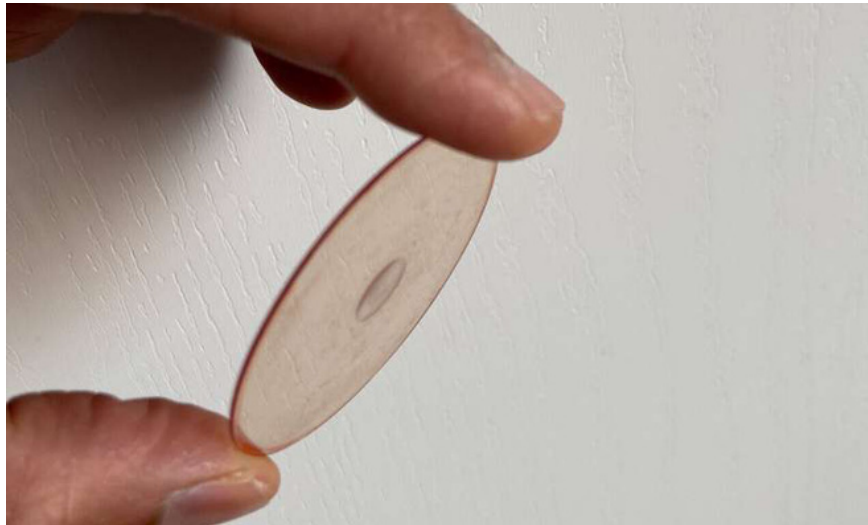


# Using nanotechnology, the scientists created a flat lens that is thinner than a hair

Though thinner than a hair, these new lenses still have the same optical properties as traditional thick lenses.

In traditional optical systems, parallel light waves are transmitted through spherical lenses so that they can focus at the focal point of the lens. That is why traditional cameras often need a different lens system to control the path of light. Also, shrinking the camera size is always a big challenge for scientific researchers.

But a recent study by Rajesh Menon, professor of Electrical and Computer Engineering at the University of Utah, not only changes what we have learned about light in textbooks, but also paves the way for create new, thinner, easier to produce and lower cost lens designs.



In their report, published in *Optica* magazine, Menon and his team say they have created an infinity focus camera (free focus camera) with an ultra-flat lens, instead of the spherical lens that is commonly seen.

Most importantly, it is only 1/1000 inches thick (25.4 centimeters per inch) - thinner than a hair, a huge step forward in terms of size reduction compared to conventional lenses. . This breakthrough not only affects the photography industry but also has important implications for other industries.

In their report, the researchers said they used a nanostructure on a flat lens surface to precisely control how light passes through it to achieve optical properties similar to those of systems. Conventional complicated and bulky lenses. This ultra-thin flat lens can ensure focusing on subjects 6m apart.

Below is a video with 2 short clips shot with a super flat lens in front of a traditional camera.

Demonstration video shows that the camera uses a new lens that can focus on the subjects in the image despite being shot in infrared light and has a relatively low aperture.

Not only has he changed the basic concepts of light that we have known before, Menon's research has also greatly benefited the creation of new photographic systems.

*" Our flat lenses significantly reduce the weight, complexity, and cost of our cameras and other imaging systems, while adding more features to it, " said Mr. Menon . is an interesting example of how abandoning traditional notions can allow new devices to do previously impossible things. past . "*

*" This new lens can bring many interesting applications beyond the imaging capabilities, for example creating a highly effective illumination system for the LiDAR sensor, which is very important for systems, " Menon said. self-driving vehicles including self-driving cars . "*

Moreover, the researchers say their approach could be extended to the creation of optical components with rare properties such as extremely high wavelength, easier to produce and cost. lower.

*See Phys.org*

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