

KCETA Colloquium

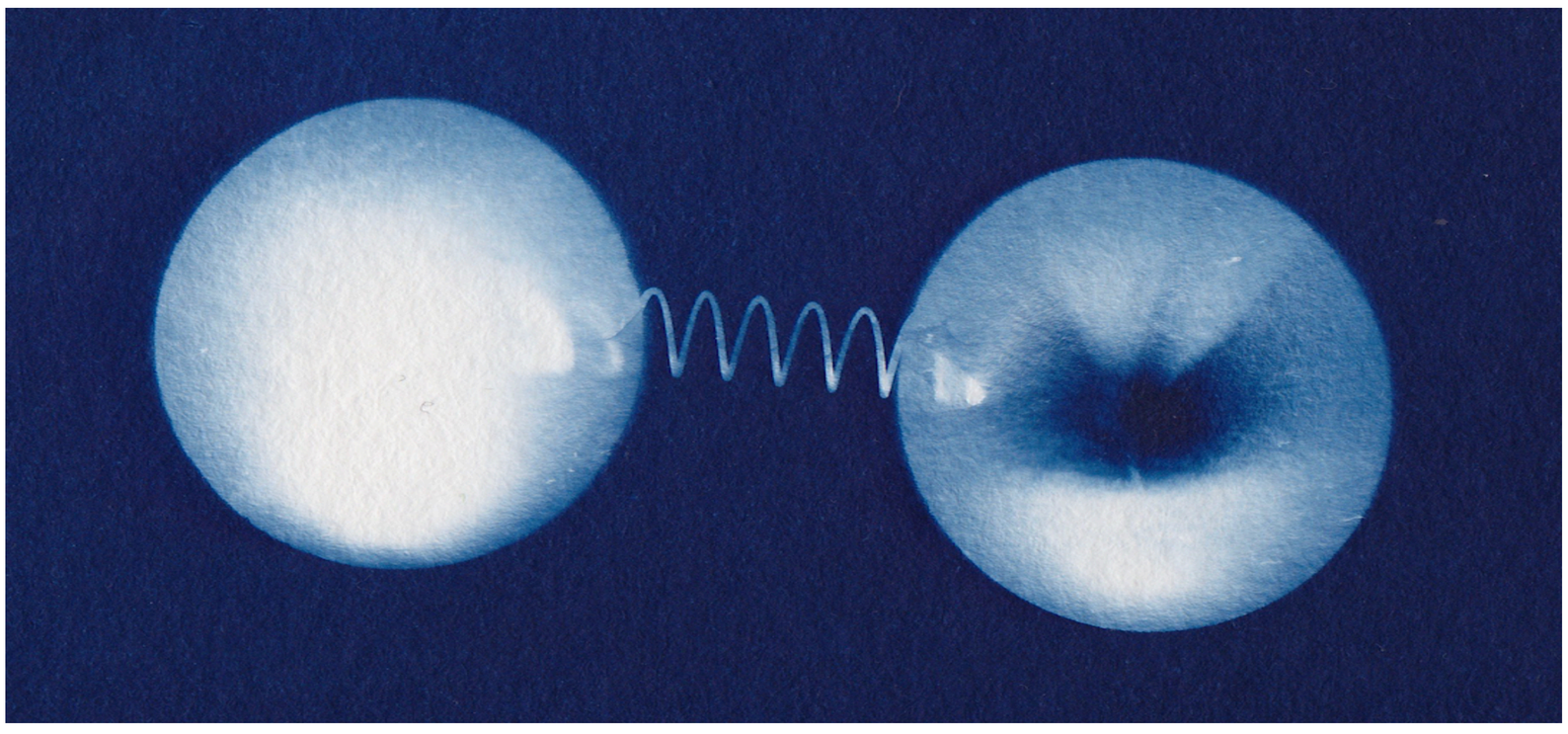
Probing the top quark pair production threshold at the LHC

Thursday, October 29, 2026
Kleiner Hörsaal A (CS) 15:45 - 17:00

Dr. Laurids Jeppe
(CERN)

Top quarks, the most massive fundamental particles known to date, are the only quarks that do not form classical bound states, since their large decay width prevents the formation of narrow quarkonium-like resonances. Nevertheless, non-relativistic QCD predicts a broad, pseudoscalar-like enhancement of the top quark pair ($t\bar{t}$) production rate just below the $t\bar{t}$ threshold. I will present a brief overview of the theory behind this enhancement, as well as the difficulties in modeling it in Monte Carlo simulation. Then, I will discuss the experimental measurements that have observed enhancements compatible with this effect: in the dilepton decay channel of $t\bar{t}$ by both CMS and ATLAS, and in the lepton+jets decay channel by CMS.

I will also briefly compare the measurements and discuss their tensions with respect to each other. Finally I will discuss the possibility of BSM interpretations of the excess and possible future avenues for investigation.



Please note:
The colloquium will also be live-streamed to B401 SR410 (CN).

KIT Center Elementary Particle and Astroparticle Physics (KCETA)
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