Announcing the Robert Hofstadter Memorial Lecture

Public Lecture: Monday, April 30, 2007
8:00 PM, Hewlett Teaching Center, Room 200

"What is that Black Hole Doing in My Quark Soup?"

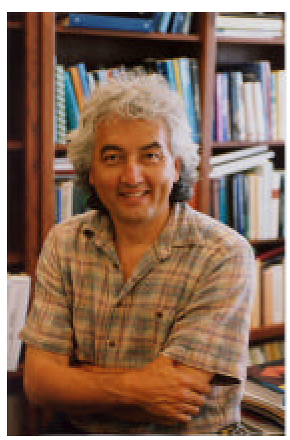
It's hot – at an absolute temperature of 10^{12} K – one hundred thousand (10^5) times hotter than the center of the sun. It's runny – runnier than anything known to man – even superfluids. What is it made from – its ingredients? Tiny quarks and gluons. Where did it come from? It's nothing ever made by man, it existed ten millionths (10^{-5}) of a second after the beginning of the Universe or about thirteen billion years ago. Can we figure out how to make it – is there a recipe? Yes, we have and are cooking it up right now. It's a Quark Soup.

I will address these and other questions about the recent creation of a primordial quark soup in the laboratory. Why would we even want to cook it up? What does this soup taste like? It seems to have a unique flavor – has anyone ever really sampled a soup of quarks and gluons? Perhaps there is a secret ingredient? And by the way – what is that tiny Black Hole doing in my Quark Soup?

Afternoon Colloquium: Tuesday, May 1, 2007
4:15 PM, Hewlett Teaching Center, Room 201

"Evidence for a Quark-Gluon Plasma in the Laboratory"

Ultra-relativistic collisions of heavy nuclei are being investigated for the first time at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory and will soon be investigated at the Large Hadron Collider at CERN. These collisions heat nuclear matter to energy densities previously reached only within the first few microseconds after the Big Bang. Temperatures of 2 x 10^{12} K are achieved, melting the vacuum into a plasma of quarks and gluons. The goal of physicists in this field is to re-create and to uniquely identify the properties of the primordial quark-gluon plasma in order to understand Quantum Chromodynamics at high energy densities. After six years of operation, RHIC and its experiments have established the presence of such extreme energy densities, temperatures and pressures. The system that is created behaves somewhat unexpectedly as a strongly-interacting, low viscosity liquid of quarks and gluons and is opaque to energetic quark and gluon probes. I will present an overview of the results establishing the creation and behavior of a hot ($T = 2 \times 10^{12}$ K) quark-gluon liquid at RHIC and its quenching of energetic probes. The quark-gluon liquid has behavior and properties similar to those of strongly-interacting classical fluids that are studied in atomic physics. Remarkably, a theoretical approach to black holes involving strings in five dimensions can describe the unique properties of this quark-gluon liquid.



This year's distinguished lecturer is **John W. Harris**, Professor of Physics and Group Leader of the Relativistic Heavy Ion Group at Yale University. Professor Harris is a Fellow of the American Physical Society, was voted one of the top 40 Distinguished Alumni of Stony Brook University, and is the recipient of the Alexander von Humboldt Senior Research Award. Prof. Harris has been both a collaborator and spokesperson for the STAR experiment at Brookhaven National Laboratory and a National Coordinator of ALICE-USA, at the CERN Large Hadron Collider. He has also served on the National Advisory Committee of the Institute of Nuclear Theory at the University of Washington.