# FOR INMEDIATE RELEASE

# New GPUs and more bandwidth to unlock astronomical data

A new graphics processing unit (GPU) cluster supporting one of Australia’s Square Kilometre Array (SKA) precursor telescopes is fully operational at the Pawsey Supercomputing Centre, enabling researchers to accelerate their data processing and deliver new insights about our Universe.

The $2 million cluster, procured from HPE in early 2020, is now available to researchers using the Murchison Widefield Array (MWA) radio telescope.

The upgrade is one part of a $70 million Pawsey capital refresh project funded by the Australian Government.

Named Garrawarla, meaning ‘spider’ in the language of the Wajarri people from the land on which the telescope is located, the dedicated 78-node cluster is being used to process petabytes of data streamed from the MWA.

Garrawarla provides users with enhanced GPU capabilities to power AI, computational work, machine learning workflows and data analytics.

MWA Director Professor Melanie Johnston-Hollitt said researchers from 20 organisations across five countries will benefit from Garrawarla.

“The MWA collects a petabyte of data a month, and we’ve already archived over 30 petabytes of data at Pawsey.

“Having a dedicated system means that we can work with Pawsey to finetune the system and maximise the efficiency of our workflows.

“Garrawarla and Pawsey’s expertise will accelerate our investigation and processing of this data, helping us to reveal more about the origins and structure of the Universe,” said Professor Johnston-Hollitt.

Early adopters accessing the system in pre-production mode benefitted from software performing two to eight times faster than with its predecessor.

Pawsey’s skilled staff are currently installing the software environment to enable MWA researchers to migrate their workflows to Garrawarla.

At the same time, Pawsey has awarded a $1 million procurement to HPE for new ingest nodes to support researchers using CSIRO’s Australian Square Kilometre Array Pathfinder (ASKAP) telescope.

The ASKAP ingest nodes are one of the most critical components of the pipeline between ASKAP and the Pawsey data store, which houses the telescope’s final data products.

The nodes are responsible for receiving data in real time from the correlators located at CSIRO’s Murchison Radio-astronomy Observatory (MRO) in the Mid West region of Western Australia, and writing the data to disk for processing on Pawsey’s Galaxy supercomputer.

The current ASKAP ingest nodes will be replaced with nodes featuring the latest AMD processors designed for data throughput, giving researchers twice as much bandwidth to and from the CPU as the previous generation and more memory channels.

Pawsey’s Executive Director Mark Stickells said that this new infrastructure will ensure that Pawsey’s systems can keep up with the torrents of data that will be produced by ASKAP when it commences full sky survey science in coming months.

“The ASKAP ingest nodes will increase the ability to transfer data from the MRO into Pawsey’s storage systems, and will help to unlock the value of the astronomical data generated by the telescope.”

Investment in both systems reflects the growing data processing needs of the MWA and AKSAP scientific instruments.

“These two important milestones will deliver state of the art technology to researchers using MWA and ASKAP, supporting advanced workflows and innovative processes to accelerate their discoveries,” said Mr Stickells.

The Pawsey Supercomputing Centre is an unincorporated joint venture of CSIRO – Australia’s national science agency, Curtin University, Edith Cowan University, Murdoch University and The University of Western Australia. The procurement of this system was conducted by CSIRO as Pawsey’s centre agent.

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# Media Contacts

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# About the Pawsey Supercomputing Centre

# The Pawsey Supercomputing Centre is a world-class high-performance computing facility accelerating scientific discoveries for Australia’s researchers. Pawsey is currently serving over 40 organisations and achieving unprecedented results, in domains such as radio astronomy, energy and resources, engineering, bioinformatics and health sciences.

The Pawsey Capital Refresh project is supported by the Australian Government through a $70 million grant. Pawsey is also supported by the Australian Government under the National Collaborative Research Infrastructure Strategy (NCRIS) through the Department of Education. The Centre would also like to acknowledge the support provided by the Western Australian Government and its partner organisations.

## ASKAP technical description

Eighteen data ingest nodes (two spares) with:

* Single AMD EPYC 7402P "Rome" processor (2.8 GHz and 24 cores)
* 128 GB RAM
* Single Mellanox ConnectX-6 InfiniBand HCA (operating at 100 Gb/s)
* Dual 10 Gbps ethernet connections to connect to the MRO

Three general purpose nodes for running support services:

* Single AMD EPYC 7402P "Rome" processor (2.8 GHz and 24 cores)
* 128 GB RAM
* 10 TB of usable SSD storage

Dedicated ClusterStor E1000 Lustre Appliance with

* Dual Active-Active Meta Data Servers
* Quad Active-Active Object Data Servers
* All NVMe high-speed storage
* 492 TB of usable storage
* Capable of 160 GB/s read and 120 GB/s write performance

## Garrawarla technical description

Seventy Eight HPE XL190 Gen10 Servers with

* Dual Intel Xeon 6230 "Cascade Lake" processors (2.1 GHz and 20 cores)
* 384 GB RAM
* 960 GB read intensive NVMe
* Single Mellanox ConnectX-6 InfiniBand HCA (operating at 100 Gb/s)
* Single NVIDIA V100 GPU (with 32 GB of high bandwidth memory)