QUANTUM INFORMATION & QUANTUM COMPUTATION

- A Quick Guide -

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Preface

Greetings,

This guide is based on *Quantum Computer Science, An Introduction* by N. David Mermin, and *Quantum Computation and Quantum Information* by Isaac Chuang and Michael Nielsen.

The entire copy of this text can be found in Chapter 4 of *Quantum Theories, A Quick Guide to*. While this text fits under the more general title of *quantum theories*, the topics covered here are no longer physical phenomena as explained by quantum theories. Rather, we will pay much attention to what happens when computation and information theory meet quantumness. This guide thus deserves its status as a separate set of notes.

This text has two parts. Part 1 covers many topics in an introductory manner. These include the "rules of the game" and some simple applications and problems. Most of Part 1 will be based on *Quantum Computer Science: An Introduction* by Mermin, even though I might pull some topics from Mike and Ike. Part 2 contains more problems and topics in greater and more advanced details. Most of this part will be based on *Quantum Computation and Quantum Information* by Mike and Ike. Part 1 should serve as an introduction to part 2.

I will assume familiarity with linear algebra. There is a section on some potentially unfamiliar linear algebra, but I would like to keep it short.

Enjoy!

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Quantum Information & Quantum Computation