

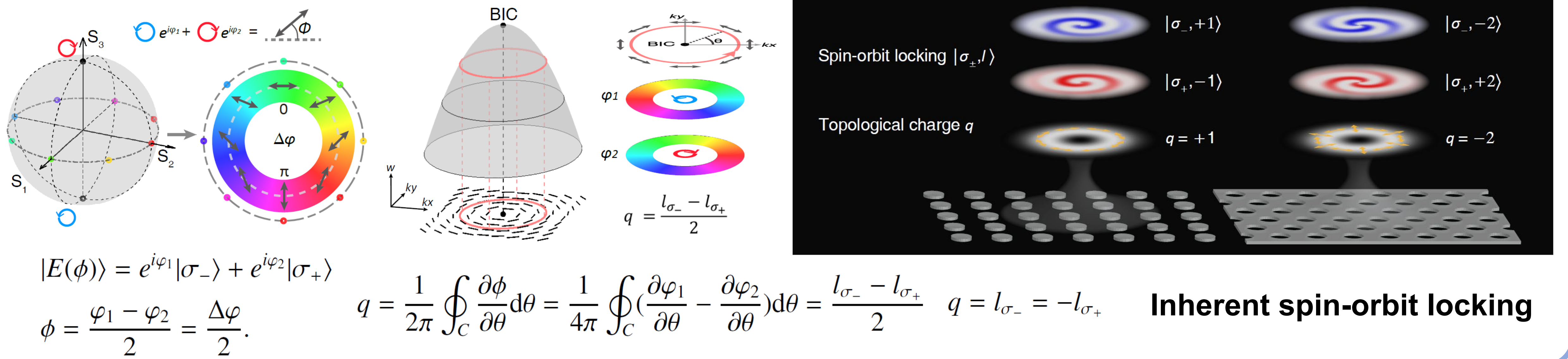
Xinhao Wang^{1,*}, Jiajun Wang¹, Zhaochen Wu¹, Lei Shi¹, Yuri Kivshar² and Jian Zi¹

¹ State Key Laboratory of Surface Physics, Key Laboratory of Micro- and Nano-Photonic Structures (Ministry of Education) and Department of Physics, Fudan University, Shanghai 200433, China.

² Nonlinear Physics Centre, Research School of Physics, The Australian National University, Canberra ACT 2601, Australia

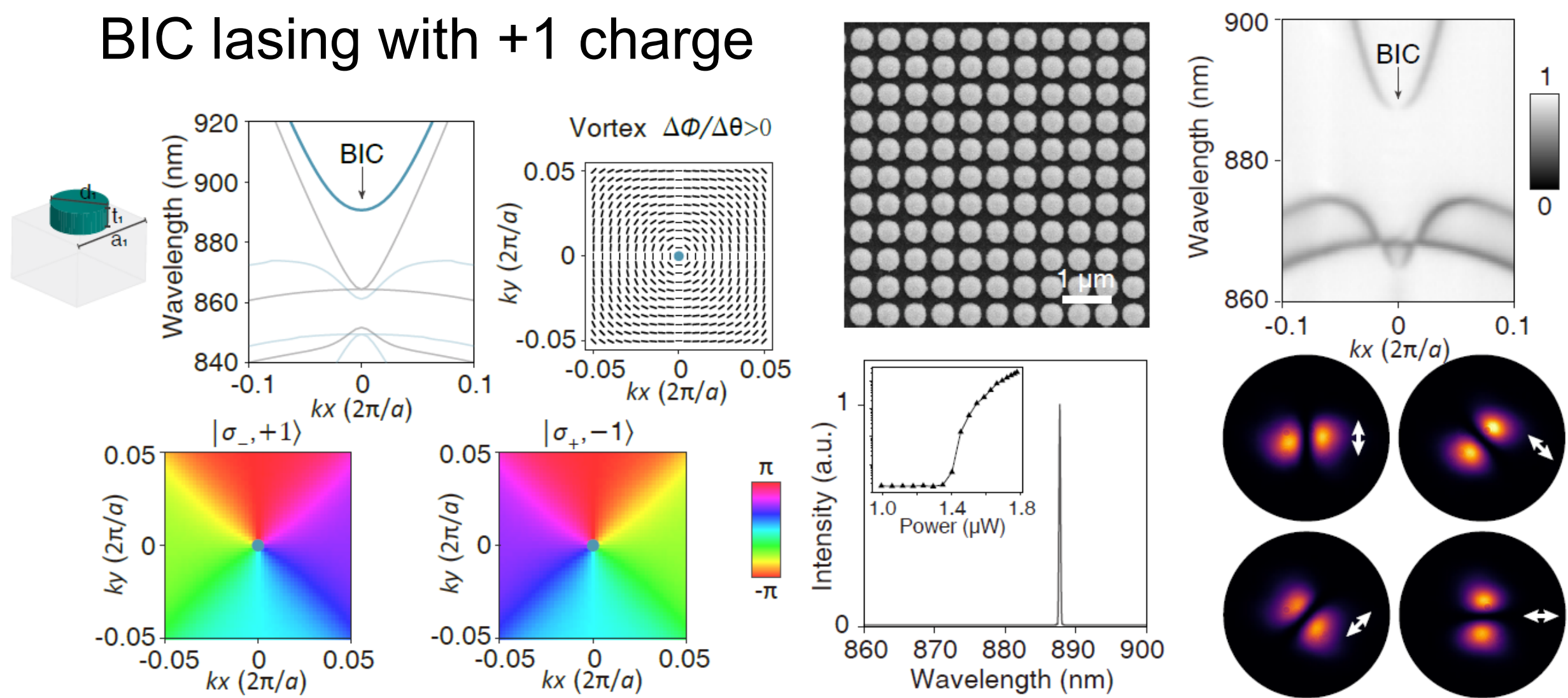
* Email: xinhaowang22@m.fudan.edu.cn

Polarization vortices of BICs and the inherent spin-orbit locking

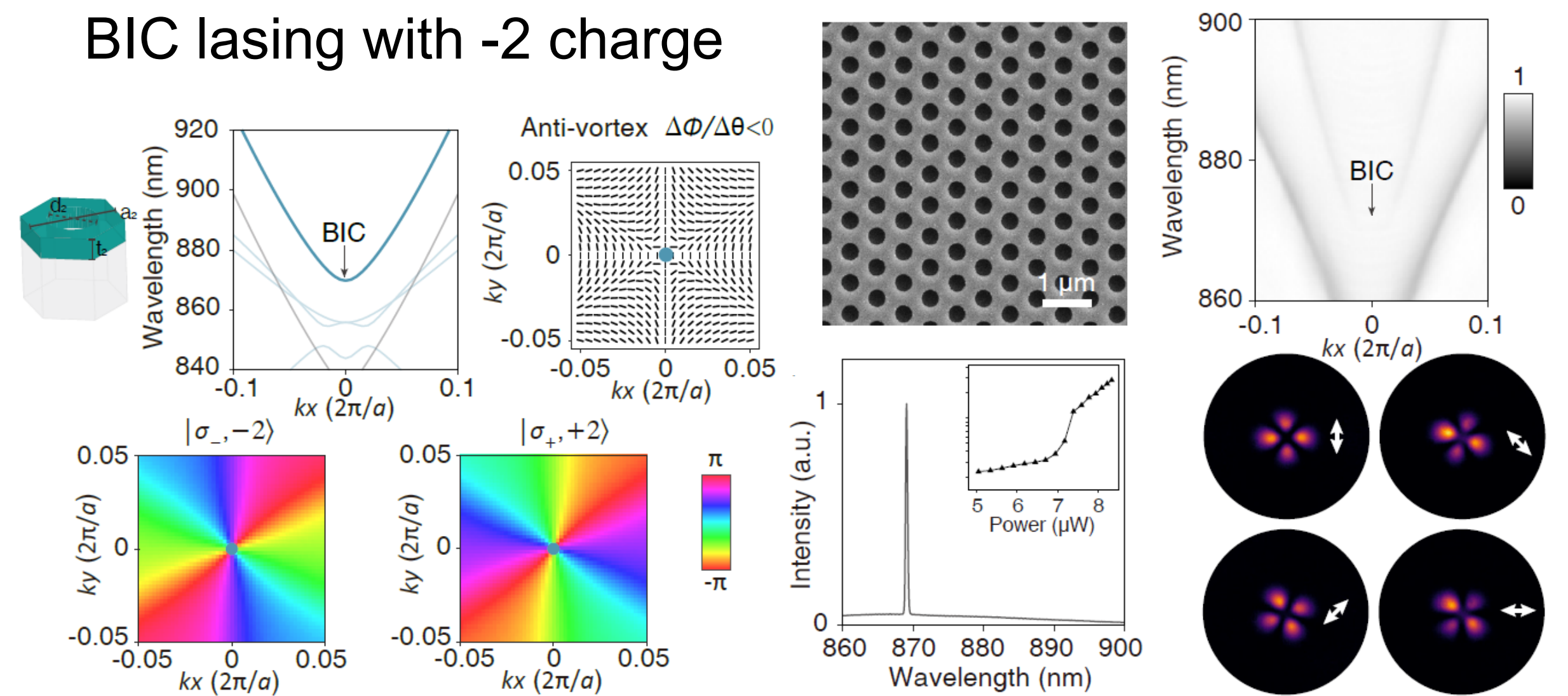


Topological BIC lasing

BIC lasing with +1 charge

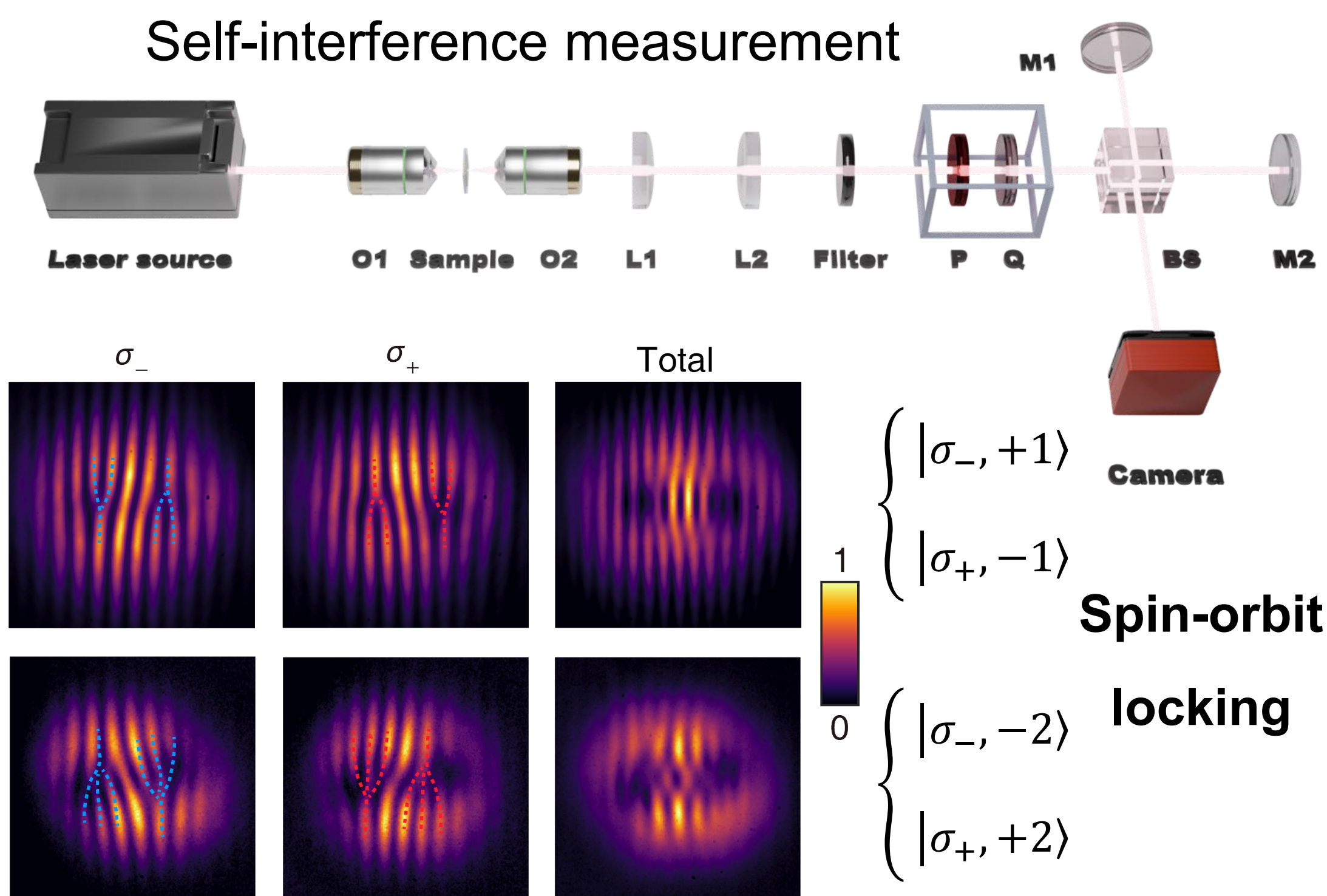


BIC lasing with -2 charge

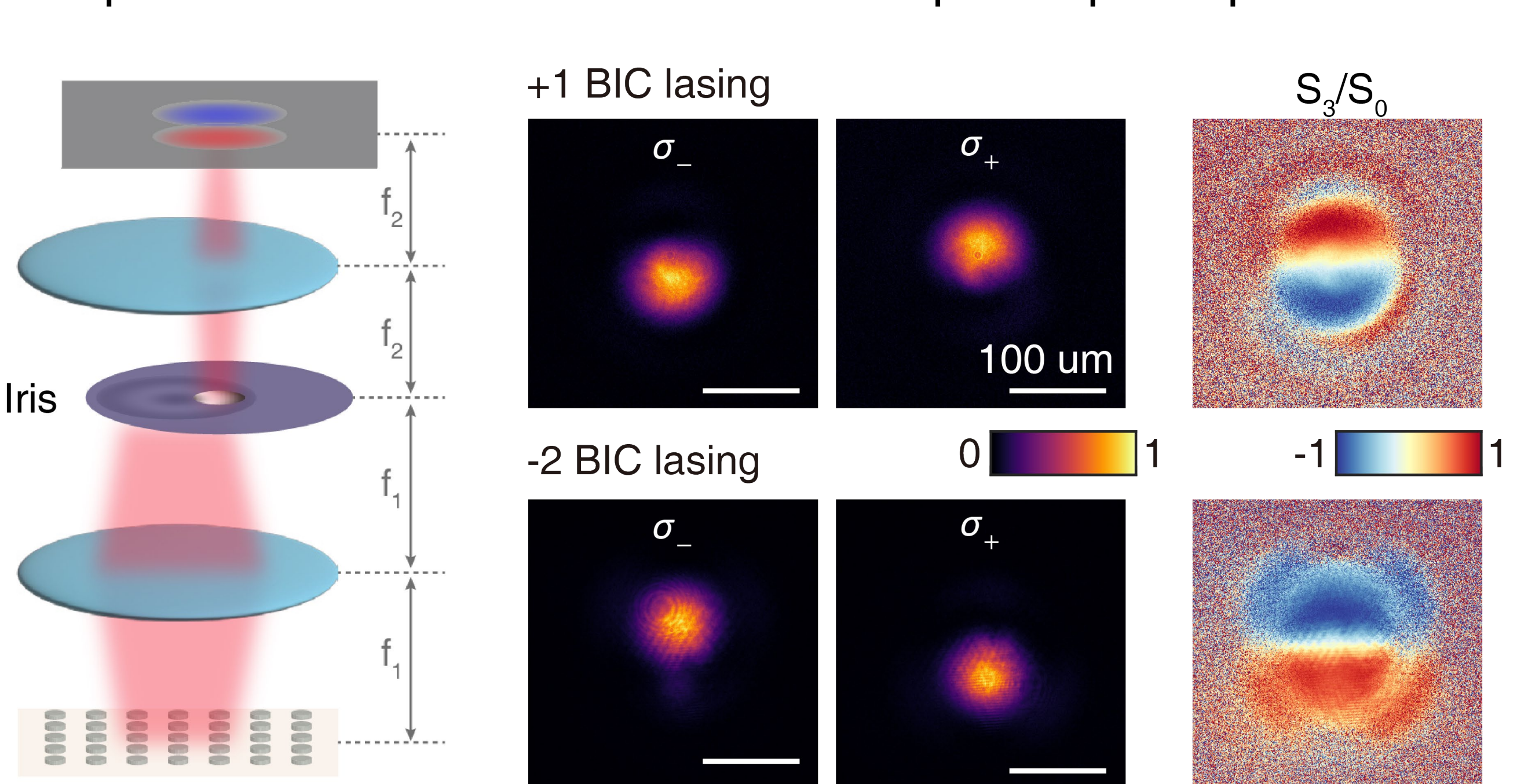


Observation of the inherent spin-orbit locking

Self-interference measurement



Experimental measurements for real-space spin separations



Conclusion

1. Revealing the **spin-orbit locking** behaviors in BIC lasing.
2. Realizing BIC lasing with topological charges of +1 and -2, manifesting as **vortex** and **anti-vortex** polarization configurations.
3. Uncovering new possibilities for **switchable OAM lasing** by controlling photonic spin.

Reference

1. Wang J, Li P, *et al.* "Optical bound states in the continuum in periodic structures: mechanisms, effects, and applications." *Photonics Insights* **3**, R01-R01 (2024).
2. Wang J, Wang X, Wu Z, *et al.* "Inherent Spin-Orbit Locking in Topological Lasing via Bound State in the Continuum." *Physical Review Letters* **134**, 133802 (2025).