NATIONAL COMPUTATIONAL INFRASTRUCTURE

# AN ESSENTIAL RESOURCE FOR OUR INDUSTRY

NCI provides essential computing resources for our industry partner, FEI Company, a world leader in imaging technology for a range of markets including oil and gas exploration. NCI has been involved in this project from the very beginning, from helping to foster the development of the underlying intellectual property, through the provision of the computational horsepower for a successful start-up company, to the establishment of a major international business.

This innovative technology arises from intellectual property in two areas of materials science. The development of a micro X-ray computerised tomography system by scientists at ANU allows the structure of rock in the form of 3D digital images to be computed, and an advanced application of the theory of composite materials, developed at ANU and UNSW, enables the inference of key material properties, such as porosity, from the digitised images. Information such as rock porosity is essential in designing the most effective ways by which to extract important resources such as oil and gas from underground reservoirs. The digitised images, central to the research process, are visualised throughout the research process using NCI-developed software.

**IMPACTED GOVERNMENT PORTFOLIOS:**

Environment and Energy
Industry, Innovation & Science
Trade, Tourism and Investment
Resources & Northern Australia

These new technologies, each of which was critically reliant on NCI, led to a start-up company Digitalcore, launched in 2009, and its successor, Lithicon, which provided advanced computational approaches for the simulation of reservoirs. The business was ultimately acquired by the US-multinational FEI in 2014 for US$76 million. NCI's relationship with this activity continues to this day, providing not only the computational resources to support ongoing research, but also the high-performance computing required for FEI operations.

The Australian Government's ongoing commitment to sustaining high-performance facilities like NCI is what enables universities and industrial companies to collaborate on these kinds of projects. Since all stages of the modelling and imaging are highly compute- and data-intensive, the use of a highly-integrated supercomputing and data storage facility is paramount in progressing the understanding of resource extraction—from research through to production, and in this case, the fostering of a successful business.

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