

Anton Zeilinger

Biosketch

Anton Zeilinger's achievements have been most succinctly described in his citation for the inaugural Isaac Newton Medal of the Institute of Physics (UK):

For his pioneering conceptual and experimental contributions to the foundations of quantum physics, which have become the cornerstone for the rapidly-evolving field of quantum information.

A visionary quantum physicist and a pioneer of quantum information science and technology, Anton Zeilinger, in his curiosity to understand the universe we live in has helped to shape a future of quantum technologies that is just now taking form. He has performed many groundbreaking experiments in quantum mechanics, from important fundamental tests all the way to innovative applications. Most of his research concerns the fundamental aspects and applications of quantum entanglement.

He discovered (with Greenberger and Horne) and later realized in experiment the first multi-particle entangled states (GHZ states) which have since become essential in fundamental tests of quantum mechanics and in quantum information science, most notably in quantum computation. Among the innovative applications he and his group developed are the first entanglement-based quantum cryptography, quantum teleportation of independent photons, key concepts in optical quantum computation, the one-way quantum computer and novel entanglement-based imaging methods.

With his team, he also realized a few of the first long-distance entanglement-based quantum communication experiments, first across the river Danube in Vienna and later in many experiments between Canary Islands. He also performed numerous tests of Bell's inequality, closing more and more loopholes and thus making quantum cryptography unconditionally secure. Most recently in cooperation with the Chinese Academy of Sciences, he established the world's first intercontinental quantum cryptography link via the quantum satellite Micius. All his work lays the groundwork for world-wide quantum communication and quantum cryptography networks.

The most important stations of his career include M.I.T., the Collège de France, the Technical Universities Munich and Vienna, Oxford University and the University of Innsbruck. Among his many awards and prizes are the German Order Pour le Mérite, the Order of Merit of Austria, the Wolf Prize (Israel), the Inaugural Isaac Newton Medal of the Institute of Physics, the John Stewart Bell Prize for Research on Fundamental Issues in Quantum Mechanics and their Applications, the Micius Quantum Prize of the Micius Quantum Foundation and the King Faisal Prize. He is a member of a number of science academies and holds various honorary professorships and honorary doctorates.

Anton Zeilinger is Professor Emeritus at the University of Vienna and Senior Scientist at the Institute of Quantum Optics and Quantum Information in Vienna (IQOQI Vienna), where he enjoys working with his group of graduate students and post-docs.