



# 复旦大学物理系 物质科学报告

Time: 2:00pm, Tuesday, 2019.11.26

Location: Room C108, Jiangwan Physics Building

Title: A Quantum Leap in Quantum Information:

Subtitle: Building Quantum Computers and Quantum Simulators with Cold Atoms and Ions

Speaker: Peter Zoller,

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Abstract: On a microscopic scale our world is governed by quantum physics. Apart from fundamental questions and ‘mysteries’ of quantum physics, learning how to control this microscopic world is also an opportunity for new applications and quantum technologies - potentially more powerful than their classical counterparts. In this lecture we discuss recent progress in building quantum computers and quantum simulators. We will focus on quantum optical systems of atoms and ions manipulated by laser light, providing prime examples of quantum systems, which can be controlled on the level of single quanta. This includes a discussion of trapped ions as a universal quantum processor, and digital and analog quantum simulation of strongly correlated quantum matter with atoms in optical lattices. We conclude with an outlook on a ‘quantum internet’, verifications of quantum devices and building a ‘quantum annealer’.



**Prof. Peter Zoller**

**Member of the Austrian Academy of Sciences**

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He received his B.S. degree from Gymnasium Innsbruck, Austria in 1970 and PhD degree in Theoretical Physics, University of Innsbruck, in 1977. In 1977 he joined the University of Innsbruck, as an assistant professor. He became an professor in 1990, Department of Physics, University of Colorado. Since 1994, he joined the Center for Quantum Physics, University of Innsbruck, as a professor. His research interests

include 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. Over 660 publications during his whole carrier, ISI h-index 143, # of citations > 88000, Average citations per article > 134.