"Influences of nuclear structure on the 'little bangs' from ultrarelativistic heavy ion collisions"

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Microseconds after the Big Bang, the universe was filled with an extremely hot and dense state of matter called the Quark Gluon Plasma. Then the tiniest building blocks of matter, quarks and gluons, were not yet confined inside of protons and neutrons but produced an exotic state of strongly interacting matter that behaved as a nearly perfect liquid. Over the past 15 years, collider experiments have been smashing heavy-ions together at nearly the speed of light in order to produce a tiny droplet with a radius (~ trillionth cm) and temperature high enough (~ a few trillion Kelvin) to recreate the Quark Gluon Plasma in the laboratory. While the the evolution of the Quark Gluon Plasma liquid is well simulated via state-of-the-art relativistic viscous hydrodynamics, many questions still remain about the initial state immediately after the collision before hydrodynamics is even applicable. In recent years heavy-ion collisions have noted that the assumption of spherical nuclei (and even protons) in their ground state cannot account for experimental data, thus, initial conditions with deformed nuclear structure have been necessary to reproduce experimental data in ultra central collisions. Questions still remain for certain nuclei, such as Pb^{208}, which has a double magic number but hints of an initial triangular shape puzzle physicists..

Tuesday, November 27, 2018

4:00 pm

Roger W. Finlay Conference Room
Coffee and Cookies at 3:50 pm