

Curriculum Vitae

Anton Zeilinger

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

Present addresses: Institute for Quantum Optics and Quantum Information
Austrian Academy of Sciences
Boltzmannngasse 3, 1090 Vienna, Austria
anton.zeilinger@univie.ac.at

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 Professor Emeritus, University of Vienna
2004-present Senior Scientist, IQOQI Vienna, Institute for Quantum Optics and Quantum Information, Austrian Academy of Sciences
2013-2022 President, 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 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)
1972-1979 Research Assistant, Atominstitut 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

MOST IMPORTANT RESEARCH ACHIEVEMENTS

- Matter wave interferometry with neutrons, atoms, buckyball molecules
- Discovery of three-particle entanglement as an extreme demonstration of quantum nonlocality. The so-called GHZ-states (Greenberger-Horne-Zeilinger) and their generalizations have become a cornerstone in the development of quantum information science and quantum computation
- First experimental realization of quantum teleportation of a single independent photon
- Theoretical concept of entanglement swapping and its first experimental verification. This is a fundamental ingredient for future quantum repeaters
- Long-distance realizations of quantum communication and of loophole-free tests of Bell's Inequality
- First experimental realization of entanglement-based quantum cryptography
- Realization of many gates and procedures for optical quantum computation

PROFESSIONAL INITIATIVES BEYOND PHYSICS

2006	Creation of the Institute of Science and Technology Austria (IST Austria). Primary idea, first concepts and important first steps in the political process
2009	Creation of "Internationale Akademie Traunkirchen". This is a small student academy to motivate and excite young students from primary school to high school for the sciences, mathematics, and engineering.
2016	Initiative for the project "Exile and Excellence" by the Austrian Academy of Sciences. In that film by Frederick Baker, émigrés from Austria were interviewed about their personal experiences when they had to flee from Nazi Austria

DISTINGUISHED LECTURES

2021	S.N. Bose Memorial Lecture, S.N. Bose National Centre for Basic Sciences, India
2021	Golden Webinar, Pontificia Universidad Católica, Chile
2019	David M. Lee Historical Lecture in Physics, Harvard University, USA
2016	Einstein Chair Professorship Lecture, University of Science and Technology of China (USTC)
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
- 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 Fujitsu Lecture, University of Cambridge, UK
- 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

- 2022 Honorary Member, Austrian Physical Society (ÖPG)
- 2021 Foreign Member, National Academy of Sciences of Ukraine
- 2020 Fellow, Optical Society of America (OSA)
- 2019 Foreign Member, Chinese Academy of Sciences (CAS)

- 2018 IEEE Honorary Membership, U.S.A.
- 2016 Foreign Member, Russian Academy of Sciences
- 2016 Foreign Honorary Member, Romanian Academy of Sciences
- 2015 Socio Corrispondente Straniero, Accademia Galileiana, Padova
- 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 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

HONORARY DOCTORATES AND PROFESSORSHIPS

- 2022 Honorary Doctor, Leopold-Franzens-University Innsbruck, Austria
- 2022 Honorary Doctor, Okinawa Institute of Science and Technology Graduate University (OIST)
- 2022 Honorary Doctor, Technion - Israel Institute of Technology, Israel
- 2019 Honorary Professor, Xi'an Jiaotong University, China
- 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

INTERNATIONAL PRIZES AND AWARDS

- 2022 Nobel Prize® in Physics
- 2022 Heisenberg-Medal, Heisenberg Society, Germany
- 2021 Gold Medal V.Vernadsky, National Academy of Sciences of Ukraine
- 2019 Micius Quantum Prize of the Micius Quantum Foundation, China
- 2019 Cozzarelli Prize of the Proceedings of the National Academy of Sciences
- 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 Einstein Chair Professorship, University of Science and Technology of China
- 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 Medaille 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
- 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
- 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

- 2018 Grand Decoration of Honour in Gold for Services to Vienna
- 2015 Grand Decoration of Honour in Gold for Services to the Republic of Austria
- 2013 Großer Tiroler Adler Orden, Federal State of 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 SERVICES

- 2013-2022 President, Austrian Academy of Sciences
- 2009-present President, Student Academy Traunkirchen, Austria
- 2008-2009 Member, Planning and Strategy Committee of the Austrian Academy of Sciences
- 2006-2016 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

- Tests of quantum mechanics
- Entanglement and quantum nonlocality
- Matter wave interferometry
- Quantum cryptography
- Quantum communication
- Quantum computation
- Quantum teleportation
- Quantum imaging

SCIENTIFIC PUBLICATIONS

More than 550 scientific publications, among these, more than 500 in peer reviewed, ISI ranked journals. 16 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 has been cited almost 4,000 times, three others over 2,000 times, another three over 1,000 times, another 17 over 500 times and another 37 over 200 times (ISI Web of Science).

2014 Thomson-Reuters Highly Cited Researcher

Some papers have become science citation classics. To date, the paper "Experimental Quantum Teleportation" (Nature 390, 1997) was cited 3,994 times and the article “New High-Intensity Source of Polarization-Entangled Photon Pairs” (PRL 75, 1995) was cited 2,320 times. The publication “Entanglement of the orbital angular momentum states of photons” (Nature 412, 2001) was cited 2,308 times and the article “Bell Theorem Without Inequality” (Am. J. Phys 58, 1990) was cited 1,790 times (Web of Science, 30.09.2022).

More than 1,100 invited talks at conferences and seminars, 43 of them distinguished lectures.

BOOKS

Edited Collections and Conference Proceedings

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

Editors: R. A. Bertlmann, A. Zeilinger

Springer 2017

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

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
New edition: Goldmann
2022

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.