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Creating the Primordial Quark-Gluon Plasma at the LHC

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Ultra-relativistic collisions of heavy ions at the Large Hadron Collider (LHC) and the Relativistic Heavy Ion Collider (RHIC) create an extremely hot system at temperatures (T) expected only within the first microseconds after the Big Bang. At these temperatures (T $\sim$ 2 x 10^{12} K), a few hundred thousand times hotter than the sun's core, the known "elementary" particles cannot exist and matter "melts" to form a "soup" of quarks and gluons, called the quark-gluon plasma (QGP). This "soup" flows easily, with extremely low viscosity, suggesting a nearly perfect hot liquid of quarks and gluons. Furthermore, the liquid is dense, highly interacting and opaque to energetic probes (fast quarks or gluons). RHIC has been in operation for twelve years and has established an impressive set of findings. Recent results from heavy ion collisions at the LHC extend the study of the QGP to higher temperatures and harder probes, such as jets (energetic clusters of particles), particles with extremely large transverse momenta and those containing heavy quarks. I will present a motivation for physics in the field and an overview of the new LHC heavy ion results in relation to results from RHIC.