Contribution ID: **144** Type: **Invited Oral**

Bayesian Constraints of Quark Gluon Plasma Properties

Friday, 16 February 2024 08:30 (30 minutes)

The ongoing goal of relativistic heavy-ion collision experiments is to constrain the properties of nuclear media under extreme densities. Mounting evidence gathered from these experiments suggests that a strongly interacting plasma of quarks and gluons –the Quark Gluon Plasma (QGP) –is created within these collisions. The QGP is well described using multi-stage simulations, where relativistic dissipative hydrodynamics plays a key role. An irreducible moment expansion of the relativistic Boltzmann equation provides a systematic way to isolate the macroscopic behaviour of hydrodynamics. This formulation is the basis of modern fluid simulations of the QGP. To capture the chemical and kinetic evolution far outside thermal equilibrium, fluid dynamics is followed by molecular dynamics of hadronic (quarks and gluon) bound states. Modern Bayesian model-to-data comparisons run these multi-stage simulations on large supercomputers to produce a statistically robust extraction of QGP properties. I will discuss the constraints on the dissipative properties of the QGP, i.e., its shear and bulk viscosity, achieved using large-scale Bayesian analyses I have led, and outline a path toward future understanding of the QGP.

Your Email

Gojko.Vujanovic@uregina.ca

Supervisor

Supervisor Email

Affiliation

University of Regina

Your current academic level,

Professor/researcher

Primary author: Prof. VUJANOVIC, Gojko (University of Regina)

Presenter: Prof. VUJANOVIC, Gojko (University of Regina)

Session Classification: Morning 1 - Feb. 16, 2024

Track Classification: QCD and Hadrons