Szanowni Państwo,
Rozpoczynamy cotygodniowe spotkania „Seminarium Fizyki Jądra Atomowego”.
Zgodnie z poleceniem władz UW i Wydziału Fizyki, zajęcia te będą odbywały się w trybie „online” za pomocą programu „zoom.us”. Link (ten sam dla wszystkich spotkań), aktywny w każdy czwartek w godz. od 10.00 do 12.00 to:

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Seminarium w czwartek 22 października 2020, wygłosi **mgr. Eliana Masha** z **Università degli studi di Milano and INFN, Sezione di Milano, Milano, Italy.**

Tytuł seminarium:
“Underground nuclear astrophysics and the study of ^{22}Ne(α; γ)^{26}Mg and ^{20}Ne(p; γ)^{21}Na reaction at LUNA.”

Abstract:
The cross sections of nuclear reactions that take place in different astrophysical scenarios are crucial ingredients to understand the synthesis of the elements and energy generation. In stars, nuclear reactions occur at energies well below the Coulomb barrier. Therefore, their cross sections are often too small and very difficult to be measured in laboratories at the Earth’s surface, where the signal would be covered by the cosmic-ray induced background. An effective solution to suppress the cosmic-ray induced background is to perform experiments in underground laboratories. The extremely low background reached at the Laboratory for Underground Nuclear Astrophysics (LUNA) located deep underground at Gran Sasso National Laboratories (Italy) allows to measure nuclear cross sections directly at the energies of astrophysical interest. In the last 30 years, many crucial reactions involved in different astrophysical scenarios have been measured at LUNA.
The presentation will provide an overview of the measurements of ^{22}Ne(α; γ)^{26}Mg and ^{20}Ne(p; γ)^{21}Na reactions ongoing at LUNA. The ^{22}Ne(α; γ)^{26}Mg reaction competes with the ^{22}Ne(α; n)^{25}Mg reaction which is the main source of neutrons for the s-process in low-mass Asymptotic Giant Branch (AGB) and massive stars. Moreover, it has been found that the uncertainty of the ^{22}Ne(α; γ)^{26}Mg reaction rate affects also the nucleosynthesis of isotopes between ^{26}Mg and ^{31}P in intermediate-mass AGB stars. The ^{22}Ne(α; γ)^{26}Mg reaction rate is influenced by the 395 keV resonance which has been studied only indirectly leading to a wide range of possible values for its resonance strength (10-15 - 10-9 eV). For the first time LUNA measured directly the resonance at 395 keV. The experimental details and preliminary results will be shown, together with their possible impact on the ^{22}Ne(α; γ)^{26}Mg reaction rate. The ^{20}Ne(p; γ)^{21}Na is the first reaction of the NeNa cycle and having the slowest reaction rate it controls the speed of the entire cycle. The rate of the ^{20}Ne(p; γ)^{21}Na reaction, depending on the temperature, is dominated by the high energy tail of a sub-threshold state at E_R = 6.7 keV, a direct capture component and a narrow resonance at E_R = 366 keV. The first campaign, dedicated to the study of the 366 keV resonance is ongoing at LUNA. The experimental approach as well as some "online" analysis will be shown.

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