MAX PLANCK INSTITUTE
OF QUANTUM OPTICS

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Press Release

Harvey Prize for Professor Immanuel Bloch

**Press &
Public Relations**
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On 5 June 2016, Immanuel Bloch will receive the "2015 Harvey Prize" in Science and Technology from the Israel Institute of Technology (Technion) in Haifa. Professor Bloch, Director at the Max Planck Institute of Quantum Optics and Professor for Experimental Physics at the Ludwig-Maximilians-Universität Munich is honoured "in recognition of his fundamental contributions in the field of light and matter interactions in quantum many-body systems." This year's Harvey Prize is awarded also to the Harvard biochemist Prof. Marc Kirschner.

The prize committee recognizes Professor Bloch "for his pioneering experiments realizing quantum simulators using cold atoms trapped in crystals of light, thereby establishing a new research field at the interface of condensed matter, atomic physics, and quantum optics." In his research, Professor Bloch investigates how the microscopic interplay of many atoms leads to new collective properties of the whole quantum many-body system. To this end, he has set up a variety of experiments in his laboratories both at the MPQ and the LMU.

Ultracold atoms trapped in such crystal of light – so called optical lattices – play the role of the electrons in solid states crystals, however with lattice spacings about 10.000 times larger than the ones in real materials. Thereby, high resolution optics makes it possible to produce direct snapshots of all atoms in the system, and to precisely control the atoms down to single lattice sites. By working with these artificial quantum systems, Prof. Bloch's group succeeded in realizing new states of matter and investigating fundamental questions in various fields of physics, ranging from condensed matter physics and statistical physics, over quantum optics to high-energy physics.

Since 1972, the Harvey Prize has been awarded annually for breakthroughs in science, technology and health. Among former prize winners are Claude Cohen-Tannoudji, who received the Harvey prize for his pioneering work on laser cooling, or Reinhard Genzel, who was honoured for the detection of black holes last year.

Professor Bloch will receive the Harvey Prize during an award ceremony at the Technion on 5 June 2016. On this occasion he will give a lecture on his research which will later on be published in the Harvey Prize papers.

Information on Immanuel Bloch:

Immanuel Bloch began his studies in physics at the Friedrich-Wilhelms-Universität in Bonn where he received his diploma in 1996. After having spent one year of research at Stanford University he joined the Laser Spectroscopy Division of Professor Theodor W. Hänsch (MPQ and LMU). In 2000 he

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obtained his doctoral degree from the LMU. He continued his research in the Hänsch group until he became appointed as Professor at the Johannes Gutenberg-Universität Mainz. Since 2008 he has been Director at the MPQ and leader of the Quantum Many-Body Systems Division, and since 2009 Chair of Quantum Optics at the Ludwig-Maximilians-Universität Munich.

Immanuel Bloch has been awarded with several highly renowned scientific awards. Twice he has won the Philip Morris Research prize (in 2000, together with Prof. Hänsch, and in 2007). In 2002 he has received the Otto Hahn Medal of the Max Planck Society, in 2005 the Gottfried-Wilhelm-Leibniz prize of the Deutsche Forschungsgemeinschaft (DFG), the German National Merit Medal, and the International Commission of Optics Prize. In 2011 the European Physical Society (EPS) has given to him the “2011 Prize for Fundamental Aspects of Quantum Electronics and Optics”. 2013 he has been awarded with the Hector Science Prize 2012, the “Körber-Preis für die Europäische Wissenschaft” and the Senior BEC Award.

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