IMPROVING DESIGN FOR OFFSHORE STRUCTURES

Professor Liang Chen, The University of Western Australia

The design of offshore infrastructure is complex due to the unpredictability of ocean behaviour. **Through the use of supercomputers accurate predictions of hydrodynamic influences are now possible.** Research findings from this project will be a resource for engineering designs and offshore cyclone evasion strategies. Results will improve future designs for marine engineers and reduce costs for oil and gas companies

REDUCING DIESEL PARTICULATE MATTER (DPM) IN UNDERGROUND MINES

Guang Xu, Curtin University

The increasing use of diesel-powered equipment in confined spaces (underground mines) has the potential to put underground miners under the threat of diesel particulate matter (DPM). **CFD simulation with supercomputing is an effective and economic method to achieve optimal DPM levels.** Results of the simulation can provide a strategy for controlling DPM and improving workers' conditions.

MODELLING MICROBIALLY ENHANCED OIL RECOVERY

Dr Jungho Park, CSIRO

The oil industry is seeking new methods of increasing oil production from reservoirs. This project studies enhanced oil recovery to design innovative engineering technologies for boosting oil industry performance. **Through Pawsey supercomputers oil recovery techniques can be continually refined allowing for greater oil production, and increased industry productivity.**

The Pawsey Supercomputing Centre is supported by:

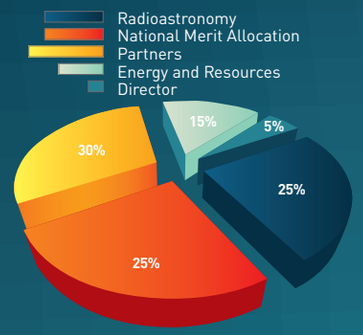
Government of Western Australia Department of the Premier and Cabinet Office of Science

Australian Government

NCRIS National Research Infrastructure for Australia An Australian Government Initiative

CSIRO · Curtin University · ECU Edith Cowan University · Murdoch University · The University of Western Australia

HOW TO ACCESS PAWSEY SERVICES



Pawsey Allocation Schemes

- Access all services via collaboration with researchers in leading universities and the CSIRO.
- Access data storage and sharing services directly via online application form.
- Access supercomputers via online application form for eligible researchers.

Project proposals are invited via a number of schemes which are targeted at different research communities, fields of research, and levels of computational experience.

Allocations on Magnus may be obtained through the following schemes:

THE NATIONAL COMPUTATIONAL MERIT ALLOCATION SCHEME (NCMAS) –The scheme operates annual allocation calls, which are open to the whole Australian research community and which provide substantial amounts of compute time for meritorious, computational-research projects. Applications for 2017 projects open **September 5 and close October 14, 2016.**

THE PAWSEY ENERGY & RESOURCES MERIT ALLOCATION SCHEME – Open to the Australian energy and resources research community, providing significant amounts of compute time for meritorious research projects in the domain. Energy examples include generation, storage and distribution. Resources examples include exploration, minerals extraction and processing, groundwater, and waste management. Applications for 2017 projects open **September 5 and close October 21, 2016.**

THE PAWSEY PARTNER MERIT ALLOCATION SCHEME- Calls are open to researchers in Pawsey Partner institutions and provide significant amounts of compute time for meritorious, computational research projects. These institutions are CSIRO, Curtin University, Edith Cowan University, Murdoch University, The University of Western Australia and the Government of Western Australia. Applications for 2017 projects open **September 5 and close October 21, 2016.**

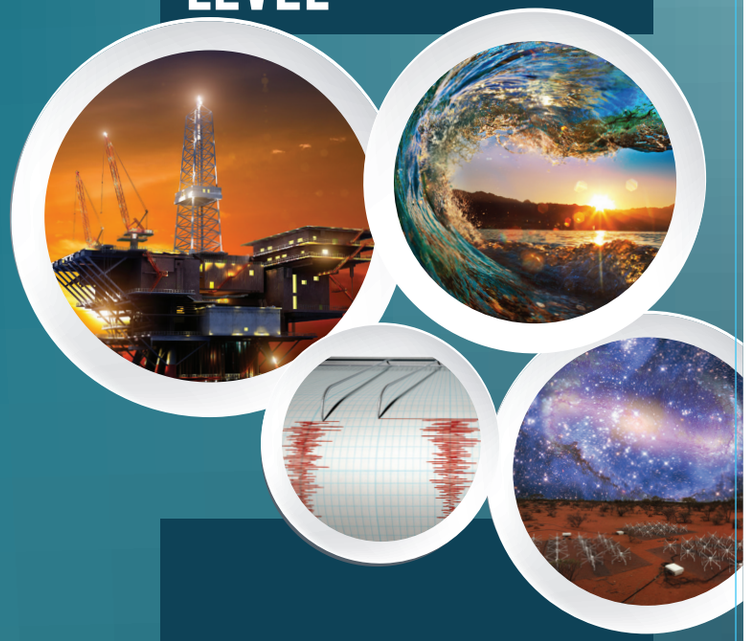
THE PAWSEY DIRECTOR'S ALLOCATION SCHEME – The scheme is open to all Australian researchers and is intended to support researchers with speculative investigations to assess the potential of supercomputing for an application. Applications are open all year round.

To apply to use the Pawsey Supercomputing Centre's resources, or to learn more about which allocation category may be applicable, please contact the Pawsey Supercomputing Centre or visit:

www.pawsey.org.au

PAWSEY supercomputing centre

TAKING YOUR RESEARCH TO THE NEXT LEVEL



The Pawsey Supercomputing Centre is an internationally significant supercomputing facility, located in Perth, Western Australia.

The Pawsey Supercomputing Centre cooperates with its sister facility, NCI in Canberra, to provide Australia with globally competitive, scientific supercomputing.

SYSTEMS

To allow Australian researchers to achieve the highest research outcomes, the following world-class systems are housed in the Centre:

MAGNUS, THE MOST POWERFUL PUBLIC RESEARCH SUPERCOMPUTER IN THE SOUTHERN HEMISPHERE.

- World-class supercomputer in excess of 1 PetaFLOPS.
- Cray XC40 featuring the 72GBps Cray Aries interconnect.
- Over 35,000 Intel 'Haswell' processor cores.
- 3PB of scratch file storage.
- Over 95TB of memory.

GALAXY, REAL-TIME COMPUTING FOR AUSTRALIAN RADIO ASTRONOMY

- Peak performance in excess of 200 TeraFLOPS.
- Real-time system for Australian Square Kilometre Array (SKA) pathfinders and radio astronomy projects.
- Cray XC30 system with over 9,000 Intel processor cores.
- Over 30TB of memory.

ZYTHOS, ACCELERATED PERFORMANCE FOR BIG DATA ANALYTICS

- Shared-memory machine for memory-intensive processing.
- SGI UV2000 system.
- 264 Intel processor cores.
- Four Nvidia Kepler K20 GPUs.
- 6TB of memory.

WORLD-CLASS DATA STORAGE

- 40PB of storage, with room for expansion up to 100PB.
- Two duplicate libraries for added resilience.
- Connected nationally and internationally at up to 40GBps.

SERVICES

The Pawsey Supercomputing Centre provides a range of world leading support services to help you take advantage of petascale supercomputing to transform your research outcomes.

SUPERCOMPUTING

Using the powerful compute hardware provided by the Pawsey Supercomputing Centre, you will be able to produce research outcomes not possible using traditional methods. This can include higher precision modelling, analysis of larger data sets, or ensembles of many simulations for parameter optimisation.

DATA

The petascale data store enables global access to research data products and collections. With data products generated on the supercomputers and locally uploaded, the data store takes collaboration to a new level with its high-speed access and close proximity to high-speed compute for data analytics.

VISUALISATION

Our visualisation infrastructure and remote visualisation capabilities enhance knowledge by providing new, tangible ways for you to interact with and understand complex data, and communicating it through easily accessible visual mediums.

CONSULTING

Our staff can assist you with a number of support services such as migrating your workflow to supercomputers, exploring data analytics, data collaboration and accessibility, visualising complex data, and upscaling software to make effective use of massively parallel processing.

TRAINING

We provide both classroom-style training sessions as well as small groups at your location, from basics through to advanced programming topics. Online training is coming soon.