

NEWS

from the **Science of Light**

Dear,

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

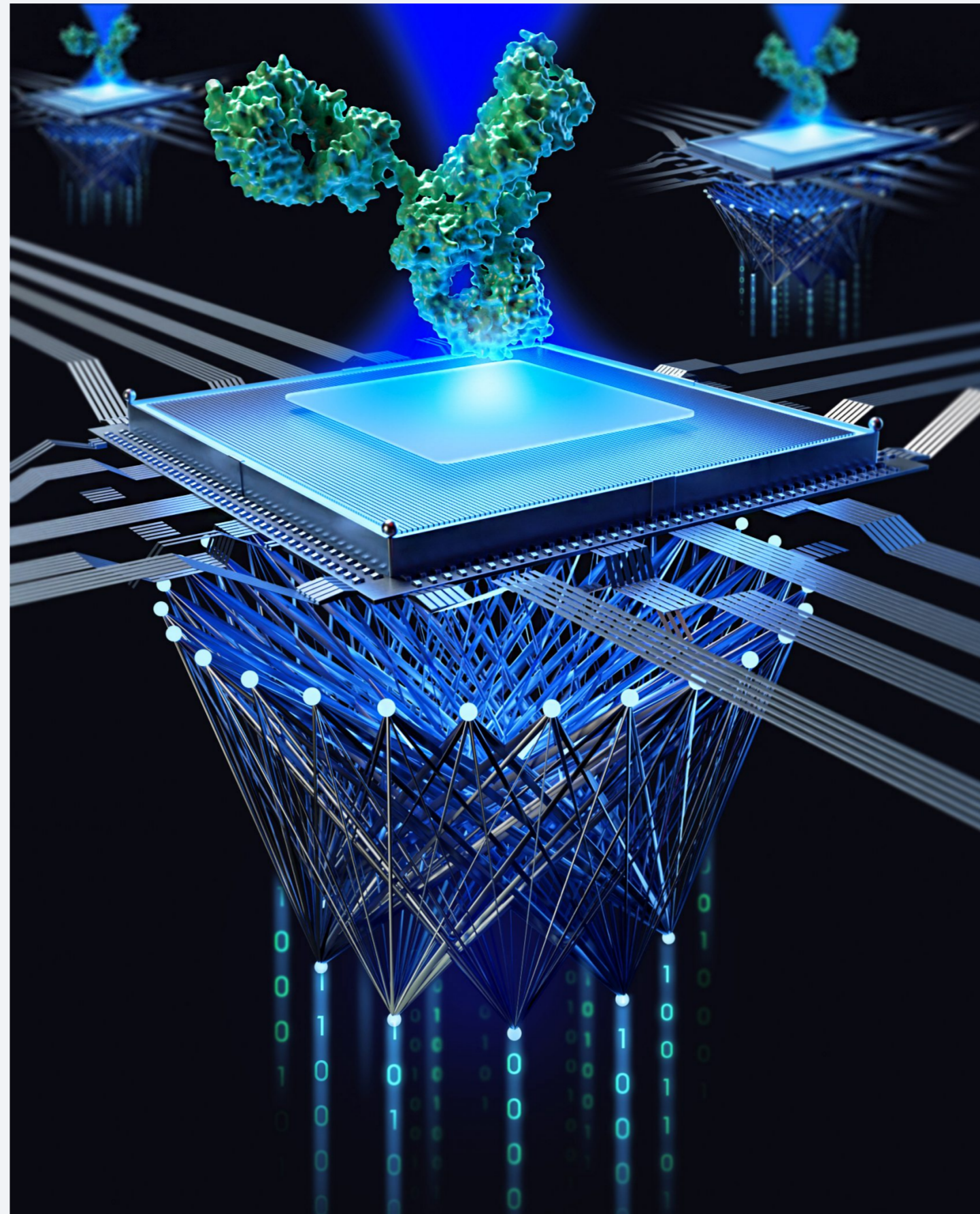
Yours sincerely,

Max Planck Institute for the Science of Light (MPL)

Research

How artificial intelligence can improve protein detection

Small proteins play a critical role in the regulation of immune response, inflammation and neurodegenerative diseases. In order to better detect and study them, scientists at MPL have combined one of the most effective microscopy methods, called ISCI, with artificial intelligence. [> MORE](#)



Little noticed, but of enormous influence: Tissue mechanics affect the growth and metastasis of cancer

The first awardee of the Rosalind Franklin Scientist-in-Residence (RFSR) Program of the Max-Planck-Zentrum für Physik und Medizin (MPZPM), Claudia Fischbach-Teschl, has started her seven-month sabbatical in Erlangen. The program offers outstanding scientists the opportunity to conduct independent research at MPZPM. [> MORE](#)

Publications

On-chip quantum interference between the origins of a multi-photon state

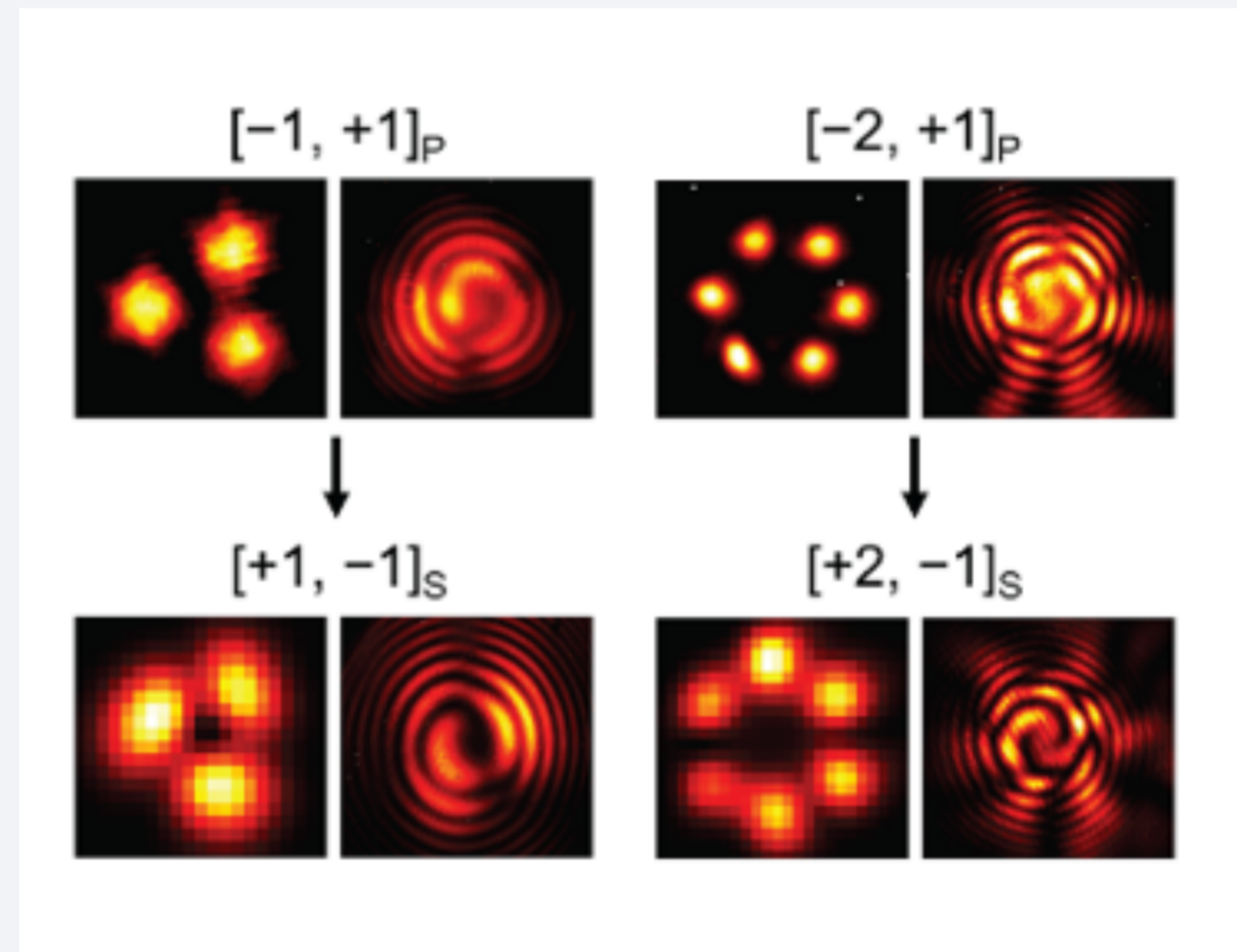
In 2019, a new multi-photon interference effect was predicted using a bridge between graph theory and quantum optics, a core research technology used by the team of Mario Krenn. Now, this phenomenon has been experimentally demonstrated in a collaboration with researchers at the USTC in Hefei, China. The authors, including Mario Krenn, demonstrate for the first time quantum interference between the origins of a multi-photon state.

Lan-Tian Feng, Ming Zhang, Di Liu, Yu-Jie Cheng, Guo-Ping Guo, Dao-Xin Dai, Guang-Can Guo, Mario Krenn, and Xi-Feng Ren, "On-chip quantum interference between the origins of a multi-photon state," *Optica* 10, 105-109 (2023).

Optical Vortex Brillouin Laser

In this paper, stable oscillation of optical vortices and acoustic modes in a Brillouin laser based on chiral photonic crystal fiber (PCF) is reported, which robustly supports helical Bloch modes (HBMs) that carry circularly polarized optical vortices and display circular birefringence. A narrow-linewidth Brillouin fiber laser that stably emits 1st- and 2nd-order vortex-carrying HBMs is implemented. The results pave the way for a new generation of vortex-carrying SBS systems with applications in optical tweezers, quantum information processing, and vortex-carrying nonreciprocal systems.

Zeng, X., Russell, P. S. J., Chen, Y., Wang, Z., Wong, G. K. L., Roth, P., Frosz, M. H., Stiller, B., "Optical Vortex Brillouin Laser," *Laser Photonics Rev.* 2023, 2203277.



Events

Life as a matter of function – DLS talk by Petra Schwillie

The Distinguished Lecturer Series had another high-profile guest in February. MPI of Biochemistry Director Prof. Petra Schwillie visited MPL to talk about her work creating functioning cells from nonliving materials. [> MORE](#)



People

Humboldt Research Fellowship for Xuemei Gu

Xuemei Gu, a postdoc at MPL has received a prestigious Fellowship from the Alexander von Humboldt Foundation for 2 years. The title of the research project she chose for her submission was "AI-assisted discovery of novel quantum optical imaging concepts from astronomy to microscopy". [> MORE](#)

Alumni

MPL Alumnus Prof. Daqing Wang receives prestigious ERC grant

Interview with Prof. Daqing Wang, an MPL alumnus who is now a Tenure Track Professor at Kassel and recently managed to secure a prestigious Starting Grant from the European Research Council (ERC). [> MORE](#)



Marta Urbańska, former PhD student of Professor Guck, awarded with Dresden Physics 2022 Doctoral Award

On Jan. 31, 2023, the Physics Faculty of the Technical University (TU) of Dresden awarded two female scientists with the Dresden Physics 2022 Doctoral Award sponsored by Wilhelm and Else Heraeus Foundation. [> MORE](#)

Jobs

3 PhD Student Positions in the Biological Optomechanics Division of Prof. Jochen Guck: They investigate the physical – mechanical and optical – properties of living cells and tissues using novel photonics and biophysical tools and test their biological importance. Are you interested in applying your knowledge to explore the boundary between physics and biology/medicine? [> MORE](#)

Postdoctoral Position in Molecular Quantum Optics: Would you like to work in a highly motivated research team that aims to understand and control the interaction of quantum emitters, in particular organic molecules, with their nanoscopic environment and with each other? [> MORE](#)

Postdoctoral position for developing a novel source of squeezed light for quantum imaging: Do you have a strong grasp of experimental optics as well as quantum and nonlinear optics? Are you interested in a project that will build sources of pulsed squeezed light for future use in a quantum-enhanced Raman microscope? [> MORE](#)

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

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