



Metasurface-based Airy light-sheet fluorescence microscopy

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Experience:

Name of School	Academic degree	Duration (from/to)
College of Optical Sciences, University of Arizona	Ph. D	2004/08~2008/09
College of Optical Sciences, University of Arizona	M.S.	2004/08~2007/06

Affiliation	Title	Period
Current Position:		
Institute of Medical Device and Imaging	Professor	2018/08~Present
Former Position:		
Institute of Medical Device and Imaging	Associate Professor	2015/08~2019/07
Molecular Imaging Center	Division Chief	2012/01~2017/07
Opti-electronic Biomedical Research Center	Assistant Professor	2011/08~2015/07
Mechanical Engineering, MIT, USA	Postdoctoral Associate	2008/12~2011/07

Market Needs:

In current technology and equipment, the size of optical systems required for special beam illumination are significantly large. To solve this problem, the metasurface combined with the phase pattern of an Airy beam is used to provide the lightweight and flat optical element which not only reduces the overall size of the light-sheet microscopy system but also provides special beam patterns to enhance measurement flexibility.

Our Technology:

This invention utilizes nano-photonics and lithographic process technology to design and fabricate an optical component capable of controlling the optical properties of laser light, such as amplitude, phase, and polarization. This lightweight and compact metasurface can convert incident light into an Airy beam with a long propagation distance, which is applied in light-sheet fluorescence microscopy.

Strength:

1. The lightweight, flat, and compact metasurface can be easily integrated into optical devices.

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2. By utilizing its surface's special phase pattern, it can convert incident beams into the desired Airy beam, enhancing measurement efficiency.
3. The device can be operated with continuous light sources as well as pulsed lasers.
4. Compared to traditional Gaussian beams, Airy beams can extend the measurement range of samples.
5. The flexible modification of the metasurface design parameters and material selection can meet different operational conditions.

Competing Products:

Traditional optical microscopy systems combined with spatial light modulators and diffractive optical elements.

Intellectual Properties:

Our research team has decades of experience in the fields of metasurfaces and microscopy, and has published several related international journal articles.

Contact (do not need to fill out):

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