Quantum Computing without Magic
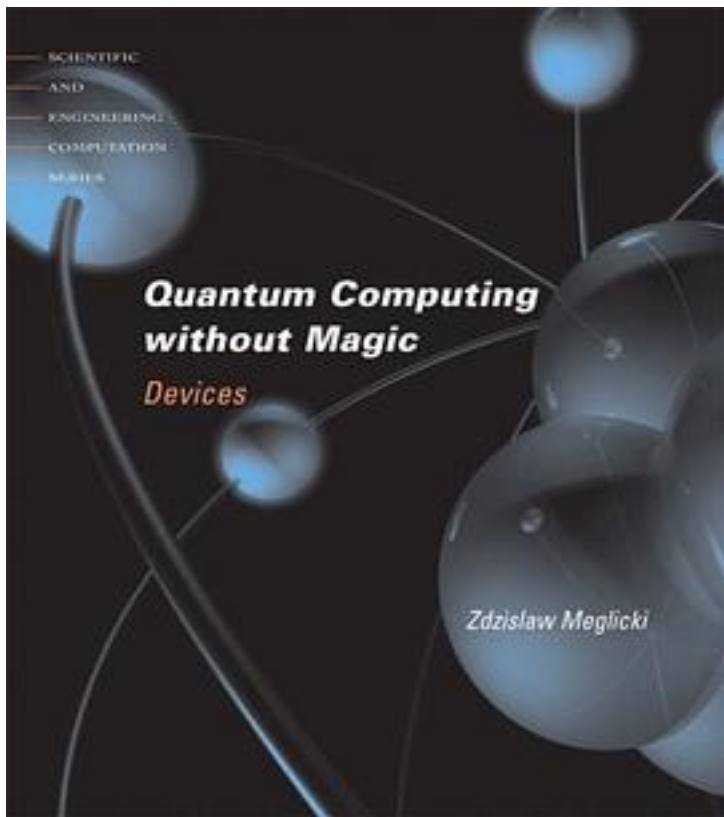

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This text offers an introduction to quantum computing, with a special emphasis on basic quantum physics, experiment, and quantum devices. Unlike many other texts, which tend to emphasize algorithms, Quantum Computing without Magic explains the requisite quantum physics in some depth, and then explains the devices themselves. It is a book for readers who, having already encountered quantum algorithms, may ask, "Yes, I can see how the algebra does the trick, but how can we actually do it?" By

explaining the details in the context of the topics covered, this book strips the subject of the "magic" with which it is so often cloaked. Quantum Computing without Magic covers the essential probability calculus; the qubit, its physics, manipulation and measurement, and how it can be implemented using superconducting electronics; quaternions and density operator formalism; unitary formalism and its application to Berry phase manipulation; the biqubit, the mysteries of entanglement, nonlocality, separability, biqubit classification, and the Schroedinger's Cat paradox; the controlled-NOT gate, its applications and implementations; and classical analogs of quantum devices and quantum processes. Quantum Computing without Magic can be used as a complementary text for physics and electronic engineering undergraduates studying quantum computing and basic quantum mechanics, or as an introduction and guide for electronic engineers, mathematicians, computer scientists, or scholars in these fields who are interested in quantum computing and how it might fit into their research programs.

作者介绍:

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