

# Outstanding Papers in 2023

[Far-field super-resolution ghost imaging with a deep neural network constraint](#)

Fei Wang, Chenglong Wang, Mingliang Chen, Wenlin Gong, Yu Zhang, Shensheng Han & Guohai Situ

*Light: Science & Applications* 2022, **11**: 1; doi: 10.1038/s41377-021-00680-w

[Photonic matrix multiplication lights up photonic accelerator and beyond](#)

Hailong Zhou, Jianji Dong, Junwei Cheng, Wenchan Dong, Chaoran Huang, Yichen Shen, Qiming Zhang, Min Gu, Chao Qian, Hongsheng Chen, Zhichao Ruan and Xinliang Zhang

*Light: Science & Applications* 2022, **11**: 30; doi: 10.1038/s41377-022-00717-8

[Deep learning in optical metrology: a review](#)

Chao Zuo, Jiaming Qian, Shijie Feng, Wei Yin, Yixuan Li, Pengfei Fan, Jing Han, Kemao Qian & Qian Chen

*Light: Science & Applications* 2022, **11**: 39; doi: 10.1038/s41377-022-00714-x

[Compact ultrabroadband light-emitting diodes based on lanthanide-doped lead-free double perovskites](#)

Shilin Jin, Renfu Li, Hai Huang, Naizhong Jiang, Jidong Lin, Shaoxiong Wang, Yuanhui Zheng, Xueyuan Chen and Daqin Chen

*Light: Science & Applications* 2022, **11**: 52; doi: 10.1038/s41377-022-00739-2

[Chiral carbon dots: synthesis, optical properties, and emerging applications](#)

Aaron Döring, Elena Ushakova & Andrey L. Rogach

*Light: Science & Applications* 2022, **11**: 75; doi: 10.1038/s41377-022-00764-1

[Liquid crystal-powered Mie resonators for electrically tunable photorealistic color gradients and dark blacks](#)

Trevon Badloe, Joohoon Kim, Inki Kim, Won-Sik Kim, Wook Sung Kim, Young-Ki Kim and Junsuk Rho

*Light: Science & Applications* 2022, **11**: 118; doi: 10.1038/s41377-022-00806-8

[Deep learning acceleration of multiscale superresolution localization photoacoustic imaging](#)

Jongbeom Kim, Gyuwon Kim, Lei Li, Pengfei Zhang, Jin Young Kim, Yeonggeun Kim, Hyung Ham Kim, Lihong V. Wang, Seungchul Lee and Chulhong Kim

*Light: Science & Applications* 2022, **11**: 131; doi: 10.1038/s41377-022-00820-w

[Blue LED-pumped intense short-wave infrared luminescence based on Cr<sup>3+</sup>-Yb<sup>3+</sup>-co-doped phosphors](#)

Yan Zhang, Shihai Miao, Yanjie Liang, Chao Liang, Dongxun Chen, Xihui Shan, Kangning Sun & Xiao-Jun Wang

*Light: Science & Applications* 2022, **11**: 136; doi: 10.1038/s41377-022-00816-6

[Real-time whole-brain imaging of hemodynamics and oxygenation at micro-vessel resolution with ultrafast wide-field photoacoustic microscopy](#)

Xiaoyi Zhu, Qiang Huang, Anthony DiSpirito, Tri Vu, Qiangzhou Rong, Xiaorui Peng, Huaxin Sheng, Xiling Shen, Qifa Zhou, Laiming Jiang, Ulrike Hoffmann and Junjie Yao

*Light: Science & Applications* 2022, **11**: 138; doi: 10.1038/s41377-022-00836-2

[Advanced liquid crystal devices for augmented reality and virtual reality displays: principles and applications](#)

Kun Yin, En-Lin Hsiang, Junyu Zou, Yannanqi Li, Zhiyong Yang, Qian Yang, Po-Cheng Lai, Chih-Lung Lin and Shin-Tson Wu

*Light: Science & Applications* 2022, **11**: 161; doi: 10.1038/s41377-022-00851-3

[Electron-phonon coupling-assisted universal red luminescence of o-phenylenediamine-based carbon dots](#)

Boyang Wang, Zhihong Wei, Laizhi Sui, Jingkun Yu, Baowei Zhang, Xiaoyong Wang, Shengnan Feng, Haoqiang Song, Xue Yong, Yuxi Tian, Bai Yang & Siyu Lu

*Light: Science & Applications* 2022, **11**: 172; doi: 10.1038/s41377-022-00865-x

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[Dielectric metalens for miniaturized imaging systems: progress and challenges](#)

Meiyan Pan, Yifei Fu, Mengjie Zheng, Hao Chen, Yujia Zang, Huigao Duan, Qiang Li, Min Qiu & Yueqiang Hu

*Light: Science & Applications* 2022, **11**: 195; doi: 10.1038/s41377-022-00885-7

[Towards higher-dimensional structured light](#)

Chao He, Yijie Shen and Andrew Forbes

*Light: Science & Applications* 2022, **11**: 205; doi: 10.1038/s41377-022-00897-3

[Multifunctional resonant wavefront-shaping meta-optics based on multilayer and multi-perturbation nonlocal metasurfaces](#)

Stephanie C. Malek, Adam C. Overvig, Andrea Alù and Nanfang Yu

*Light: Science & Applications* 2022, **11**: 246; doi: 10.1038/s41377-022-00905-6

[Fundamentals and comprehensive insights on pulsed laser synthesis of advanced materials for diverse photo-and electrocatalytic applications](#)

Jayaraman Theerthagiri, K. Karuppasamy, Seung Jun Lee, R. Shwetharani, Hyun-Seok Kim, S. K. Khadheer Pasha, Muthupandian Ashokkumar and Myong Yong Choi

*Light: Science & Applications* 2022, **11**: 250; doi: 10.1038/s41377-022-00904-7