Challenges in Computational Science at Exascale

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Abstract

Modeling and simulation in nuclear theory can be very compute-intensive. Examples include calculations in *ab initio* nuclear structure and lattice quantum chromodynamics. Some of these calculations have already been performed on some of the currently available petascale high-performance architectures. There is, however, evidence that some of the further scientific discoveries and breakthroughs will not be achievable on such architectures — more powerful high-performance architectures, at the exascale, will be needed. In this talk, we will discuss technologies that may enable exascale computing and explain why such technologies will be disruptive. We will also discuss challenges that we may face in achieving exascale computing.