

HK 48: Invited Talks

Time: Friday 11:00–12:30

Location: MED 00.915

Invited Talk HK 48.1 Fri 11:00 MED 00.915
Probing confinement and string-breaking with quantum simulations — •TORSTEN ZACHE — Universität Innsbruck, Institut für Theoretische Physik — Institut für Quantenoptik und Quanteninformatik (IQOQI Innsbruck) der Österreichischen Akademie der Wissenschaften

The simulation of QCD at finite baryon density or in non-equilibrium scenarios remains an outstanding challenge for traditional computing methods. Quantum simulation offers a promising alternative. In this talk, I briefly review the current status of quantum simulations of lattice gauge theories and present recent progress toward simulating QCD-like physics, including the observation of confinement and string-breaking in lower dimensional gauge theories on existing quantum devices.

Invited Talk HK 48.2 Fri 11:30 MED 00.915
Exploring stochastic aspects of nuclear gamma decays with photonuclear reactions — •JOHANN ISAAK — TU Darmstadt, Institut für Kernphysik, Darmstadt, Germany

Understanding electromagnetic decays of atomic nuclei is essential both for advancing our knowledge of fundamental nuclear structure phenomena and for numerous applications, such as modeling nucleosynthesis processes. Photonuclear reactions provide a powerful tool to probe the photoresponse of nuclei and to explore the competition between statistical and non-statistical gamma decays. In this talk, I will present recent results obtained with quasimonochromatic photon

beams, exploring the gamma decay behavior of both spherical and deformed nuclei across a wide range of excitation energies, from the dominant giant dipole resonance down to energies below the neutron separation threshold. I will highlight the interplay between statistical and non-statistical decays and discuss their consequences on our understanding of nuclear structure and broader implications. The talk will conclude with a perspective on open questions and future directions in this field.

Invited Talk HK 48.3 Fri 12:00 MED 00.915
Precision QCD with ePIC at the Electron-Ion Collider — •TYLER KUTZ — Johannes Gutenberg-Universität Mainz

The majority of visible matter in the Universe is hadronic, composed of quarks and gluons whose interactions are modeled by quantum chromodynamics (QCD). Describing the properties of protons, neutrons, and nuclei in terms of their fundamental QCD constituents remains a major experimental and theoretical effort. The electron-ion collider (EIC), being developed at Brookhaven National Lab, is a next-generation facility designed for high-precision studies of QCD. By facilitating collisions of polarized electrons with polarized protons and nuclei, the EIC will enable multi-dimensional probes of nucleon and nuclear structure. These measurements are essential to understanding the origin of nucleon mass and spin, the nucleon's 3D structure, QCD in the nuclear medium, and other emergent QCD phenomena. This talk will give an overview of ePIC, the first EIC detector collaboration, including the collaboration organization, detector capabilities, physics program, and future outlook.