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From Nanoscale Light Sources to Photonic Integrated Circuits

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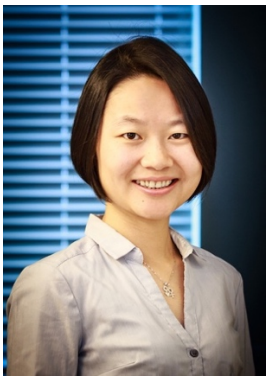
ABSTRACT: A crucial yet unavailable component in high-performance photonic integrated circuits (ICs) and other chip-scale photonic systems is an on-chip light source that is efficient, economical, silicon-compatible, and electronically addressable. In this talk, I will cover two types of light sources – III-V nanoLEDs and perovskite microlasers – that have the potential to be inserted into photonic ICs, as well as luminescent hyperbolic metamaterials that can lead to highly polarized light sources with fast emission rates. I will further discuss emerging physics and applications enabled by these material systems, including topological states for robust data transport, and all-dielectric hyperbolic metamaterials for super-resolution imaging.



BIOGRAPHY: Prof. Qing Gu is an Assistant Professor of Electrical and Computer Engineering at UT Dallas since 2016, directing research in the Nanophotonics Lab (www.utdallas.edu/nanophoton/). She received the Bachelor degree from the University of British Columbia, Canada in 2008, and the Ph.D. degree from the University of California, San Diego in 2014, both in Electrical Engineering. Her research interests include the design, fabrication and characterization of nano- and micro- scale photonic devices (such as lasers, waveguides and sensors), novel light-emitting materials and optical cavity configuration, and integrated photonic circuits. She is the author of book "Semiconductor Nanolasers" by Cambridge University Press, published in 2017. She is a recipient of the ARO Young Investigator Award in 2019 and NSF CAREER award in 2020.

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