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Let's Get (Quantum) Physical

An Interview with Professor Thomas Jennewein, Quantum Physicist
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How does quantum physics affect communication?

Quantum physics is the science of the microscopic world, of the particles and atoms and so on around us that make up the matter we know. Quantum physics does not relate to our intuitive understanding of the world. It leads to a lot of mysteries and unknown effects and phenomena. So I'm most excited about the combination of the fundamental aspects of quantum physics as well as finding ways to turn this into applications in the real world which will improve aspects of technology.

What are some potential applications?

Very specifically, the line of research that I'm pursuing is about quantum communication, where we are working on sending quantum bits from one place to another. One of the near-term application paths is for secure communication. Because if somebody were to try to tap or manipulate the quantum bits on their way, they would suffer, they would degrade, and this would lead to a signal which would be detected. Therefore quantum communication could enable very secure encryption. Another example is where quantum information which is transmitted could be used for connecting telescopes, for example, and improving astronomical observations. These quantum particles and quantum correlations that we're producing could have a widespread use in the end. And there might be a lot of applications that we don't even foresee at the moment. It's just going to emerge once the first real implementations of a quantum internet become real.

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