

Physics Seminar

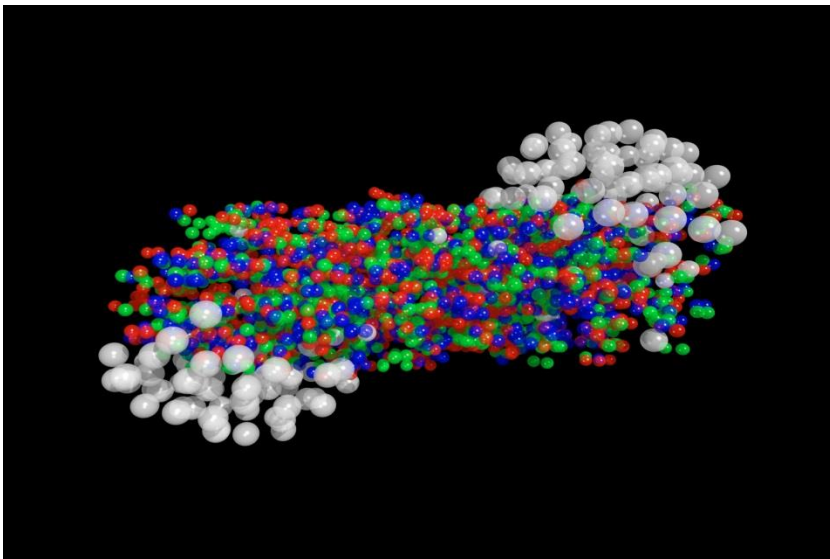
Thursday, February 1, 3:30 pm
Science & Engineering Building Room 144

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Melting the Nucleus in the 5th Dimension

When nuclear matter is heated to trillions of degrees or brought to immense pressure, it "melts," producing a new plasma-like phase. This new state of matter, called the quark-gluon plasma (QGP) was discovered in the mid-2000s by colliding gold ions near the speed of light. It is believed that the entire universe was in a QGP state for a few milliseconds after the Big Bang. Studying the phases of nuclear matter will yield insights into the fundamental nuclear interactions, the interior of neutron stars, and our cosmic origins. However, the force of interaction present in this phase is very strong, meaning that traditional techniques of particle and nuclear theory do not work on this system.



I work on a novel approach to this problem that is inspired by string theory. Under certain assumptions, the mathematical description of a 5-dimensional black hole will also describe a plasma of nuclear matter. Surprisingly, the 5D black hole is actually simpler! I will present results about the transition to the plasma phase that are obtained from this extra-dimensional model, and my goals for future research paralleling ongoing particle collider experiments

*Please join us for light refreshments at
3:15pm in the SEB Lobby.*