

# University of Dayton lands \$1.5M grant to develop 'super-resolution' imaging tech

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With federal funding in hand, a University of Dayton professor is creating a high-tech imaging system that will allow researchers to observe structures up to 10,000 times smaller than a human hair.

Chenglong Zhao, associate professor of physics and electro-optics at UD, received a four-year grant from the National Institutes of Health to develop the imaging system. The \$1.5 million grant runs through July 2025.

Using microspheres and acoustic waves, the system will scan objects to produce "super-resolution" images of structures as small as 10 nanometers. To put that into perspective, the average human fingernail grows at a rate of 1 nanometer per second.

It has major potential for the bioscience and medical fields, where researchers often study proteins, viruses and other structures that



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measure in billionths of a meter.

"The NIH has high demand to develop this super-resolution imaging technology," Zhao said in a release.

The grant builds upon a previous round of NIH funding Zhao scored in 2018, which helped develop a process for building three-dimensional nanostructures. Viewing those structures proved difficult because conventional optical microscopes are limited by the diffraction of light.

In addition, 3D imaging technologies on the market are relatively limited in terms of resolution, field of view, image speed and ease of use. By using acoustics to manipulate multiple microsphere lenses, Zhao's proposed technology would provide a larger field of view while maintaining high resolution.

"One of our aims is to get a patent on this technology and, hopefully, get a prototype and commercialize it to optical microscope manufacturers," he said.

Under the NIH grant, Zhao will hire a postdoctoral researcher to collaborate on his research. He also will include a graduate student on the project.

This is the second recent NIH grant awarded to UD projects. Earlier this year, the agency gave nearly \$1.7 million to support a medical research effort that uses fruit fly eyes to study retinal diseases.

The University of Dayton is the largest private university in Ohio, according to DBJ research. Founded in 1850, the Marianist institution has more than 11,600 enrolled students and employs more than 3,400 workers.

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