Contribution ID: **57** Type: **Invited Talk**

Review of recent progress in di-baryonic sector

Tuesday, 14 September 2021 16:00 (30 minutes)

Several new findings in the four, five and six quark systems have catalysed new interest in the field of multi-quark states. Very significant progress has recently been made in the 6q sector, on both the theoretical and experimental fronts. The first theoretical work on di-baryonic states can be dated back to Dyson and Xoung (1964) when they predicted an existence of six non-strange dibaryons based on SU(6) symmetry. Finally, we were able to identify the last members of this sextet experimentally, by detecting isotensor dibaryon.

Major progress has been made by extending di-baryonic studies from hadronic beams to electromagnetic probes. Latest results from ELPH and MAMI facilities confirm the feasibility of dibaryon production in photo-induced reactions. Clean and controlled environment of photon beams allows to pin down our knowledge about the size and internal structure of di-baryonic states.

A lot of progress has been made by heavy-ion experiments in extracting baryon-baryon interaction strength in the strange quark sector.

A progress in experimental part was complimented by the theoretical studies. Latest results in quark models and lattice QCD calculations demonstrated significant improvement in our understanding of di-baryonic physics.

The results on di-baryonic states also got a new pace in astrophysical direction, where the property of the lightest genuine hexaquark state was linked to a neutron star dynamics and the limits on heaviest possible neutron star mass.

In my talk I will review recent experimental results and outline future perspectives in di-baryonic sector.

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Session Classification: Oral Presentations