MAX PLANCK INSTITUTE
FOR THE SCIENCE OF LIGHT

NEWS

from the **Science of Light**

Dear ,

Here you can find news about research and people from our institute.
Enjoy reading!

Yours sincerely,

Max Planck Institute for the Science of Light

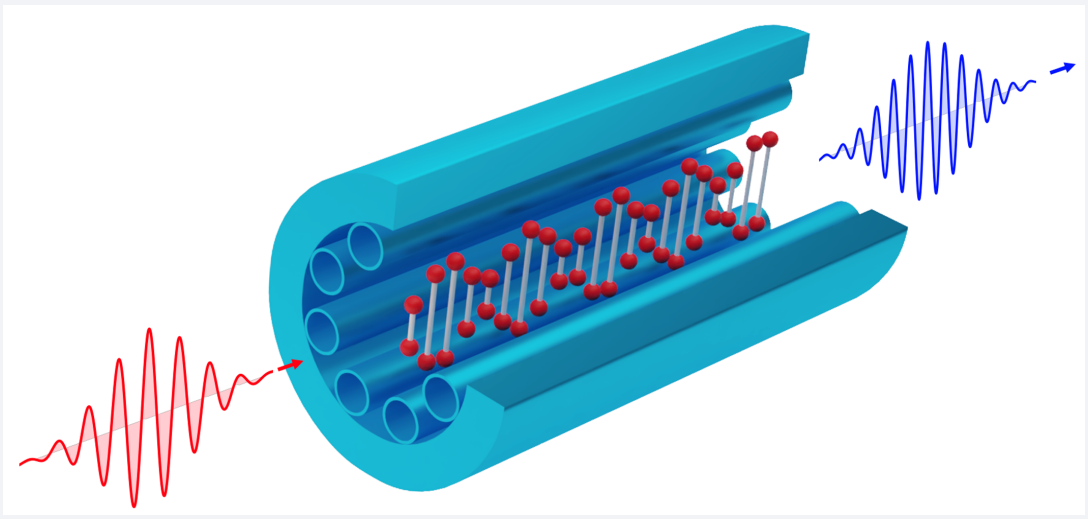
Research

Twisted photonic technology for measuring the safety and efficacy of drugs

Measuring the chirality – the lack of symmetry upon reflection – of substances is of fundamental importance to pharmacology. Until now, this has been a very time-consuming and inefficient process. Fast and high sensitivity chiral sensors could become game-changers in drug discovery and nanomedicine. **> MORE**

Frequency conversion of single photons at arbitrary wavelengths

Quanta of light - photons - form the basis of quantum key distribution in modern cryptographic networks. Before the huge potential of quantum technology is fully realized, however, several challenges remain. A solution to one of these has now been found. **> MORE**



A new method for exploring the nano-world

Scientists at the Max Planck Institute for the Science of Light (MPL) and Max-Planck-Zentrum für Physik und Medizin (MPZPM) in Erlangen present a significant step forward in the characterization of nanoparticles. They used a special microscopy method based on interferometry to outperform existing instruments. One possible application of this technique is to identify illnesses. **> MORE**

People

Director Jochen Guck honored by the Saxon Academy of Sciences and Humanities

Jochen Guck received the Wilhelm Ostwald Medal of the Saxon Academy of Sciences and Humanities in Leipzig for his fundamental contributions to laser physics and cell biomechanics, which enable key advances in medical diagnostics. **> MORE**

Portrait of Vahid Sandoghdar in Nature Methods

From a physicist who explores biology's unknowns, greater precision by linking two methods. **> MORE**

Christoph Marquardt becomes FAU professor

Christoph Marquardt, Research Group Leader at MPL, has now taken on a chair at the Friedrich Alexander University Erlangen-Nuremberg. The focus of his work is on continuous-variable quantum communication.**> MORE**

Peter Hommelhoff received Leibniz Prize

MPL-Fellow Peter Hommelhoff from Friedrich Alexander University Erlangen-Nuremberg received the most prestigious research prize in Germany, also known as the German Nobel Prize: the Gottfried Wilhelm Leibniz Prize. **> MORE**

Publications

Polarization Patterns in Nanomechanics

Polarization patterns in electromagnetic waves can show topological singularities, whose properties are robust. Now scientists from the MPL theory division have teamed up with experimentalists at TU Munich to demonstrate that suitably engineered nanomechanical systems can display a similar kind of physics. Arrays of coupled nanopillars exhibit vibrations that can be optically imaged to reveal mechanical polarization patterns, opening the door to a new area of research.

Juliane Doster, Tirth Shah, Thomas Fösel, Philipp Paulitschke, Florian Marquardt, Eva M. Weig, Observing polarization patterns in the collective motion of nanomechanical arrays, Nature Communications volume 13, Article number: 2478 (2022)

Epsilon-near-Zero media for coupling magnons to photons

Cavity magnonics is a promising solid-state platform for hybrid quantum systems, but the weakness of the coupling between magnons and optical photons has been a barrier to applications. A new concept for optomagnonic systems based on a dispersive magnetic medium could yield the long-sought strong coupling regime, relying on the enhancement of magneto-optical effects at Epsilon-near-Zero frequencies.

V. A. S. V. Bittencourt, I. Liberal, and S. Viola Kusminskiy, Optomagnonics in Dispersive Media: Magnon-Photon Coupling Enhancement at the Epsilon-near-Zero Frequency, Phys. Rev. Lett. 128, 183603

V. A. S. V. Bittencourt, I. Liberal, and S. Viola Kusminskiy, Light propagation and magnon-photon coupling in optically dispersive magnetic media, Phys. Rev. B 105, 014409

Nonreciprocal light-driven vortex isolator

Optical nonreciprocity, which breaks the symmetry between forward and backward propagating optical waves, is of fundamental scientific interest. Now scientists from the Stiller research group and Russell emeritus group have reported a breakthrough in nonreciprocity, in which they used topology-selective stimulated Brillouin scattering to achieve high quality isolation of vortex modes guided in a 3-fold and 6-fold rotationally symmetric chiral photonic crystal fibres. This system will impact applications such as multi-mode optical communications, quantum information processing, optical tweezers, and fibre lasers. The work led by Xinglin Zeng in the Stiller research group has been accepted as a postdeadline paper at CLEO2022 in San Jose, USA.

Xinglin Zeng, Philip Russell, Christian Wolff, Michael Frosz, Gordon Wong, Birgit Stiller, Nonreciprocal light-driven vortex isolator, CLEO2022, JTh6A.8

Events

WOMBAT Workshop in Erlangen

The 4th International Workshop on Optomechanics and Brillouin scattering: Fundamentals, Applications and Technology (WOMBAT) takes place in Erlangen from 14 - 17 June 2022. The registration closes on 31st of May. **> MORE**

Girls` Day at MPL

What is the daily work of a scientist like? 14 participants of Girls Day 2022 visited MPL on 28 April to find out. **> MORE**

Jobs

Looking for a Master`s degree or Ph.D. at the forefront of optics?

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