UIC COLLOQUIUM
Department of Physics

Wednesday, February 12, 2020

“Fluid Dynamics in the Extreme - The Quark-Gluon Plasma”

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The strongest fundamental force of nature generates ~96% of the mass of the visible universe and binds together the building blocks of Quantum Chromodynamics, quarks and gluons, within the proton. At temperatures of a few trillion Kelvin these quarks are gluons strongly interact in an exotic state of matter known at the Quark Gluon Plasma that behaves as a nearly perfect liquid. Collider experiments have been smashing heavy-ions together at nearly the speed of light in order to produce tiny droplets of the Quark Gluon Plasma in the laboratory with a size of the order of trillionth cm.

In this talk I will discuss the "standard model" of the Quark Gluon Plasma that has emerged with the development of relativistic viscous hydrodynamics. With the help of high performance numerical simulations of relativistic viscous hydrodynamics requiring Big Data techniques for statistical analysis, I will show that is now possible to make connections to nuclear structure and understand the limits of the smallest fluid possible using heavy quarks. Future goals of mapping out the Quantum Chromodynamic phase diagram will also be discussed.

The Department of Physics Colloquium will be held at 3pm in 238 SES.
**Refreshments will be served from 2:45 pm to 3pm outside of room 238 SES*