through a series of engaging experiments. This activity is recommended for students above 12 years old (middle school classes). "Superconductors take off" guides the participants into the world of superconductivity and its applications at CERN. The recommended minimum age for taking part in the activity is 14 years old. For more information and reservations do

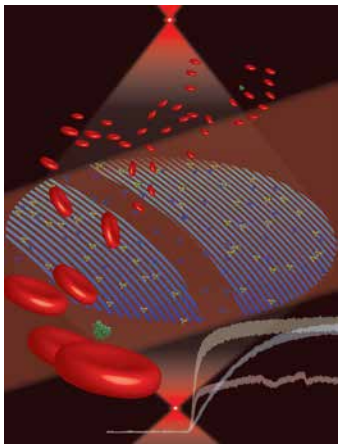
not hesitate to get in touch with the S'Cool lab team.

Understanding Dark Energy with DESI

The Dark Energy Spectroscopic Instrument (DESI), designed to measure the effect of dark energy on the expansion of the Universe, aims to construct a 3D map of galaxies and quasars spanning the nearby Universe to 11 billion light years. Before DESI can start its 5-year mission from an Arizona mountaintop, an even larger 2D map is needed. Such a map, which covers half of the sky and shows more than 1 billion galaxy images, was now stitched together from 200'000 telescope images and years of data. This map will help to identify the galaxy and quasar targets for DESI, which will measure their light to determine their redshift and distance. The ultimate goal is to unravel the mysterious dark energy which drives the accelerated expansion of the Universe. Dark energy makes up about 68% of the energy density of the Universe, while 5% is made out of dark matter, which leads to the formation of galaxies, clusters, and large-scale structures. In Switzerland, groups at the University of Zurich are involved in experimental direct dark matter detection (more information can be found on the particle astrophysics group page and on the DAMIC experiment page), while a group at the ETH is working on the Dark Energy Survey (DES), which recently released data from six years of observation, including about 691 million objects.

An image extracted from the Sky Viewer map, a resource publicly viewable that includes 2 billion objects, more than half of which are galaxies, and numerous features to select and explore individual objects.

New developments in Focal Molography method



The biomolecular interaction analysis (BIA), i.e. the direct and label-free monitoring of the binding events between biomolecules on a sensor surface, is a key methodology in molecular biology, developed over the past 30 years. The new BIA method "Focal Molography" was described within the series "Progress in Physics" of the SPS-Communications Nr 62 (October 2020). In addition, new development results of Focal Molography are recently presented in two papers, providing an in-depth analysis [Part I] and a demonstration [Part II] of the “spatial affinity lock-in” as a universal design principle to overcome the drawbacks of the established refractometric BIA methods. This finding, combined with the right surface chemistry and recognition elements on the sensor surface, might lead to robust and sensitive environmental/medical sensors that enable new applications.

In the image a representation of the Focal Molography technique (from C. Fattinger).

WHAT'S UP IN THE WORLD?

STEMtastic21 online from 5 to 14 March

STEMtastic21 is an innovative virtual celebration of science, technology, engineering and maths. From Friday 5 to Sunday 14 March 2021, watch some of the world's leading scientists, engineers and innovators talking about their work and join in with STEM workshops and activities. The event is totally free, virtual and a true festival of STEM. More information and registration on the

STEMtastic21 website.

Women in science Wiki page with APS March meeting

The American Physical Society (APS) and Wiki Scientist Course Alum are hosting a virtual Wikipedia Editathon, focusing on women and minorities in STEM, in conjunction with the APS March Meeting 2021. This event is a virtual meeting taking place on Pi Day, **Sunday, March 14 from 11:00 a.m. CDT to 2:00 p.m. CDT** to create Wikipedia pages about inspiring women and minority physicists. You do not need to be a registered attendee of March Meeting to attend. For more information visit the event webpage and register here.