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FPM-WSI: Fourier ptychographic whole slide imaging via feature-domain backdiffraction

Shuhe Zhang, Aiye Wang, Jinghao Xu, Tianci Feng, Jinhua Zhou, and An Pan

Optica 11(5) 634-646 (2024)

Conventional Fourier ptychographic microscopy requires high accuracy of system parameters and cannot reconstruct an entire field of view without blocking and stitching, which can introduce extra color inconsistency or stitching artifacts. By re-establishing the forward model in the image's feature domain, the authors report a feature-domain microscopy computational framework that can overcome these challenges. With this technology, they achieve full-color and high-throughput imaging, free of blocking-and-stitching procedures, on a self-developed automated whole-slide imaging platform.

Airborne single-photon LiDAR towards a small-sized and low-power payload

Yu Hong, Shijie Liu, Zheng-Ping Li, Xin Huang, Pengyu Jiang, Yang Xu, Cheng Wu, Hao Zhou, Yu-Chen Zhang, Hai-Lun Ren, Zhao-Hui Li, Jianjun Jia, Qiang Zhang, Chunlai Li, Feihu Xu, Jian-Yu Wang, and Jian-Wei Pan

Optica 11(5) 612-618 (2024)

This article presents an airborne single-photon LiDAR that achieves high-resolution 3D imaging through the use of small telescopes and low-power lasers. The authors employ a photon-efficient computational algorithm, a sub-pixel scanning approach, and a high-quality single-photon avalanche diode array. The results could lead to a compact, small-size, and low-power payload for airborne and spaceborne LiDAR applications.

Supercharged two-dimensional tweezer array with more than 1000 atomic qubits

Lars Pause, Lukas Sturm, Marcel Mittenbühler, Stephan Amann, Tilman Preuschoff, Dominik Schäffner, Malte Schlosser, and Gerhard Birkl

Optica 11(2) 222-226 (2024)

The authors report on the operation of a quantum computing platform that surpasses 1000 individually controllable atomic quantum bits in a single plane. In a quantum register of 3000 sites, 1305 individual-atom qubits are stored and rearranged into defect-free clusters of up to 441 qubits. Further scaling could allow access to the regime of quantum utility.

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