

# Curriculum Vitae

## Anton Zeilinger

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

Present addresses: Faculty of Physics, University of Vienna  
Boltzmannngasse 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  
2013-present Professor Emeritus, University of Vienna  
2004-present Senior Scientist, IQOQI Vienna, Institute for Quantum Optics and Quantum Information, Austrian Academy of Sciences  
2004-2013 Director, IQOQI Vienna, Institute for Quantum Optics and Quantum Information, Austrian Academy of Sciences  
1999-2013 Professor of Experimental Physics, University of Vienna  
1990-1999 Professor of Experimental Physics, University of Innsbruck  
1988-1989 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, Atominstytut Vienna  
1977-1978 Research Associate (Fulbright Fellow) at M.I.T. in the Neutron Diffraction Laboratory under Prof. C.G. Shull (Nobel Laureate 1994)  
1972-1979 Research Assistant, Atominstytut Vienna  
with Professor Helmut Rauch

### VISITING RESEARCH AFFILIATIONS

2016 Einstein Visiting Professor, University of Science and Technology of China  
2010 Visiting Researcher, Part-Time, Merton College, Oxford  
2001-2004 Senior Humboldt Foundation Fellow, Humboldt University, Berlin  
1998 Visiting Research Fellow, Merton College,  
Oxford University, UK  
1995 Chaire Internationale, Collège de France, Paris, France

1986-1989 Adjunct 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

2016 Bethe Lectures, Cornell University, USA  
2016 Zhongshan Lecture, Nanjing University, China  
2015 Hofstadter Lecture, Stanford University, USA  
2014 Montroll Memorial Lecture, University of Rochester, USA  
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 f. P. Becker, Physikalisch-Techn. 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 Ofer 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

- 2016 Foreign Member, Russian Academy of Sciences
- 2016 Foreign Honorary Member, Romanian Academy of Sciences
- 2015 Socio Corrispondente Straniero, Accademia Galileiana
- 2014 Fellow, The World Academy of Sciences (TWAS)
- 2014 Foreign Associate, National Academy of Sciences of Belarus
- 2014 Foreign Associate, U.S. National Academy of Sciences
- 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 National Academy of Sciences Leopoldina
- 2002 Member, Berlin-Brandenburg Academy of Sciences
- 2000 Member, Academia Scientiarum et Artium Europaea
- 1999 Fellow, American Physical Society (APS)
- 1998 Full Member, Austrian Academy of Sciences
- 1994 Corresponding Member, Austrian Academy of Sciences

## INTERNATIONAL PRIZES AND AWARDS

- 2017 John Stewart Bell Prize for Research on Fundamental Issues in Quantum Mechanics and their Applications
- 2017 Medal of the Senate of the Czech Republic
- 2016 Willis E. Lamb Award for Laser Science and Quantum Optics
- 2015 Medal of The World Academy of Sciences (TWAS Medal)
- 2015 Academy Medal of the Heidelberg Academy of Sciences
- 2015 Médaille du Collège de France
- 2014 Medal of the National Academy of Sciences of Belarus
- 2013 Urania Medal, Urania Berlin
- 2012 Finalist, World Technology Award for Communications Technology
- 2010 Ben Gurion Medal
- 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

## HONORARY DOCTORATES AND PROFESSORSHIPS

- 2016 Honorary Professor, Nanjing University, China
- 2015 Honorary Doctor, National Academy of Sciences of Ukraine
- 2006 Honorary Doctor, Gdansk University, Poland
- 2005 Honorary Doctor, Humboldt University Berlin, Germany
- 1996 Honorary Professor, University of Science and Technology of China

## AUSTRIAN PRIZES AND AWARDS

- 2015 Grand Decoration of Honour in Gold for Services to the Republic of Austria
- 2013 Großer Tiroler Adler Orden, Federal Province Tyrol
- 2006 Grand Gold Decoration, City of Vienna
- 2005 Wilhelm-Exner-Medal, Austrian Association of 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

- 2013-present President, Austrian Academy of Sciences
- 2009-present President, Postgraduate Academy Traunkirchen, Austria
- 2008-2009 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
- 2006-2012 Member, Executive Board, Institute of Science and Technology of Austria
- 2006-2009 Dean of the Faculty of Physics, University of Vienna
- 2004-2013 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
- Quantum Imaging

## 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 Nonlocality (GHZ)
- Discovery of Entanglement Swapping
- Identification of Information as Fundamental in Quantum Physics
- Mathematical Irreducibility and Quantum Randomness

## SCIENTIFIC PUBLICATIONS

More than 500 scientific publications, among these, more than 430 in peer reviewed, ISI ranked journals. Thirteen publications are ranked as “highly cited papers”, which places them in the top 1% of the academic field of physics based on a highly cited threshold for the field and publication year. One paper is currently a “hot paper”, placing it in the 0.1% in the field of physics. Four papers have been cited more than 1,000 times. Another 11 papers have been cited more than 500 times and another 10 papers more than 200 times (ISI Web of Science).

2014 Thomson-Reuters Highly Cited Researcher

Some papers have become science citation classics. The paper "Experimental Quantum Teleportation" (Nature 390, 1997) was cited more than 2,660 times and the article “New High-Intensity Source of Polarization-Entangled Photon Pairs” (PRL 75, 1995) was cited more than 1,630 times. The publication “Bell Theorem Without Inequality” (Am. J. Phys 58, 1990) was cited more than 1,420 times and the article “Entanglement of the orbital angular momentum states of photons” (Nature 412, 2001) was cited more than 1,150 times so far (ISI Citation Index).

More than 850 invited talks at conferences and seminars.

## BOOKS

### Edited Collections and Conference Proceedings

*Quantum [Un]Speakables II. Half a Century of Bell's Theorem*

Editors: R. A. Bertlmann, A. Zeilinger

Springer 2016, to be published.

*Frontiers of Neutron Scattering*

In honour of Clifford G. Shull on the occasion of his 70<sup>th</sup> 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*

At 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.