**Realization of a topological one-way photonic crystal fiber**

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Recently, topological one-way fiber based on the second Chern number in the four-dimensional parameter space has been theoretically proposed in a three-dimensional (3D) magnetic Weyl photonic crystal. Here we report the first experimental realization of a topological one-way photonic crystal fiber by inducing a screw dislocation defect in a 3D magnetic photonic crystal. Using direct field measurements, we map out the dispersion of the one-way photonic crystal fiber mode and demonstrate nonreciprocal and robust photonic propagation along arbitrary curved paths in 3D space. This work demonstrates a unique application of topological defects and high-dimensional topological physics in three-dimensional robust photonic manipulations.



**Short Bio:**

**Zhen Gao** received his PhD degree in Applied Physics from Nanyang Technological University, Singapore. He is an associate professor of Southern University of Science and Technology, China. His current research interests include topological photonics/phononics/circuits, photonic crystals, metamaterials, and terahertz photonics and integrated photonics. As the first author or corresponding author, he has published more than 40 papers on Nature, Nature Communications, Physical Review Letters and Advanced Materials. He received National Distinguished Youth Expert in 2020, the Chinese Government Award for Outstanding Self-financed Student Award in 2016, Ten Major Advances in Chinese Optics in 2019 and The National-level Talent in Shenzhen.