III-V Nanowires for Optoelectronic Applications

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Nanowire research is a new and emerging field growing at a fast pace due to the unique electronic and optical properties of the nanowires. These properties stem from their large surface to volume ratio, high aspect ratio and confinement in two dimensions. These nanowires are usually grown by the so-called vapour-liquid-solid mechanism using catalysts or by selective area growth.

In this talk, I will present an overview of the III-V nanowire research at the The Australian National University. The optical and structural properties of the nanowires grown by MOCVD will be presented. Various issues with such as tapering, compositional non-uniformity along nanowires, crystal structure and carrier lifetime will be discussed. I will also present our results of III-V nanowires grown on Si substrates which are of great interests for integration applications. Finally, some prototype nanowire device results such as lasers, detectors and solar cells will be presented.