

**INTERNATIONAL SYMPOSIUM**  
**Advances in Dark Matter and Particle Physics**  
**Messina (Italy) , October 24-27, 2016**

**Scientific Editors:**

Marco Battaglieri, Francesca Curciarello, Giuseppe Mandaglio, Mauro Raggi, Paolo Valente

**Symposium presentation:**

The Symposium will focus on the latest results of running experiments and new ideas in dark matter and dark force searches at accelerators. This new and rapidly growing field is based on the idea of the existence of light dark matter with particle-like nature but with a very weak coupling to the Standard-Model world. Light dark matter may be produced in the interaction of moderate energy ( $\sim$ GeV) but high intensity ( $\sim 10^{20}$  EOT/year) electron and proton beam with ordinary matter and detected via its decay to  $e^+e^-$  pairs (visible decay) or via the effect of the interaction with a detection volume (invisible decay). In a consistent way, a new boson (the  $A'$  or dark photon) is expected to mediate the interaction between the light dark matter and the SM particles. An  $A'$ , with mass in the MeV-GeV range, is predicted in various extensions of the Standard Model of elementary particles by adding a new gauge symmetry interacting with SM particles, the  $A'$  provides a “portal” between the ordinary matter and the secluded sector. Over the past few years, an intense activity has produced a significant number of experimental programs focused on dark photon search with different techniques. The  $A'$  search is being pursued in the major high-energy and nuclear physics facilities world-wide, with a notable concentration in USA and Europe.

The latest results in dark photon searches both in the invisible and visible will be reviewed in the broader context of the current searches for dark forces and light dark matter using beam dump experiments, meson decays, and other techniques. Special emphasis will be placed to the complementarity of the different approaches and the perspectives of joint efforts between major players on the two sides of the Atlantic Ocean.

The Symposium will also review and discuss, from experimental and theoretical point of view, other topics relevant in astrophysics, high precision test of Standard Model, meson resonances formation in hadronic and non-hadronic channels, hadron spectroscopy, leptons and electromagnetic radiation.

**Organized by:**

University of Messina

Ministero degli Affari Esteri e della Cooperazione Internazionale

Fondazione Bonino-Pulejo (Messina)

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**Topics:**

- Dark matter and dark forces
- Hadron Spectroscopy
- R measurements
- Searches of new particles and interaction forces
- Precision Tests of Standard Model

Website: <http://newcleo.unime.it/Events/ADMPP2016>