Quark-Gluon Plasma

What Kind of Fluid is a Quark-Gluon Plasma?

The hot soup of free quarks and gluons that existed in the very early universe, and a state of matter that physicists have been trying to re-create amid high-energy nuclear collisions, QGP is actually not a superfluid, as the original version of Update 681 erroneously suggested.

According to University of Washington physicist Laurence Yaffe (206-543-3902, lgy@phys.washington.edu), QGP is actually a normal, conducting fluid. It has viscosity, eliminating it from the list of superfluids. It is somewhat electrically resistive, precluding it from being a superconductor. http://www.aip.org/enews/physnews/2004/split/683-3.html 2

Particle collisions recreating the **quark-gluon plasma** (QGP) that filled the early universe reveal that droplets of this primordial soup swirl far faster than any other fluid. The new analysis of data from the Relativistic Heavy Ion Collider (RHIC) - a U.S. Department of Energy Office of Science User Facility for nuclear physics research at Brookhaven National Laboratory - shows that the "vorticity" of the QGP surpasses the whirling fluid dynamics of super-cell tornado cores and Jupiter's Great Red Spot by many orders of magnitude, and even beats out the fastest spin record held by nanodroplets of superfluid helium.

"The theory is that if I have a fluid with vorticity - a whirling substructure - it tends to align the spins of the particles it emits in the same direction as the whirls," Lisa said. And, while there can be many small whirlpools within the **QGP** all pointing in random directions, on average their spins should align with what's known as the angular momentum of the system - a rotation of the system generated by the colliding particles as they speed past one another at nearly the speed of light.

Read more at: https://phys.org/news/2017-08-liquid-quark-gluon-plasma-vortical-fluid.html

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