Contribution ID: **151** Type: **Parallel talks**

Phase transitions in strongly-coupled gauge theories and glueball Dark Matter

Wednesday 19 July 2023 17:00 (20 minutes)

We delve deeper into the potential composition of dark matter as stable scalar glueballs from a confining dark $SU(N)$ gauge theory, focusing on $N = \{3, 4, 5\}$. To predict the relic abundance of glueballs for the various gauge groups and scenarios of thermalization of the dark gluon gas, we employ a thermal effective theory that accounts for the strong-coupling dynamics in agreement with lattice simulations. We compare our methodology with previous works and find that our approach is more comprehensive and reliable. The results are encouraging and show that glueballs can account for the totality of dark matter in many unconstrained scenarios with a phase transition scale $20\ MeV < \Lambda < 10^{10}\ GeV$, thus opening the possibility of exciting future studies.

Authors: CARENZA, Pierluca; PASECHNIK, Roman (Lund university); Dr WANG, Zhi Wei (CP3-Origins, SDU)

Presenter: PASECHNIK, Roman (Lund university)

Session Classification: Particle cosmology: Theory and Experiment

Track Classification: Particle cosmology: Theory and Experiment