ELPH seminar

講師： Catalina Curceanu
Laboratori Nazionali di Frascati dell'INFN, Via E. Fermi 40, 00044 Frascati (Roma), Italy

日時： 12月20日（火）10:00 – 10:50

場所： 電子光理学研究センター三神峯ホール

Kaonic atoms at the DAΦNE Collider in Italy: a strangeness Odyssey

The low-energy QCD, the theory within the Standard Model describing the strong interaction, is still missing fundamental experimental results in order to achieve a breakthrough in its understanding. Among these experimental results, the low-energy kaon-nucleon/nuclei interaction studies are playing a key-role, with important consequences going from particle and nuclear physics to astrophysics (neutron stars and their equation of state).
Combining the excellent quality of the low-energy kaon beam delivered by the DAΦNE collider in Frascati (Italy) with new experimental techniques, as fast and very precise X ray detectors, like the Silicon Drift Detectors, we have performed unprecedented measurements in the low-energy strangeness sector in the framework of the SIDDHARTA Collaboration and are presently running the SIDDHARTA-2 experiment for the challenging kaonic atoms measurements, such as kaonic deuterium first measurement.
I shall introduce the physics of kaonic atoms, the experiment and the first results, and discuss future plans.
The experiments at the DAΦNE collider represents an unique opportunity in the world to, finally, unlock the secrets of the QCD in the strangeness sector and contribute to better understand the role of strangeness in the Universe, from nuclei to the stars.

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講師： *Francesco Sgaramella*
Laboratori Nazionali di Frascati dell'INFN, Via E. Fermi 40, 00044 Frascati (Roma), Italy

日時： 12月20日（火）10:50 – 11:40

場所： 電子光理学研究センター三神峯ホール

Kaonic Atom X-ray spectroscopy: the kaon mass puzzle

Kaonic atoms X-ray spectroscopy is a unique tool to provide experimental data with consequences going from particle and nuclear physics to astrophysics. 30 years ago, kaonic atoms were used to measure the charged kaon mass with unprecedented precision. However, there is still a discrepancy of 60 keV between the two most precise measurements, leading to an error of 16 keV on the charged kaon mass with severe consequences for particle physics and all those processes in which kaons are involved, such as the charmonium spectrum.

Combining the excellent quality of the low-energy kaon beam delivered by the DAΦNE collider in Frascati (Italy) with new experimental techniques, as fast and very precise X-ray detectors, we have performed unprecedented measurements of medium and heavy mass kaonic atoms, in the framework of the SIDDHARTA Collaboration, with implication on the charged kaon mass.

I shall introduce the kaon mass puzzle, the first measurement of the kaonic neon, the ongoing measurement of the kaonic lead and their impact on the kaon mass. Finally, I shall discuss future measurements that can lead to the solution of the kaon mass puzzle.

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