The Perfect Fluid Created at RHIC

Abstract

The experiments of Au-Au collision carried at Relativistic Heavy Ion Collider (RHIC) in BNL have created a kind of hot, dense matter called quark-gluon plasma (QGP) which exhibit intriguing properties. It is extremely opaque to energetic quarks and gluons travelling through it. This matter behaves like a "perfect fluid" with extremely low viscosity. (Its viscosity-to-entropy ratio $\eta/s$ is about 380 times smaller than the value for water under normal conditions and 9 times lower than that for liquid helium.) Later on, similar properties have been observed in strongly correlated system. Such kind of matter must have existed in the early universe about $10^{16}$ s after the big bang. By recreating the matter in a laboratory environment and studying its properties and formation will help us gain a deep insight in what the early universe may look like.

Reference