



# Advanced Visualisation Lab

Data visualisation uses a combination of hardware and software to explore patterns and relationships in research data, giving researchers greater understanding of their projects and potential outcomes.

[swinburne.edu.au/dricp/advanced-visualisation-lab](https://swinburne.edu.au/dricp/advanced-visualisation-lab)

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In this era of big data, traditional approaches to visualisation are being challenged.

The Advanced Visualisation Lab explores new techniques and technologies to produce the most effective visualisation tools available for a wide range of research and industries.

The Lab's work supports, enhances and extends the use of advanced visualisation; builds capability in data visualisation; and researches, designs, develops and implements new solutions.

## CASE STUDY

### Seeing Stars: Tera-scale Astronomical Data Analysis and Visualisation (GraphTIVA)

The sheer volume of data that requires sifting and analysis is a challenge for contemporary science. The ability to perform the fundamental tasks of analysis, processing and visualisation is becoming a key factor for competition and scientific discovery.

To support deeper research, Swinburne has designed and built the Tera-scale interactive visualisation and data analysis framework, GraphTIVA. GraphTIVA's computing power is approaching one teravoxel per second, resulting in performance that is 10–100 times faster than the best possible performance with traditional single-node, multi-core CPU implementations. GraphTIVA's scalability and ability to use parallel algorithms for analysis allows the framework to meet the image analysis and visualisation requirements of next-generation telescopes.

## FACILITIES

The Advanced Visualisation Lab's facilities and equipment include the 100 Megapixel Discovery Wall, the Virtual Reality Theatre and Swinburne's Supercomputer, OzSTAR, which has a dedicated optical fibre link with the Parkes telescope. The Lab also has access to The Virtual Design Lab, which allows researchers to visualise, model and test systems and products, providing a cost-effective method of research and development.

## KEY CONTACTS

Associate Professor Christopher Fluke, Director of the Advanced Visualisation Lab, brings his expertise in astronomy visualisation to the Lab's work of developing data visualisation techniques and outcomes. His research has contributed to terabyte-scale astronomy visualisation and analysis; accelerated computing with graphics processing units; the fundamental astrophysics of gravitational microlensing; and multi-disciplinary research applying visualisation techniques to biomaterials and surface chemistry.



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