APR18-2018-030051

Abstract for an Invited Paper
for the APR18 Meeting of
the American Physical Society

Quantum Computing and Feynmans Opportunity

CHRISTOPHER MONROE, University of Maryland and IonQ, Inc.

In 1959, Richard Feynman speculated what might happen if electrical circuits were made with individual atoms, noting the potential for completely new opportunities for design. His prophecy is now coming true in the guise of quantum computing, where entangled quantum superpositions of bits can be harnessed for certain hard computational problems. Feynmans influence continued into the 1980s, where he imagined using quantum computers for simulating hard problems in quantum mechanics, from chemistry to nuclear structure. I will give a survey of this rapidly advancing field, which is now evolving from the laboratory to real devices.