

# EXTREME NANOTECHNOLOGY



## Revolutionary Single Atom and Single Photon Technologies

Qucor Pty Ltd is a young, energetic Australian company using extreme nanotechnology - manipulation of individual atoms and photons - to create next generation products for computing and communications.

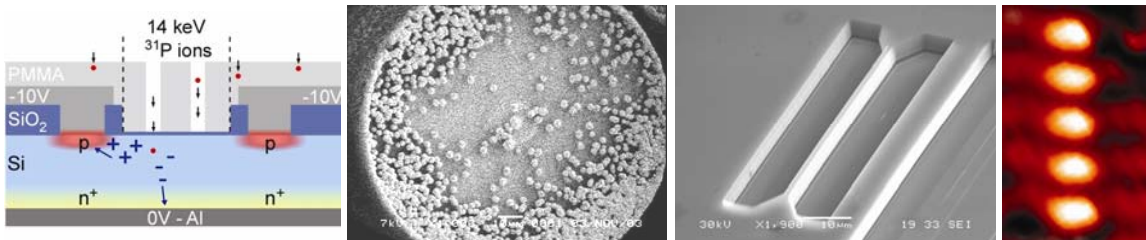
The company is backed by the world-leading Australian Centre for Quantum Computer Technology, a 140-strong research team working to develop the fundamental building blocks for a solid-state quantum computer in silicon. Along the pathway to quantum computing (a long-term challenge), this enormous research effort is generating many technologies with nearer-term applications. As well as making available ground-breaking nanotechnologies, Qucor is therefore able to marshal an exceptionally capable technical team to assist partners in applying specific technologies to their own product requirements.

## Innovative Industrial Applications

We manipulate individual atoms and ions in silicon. Our patented STM and ion-implantation techniques actually **count individual atoms into a silicon substrate**, in locations determined with nanometre precision. We can therefore implant a semiconductor with a precise number of dopant ions, in a precisely ordered layout or array. As a result, transistor size can be further reduced, more can be integrated onto a single chip, and their threshold voltage uniformity and reliability can be improved.

Our patented techniques for growing **single photon sources** directly into optical fibres have been demonstrated at laboratory scale. Work is now directed to developing a lab prototype in fibre, and demonstrating its superiority over existing attenuated laser systems. This is central to the truly secure operation of the emerging range of quantum key distribution (QKD) systems for unbreakable code transmissions.

For the rapidly-growing MEMS market, we have developed technology that enables **micromachined devices and structures** to be accurately fabricated in a single crystalline material. Using these patented techniques, and line widths of less than one micron, accurate trenches, channels and cantilevers can be constructed. This provides a means of creating micron-scale resonators, waveguides, and fluidic devices in materials such as single crystal diamond, which is highly durable, inert, thermally robust, and has accurately calibrated optical and mechanical properties.



## Commercialisation Strategy

Qucor's commercialisation strategy is to convert technologies into prototype products in partnership with leading industry corporations. We ensure that the technologies themselves are well-protected by patents, then enter into joint development projects with partners, in which our technical expertise and their product and market knowledge can be combined to create new prototype products. Once prototype products are developed, the industry partner then undertakes its own product development through to product sales, with technical expertise and support continuing to be provided by Qucor.

## Can I invest in Qucor?

Qucor has secured initial financial backing to position itself early in the nanotechnology arena, and has some initial partnerships in place. Enquiries regarding possible investment or industry partnering are welcomed.

**For more information** visit our website at [www.qucor.com.au](http://www.qucor.com.au), or contact Dr Richard Sharp (Managing Director) at [r.sharp@qucor.com.au](mailto:r.sharp@qucor.com.au) or by phone on +61 2 9385 5511.