

Physics Colloquium

Monday, January 22, 2018 / 428 Pupin Hall / 4:15 PM

(reception immediately following)

"Unlocking the secrets of the fastest fluid in nature"

Jorge Noronha, University of São Paulo

Fluid dynamic behavior is observed in radically different systems, ranging from ordinary fluids (such as water) to their exotic counterparts formed in ultra-relativistic particle collisions and the strongly interacting matter formed in neutron star mergers. Yet, their description defies physicists and mathematicians, especially when the flow velocities involved are near the speed of light.

This talk will present an introduction to the modern applications of fluid dynamics, focusing on the Quark-Gluon Plasma, the primordial liquid that existed microseconds after the Big Bang. First principles calculations that have challenged the very foundations of fluid dynamics, pushing it towards the far-from-equilibrium regime, will be discussed. A new type of universality is shown to emerge in systems far from equilibrium via non-equilibrium attractor solutions, first found in relativistic liquids.

