APL Photonics
Future Luminary Award

APL Photonics Announces 2020 Future Luminary Awardee

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Characterizing optical pulses from speckle patterns recognized as best paper by an early career researcher for APL Photonics

Wen Xiong won the annual Future Luminary Award by *APL Photonics*, a publication of AIP Publishing for her work in proposing and demonstrating a self-referenced method of characterizing ultrafast pulses with a multimode fiber. The $3,000 award recognizes excellence in highly promising early career researchers and comes with an invitation to join the Early Career Editorial Advisory Board and write an Invited Article in *APL Photonics*.

In her winning paper, "Deep learning of ultrafast pulse with a multimode fiber," Xiong and her colleagues applied machine learning to extract the encoded information from the two-photon absorption speckle patterns.

"Our approach is to convert the temporal information into spatial patterns," Xiong said. "A multimode fiber couples the spatial and temporal degrees of freedom of light. It means that when the temporal shape of the pulse changes, it will generate a different nonlinear speckle pattern."

Xiong grew up in Enshi, China, and began developing an interest in physics when she was in high school.

"My high school physics teacher was very good at cultivating students' intuition of solving physics problems. I was very impressed by the fact that with a very simple physics law, I can solve a lot of problems," she said.

She went on to earn her doctorate degree from Yale University in 2019, focusing on the physics and applications of light transmission in multimode fibers. The use of these fibers in sensing and imaging led her to Facebook Reality Labs, where she currently works on applying novel optics techniques to augmented reality.

In her *APL Photonics* paper, the machine learning technique provides a simple, low-cost solution to measuring ultrafast pulses, making multimode fibers even more versatile in a wide range of sensing and imaging applications.

“These patterns are like the fingerprints of the pulse and machine learning algorithms can be used to reversely find the pulse shape,” said Xiong.

“I am excited to know that people in the optics community like this paper. It would not have worked out without all the contributions from my coauthors, especially my advisor, Professor Hui Cao,” Xiong said. “I also thank *APL Photonics* for recognizing our work.”

ABOUT THE AWARD

The *APL Photonics* Future Luminary Award recognizes the achievements of highly promising early career researchers with the potential to become luminaries in the field of photonics. Eligible applicants are within 10 years of their Ph.D. and have a paper published in *APL Photonics* within the selection year.

ABOUT THE JOURNAL

APL Photonics is the dedicated home for open access multidisciplinary research from and for the photonics community. The journal publishes fundamental and applied results that significantly advance the knowledge in photonics across physics, chemistry, biology and materials science. See https://aip.scitation.org/journal/app

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