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## Leveraging quantum science to support scientific discovery and workforce development in HEP

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The introduction of Quantum Information Science (QIS) techniques to HEP problems (and of HEP techniques to QIS problems) has created a wealth of opportunities for innovative and impactful cross-disciplinary work. If we invest in the development of this emerging technology, it will benefit the outcomes and execution of HEP science in several ways:

- **Scientific impact:** QIS technologies promise applications to a wide variety of HEP problems, including computation, simulation, sensing, and metrology. One application that I am particularly excited about is the potential sensitivity to small energy deposits, giving us a path towards ultra-sensitive dark matter searches.
- **Early career opportunities:** Since this confluence of fields is still new and largely unexplored, the experiments required to make progress on applying QIS technology to HEP problems are still relatively small in scale. This makes them particularly beneficial for early career researchers because they can yield impactful results from a small team on the timescale that is beneficial to career progress.
- **Workforce training:** The development of a generation of scientists with skills in QIS techniques is vital to filling roles in both industry and academia that are aligned with National priorities.

For these reasons, I would like to advocate for the P5 Committee's strong support of a robust QIS + HEP program for the coming decades.

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