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The road to early fault-tolerance

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For the last five years, quantum computing has been in the era colloquially known as ‘NISQ’ - where computation is limited by error rates instead of qubit count. The next steps on quantum computing roadmaps push us into the early-fault tolerant era. Here, limited amounts of error correction will be available, but achieving beyond-classical quantum computation will require robust algorithm design, and error mitigation. I will cover the learnings that we have made over the last 5 years, explain how early-fault tolerant algorithms differ from the circuits we have used thus far, and suggest means to future-proof research in near-term quantum computing from becoming redundant.

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