

News Release

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Major early-career honor for attosecond optics pioneer:

2010 ICO Prize is awarded to TUM physicist Reinhard Kienberger

Attoseconds are the time interval of electron movements in atoms. With his experiments Reinhard Kienberger, professor of experimental physics at the Technische Universität München (TUM), opened the door to this fascinating field of research. Now the International Commission for Optics awarded him with the ICO Prize 2010, honoring not only his achievements, but also the speed with which he has racked up experimental "firsts" and opened new paths for both basic and applied physics. With its ICO Prize, the International Commission for Optics singles out one researcher each year for outstanding contributions to optics made before the age of 40.

Kienberger received the 2010 ICO Prize for pioneering contributions to attosecond physics. One of the main goals of this new scientific discipline is to capture snapshots of the inner life of atoms. This capability is expected to yield important insights into the actual course of chemical reactions, the behavior of electrons in solid materials, and the interactions between light and matter.

"An attosecond is a billionth of a billionth of a second, an unimaginably small space of time," Kienberger says. "This is the time scale on which the motion of an atom's electrons takes place. With extremely short laser pulses, we can make this motion visible and investigate it." New discoveries made through this approach could find application in chemistry, molecular biology, nanotechnology, and treatment of tumors.

During his doctoral research in the laboratory of Prof. Ferenc Krausz, then at the Technical University of Vienna, Kienberger was the first ever to produce laser pulses shorter than one femtosecond (a millionth of a billionth of a second). With that achievement, he opened the door to attosecond physics. While conducting research at the Stanford Linear Accelerator Center, he showed for the first time that techniques for characterizing laser-generated X-rays could be extended to femtosecond X-rays produced by an accelerator. Today, Kienberger and colleagues in the Garching-based Laboratory for Attosecond Physics have measured intervals as short as 20 attoseconds, the world's record.

"Reinhard Kienberger's excellent research work has made him, without a doubt, one of the leading scientists in this promising young field of physics," says Prof. Krausz, who is now a director at the Max Planck Institute for Quantum Optics in Garching and head of the

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Laboratory for Attosecond Physics. As from the beginning, Kienberger and Krausz are close collaborators.

With its ICO Prize, the International Commission for Optics singles out one researcher each year for outstanding contributions to optics made before the age of 40. The prestigious ICO Prize brings with it the Ernst Abbe Medal, which Prof. Kienberger will receive when he presents an honorary lecture at a future congress of the International Commission for Optics.

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Technische Universität München (TUM) is one of Europe's leading universities. It has roughly 460 professors, 7,500 academic and non-academic staff (including those at the university hospital "Rechts der Isar"), and 25,000 students. It focuses on the engineering sciences, natural sciences, life sciences, medicine, and economic sciences. After winning numerous awards, it was selected as an "Elite University" in 2006 by the Science Council (Wissenschaftsrat) and the German Research Foundation (DFG). The university's global network includes an outpost in Singapore. TUM is dedicated to the ideal of a top-level research based entrepreneurial university. <http://www.tum.de>

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