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Twisting Light with Nanomachines

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Abstract
Optical metamaterials and quantum materials have optical properties that are widely tunable via several approaches, such as heating, electrostatic gating, and interfacial engineering such as twisting. Being able to tailor the interfacial properties in a similar real-time manner represents the next leap in our ability to modulate the underlying physics and build exotic photonics and optoelectronics devices, such as light sources, modulators, and sensors. We demonstrate the first on-chip platform designed for optical nanostructures and quantum materials with *in situ* tunable interfacial properties, utilizing a microelectromechanical system. Each of these compact, cost-effective, and versatile devices is a standalone micromachine that allows voltage-controlled approaching, twisting, and pressurizing of two sheets of materials with high accuracy.

Bio
Dr. Haoning Tang is currently a research associate at Harvard University. She was a Harvard Quantum Initiative Postdoctoral Fellow at the John A. Paulson School of Engineering and Applied Sciences at Harvard University. She earned her Ph.D. in Applied Physics from Harvard University and her bachelor's degree in electronic and computer engineering from the Hong Kong University of Science and Technology. Dr. Tang has received several prestigious awards, including the Rising Star of Light Award, the Harvard Quantum Initiative Fellowship, and the Harvard Hong Kong Jockey Club Fellowship. Her primary research interests lie in exploring the nonlinear and quantum optical properties of metamaterials and quantum materials, as well as engineering these properties using advanced nanotechnologies, including micro-electromechanical systems.

Host
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