Curriculum Vitae
Anton Zeilinger

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

Present addresses: Faculty of Physics, University of Vienna
Boltzmanngasse 5, 1090 Vienna, Austria

Institute for Quantum Optics and Quantum Information
Austrian Academy of Sciences
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EDUCATION

1979	Habilitation, Vienna University of Technology
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, University of Vienna
1963	Matura (School Leaving Examination), Bundesgymnasium Wien 13, Fichtnergasse 15, Vienna

PROFESSIONAL CAREER

2013-present	President, Austrian Academy of Sciences
2004-2013	Director, IQOQI Vienna, Institute for Quantum Optics and Quantum Information, 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, Vienna University of Technology
1981-1983	Associate Professor of Physics, M.I.T. (Visiting)
1979-1983	Assistant Professor, Atominstitut Vienna
1977-1978	Research Associate (Fulbright Fellow) at M.I.T. in the Neutron Diffraction Laboratory under Prof. C.G. Shull (Nobel Laureate 1994), USA
1972-1979	Research Assistant, Atominstitut Vienna with Professor Helmut Rauch

VISITING RESEARCH AFFILIATIONS

2010	Visiting Research Fellow, Part-Time, Merton College, Oxford
2001-2004	Senior Humboldt Fellow, Humboldt University, Berlin, Germany
1998	Visiting Research Fellow, Merton College, Oxford University, UK
1995	Chaire Internationale, Collège de France, Paris, France
1986-1989	Adjunct Full Professor, part-time, Hampshire College, Amherst, USA
1983-1990	Regular summer research appointments at M.I.T., USA
1974-1989	Guest Researcher (part-time), Institut Laue-Langevin, Grenoble, France

DISTINGUISHED LECTURES

2012 Herzberg Memorial Lecture, Canadian Association of Physicists, Calgary, Canada
2012 Racah Lecture, Hebrew University, Jerusalem, Israel
2012 Cherwell-Simon Lecture, Oxford University, UK
2012 Festkolloquium, 500. WE-Heraeus Seminar, Bad Honnef, Germany
2011 Vice Chancellors Lecture, University of Cape Town, South Africa

2011 Mark W. Zemansky Lecture, City College of New York, USA
2011 Festvortrag, 75th Annual Meeting, German Physical Society, Dresden
2011 Van Vleck Lecture, University of Minnesota, USA
2011 Festkolloquium für Peter Becker, Physikalisch-Technische Bundesanstalt Braunschweig, Germany
2010 Frontiers in Physics Lecture, City College of New York, USA
2010 Ockham Lecture, Merton College, Oxford University, UK
2010 Dvorak Memorial Lecture, University of Prague, Czech Republic
2010 Celsius Lecture, Uppsala University, Sweden
2009 Carl Friedrich von Weizsäcker Lectures, University of Hamburg, Germany
2009 Festvortrag, 150th birthday of Max Planck, Max Planck Society, German Physical Society, Berlin Brandenburg Academy of Sciences, Humboldt University Berlin, Germany
2009 Inaugural Kavli Colloquium at Kavli Institute of Nanoscience, Delft University of Technology, The Netherlands
2009 PITP Lecture on Quantum Phenomena, Pacific Institute of Theoretical Physics, Vancouver, Canada
2008 Newton Prize Lecture, Institute of Physics, London, UK
2008 Asher Perez Memorial Lecture, Technion, Haifa, Israel
2007 Wolfgang-Paul Lecture, Bonn University, Germany
2006 Barut Memorial Lect., Bogazici University, Istanbul, Turkey
2006 Rosenthal Lecture, Yale University, USA
2006 Johannes Gutenberg Lecture, Mainz University, Germany
2004 Colloquium Ehrenfestii, Leiden University, Netherlands
2003 Angstrom 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, UK
2003 Niels Bohr Lecture, Copenhagen University, Denmark
2002 Chemerda Lecture, Pennsylvania State University, USA
1999 Schrödinger Lecture, Trinity College, Dublin, Ireland
1997 H.L. Welsh Lecture in Physics, University of Toronto, Canada
1996 Colloquium Ehrenfestii, Leiden University, Netherlands
1984 Sir Thomas Lyle Lecture, University of Melbourne, Australia

DISTINGUISHED MEMBERSHIPS

2013 Foreign Associate, National Academy of Sciences America (NAS)
2012 Fellow, American Assoc. for the Advancement of Science (AAAS)
2011 Full Member, Academia Europaea
2009 Foreign Member, Académie des Sciences, Institut de France
2006 Foreign Member, Serbian Academy of Sciences and Arts
2005 Honorary Member, Slovak Academy of Sciences
2005 Member, German Academy of Sciences Leopoldina
2002 Member, Berlin-Brandenburg Academy of Sciences
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

2013 Urania Medal, Urania Berlin

2012 Finalist, World Technology Award for Communications Technology
2010 Wolf-Prize in Physics, Wolf Foundation, Israel
2009 Great Cross of Merit with Star of the Federal Republic of Germany
2008 ERC Advanced Grant, European Research Council
2008 Quantum Communication Award, Tamagawa University, Japan
2008 Inaugural Isaac Newton Medal, Institute of Physics, UK
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, Society of German Researchers and Physicians, Germany
2004 Klopsteg Award, American Association of Physics Teachers, USA
2003 Sartorius Prize, Göttingen Academy of Sciences, Germany
2001 Order Pour le Mérite for Sciences and Arts, Germany
2000 Senior Humboldt Fellow Prize, Alexander von Humboldt-Stiftung, Germany
1997 European Optics Prize, European Optical Society
1996 European Lecturer, European Physical Society
1995 Prix Vinci d'Excellence, Fondation LVMH, Paris, France

AUSTRIAN PRIZES AND AWARDS

2013 Großer Tiroler Adler Orden, Federal Province Tyrol
2006 Grand Gold Decoration, City of Vienna
2005 Wilhelm-Exner-Medal, Austrian Association for Enterprises
2002 Johannes Kepler-Prize, Science Prize of Upper Austria
2001 Decoration of Sciences and Arts (Austrian equivalent to the Order of Merit)
2001 Visionary of the Year in Science
2000 Science Prize, City of Vienna
1997 Kardinal Innitzer Würdigungspreis, Vienna
1996 Austrian Scientist of the Year
1980 Junior 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

ADMINISTRATION AND COMMUNITY SERVICES

2009-present President, International Academy Traunkirchen, Austria
2008-present Member, Planning and Strategy Committee of the Austrian Academy of Sciences
2006-present Vice Chair, Board of Trustees, Institute of Science and Technology of Austria
2006-present Member, Executive Board, Institute of Science and Technology of Austria
2006-2009 Dean of the Faculty of Physics, University of Vienna
2004-present Scientific Director, Institute of Quantum Optics and Quantum Information Vienna, Austrian Academy of Sciences
2002-2003 Member, Founding Convent, University of Vienna, Austria
2002 Initiator of a new Postgraduate Research Institution which has been implemented as Institute of Science and Technology in Austria
1997-1998 President, Austrian Physical Society
1996-1998 Member, Quantum Electronics and Optics Division, European Physical Society
1994-2000 Member, Editorial Board, Physical Review A
Since 1988 Member, Editorial Board, Foundations of Physics
2006 – 2008 Member, Editorial Board, New Journal of Physics

RESEARCH INTERESTS

Fundamental Phenomena in Quantum Mechanics (experiment and theory) and their Applications in Quantum Information Science and Technology

- Fundamental investigations in Quantum Physics, experiment and theory
- Tests of Quantum Mechanics
- Entanglement and Quantum Nonlocality

- Coherent Neutron and Atom Optics
- Matter Wave Interferometry
- Quantum Cryptography
- Quantum Communication
- Quantum Computation
- Quantum Teleportation
- Einstein-Podolsky-Rosen Paradox
- Decoherence

MAJOR RESEARCH ACHIEVEMENTS

Fundamental 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
- Identification of Information as Fundamental in Quantum Physics
- Mathematical Irreducibility and Quantum Randomness

Neutron Interferometry and Neutron Optics

- Demonstration of Spinor Symmetry using a Neutron Interferometer
- Observation of Coherent Spinor Superposition with Neutrons
- Young's Double-Slit Experiment with Neutrons
- Development of Novel Perfect-Crystal Neutron Interferometers
- Neutron Interferometry with Very Cold 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
- Observation of the Fizeau-Effect for Neutrons
- Observation of In-Crystal Gravitational Effects with Neutrons
- Observation of Generalized Aharonov-Bohm-Effects with Neutrons

Atom Optics

- Dynamical Diffraction of Atoms at Thick Light Crystals
- Diffraction of Atoms at a purely Imaginary Potential
- 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
- Diffraction of Atoms at Complex Potentials
- Observation of a Violation of Friedel's Law with Atoms
- Coherent Diffraction of Atoms at Light Crystals in the Channeling Limit
- Atom Holography

Molecule Optics

- Development of a Macromolecule Interferometer
- Quantum Interference of C-60 and C-70 Molecules
- Quantum Interference of Porphyrine, a biological molecule
- Decoherence by Collisions
- Decoherence by Photon Emission
- Detailed Investigation of the Quantum-Classical Transition

Mesoscopic Physics

- First Demonstration of the Self-Cooling of a Micromechanical Mirror 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 Single Photons with High Precision
- Measurement of Pendellösung for Single Photons and for Entangled Photon Pairs
- Experimental Demonstration of Interaction-Free Measurement
- Entangled Entanglement
- First Experiment 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
- First Bell Experiment closing two Loopholes
- First Kochen-Specker Experiment with single Qutrits

Quantum Information, Quantum Communication and Quantum Computation

- First Experimental Observation of Hyper-Dense Coding
- First Teleportation of Independent Entangled Photons
- Experimental Entanglement Swapping
- First Experimental Observation of GHZ States
- 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
- Demonstration of a Nonlinear Sign-Shift Logical Gate
- First Demonstration of Decoherence-Free Quantum Computation
- Realization of a Photonic C-Not Gate
- Characterization and Conversion of GHZ and W States
- 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
- Development of a Fully Automated Entangled-State Quantum Cryptography System
- Quantum Simulation of a Frustrated Heisenberg Spin Chain

SCIENTIFIC PUBLICATIONS

More than 450 scientific publications among those, more than 350 in peer reviewed, ISI ranked journals

More than 700 invited talks at conferences and seminars

Some papers have become science citation classics. Three papers have been cited more than 1.000 times. Another 14 papers have been cited more than 200 times. The paper "Experimental Quantum Teleportation" (Nature 390, 1997) has been cited more than 1.700 times so far (ISI Citation Index).

BOOKS

Edited Collections and Conference Proceedings

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

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

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

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

Einsteins Schleier
A. Zeilinger
C.H. Beck 2003

Einsteins Spuk
A. Zeilinger
Bertelsmann 2005

Dance of the Photons
A. Zeilinger
Farrar, Straus and Giroux 2010

Einsteins Schleier and *Einsteins Spuk* appeared in German. Translations into other languages have appeared or are currently in preparation.