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## Scattering probes for quantum electronics and strain engineering for quantum devices

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Quantum electronic devices in epitaxial semiconductor heterostructures are based on an extremely precise level of control of the control of structure and compositions. Epitaxial growth techniques provide substrates with exceptionally low concentrations of chemical impurities and structural defects such as dislocations and stacking faults. The advent of quantum devices establishes a new range of structural problems associated with the comparatively large size of quantum devices and the small splitting of quantum states. Structural features of interest include atomic steps at heterostructure interfaces, complex stress distributions arising from the formation of electrodes, and the thermal stress arising during cooling to low temperatures. This talk surveys the electronic evidence for structural effects and illustrates the scale of distortion relevant to quantum devices. Prospects for exploiting these structural features to provide new routes for device fabrication will be presented. Other structural effects will impact the integration of other quantum devices and will be briefly discussed.

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