

ICHEP2012



Contribution ID: 421

Type: **Parallel Sessions**

## Heavy-quarkonium theory in the LHC era

*Saturday, July 7, 2012 2:00 PM (15 minutes)*

We review the present landscape of heavy-quarkonium theory, its tests by worldwide collider and fixed-target experiments, and the future perspectives offered by the LHC. Special emphasis is placed on the effective quantum field theory of nonrelativistic QCD (NRQCD), endowed with the factorization theorem conjectured by Bodwin, Braaten, and Lepage, which arguably constitutes the most probable candidate theory at the present time. Being impressively consolidated at the next-to-leading order (NLO) by the world's data on unpolarized J/psi production, NRQCD factorization has now reached the crossroads. In fact, NLO NRQCD exhibits encouraging agreement with the first J/psi polarization measurement at the LHC, performed by ALICE at 7 TeV (cf. the cover story of the current issue of CERN Courier), while it severely disagrees, by 10-20 experimental standard deviations, with a similar measurement by CDF at Tevatron's Run II, with 1.96 TeV. In this tantalizing situation, we eagerly await final clarification by the wealth of LHC data to come.

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**Session Classification:** Room 217 - Education & Outreach - QCD, Jet, Parton Distributions - TR15&6

**Track Classification:** Track 6. QCD, Jets, Parton Distributions