Solid-state single photon emitters (SPEs) are useful sources of quantum light for fundamental quantum optics research and enable scalable applications for quantum computing, sensing, and communication. Defects in two-dimensional (2D) material hexagonal boron nitride (hBN) offer unique advantages as SPEs, but controlled fabrication remains a challenge. In this talk, I will address two main challenges limiting progress toward realizing practical solid-state SPEs. I will first present a novel hBN SPE fabrication technique that can be tailored to meet individual application needs. I will then discuss the effects of fabrication-induced material damage on SPE properties, as well as ways to leverage these effects to further tailor defect engineering and application in hBN and beyond.

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