

Quantum Computing Opportunities @ FAIR

Dr. Thomas Neff, GSI/FAIR

Abstract:

I will present a short introduction into the physics questions addressed at GSI and FAIR. From the theoretical side this requires to calculate the properties of strongly interacting quantum many-body problems in nuclear structure or of quantum field theories when studying the equation of state of quantum chromo dynamics. I will shortly discuss why these problems are hard to solve on classical computers and why quantum computers promise to be the ideal tool to attack these challenges. I will shortly discuss how analog quantum computing can provide insights into interacting quantum systems today and what ideas have been developed to solve quantum many-body problems and field theories on universal quantum computers in the future.