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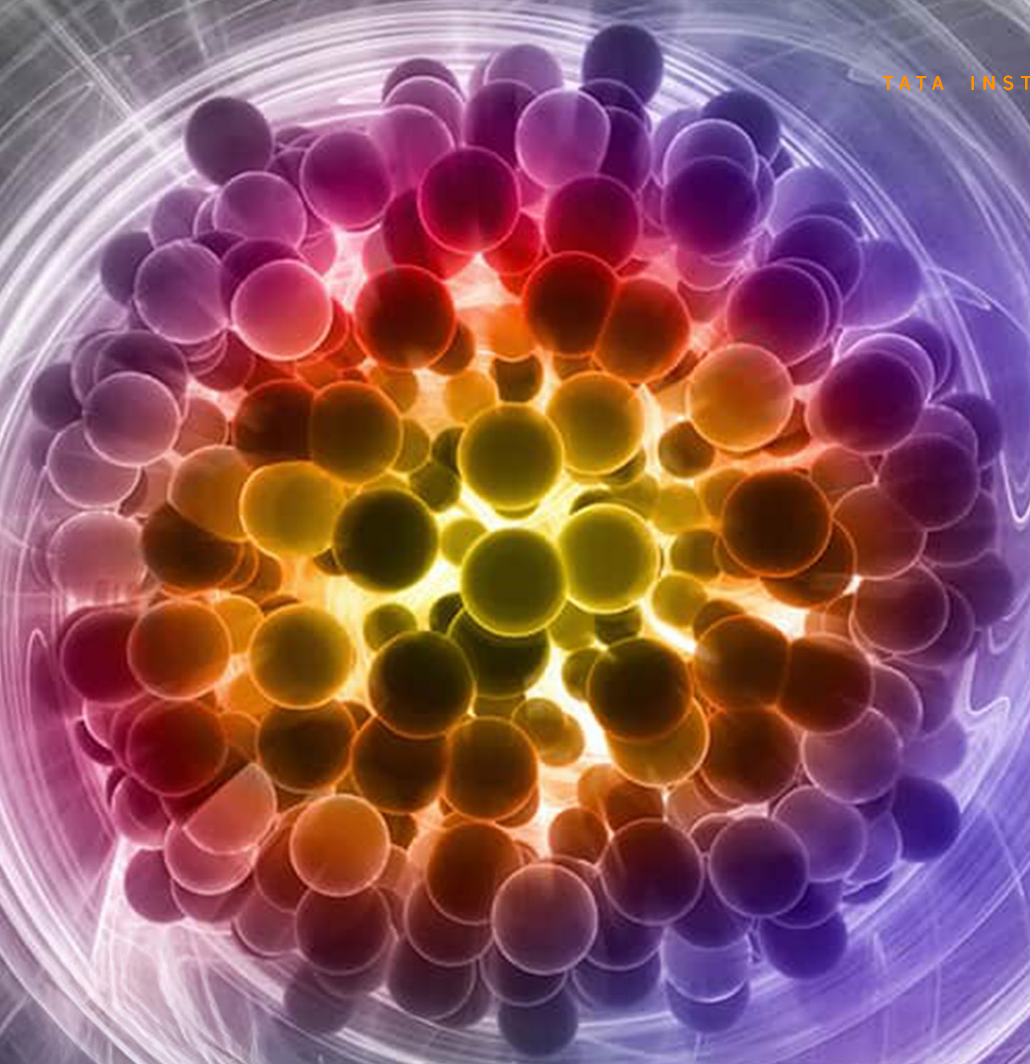

ICTS SPECIAL COLLOQUIUM

Quark-Gluon Plasma: From asymptotic freedom to the hottest matter on earth

Ten microseconds after the Big Bang, the universe was a hot and dense soup of quarks and gluons - a Quark-Gluon Plasma (QGP) - with temperatures exceeding a million times the core temperature of the sun. As matter cooled in the expansion, these "colorful" quarks and gluons underwent a transition to colorless protons, neutrons, and other hadrons, eventually forming atomic nuclei, and us. Experiments at the Relativistic Heavy Ion Collider (RHIC) and the Large Hadron Collider (LHC) colliding nuclei at ultra-relativistic energies now routinely recreate this QGP - the study of its properties is an active branch of physics. We discuss how strongly interacting quark-gluon matter is created in these experiments, its properties as a nearly perfect fluid, and concrete interdisciplinary connections thereof across energy scales ranging from ultra-cold atomic gases, to the early universe, and to the physics of black holes

Raju Venugopalan

Distinguished Scientist, Brookhaven National Lab, USA

Raju Venugopalan is a Distinguished Scientist at BNL and the Director of the BNL EIC Theory Institute. He has been an Adjunct Professor at Stony Brook since 2009. Venugopalan's interests are primarily in nonperturbative many-body features of gauge theories. He is known for his seminal work on the Color Glass Condensate effective field theory of high energy QCD, and for his work on thermalization of the quark-gluon plasma. With his BNL colleagues, Venugopalan came up with the idea of introducing a high energy electron beam in the RHIC tunnel, and developed the science case for the Electron-Ion Collider (EIC) now under construction at BNL. A recent research focus of his is on the double copy between QCD and gravitational amplitudes at high energies. Venugopalan is a Fellow of the APS, and has received several awards for his research including the Humboldt Research Award, and most recently, the UK Royal Society Wolfson 2025-2026 Visiting Fellowship.

06 February 2026

3:30 PM

Madhava Lecture Hall

Zoom link: https://shorturl.at/zy2Ks

Meeting ID: 968 8879 9183

Passcode: 020206