Recreating conditions of the early Universe

John Harris
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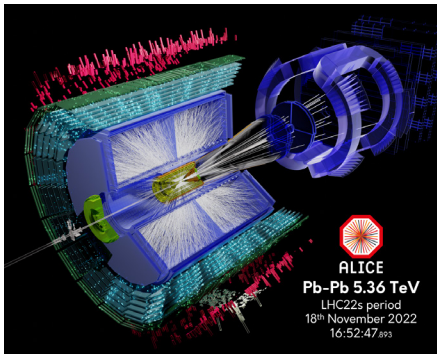
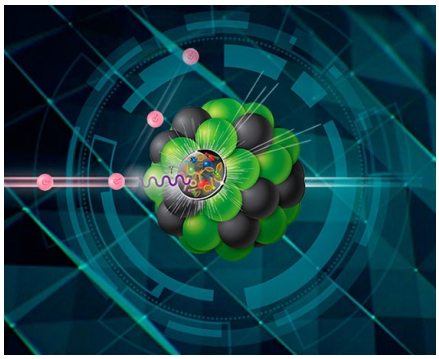
Professor Emeritus

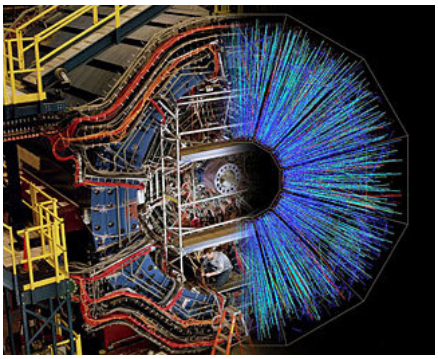
John Harris focuses on understanding high energy density quantum chromodynamics (QCD) created in relativistic collisions of heavy nuclei.

Harris is an American Physical Society (APS) Fellow. He was awarded the Alexander von Humboldt Senior Research Award in Frankfurt and was named one of the Top 40 Distinguished Alumni by Stony Brook University. He has served on and chaired many conference and workshop organizing committees, as well as Yale University committees. Harris is a member of the International Scientific Advisory Board for Romania and is the Chair of the Nuclear and Particle Physics Program Advisory Committee for Brookhaven National Laboratory.

Harris has organized and been a panelist for "Science Happy Hour at BAR" for public outreach.







Relativistic Heavy Ion Group (RHIG)

RHIG, co-led by Helen Caines, Laura Havener, and John Harris, uses experiments that accelerate and then collide particles to recreate a primordial state of matter, the quark-gluon plasma (QGP). The QGP is a hot, dense, soup-like state of the fundamental particles of nature—predicted by the Standard Model of particle physics to have existed ten millionths of a second after the Big Bang—and is one of nature's most extreme fluids. The group's research focuses on measuring jets—the spray of high momentum particles from high energy particle collisions—and jet substructure to further understanding of the the properties and evolution of the QGP. RHIG is involved in the ALICE, STAR and ePIC collaborations.

A Large Ion Collider Experiment (ALICE)

ALICE is a detector at the Large Hadron Collider (LHC) at the European Organization for Nuclear Research (CERN) in Switzerland. The ALICE detector was recently upgraded to allow for the production of two orders of magnitude more data. RHIG members have contributed to various aspects of the preparations and data-taking, and this expanded data set will be a primary focus of the RHIG ALICE program in the next few years. Harris served as the National Coordinator for the ALICE-USA Collaboration; Chair and Deputy Chair of the ALICE Collaboration Board; and on the ALICE Physics Board. He currently serves as an elected member of the ALICE Management Board.

Electron-Ion Collider (EIC)/Electron-Proton Ion Collider (ePIC)

RHIG has substantially increased its involvement in preparations for the future EIC, which will be built at Brookhaven National Laboratory (BNL) in Long Island, New York. The group has multiple ongoing research and development projects for the EIC, including particle identification (PID) detectors. Testing and characterizing photosensors for the proximity-focused ring-imaging Cherenkov (pfRICH) detector will be done at Wright Lab. Members of the group are also involved in software development for PID reconstruction.

Solenoidal Tracker at RHIC (STAR)

Harris has been an active member in the planning, conceptual design, construction, data acquisition, and physics of ultrarelativistic nucleus-nucleus experiments at the STAR experiment at BNL. He was the founding spokesperson for STAR from 1991 to 2002. Performing measurements in the different energy regimes at LHC and RHIC provides a complementary picture of the quark-gluon plasma.