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Press Release

## **Prof. Peter Zoller is elected as “External Scientific Member” at the Max Planck Institute of Quantum Optics**

**Press &  
Public Relations**  
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**At the 65th annual meeting of the Max Planck Society in June 2014 the Austrian physicist Professor Peter Zoller (Photo: C. Lackner), Chair of Theoretical Physics at the Leopold-Franzens-Universität Innsbruck and Director at the Institute of Quantum Optics and Quantum Information (IQOQI) of the Austrian Academy of Sciences in Innsbruck (Austria), has been elected as an “External Scientific Member” at the Max Planck Institute of Quantum Optics. He has been nominated by Professor Ignacio Cirac, Director at MPQ and head of the Theory Division.**

Only excellent scientists are being elected as candidates for this position; a long-time connection with the nominating institute is another prerequisite. As in the case of the scientific members of the institutes the appointment is preceded by a severe selection procedure. Once the candidate has been approved by the section in question the candidate is appointed by the senate of the MPG.

For many years, Prof. Peter Zoller and Prof. Ignacio Cirac have been conducting research in close cooperation in various fields of quantum optics. Since December 2012 Zoller has been cooperating with the Quantum Many-Body Systems Division of Prof. Immanuel Bloch at MPQ as a partner of the project UQUAM. Other partners of this project which is supported via an ERC synergy grant “for the investigation of ultracold quantum matter” are Prof. Jean Dalibard (Collège de France and Laboratoire Kastler Brossel, Paris) and Prof. Ehud Altman (Weizmann-Institute of Science in Rehovot, Israel). “We are most happy and very proud to have won Peter Zoller, an excellent scientist and most agreeable colleague, as an external scientific member of our institute”, Prof. Cirac claims. “This will even strengthen the ties and open more possibilities for further cooperation.”

Prof. Peter Zoller was born in Innsbruck (Austria). He studied physics at the Leopold-Franzens-Universität, where he received his doctoral degree in 1977 and, after a two-years postdoc in the USA, defended his Habilitation in 1981. Having spent several years abroad at renowned institutes as a research scientist, he accepted a position as a Professor of Physics at the Institute for Theoretical Physics of the Leopold-Franzens-Universität in 1994, heading the institute from 1995 to 1999. In 2003 he was also appointed Research Director of the newly founded Institute for Quantum Optics and Quantum Information of

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the Austrian Academy of Sciences, where he acted as managing director from 2009 to 2012.

The scientific interests of Prof. Zoller include the description of the interactions of atoms, molecules and ions with the electromagnetic field, the theoretical proposal of quantum computers and communication devices, the proposals to simulate many-body quantum systems with atomic systems, and the study of open and non-equilibrium quantum systems.

The work of Peter Zoller is unique in the sense that he has, for the first time, made the connection between the abstract theory of quantum information and real physical systems. At the moment, there are many laboratories implementing those proposals, and there are even entire workshops dedicated to some of those topics. Highlights of his work include the first realistic proposals for quantum computers based on trapped ions, atoms in cavities, Rydberg atoms, or cold molecules, or the proposals to implement quantum networks and repeaters using atoms in cavities or atomic ensembles.

Concerning atomic many-body systems in optical lattices Peter Zoller had, for example, predicted the quantum phase transition from a superfluid to a Mott-insulator. This quantum phase transition was verified experimentally in 2001. The quantum simulation of many-body problems, which is rooted in this work, is one of the most active fields of research in quantum physics at the moment.

The work of Prof. Peter Zoller has been recognized with very prestigious prizes. They include the Wittgenstein Award (1998) from the Austrian Science Fund, the Schrödinger Prize (1998) from the Austrian Academy of Sciences, the Max Born Award (1998) from the Optical Society of America, the Max Planck Medal (2005) from the German Physical Society, the Niels Bohr /UNESCO Gold Medal (2005), the Dirac Medal (2006), the BBVA Frontiers of Knowledge Award (2008), the Benjamin Franklin Medal (2010), the Blaise Pascal Medal (2011) of the European Academy of Sciences, and the Wolf Prize in Physics (2013).

He has also obtained the Honorary Doctorate from the Free University of Amsterdam, and has held many other prestigious lectures and guest professorships, like the Loeb Lecture (Harvard), Lorentz-Professor (Leiden), Distinguished Lecturer (Technion, Haifa), Moore Distinguished Scholar (CALTECH), or the Arno Sommerfeld Lecturer (Munich). [*Olivia Meyer-Streng*]

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