Curriculum Vitae
Anton Zeilinger

Born on May 20, 1945 in Ried/Innkreis, Austria

Present addresses:

Faculty of Physics, University of Vienna
Boltzmanngasse 5, A-1090 Vienna, Austria

Institute for Quantum Optics and Quantum Information
Austrian Academy of Sciences
Boltzmanngasse 3, A-1090 Vienna, Austria

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EDUCATION

1979	Habilitation, Technical University Vienna
1971	Ph.D., University of Vienna, thesis on "Neutron Depolarization in Dysprosium Single Crystals" under Prof. H. Rauch
1963-1971	Study of Physics and Mathematics, Universität Wien
1963	Matura (School Leaving Examination), Bundesgymnasium Wien 13, Fichtnergasse 15

PROFESSIONAL CAREER

2004-present	Scientific Director, Institute of Quantum Optics and Quantum Information IQOQI, Austrian Academy of Sciences
1999-present	Full Professor of Experimental Physics, University of Vienna
1990-1999	Full Professor of Experimental Physics, University of Innsbruck
1988-1989	Full Professor of Physics (Lehrstuhlvertretung), Technical University of Munich
1983-1990	Associate Professor, Technical University of Vienna
1981-1983	Associate Professor of Physics, M.I.T. (Visiting)
1972-1981	Research Assistant (Senior), Atominstitut Vienna, with Professor Helmut Rauch

VISITING RESEARCH AFFILIATIONS

2001-2004	Senior Humboldt Fellow, Humboldt University, Berlin
1998	Visiting Research Fellow, Merton College, Oxford University, U.K.
1995	Chaire Internationale, Collège de France, Paris, France
1986-1989	Adjunct Full Professor, part-time, Hampshire Coll., Amherst, U.S.A.
1983-1990	Regular summer research appointments at M.I.T.
1977-1978	Fulbright Fellow, Research Associate at M.I.T. in the Neutron Diffraction Laboratory under Prof. C.G. Shull (Nobel Laureate 1994)
1974-1989	Guest Researcher, Institut Laue-Langevin, Grenoble, France

DISTINGUISHED LECTURESHIPS

2008	Asher Perez Memorial Lecture, Technion, Haifa, Israel
2007	Wolfgang-Paul Lecture, Bonn University, Germany
2006	Barut Memorial Lect., Bogazici Univ., Istanbul, Turkey
2006	Rosenthal Lecture, Yale University, U.S.A.
2006	Johannes Gutenberg Lecture, Mainz University, Germany
2003	Angström Lecture, Uppsala University, Stockholm, Sweden
2003	Amos de-Shalit Memorial Lecture, Weizmann Institute, Rehovot, Israel
2003	Solly Cohen and Shimon Offer Memorial Lecture, Racah Institute of Physics, Hebrew University of Jerusalem, Israel
2003	Schrödinger Lecture, Imperial College, London
2003	Niels Bohr Lecture, Copenhagen University, Denmark
2002	Chemerda Lecture, Pennsylvania State University, U.S.A.
1999	Schrödinger Lecture, Trinity College, Dublin, Ireland
1997	H.L. Welsh Lecture in Physics, University of Toronto, Canada
1984	Sir Thomas Lyle Fellow, University of Melbourne, Australia

DISTINGUISHED MEMBERSHIPS

2006	Foreign Member, Serbian Academy of Sciences and Arts
2005	Honorary Member, Slovak Academy of Sciences
2005	Member, Deutsche Akademie der Naturforscher und Ärzte *Leopoldina*
2002	Member, Berlin-Brandenburgische Akademie der Wissenschaften
2000	Member, Academia Scientiarum et Artium Europaea
1999	Fellow, American Physical Society
1998	Full Member, Austrian Academy of Sciences
1994	Corresponding Member, Austrian Academy of Sciences

HONORARY PROFESSORSHIPS AND DOCTORATES

2006	Honorary Doctorate, Gdansk University, Poland
2005	Honorary Doctorate, Humboldt University, Berlin, Germany
1996	Honorary Professor, University of Science and Technology of China

INTERNATIONAL PRIZES AND AWARDS

2008	Quantum Communication Award, Tamagawa University, Japan.
2008	Isaac Newton Medal, Institute of Physics
2007	Quantum Electronics Prize, European Physical Society
2005	King Faisal Prize, King Faisal Foundation, Saudi Arabia
2005	Descartes Prize, European Commission
2004	Lorenz-Oken-Medal, Gesellschaft Deutscher Naturforscher und Ärzte
2004	Klopsteg Award, American Association of Physics Teachers
2003	Sartorius Prize, Göttingen Academy of Sciences
2001	"Orden pour le mérite für Wissenschaften und Künste" (Order Pour le mérite for scientists and artists), Germany
2000	Senior Humboldt Fellow Prize, Alexander von Humboldt-Stiftung
1997	European Optics Prize, European Optical Society
1996	European Lecturer, European Physical Society
1995	Prix "Vinci d'Excellence", Fondation LVMH, Paris

AUSTRIAN PRIZES AND AWARDS

2006	Grosses Ehrenzeichen in Gold (Grand Gold Decoration), City of Vienna
2005	Wilhelm-Exner-Medal, Österreichischer Gewerbeverein
2002	Johannes Kepler-Prize, Science Prize of the state of Upper Austria
2001	Ehrenzeichen für Wissenschaft und Kunst (Austrian equivalent to the Order of Merit), Republic of Austria
2001	Visionary of the Year in Science, Austria
2000	Science Prize, City of Vienna
1997	Kardinal Innitzer Würdigungspreis, Vienna
1996	Austrian Scientist of the Year
1980	Prize of the Theodor Körner Foundation, Vienna
1979	Prize for Junior Scientists, Kardinal Innitzer Foundation, Vienna
1975	Prize of the City of Vienna for the Encouragement of Young Scientists

RESEARCH INTERESTS

- Fundamental investigations in quantum physics, experiment and theory
- Coherent Atom Optics
- Atom Interferometry
- Quantum Cryptography
- Quantum Communication
- Quantum Computation
- Tests of quantum mechanics
- Entanglement and Quantum Nonlocality
- Einstein-Podolsky-Rosen Paradox
- Quantum Teleportation
- Decoherence
- Macroscopic Interference
- Mesoscopic Quantum Entanglement

MAJOR RESEARCH ACHIEVEMENTS

General Physics and Theory

- Generalized Aharonov-Bohm Effects for Time-Dependent Potentials
- First Papers ever published on Quantum Cellular Automata
- Invention of First Einstein-Podolsky-Rosen Experiment Based on an External Variable (Momentum) Instead of an Internal One (e.g. Spin)
- Discovery of Three-Particle Entanglement as an Extreme Demonstration of Quantum Non-Locality (GHZ)
- Discovery of Entanglement Swapping, the Teleportation of Entanglement
- Identification of Information as the Fundamental Concept in Quantum Physics
- Precision Tests of Quantum Mechanics

Neutron Interferometry and Neutron Optics

- Demonstration of Spinor Symmetry using a Neutron Interferometer
- Young's Experiment with Neutrons
- Measurement of the Magnetic Neutrality of the Neutron
- Observation of the Anomalous Effective Mass of Neutrons
- Tests of the Linearity and the Unitarity of the Schrödinger Equation

Atom and Molecule Optics, Mesoscopic Physics

- Dynamical Diffraction of Atoms at Thick Light Crystals
- Diffraction of Atoms at a purely Imaginary Potential (On-Resonant Light Field)
- Anomalous Transmission of Atoms through Light Fields
- Coherent Side-Band Modulation of Atomic DeBroglie Waves
- Development of an Atom Interferometer with Gratings of Light
- Development of a Nanometer Mask made of Light for Atoms
- Development of a Moiré Accelerometer and Rotation Sensor using Atoms
- Diffraction of Atoms at Complex e^{iGx} and $e^{i\omega t}$ Potentials
- Observation of a Violation of Friedel's Law with Atoms
- Coherent Diffraction of Atoms at Light Crystals in the Channeling Limit
- Atom Holography
- Quantum Physics with Macromolecules and Mesoscopic Systems
- Development of a Macromolecule Interferometer
- Quantum Interference of C-60 and C-70 Molecules
- Quantum Interference of of Porphyrine, a biological molecule
- Clarification of Decoherence Mechanisms in Macromolecule Interference
- Detailed Investigation of the Quantum-Classical Transition
- First Demonstration of the Cooling of a Mesoscopic System by Radiation Pressure

Fundamental Physics with Entangled Photons

- Development of a Novel High-Intensity Source for Polarization-Entangled Photon Pairs
- Observation of a Violation of Bell's Inequality by more than 100 Standard Deviations
- Two-Photon Quantum Eraser Experiments
- Young's Experiment with Photons with High Precision
- Measurement of Pendellösung for Single Photons and for Entangled Photon Pairs
- Experimental Demonstration of Interaction-Free Measurement
- Entangled Entanglement
- Demonstration of Two-Photon Antibunching at a Beam Splitter
- A Double-Slit Heisenberg Microscope Experiment with Photon Pairs
- First Experimental Quantum Teleportation
- Long-Distance Test of Bell's Inequality under Einstein Locality Conditions
- Realization of Multi-Photon Entanglements (GHZ-states)

- Demonstration of GHZ nonlocality
- Entanglement of the Orbital Angular Momentum of Photons
- Tests of a Leggett-type Nonlocal Hidden Variable Theory
- Nonlocal Delayed-Choice Experiments with Entangled Photons

Quantum Information, Quantum Communication and Quantum Computation

- Verification of Quantum Dense Coding
- Teleportation of an Entangled Photon
- Experimental Entanglement Swapping
- Development of an Entangled-State Quantum Cryptography System
- Demonstration of Purification of Entangled Pairs
- First Quantum Cryptography with Entangled Photons
- First Experimental Realization of the One-Way Quantum Computer
- Grover's Search Algorithm on a One-Way Quantum Computer
- One-Way Quantum Computation with Active Feed-Forward
- Long-Distance Teleportation Across the River Danube
- Quantum Cryptography Over 144 km
- Detection of Single Photons Returning from a Satellite
- Realization of Quantum Games on a One-Way Quantum Computer

SCIENTIFIC PUBLICATIONS

More than 390 scientific publications
among those, more than 220 in peer reviewed, ISI ranked journals

More than 600 invited talks at conferences and seminars

Some papers have become science citation classics. The paper "Experimental Quantum Teleportation" (Nature **390**, 1997) has been cited more than 1.000 times so far (ISI Citation Index).

BOOKS

Frontiers of Neutron Scattering.
In honour of Clifford G. Shull on the occasion of his 70th birthday.
Editors: R. J. Birgenau, D. E. Moncton, A. Zeilinger, Elsevier Science / North-Holland Publishing Division 1986.

Matter Wave Interferometry.
On the occasion of the 100th anniversary of E. Schrödinger's birth.
Editors: G. Badurek, H. Rauch, A. Zeilinger, Elsevier Science / North-Holland Publishing Division 1988.

New Techniques and Ideas in Quantum Measurement Theory.
Annals of the New York Academy of Sciences, Vol. 480.
Editors: D. M. Greenberger, A. Zeilinger, New York Academy of Sciences 1987.

Fundamental Problems in Quantum Theory.
In Honor of Professor John A. Wheeler.
Annals of the New York Academy of Sciences, V. 755.
Editors: D. M. Greenberger, A. Zeilinger, New York Academy of Sciences 1995.

Epistemological and Experimental Perspectives on Quantum Physics.
Vienna Circle Institute Yearbook, Volume 7.
Editors: D. Greenberger, W. L. Reiter, A. Zeilinger, Kluwer Academic Publishers 1999.

The Physics of Quantum Information.
Quantum Cryptography, Quantum Teleportation, Quantum Computation.
Editors: D. Bouwmeester, A. Ekert, A. Zeilinger, Springer 2000.

Quantum Information.
An Introduction to Basic Theoretical Concepts and Experiments.
Springer Tracts in Modern Physics, Volume 173.
Editors: G. Alber, T. Beth, M. Horodecki, P. Horodecki, R. Horodecki, M. Rötteler, H. Weinfurter, R. Werner, A. Zeilinger, Springer 2001.

Quantum Computation and Quantum Information Theory.
Editors: C. Macchiavello, G.M. Palma, A. Zeilinger, World Scientific Publishing 2001.

Quantum [Un]speakables, From Bell to Quantum Information.
Editors: R. A. Bertlmann, A. Zeilinger, Springer 2002.

Popular science books

Both books appeared in German. Translations into other languages have appeared or are currently in preparation.

Einsteins Schleier.
A. Zeilinger. C.H. Beck 2003.

Einsteins Spuk.
A. Zeilinger. Bertelsmann 2005.