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### **QCD Intersections of Nuclear and Particle Physics at the High-Energy Frontier<sup>1</sup>**

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The connection between nuclear and particle physics is, arguably, most strongly manifested at the high-energy frontier. In recent years, advances in QCD theory have allowed one to describe with a high degree of accuracy the energetic final states that are experimentally accessible at today's premier hadronic and heavy ion collider facilities. These production processes include jets, heavy flavor, and electroweak bosons and are known at least up to next-to-leading order. Concurrent advances in many-body QCD theory of in-medium parton and hadron dynamics have shed light on a multitude of open questions that range from the wavefunction properties of large nuclei to the stopping power and medium response of strongly-interacting plasmas. Today these theoretical developments come together to provide the foundation for the ongoing and future searches for new forms of matter: from the elusive dark matter that is believed to make up the fabric of our universe to the quark-gluon plasma phase that RHIC and LHC aim to recreate and study under controlled laboratory conditions. In this talk, I will discuss recent progress in the QCD theory of hard probes in light of the exciting upcoming experimental opportunities in particle and nuclear physics to discover new forms of matter and/or to quantify their properties.

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