



**UNSW**  
SYDNEY



## Semiconductor Nanowire Electronics

**The fabrication of nanoscale devices featuring inorganic semiconductor nanowires and organic electronic and bioelectronic materials enables novel electronic applications such as bio-compatible devices.**

### Competitive advantage

- Electron-beam lithography of polymer electrolytes and ionomers for electronics applications
- Deposition and nanoscale patterning of ultra-thin (< 50nm) parylene films for nanoscale device applications
- Fabrication of semiconductor nanowire devices
- Electrical characterisation of semiconductor nanowire devices

### Impact

- Harnessing the advantages offered by nanoscale structures including power to size ratio and enhanced functionality and durability

### Successful applications

- Development of nanowire transistors with gate-all-around structures with multiple independent gates and polymer insulators
- Nanoscale patterning of ion-conducting polymers for use as gate structures for nanowire transistors
- Nanoscale devices for ion-to-electron signal transduction
- High-performance p-GaAs MESFETs for nanowire CMOS
- Ultra-thin parylene films as patterned insulators in nanoscale devices
- Nanowire devices for bioelectronics applications

### Capabilities and facilities

- Equipment for electrical measurements down to 1 Kelvin and magnetic fields up to 9 Tesla (with full-sphere rotation)
- Custom-built parylene deposition system for ultra-thin film deposition
- Electrical characterisation of devices under controlled atmosphere

### Our partners

- Collaborations with numerous internationally respected teams

### More Information

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