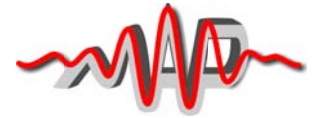




PRESS-RELEASE

Max Planck Institute of Quantum Optics and Munich-Centre for Advanced Photonics



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A collective of electrons under the influence of light

Dr. Peter Dombi is now leader of a new MPQ partner group in Budapest



The Max Planck Institute of Quantum Optics has a new research partner group at the Wigner Research Centre for Physics, which is part of the Hungarian Academy of Sciences in Budapest. Dr. Dombi's (Foto: MPQ) research group will work together closely with the Laboratory for Attosecond Physics (LAP) of Prof. Ferenc Krausz at the MPQ for the next three years. Dombi's team is working on ultrafast interactions of electron collectives in solid states with light, processes which take place within femtoseconds to attoseconds. A femtosecond is a millionth of a billionth of a second (10^{-15}), an attosecond is even a thousand times shorter.

In 2013, Prof. Krausz and his team were able to demonstrate for the first time that it is possible to control electrical and optical properties of solid states by using the electrical fields of light. Scientists were now able to turn electric current on and off by using light. Furthermore light signals could be controlled with the frequency of visible light which oscillates a million times a billion (10^{15}) per second. Dr. Dombi and his group in Hungary will continue the research on the basis of this knowledge. They will mainly concentrate on ultrafast nanoplasmonic phenomena.

In the field of nanoplasmonics physicists investigate the behaviour of collectives of electrons in solid states of nanometre size, for example metallic nanoparticles. When these collectives are excited by light they generate electric fields at the surfaces. Understanding these light-steered phenomena will help to pave the way towards "light-wave electronics" which operates at frequencies about 100,000 times faster than today's techniques.

The Max Planck Society is presently related to more than 40 partner groups worldwide. These relations serve as basis for a collective support of young scientists in countries which are interested in research via international cooperation. These countries are, e.g., India, China, Middle and Eastern European as well as South American countries. After three years the work of a group will be evaluated and can be extended up to five years, if the evaluation comes to a positive result.

The Wigner Research Centre for Physics is the largest physics research institute in Hungary with more than 350 employees and 40 research groups. More than 50 years ago, the first laser has been constructed in Hungary and ever since optics and light-matter interactions have been very important elements of the research program. Now, due to this new cooperation with the MPG an important line of research will be added to this program.

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