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What Heavy Flavor Has Taught Us About the QGP and Whats in Store for the Future

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In ultra-relativistic heavy-ion collisions a hot and dense QCD matter, called Quark- Gluon Plasma (QGP), is produced. Heavy quarks (charm and beauty) are powerful probes to investigate the production and properties of the QGP. They are produced in hard scattering processes with large momentum transfer before the formation of the QGP, thus experiencing the full evolution of the system. The partons transversing the QGP undergo energy loss by collisional and radiative processes. The dependence of these processes on the mass and color charge of partons can be studied with charm and beauty quarks. Furthermore, quarkonia, which are bound states of heavy flavor quarks and their anti-quarks are of particular interest for the understanding of the deconfined QGP, as they exhibit unique features like the recombination of quark and anti-quark due to their abundance at LHC energies. In this talk, I will present a review of the most recent open heavy-flavour hadron and quarkonia measurements at RHIC and at the LHC. I will discuss what we have learnt from these results, and project future prospects.