

# Peter Zoller

Institute for Theoretical Physics  
University of Innsbruck, and Institute for Quantum Optics, and  
Quantum Information of the Austrian Academy of Sciences  
6020 Innsbruck, Austria  
Tel.: (+43) –512-507 4780 / 4781  
Fax: (+43) –512-507 9815  
[Peter.Zoller@uibk.ac.at](mailto:Peter.Zoller@uibk.ac.at)  
<http://iqoqi.at/people&v=i&i=274807>



## Personal Data

Date of Birth      16 September, 1952  
Nationality        Austria

## Professional Experience

9/1994-present	Professor of Physics with tenure, Institute for Theoretical Physics, University of Innsbruck, Austria, vice dean of studies (2001-2004), Head of the Institute of Theoretical Physics (1995-1999)
11/2003-present	Research Director, Institute for Quantum Optics and Quantum Information of the Austria Academy of Sciences, Innsbruck, Austria; Managing Director 11/2009-1/2012
9/1994-present	JILA Adjoint Fellow, Joint Institute for Laboratory Astrophysics, Boulder, Colorado
2016	KITP Simons Distinguished Visiting Scholar
2015	Jacques Solvay professor in physics
6-7/2012; 1/2013	Distinguished Fellow, Max-Planck Institute for Quantum Optics, Garching, Germany
1/2010	Arnold-Sommerfeld Lecturer, LMU München
8-9/2008; 3/2010	Moore Distinguished Scholar, Caltech
3/2007	Distinguished Lecturer, Technion, Haifa
2-3/2006	Guest Professor, Institut Henri Poincaré, Paris
3-6/2005	Lorentz-Professor, Leiden
11/2004	Chair Professor Tsinghua University, Beijing, China; Yan Jici Chair Professorship, The University of Science and Technology, Hefei, China
2/2004; 1/2004	Loeb Lecturer Harvard, Boston, MA
1/1991-8/1994	Professor of Physics with tenure, Department of Physics and JILA Fellow, Joint Institute for Laboratory Astrophysics, University of Colorado
1981-1982; 1988	JILA Visiting Fellow, University of Colorado, Boulder, CO
1986	Guest Professor, University Paris – Sud, Orsay, France
1977-1990	Assistant Professor, University of Innsbruck; Habilitation 1981, tenure since 1981
1978-1979	Max Kade Fellow, University of Southern California, Los Angeles, USA

## Education

2/1977    PhD thesis in Theoretical Physics, University of Innsbruck

1962-1970 Gymnasium Innsbruck, Austria (high school including college)

### **Scientific Interests**

- Theoretical Quantum Optics
- Interaction of Atoms, Molecules and Ions with Electromagnetic Fields
- Theory of Quantum Noise
- Quantum Computing, Quantum Communication and Quantum Simulation
- Many-Body Quantum Systems, and Strongly Interacting Systems
- Open System and Non-equilibrium Dynamics

### **Main Scientific Achievements (Short List)**

- Quantum Stochastic Formulation of Quantum Noise and Continuous Measurement Theory in Quantum Optics
- Interactions of Atoms with Stochastic Classical and Non-Classical Light Fields
- Quantum Information Processing with Atoms, Molecules, Ions and Photons
- Hubbard Models and Quantum Phase Transitions with Atoms and Molecules in Optical Lattices
- Quantum Repeater, and Quantum State Transfer for Quantum Communications
- Entanglement via Cold Collisions
- Rydberg Blockade Mechanism and Quantum Gates
- Open Many-Body Systems with Atoms, Molecules and Ions

### **Member of International Scientific Societies**

- Foreign Member of the Max-Planck-Institute for Quantum Optics in Garching since 2014
- Member of the Academy of Europe (Academia Europea) since 2013
- Member of the European Academy of Sciences since 2011
- Member of the German National Academy of Sciences (Leopoldina) since 2010
- Foreign Associate of the US National Academy of Sciences since 2009
- Foreign Associate of the Royal Spanish Academy of Sciences since 2008
- Foreign Member of the Royal Netherlands Academy of Arts and Sciences since 2008
- Member of the Austrian Academy of Sciences since 2001; Corresponding Member since 1999
- Fellow of the American Physical Society since 1993
- Member of the Austrian Physical Society

### **Other Activities (last ten years)**

Member of Advisory Boards:

Solvay Committee (2011-present); Institute for Interdisciplinary Information Sciences, Tsinghua University, Beijing (2010-present); Physics Frontier Center, JILA, NIST – University of Colorado (2009-present); Physics Frontier Center, Joint Quantum Institute, NIST – Maryland (2009-2012); QUEST Center of Excellence, Hannover (2009-2012); Arnold Sommerfeld Center for Theoretical Physics, LMU Munich (2005-present); Max Planck Institute for Quantum Optics, Garching (2001-2011); Kavli Institute of Theoretical Physics, University of California at Santa Barbara (2005-2008); Institute of Theoretical Physics, Beijing, Chinese Academy of Sciences (2005-2008); Perimeter Institute, Canada (2005); BEC Institute, Trento, Italy (2003-2009); Chinese National Lab, USTC Hefei (2004); Steering Committee of the DFG funded SFB/TRR49 (until 2008); ITAMP, Harvard University (1996-2000); Speaker Sonderforschungsbereich “Quantum Control and Measurement”, Innsbruck – Vienna (1999-2008)

## Support of Young researchers

Since 1981 I have supervised **34** PhD students. **4** of them are currently working for their PhD. Among those who graduated **15** continued as postdoctoral fellows, and **9** became professors. I have also supervised **38** postdoctoral fellows, **23** are now professors.

## Publications

Over 450 publications during the whole carrier, ISI h-index 103, # of citations > 43000, Average citations per article in 2014 > 78.5

*Full list of publications can be downloaded from:* <http://iqoqi.at/home> (People/Peter Zoller)

*ResearcherID:* <http://www.researcherid.com/rid/O-1639-2014>

## Invited Presentations to International Conferences and International Advanced Schools

Over 200 invited talks since 2001 at international conferences and workshops, including several plenary and keynote talks as well international schools.

*Full list can be downloaded from:* <http://iqoqi.at/home> (People/Peter Zoller)

## Organization of International Conferences (Steering Committee, Program Committee)

- 2015 Frontiers of Quantum Physics 2015, Symposium in honor of the landmark birthdays of Roy Glauber and Maciej Lewenstein, Barcelona, Spain
- 2015 INT Program INT-15-1, "Frontiers in Quantum Simulation with Cold Atoms", Seattle, USA
- 2014 Symposium in honor of Jeff Kimble's 65<sup>th</sup> birthday "The quantum optics frontier", Pasadena, USA
- 2011 BEC Prize committee associated with the BEC Conference (Sant Feliu, Spain)
- 2011 International Workshop on Quantum Physics of Low-Dimensional, Stellenbosch, South Africa
- 2011 QIPC, Zurich, Switzerland
- 2011 25th Solvay conference on physics „The Theory of the Quantum Physics”, Brussels, Belgium
- 2010 Quantum Optics conference, Obergurgl, Austria
- 2009 Bose-Einstein Condensation 2009, Frontiers in Quantum Gases, Sant Feliu de Guixols, Spain
- 2009 KITPC program on Condensed matter physics of cold atoms, Beijing, China
- 2009 KITP program on Quantum Information Science, Santa Barbara, USA
- 2008 The 25th Jerusalem Winter School in Theoretical Physics: Condensed Matter Physics and Quantum Information with Cold Atoms, Jerusalem, Israel
- 2008 Workshop on Quantum Phenomena and Information, Trieste, Italy
- 2008 ICAP, Storrs, Connecticut, USA
- 2007 KITP program on Strongly Correlated Phases in Condensed Matter, Santa Barbara, USA
- 2007 Bose-Einstein Condensation 2007, Frontiers in Quantum Gases, Sant Feliu de Guixols, Spain
- 2006 ICAP, Innsbruck, Austria
- 2005 Gordon Research Conference on Quantum Information Science, Ventura, USA
- 2005 International School of Physics "Enrico Fermi" on Quantum Computers, Algorithms and Chaos", Varenna, Italy
- 2005 Quantum Optics conference, Obergurgl, Austria
- 2004 ICAP, Rio de Janeiro, Brazil
- 2003 Quantum Optics conference, Obergurgl, Austria
- 2003 ASPEN 2003 Summer Program, "Exploring the Interface Between Cold Atom and Condensed Matter Physics: From Strong Correlation to Entanglement", Aspen, USA
- 2002 ICAP, Cambridge, Massachusetts, USA
- 2001 "Quantum Computers and Quantum Chaos" Conference, Villa Olmo, Como, Italy

## International Prizes/Awards

- 2016 Herbert-Walther-Preis der Optical Society of America und der Deutschen Physikalischen Gesellschaft
- 2013 Wolf Prize in Physics
- 2013 David Ben Gurion Medal
- 2012 ERC Synergy Grant together with I. Bloch (Max Planck Institute for Quantum Optics), E. Altman (Weizmann) and J. Dalibard (College de France)
- 2012 Honorary doctorate from the Free University of Amsterdam
- 2011 Hamburg Prize for Theoretical Physics
- 2011 Blaise-Pascal-Medal of the European Academy of Sciences
- 2010 Benjamin Franklin Medal
- 2009 Wissenschaftspreis der Stiftung Südtiroler Sparkasse
- 2008 BBVA Foundation Frontiers of Knowledge Award in Basic Sciences (Spain)
- 2006 Dirac Medal (ICTP Trieste)
- 2006 6<sup>th</sup> International Quantum Communication Award
- 2005 Niels Bohr/UNESCO Gold Medal
- 2005 Max Planck Medal (German Physical Society)
- 2002 Tiroler Landespreis für Wissenschaft
- 2001 K. Innitzer Award
- 2000 Senior Humboldt Award, Germany
- 1998 Schrödinger Prize of the Austrian Academy of Sciences
- 1998 Max Born Award (Optical Society of America)
- 1998 Wittgenstein Award (Austrian Science Foundation)
- 1983 Ludwig-Boltzmann Award
- 1981 Award of the City of Innsbruck

## Memberships of Editorial Boards of International Journals (last ten years)

- Member of the Editorial Board of Springer Quantum Information Processing (since 2011)
- Member of the Editorial Board of Annalen der Physik (since 2011)
- PNAS Ad hoc Editor (since 2009)
- Associate Editor of Physical Review A (2008-present)
- Associate Editor of Advances of Physics (2006-2009)
- Editor Reviews of Modern Physics (2001-2004)
- Divisional Associate Editor Physical Review Letters (1996-1999)

## Granted Patents

- USA patent with MagiQ Technologies on “*Long-Distance Quantum Communication*”, Luming Duan, M. Lukin, J.I. Cirac and P. Zoller
- Austrian patent on “Programmable Quantum Annealing Device”, P. Hauke, W. Lechner and P. Zoller