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Holey-Metal Lens

A planar, ultra-thin metal film microlens with nanoscale holes offers a tunable focal length and polarization independence for simplified manufacturing and integration into miniaturized electronic and fiber-coupled devices.

Microlenses are small lenses that are used in applications like fiber optic coupling, LCD panels, and cell phone cameras. The small size of the lenses allows them to focus light in a short distance, reducing the overall size of the devices and providing finer control of a light source. For example, they are used in some cameras and projectors to concentrate the light onto the sensors and color elements where it is most effective. Microlenses are also being used to create glasses-free 3D displays by directionally focusing the pixels of the screen.

Researchers at Purdue University have developed a new type of microlens that consists of a thin metal film with nanoscale holes. Unlike conventional microlenses, which are made out of dielectrics, the new lens is only a few hundred nanometers thick and it is completely flat. The small size and simple design make the lenses easier to manufacture and fit into increasingly miniaturized devices. The lens also has a tunable focal length and can focus incident light of any polarization, making it suitable for on-chip and fiber-coupled devices.

Advantages:

- Planar

- Works for any polarization

- Tunable focal length

Potential Applications:

-Electronic devices

-Lens Manufacturers

TRL: 5

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Category
Semiconductors/Devices & Components
Materials Science & Nanotechnology/Nanomaterials & Nanostructures
Computing/Photonic & Optical Computing Technologies

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