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# Epitaxial Growth of GaN on Silicon

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## Personnel

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## Sponsorship

SMA

GaN can be used for high power and high efficiency photonic devices. There is great interest in the possibility of monolithic integration of GaN and silicon, for multi-chip optical communication and other applications. However, GaN and silicon have a lattice mismatch of 17%, which makes heteroepitaxial growth of low-defect-density GaN films on silicon difficult. We are investigating structure and stress evolution during the heteroepitaxial growth of GaN films on patterned silicon surfaces, and on silicon surfaces with different crystallographic orientations. We are also investigating the effects of changes of the growth temperature or thermal variations during growth, as well as of the use of surfactants and the use of controlled changes in film stoichiometry during growth. Our goal is to develop new techniques for monolithic integration of high performance GaN devices on silicon.

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