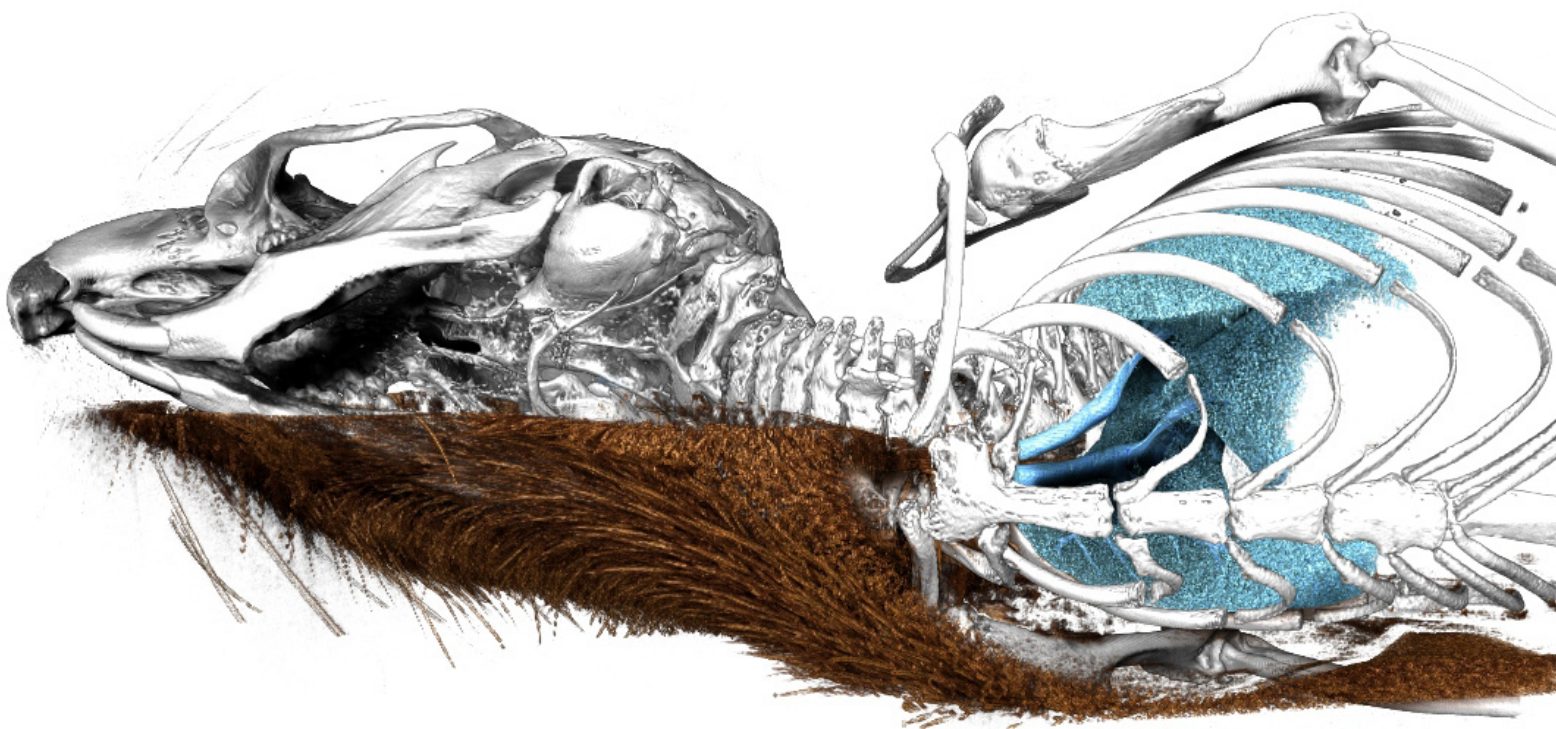




MASSIVE - The Multi-modal Australian ScienceS Imaging and Visualisation Environment



MASSIVE

The Multi-modal Australian ScienceS Imaging and Visualisation Environment (MASSIVE) is a facility that will help researchers to visualise, process and reconstruct large-scale and multi-dimensional data. The MASSIVE facility will provide scientists an unprecedented view of captured data and simulated models by providing the capability to view full resolution datasets.

MASSIVE is being developed by the Australian Synchrotron, CSIRO, Monash University and VPAC. In addition, MASSIVE is one of two specialised facilities being funded by the National Compute Infrastructure (NCI).

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The MASSIVE facility

The facility will consist of:

- A supercomputer designed for fast volume reconstruction, visualisation and image processing.
- Specialist expertise in visualisation to help researchers use specialist visualisation and analysis tools.
- Commercial and free software for volume reconstruction, visualisation and image processing.

Purpose

MASSIVE is being developed to help with:

- Reconstruction, processing and visualisation of high resolution 2D, 3D and 3D+ data that will be generated by the newest generation of Australian imaging facilities. For example, the Australian Synchrotron Imaging and Therapies Beamline which will be capable of producing 4K³ (128GB) volumes that would otherwise be difficult to reconstruct and view at full resolution.
- Processing and visualisation of multi-spectral and hyper-spectral data sets such as those produced by the X-ray Fluorescence Microprobe Beamline at The Australian Synchrotron, or large-scale hyper-spectral images captured using satellite or plane flyover.
- Execution and visualisation of large-scale multi-dimensional models such as astronomical simulations, physiological models of organs, geodynamic simulations, or high-resolution weather models.

Services

MASSIVE will provide a number of services to researchers:

- Access for Australian Synchrotron users to do near-real-time volume reconstruction and processing. This will allow researchers to view and analyse 3D volumes within minutes of them being captured. This is expected to increase productivity on the Imaging and Therapies Beamline and other beamlines.
- Interactive access for users to view and explore large data sets that would otherwise require significant down sampling and reduction of quality. Researchers will be able to prebook access time and use the rendering power of multiple computers to view their data.
- Batch access for scientists running large-scale simulations or data processing.

Users

- Australian Synchrotron users. In particular, users of the Imaging and Therapies Beamline.
- CSIRO researchers.
- Monash University researchers.
- Australian researchers through the National Compute Infrastructure (NCI) merit allocation scheme.

Cover image:

Mouse data courtesy of David Parsons, Women's and Children's Hospital, Adelaide and Karen Siu, Monash Centre for Synchrotron Science

Rendering by Wojtek James Goscinski, Monash e-Research Centre

Supports

- Volume reconstruction, segmentation and visualisation software: X-TRACT, ITK, Imaris, Amira, Seg3D, VolView, Drishti.
- Image processing and analysis software: Matlab, Matlab Image Processing Toolbox and IDL.
- Visualisation tools and libraries for scientific, large-scale and distributed visualisation: VTK, OpenDX, Enight Gold, IRIS Explorer, VisIt, ParaView, Clmg, Vis5D+, SciRun, ImageVis3D and Chromium.
- Domain specific visualisation and image processing libraries: FSL, SPM.
- MASSIVE will feature GPU nodes and high memory nodes.

Contact MeRC

MeRC support staff are available to discuss all your research needs.

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