

# **The Landscape of Quantum Information Science and Engineering Education and the role of Physics Departments**

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Quantum technologies are working to leverage some of the most fundamental concepts of quantum mechanics to revolutionize modern technology. Superposition, entanglement, and measurement are all core concepts of quantum that are at the very center of quantum technologies. The potential implications of realizing modern quantum technologies have resulted in its rapid growth in both industry and academia. As with any new area of interest, higher education needs to adapt to the changing landscape. Although quantum information science and engineering (QISE) education is increasingly interdisciplinary, the field still has a strong presence and roots in physics. There is a need to understand the presence of QISE instruction and quantum-related instruction across all disciplines in order to figure out where QISE education is already happening and where it could be expanded. Although there is recent work that characterizes introductory QISE courses, there is no holistic picture of QISE and quantum-related education in the United States. This work is part of an effort to characterize the current landscape of QISE courses and degree programs in higher education. We recorded quantum-related course and program details from publicly available institutional catalogs and websites for a sample of 1456 institutions. Within that sample we identified 61 institutions with QISE programs, which are highly concentrated in PhD granting institutions. Of the 89 individual programs offered by these institutions, the largest group of them is interdisciplinary. We also identified over 8000 courses with 'quantum' in their title or description offered in primarily physics and chemistry departments. Within the overall set of courses, we identified over 500 dedicated QISE courses offered primarily in physics, electrical and computer engineering, and computer science departments at PhD-granting institutions. This talk will seek to motivate all the excitement that has been generated around quantum technologies, provide a clear picture of the current landscape of QISE education, and provide access to a resource for anyone interested in QISE in higher education.