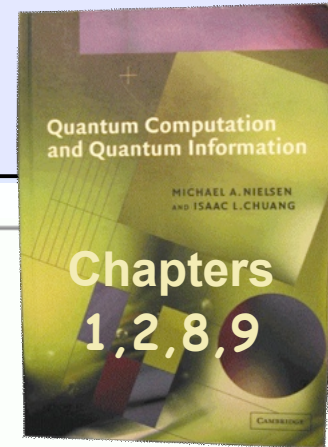


The quantum measurement orthodoxy of “Mike and Ike”:
All quantum simulations are equivalent to ...



while *the simulation is running*

... evolve the wave function dynamics one step forward in time

let $|\psi_{n+1}\rangle = \exp(-iH\delta t/\hbar) |\psi_n\rangle$

... evolve the noise and measurement processes one step forward in time

for *each pair of Kraus operators*[‡] $\{A_k, B_k\}$

let $|\psi_{n+1}\rangle = \begin{cases} A_k|\psi_{n+1}\rangle / \sqrt{p_A} & \text{with probability } p_A = \langle \psi_{n+1} | A_k^\dagger A_k | \psi_{n+1} \rangle \\ B_k|\psi_{n+1}\rangle / \sqrt{p_B} & \text{with probability } p_B = \langle \psi_{n+1} | B_k^\dagger B_k | \psi_{n+1} \rangle \end{cases}$

end for *each pair of Kraus operators*

end while *the simulation is running*

[‡] *also called “measurement operators”, per Mike and Ike, Chapter 2, Postulate III.*

- **Objective:** compute the wave function in P-time and store it in P-space
- **Strategy:** tune the noise to “compress” the Hilbert space trajectory
- **First requirement:** the compressed trajectory must fit in P-space
- **Second requirement:** the compression algorithm must run in P-time