Contribution ID: **277** Type: **Oral presentation (plenary)**

Underground Laboratories and Dark Matter direct detection

Friday 22 July 2022 12:00 (30 minutes)

Deep Underground Laboratories are large research infrastructures with a rock overburden of order one km water equivalent.
In DULs the flux of muons from cosmic rays is reduced by several orders of magnitude with respect to surface. This allows to search for very rare events,
such as exotic radioactive decays, double beta decays, low energy neutrino and dark matter interactions.
The phenomenon of neutrino oscillations has been discovered in DULs back in 1998. Solar neutrinos were first observed in a DULs in 1968.
In 1987 neutrinos from a core collapse supernova in the Large Magellanic Cloud were observed in DULs, confirming our basic understanding of this high energetic event.
At present, DULs are equipped with more sensitive and better performing experiments to improve significantly these early studies.
In the last decade the research horizon in DULs has expanded to include gravitational waves, geophysics, and biology in underground environments.
DULs are equipped with unique facilities to support research by means of different techniques.
DULs are being used by a large community of scientists ranging from astrophysics, particle physics, geophysics, and biology.
There are 14 underground locations worldwide which can be classified as DULs.
In the talk a brief review of DULs main features and research activities will be discussed with emphasis to rare events search, in particular to dark matter direct detection.

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Session Classification: Plenary 5