Quantum Networks Cheat Sheet

The Bell Test is an experiment to check that quantum science is correct. The 2022 Nobel Prize in Physics went to scientists who did some of the first Bell tests a few decades ago. You can try this out with this new exhibit here at TUFL.

Entanglement ties quantum particles together, even if they are very far apart. We can create entanglement in a lab and use it for technology like quantum networks. From now on, there will be an entanglement link between the lab on campus and TUFL.

Fiber-optic cables are thin threads of glass that can guide light from one point to another. UC2B has a fiber network that we are using as the basis of our quantum network.

Measurement can affect the properties of a quantum particle. This is different than what usually happens when we measure something, like the length of a table. We don't expect the table's length to change due to the measurement! In this exhibit, you will choose how to measure photons that come from a lab at UIUC.

Photons are the smallest possible specks of light. Amazingly, your eyes can see just a few photons if you are in a very dark room. Photons do not weigh anything, so they are the fastest particles in the universe. Photons carry information in a quantum network.

Polarization is the direction light wiggles. Polarizing sunglasses block light that is wiggling left to right. In this exhibit, you will decide how we make measurements on photons that are entangled.

Quantum science helps us understand nature when things get very tiny. Even germs are too big for quantum science! Examples of quantum particles: atoms, electrons, photons, neutrons, protons.

Superposition When a quantum particle is in a superposition, its properties are not set to only one value. For example, a particle of light can be both red and blue at the same time. It won't be either one until we make a measurement of its color. In this quantum network we are interested in the polarization of a photon, which is a property that we can't see directly.

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PUBLIC QUANTUM NETWORK

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