Contribution ID: **300** Type: **Plenary**

From COMPASS to AMBER: from the proton spin crisis to the hadron mass puzzle

Friday, 9 June 2023 14:00 (30 minutes)

Proton spin crisis was initiated by the EMC (CERN, SPS) collaboration measurement in late 80's which says proton spin carried by quarks far smaller than 100%. Where is the rest coming from? Yes, from gluon contribution and orbital momenta, but details still to be understood. Today, the next biggest science question is: why proton is so heavy and pion is so light? The origin of hadron masses is deeply connected to the parton dynamics just like the spin contributions. We are in a very beginning of the journey to find an answer to this question.

AMBER is a newly approved fixed-target facility in the EHN2 experimental hall of the SPS at CERN, devoted to various fundamental QCD measurements. A determination of the valence-quark PDF of the pion, through Drell-Yan and J/Psi di-muon production, Direct Photon production and high precision Hadron Spectroscopy measurement would provide the needed sensitivity to the mechanism(s) responsible for the emergence of mass in QCD. At the initial phase (Phase-1) of the experiment unique measurements of the proton-charge radius and antiproton production cross-section in proton-He4 collisions will as well take place.

Primary author: DENISOV, Oleg (Istituto Nazionale di Fisica Nucleare)

Presenter: DENISOV, Oleg (Istituto Nazionale di Fisica Nucleare)

Session Classification: Plenary

Track Classification: Plenary