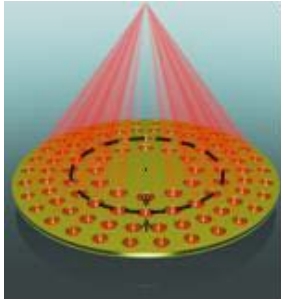
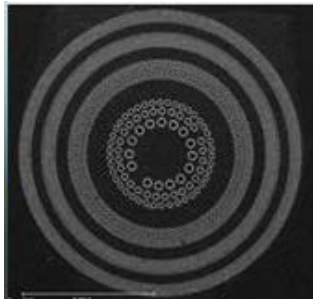




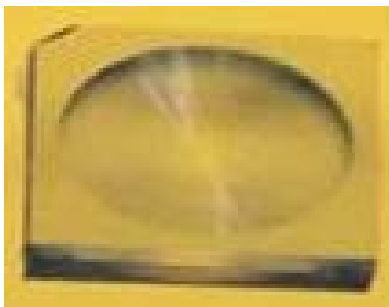
Science behind the Technology



Schematic diagram of
flat lens



SEM microgram
of flat lens



Optical microscope image of a
flat lens demonstrated in IMRE

References:

- Huang K, Liu H, Garcia-Vidal FJ, Hong M, Luk'yanchuk B, Teng J, et al. Ultrahigh-capacity non-periodic photon sieves operating in visible light. *Nat Commun.* 2015;6:7059.
- Liu YJ, Liu H, Leong ESP, Chum CC, Teng JH. Fractal Hole Metal Microlenses with Significantly Suppressed Side Lobes and High-Order Diffractions in Focusing. *Advanced Optical Materials.* 2014;2(5):487-92.
- Huang K, Qin F, Liu H, Ye HP, Qiu CW, Hong MH, et al. Planar Diffractive Lenses: Fundamentals, Functionalities, and Applications. *Adv Mater.* 2018;30(26):22.

Addressing ...

- bulky conventional lens leading to optical system with larger footprints
- lack of sub-diffraction-limited focusing and optical angular momentum control
- shorter focal length and therefore shorter working distance

Key Features

- Compact and ultra-flat optical structure system designs
- Slimmer yet more powerful lens
- Sharper resolution
- Enhanced functionalities including desirable properties of sub-diffraction-limited focusing
- Far field sub-diffraction-limited focusing (FWHM0.4λ) with a focal length larger than that of typical conventional objective lenses

Potential Applications

- Additive manufacturing
- Aerospace applications
- Spectroscopy

Collaboration Opportunities

- Development towards large-scale manufacturing
- Exploration of new applications



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A*STAR website: <https://www.a-star.edu.sg/>

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