

Physics Colloquium

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“Building our Universe with Qubits”

The success of the standard model of particle physics is based on the quantum theory of fields where the basic assumptions require us to deal with concepts of infinity. While the theory of renormalization helps us understand why these infinities are in fact harmless, they are still difficult to handle computationally, especially within the strongly interacting sector of the standard model that describes nuclear physics. Recent effort to overcome these computational bottlenecks using quantum computers is motivating us to think of new ways to build our universe with qubits. I will discuss the basic ideas behind this effort and show some recent results that suggest that asymptotic freedom, which is considered a holy grail of fundamental quantum field theories, may also emerge with qubits.

Professor Chandrasekharan obtained his PhD from Columbia University (New York) in 1995. After being a postdoctoral associate at MIT for two years and at Los Alamos National Laboratory for four months, he joined the faculty at Duke University in 1998. He has been at Duke since then and is now a full professor there. He was awarded an Outstanding Junior Investigator award in 2003 from the Division of Nuclear Theory at the Department of Energy and was elected a fellow of the American Physical Society in 2018.

Thursday, March 24, in LL 316 at 4:25 PM

For Zoom participation, please see information below:

Meeting ID: 972 1274 7894

Passcode: 631869