

Physics Colloquium

Prof. Barbara Jacak

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and

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“Exploring QCD Matter”

Quantum Chromodynamics (QCD) describes the strong interaction, predicting interesting features when a system of quarks and gluons is hot and/or dense. Hot quark-gluon plasma with remarkable properties is produced in high energy collisions of heavy nuclei. A vanishingly small shear viscosity to entropy density ratio means that it flows essentially without internal friction. The plasma is also opaque to transiting quarks and gluons. These features might be expected from many-body interactions within the plasma. Small colliding systems seem to also produce a small quark gluon plasma droplet, leading us to wonder how can this emerge from the cold, dense gluonic matter deep inside nuclei within 1 fm/c. Perhaps many-body interactions affect transport in such matter too? I will discuss how we probe transport properties of QCD matter experimentally, and how the future electron-ion collider will shed light on the dense stuff at the heart of nuclei.

Barbara V. Jacak holds a Ph.D. from Michigan State University. She was an Oppenheimer Fellow at Los Alamos National Laboratory from 1984 to 1987, then staff member at LANL. In 1997, she joined Stony Brook University as Professor of Physics, becoming Distinguished Professor of Physics in 2008. In 2015, she was appointed Director of the Nuclear Science Division at Lawrence Berkeley Laboratory and Professor of Physics at UC Berkeley. Her research has focused on production and characterization of quark gluon plasma in heavy ion collisions, initially at CERN's SPS. She then joined the PHENIX Collaboration at RHIC, serving as spokesperson from 2007 to 2012. She is currently an active member of the ALICE Collaboration at the LHC and ATHENA at the future EIC. She was a member of the National Academies' Board on Physics and Astronomy, chairing it in 2016 and 2017. Barbara was a member of NSAC in 1995-1996, and the Long Range Plan working groups in 1995, 2001, 2007. She has served on numerous advisory committees for international conferences, and for national and international funding agencies and laboratories. Barbara is a Fellow of the American Physical Society and of the American Association for the Advancement of Science, and a member of the National Academy of Sciences, American Academy of Arts and Sciences, and the American Philosophical Society. She recently won the 2019 APS Tom W. Bonner Prize and the DOE 2019 Distinguished Scientist Fellows Award.

Thursday, November 18 via ZOOM

On the regular schedule that starts at 4:25 PM

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(This is an online colloquium)