

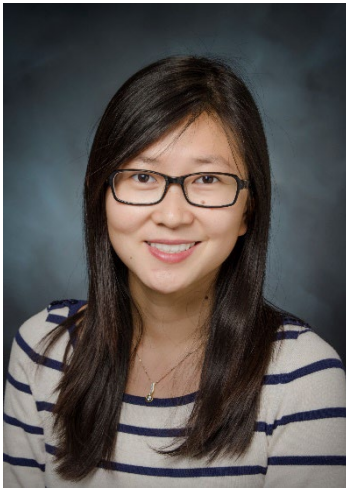
UCSD MRSEC/NANOENGINEERING/CHEMICAL
ENGINEERING

SEMINAR SERIES

Wednesday, June 7th, 2023

Seminar Presentation: 11:00am - 12:00pm

SME room 248



“Chip-Scale Quantum Communication with SiC Integrated Photonics”

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Abstract: A scalable quantum network is enabled by wafer-level integration of all key elements of a node: spin qubits, low-loss photonic waveguides, nonlinear optical elements, and single-photon detectors. 4H silicon carbide on insulator (4H-SiCOI) is a promising monolithic platform for mass production of quantum integrated photonic circuits. In this talk, I will present our work on producing 100 mm diameter wafers of thin film 4H-SiCOI and fabricating single mode photonic waveguide structures with low loss (< 10 dB/cm) across a large spectral region spanning the near infrared to telecom wavelengths. I will then highlight our work on integrating divacancy defect ensembles into these low loss waveguides. Finally, I will discuss how photoelectrochemical etching can be used as a dopant-selective wet etch of SiC to create wafer-scale uniform SiCOI. Our progress with these integrated devices shows that 4H-SiCOI is a promising material platform for quantum integrated photonics.

Biosketch: Shanying Cui is a Program Manager and Senior Research Scientist in quantum network programs at HRL Laboratories in Malibu, CA. She is also a Deputy Department Manager of Device Technologies and a Group Lead for Electrooptic Devices in Sensors and Electronics Laboratory. Dr. Cui has over ten years of technical research experience in photonics, surface chemistry, and quantum optics. Shanying received her Ph.D in Applied Physics at Harvard University and her bachelor's degree in Chemistry from Massachusetts Institute of Technology.