CASE STUDY

ANFF

The research infrastructure behind Australia's semiconductor spinouts

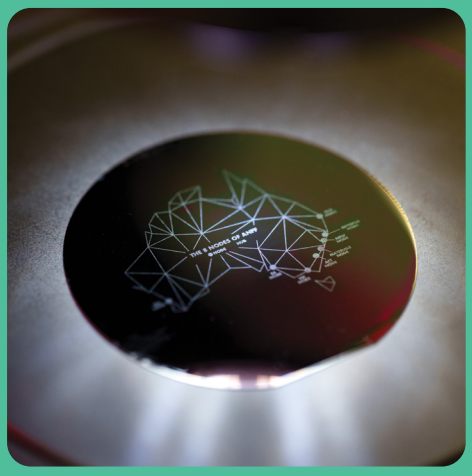

Image courtesy of Andrew Beveridge / ANFF

For nearly two decades, researchers developing semiconductor technologies have relied on the ANFF – a federally, state and university-funded 'one-stop-shop' that brings together the specialist equipment and technical expertise needed to build early-stage devices.

ANFF was founded in 2007 through the Australian Government's National Collaborative Research Infrastructure Strategy (NCRIS) to give researchers and industry open access to suites of micro and nanofabrication equipment that would otherwise be difficult for a single entity to obtain and maintain on their own.

Dr Jane Fitzpatrick, Chief Executive Officer of ANFF said the organisation's value lies as much in its people as its tools. "That ability to provide the people, as well as the tools and specialist infrastructure, the whole ecosystem really, is the thing that sets ANFF apart."

ANFF operates through a network of nodes across Australia, which each have specialised capabilities ranging from microfluidics to quantum devices. This approach avoids unnecessary duplication, while ensuring deep specialist expertise. It employs over 120 engineers and scientists across the country whose job is to help clients use their infrastructure and tools. One company that has flourished from that support is QuantX Labs, a South Australian spinout from the ANFF-OptoFab Node.

The company uses photonics, quantum sensors and advanced fabrication techniques to develop products that can provide precise timing, even without access to satellite GPS signals.

This is particularly useful in defence, navigation and communications. However, these products require components that are extremely difficult to prototype without dedicated fabrication facilities.

QuantX Labs started as university research, spending years building its technology through ANFF's network before it became a commercial spinout. QuantX Labs relied on the capability of the ANFF-OptoFab Node, which enables companies and researchers to fabricate optical fibres, link components together, or mount detectors directly onto chips.

ANFF can provide researchers with the "ability to get their concept out of their head, turn it into a real-world device, test it and then see if it actually works."

QuantX Labs isn't alone, with many companies making the same journey from university cleanroom to commercial spinout through ANFF's network. Some researchers and companies rely on multiple ANFF Nodes along the way, drawing on different specialisations. "The national network of state and territory nodes allows Australia to have differentiation, as well as foundational technology capability which is really important, especially for a country of our size," Dr Jane Fitzpatrick said.

ANFF has helped build the talent and capability to support the sector today and will provide a platform for the much-needed expertise as we grow the sector. But what still doesn't really exist in Australia: enabling pilot-scale or low-volume production infrastructure.

Research infrastructure is about the freedom to experiment. Once a company knows what it wants to build and needs to make quantities of it, ANFF's setup cannot provide what the company needs, requiring different infrastructure and operating conditions.

"Australia needs technology infrastructure and capability that runs at a pilot-scale – providing companies with the ability to manufacture small volumes. That's the stepping stone between research infrastructure and a major foundry and is where Australia can build capability," Dr Jane Fitzpatrick said.

ANFF-OptoFab
Image courtesy of Andrew Beveridge / ANFF