

## Day 3

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Title: Landscapes, trainability, and scalability of variational quantum algorithms

Abstract:

Variational quantum algorithms (VQAs) are the leading proposal for near-term quantum advantage, with applications including electronic structure, dynamical simulation, solving linear systems, and quantum sensing. However, there has recently been major progress in understanding the training landscapes for VQAs, and the results paint a concerning picture. Exponentially vanishing gradients, known as barren plateaus, have been shown to occur for various situations, including circuits that are either deep or noisy or that generate much entanglement. This can impact the trainability and scalability of VQAs. In this talk, I will overview our understanding of VQA training landscapes and how we might engineer them to achieve scalability for VQAs.