Start from zero

You don’t need a physics degree. Bring your curiosity, and we’ll build the ideas together.

5 min read Dr. Charith Jayasekara

Quantum computing is a different way to represent and transform information. You can begin with a few clear ideas, test them in your browser, and learn the mathematics as you need it.

This book is written by **Dr. Charith Jayasekara**, a computing educator and quantum computing researcher. The author’s introduction is available alongside guided lessons and interactive experiments.

A gentle first route

1. **Classical computing versus quantum computing** — understand what changes, and what stays familiar.
2. **Understanding qubits** — meet a quantum state and try the Bloch sphere.
3. **Superposition** — see why amplitudes are more than probabilities.
4. **Quantum measurement** — predict outcomes, run shots and interpret the results.
5. **Quantum phase and interference** — discover how phase changes what you can measure.
6. **Entanglement and Bell states** — investigate states that must be described together.

Allow about 20–30 minutes for each foundation lesson, including calculations and experiments. These times are suggestions; there is no deadline and no locked content.

If the mathematics feels unfamiliar

Use complex numbers, vectors and matrices and probability and amplitudes as short bridges. The conceptual route above remains open while you work through them.

Make the learning active

Read → visualise → predict → experiment → verify → practise → extend. Before changing a control, say what you think will happen. After running a lab, compare the result with your prediction. A surprising result is a useful place to slow down.

The experiment studio runs small, ideal quantum simulations in your browser. It does not connect to quantum hardware. You can save reading progress on this device, download chapter PDFs, and study without an account.

A book that grows with you

After the foundations, follow the guided algorithms route. It begins with small interference examples and builds toward search, Fourier methods, factoring, optimisation, simulation and modern matrix algorithms. The algorithm atlas supplies further families and connections. Read the intuition first, then work the numerical example before attempting a general proof.

The full catalogue preserves the complete 170-chapter plan: foundations, programming, algorithms, security, advanced research and an algorithm atlas. **Available** means there is a reading lesson; **planned** means the detailed chapter is still being developed. The pathways describe

how those volumes fit together.