

# Uptake Project Call

## Information for Applicants – 2019

### Contents

Contents.....	1
Introduction .....	2
Eligibility.....	2
Pawsey Systems .....	2
Magnus.....	2
Zeus .....	2
Nimbus .....	3
Pawsey Expertise .....	3
Uptake Project Process .....	3
Submission .....	3
Initial Review.....	3
In-depth Review .....	4
Project Work .....	4
Reporting.....	4
Collaborative Work .....	4
Further Information .....	5

## Introduction

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The Pawsey Supercomputing Centre provides access to a range of supercomputing services to the Australian research community and international collaborators. This call for Pawsey Uptake Projects is to provide access to dedicated Pawsey staff time for researchers in a collaboration to help maximize the research impact of the Pawsey Supercomputing Centre resources.

The Pawsey Uptake Project call is open to Australian-based research communities. It provides dedicated Pawsey staff time (up to 0.25 FTE over six months) to collaborate in the improvement of the capability of research applications used on Pawsey Supercomputing Centre compute resources. Depending on the nature of the project detailed in the application, this time may be distributed across expertise from multiple Pawsey staff if necessary. The distribution and total effort awarded will be determined by Pawsey based on the project proposed in the application.

## Eligibility

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The project leader must be an Australian-based researcher and hold a substantive position at a higher education institute or research institute that is eligible to apply for funding via the Australian Research Council (ARC) or National Health and Medical Research Council (NHMRC). Alternatively, staff members from Australian publicly-funded research and government agencies may also apply. A researcher undertaking a higher degree by research, or holding only an adjunct position, is not eligible to be a project leader.

Other members of the project team may be staff or students at an academic institution or research organization, including those located internationally as well as within Australia. The use of Pawsey Supercomputing Centre infrastructure is conditional on complying with relevant laws and export controls, including the Australian Defence Trade Controls Act, United Nations Security Council (UNSC) sanctions regimes and the Australian autonomous sanctions regimes, and U.S. Export Controls.

## Pawsey Systems

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### Magnus

Magnus is Pawsey's petascale supercomputer, which supports capability computational research workflows, and is available to Australian researchers via the various merit allocation schemes. System specifications are available in the [User Support Documentation](#).

### Zeus

Zeus is Pawsey's mid-range HPC cluster, which supports throughput, high memory, GPU-accelerated or visualization work flows. Zeus is available to Magnus users and via Director Share allocations. System specifications are available in the [User Support Documentation](#).

## Nimbus

Nimbus is Pawsey's cloud computing service, and as a national facility, it is available to Australian researchers. It provides a centralised system and toolset for computational research. System specifications are available on the [Pawsey website](#).

## Pawsey Expertise

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The Pawsey uptake staff includes specialists with backgrounds in various computational sciences including applied mathematics, engineering, applied physics, chemistry, and computer science. The collective expertise spans a wide range of capabilities, and can assist with:

- Application code migration from MATLAB, Python or R to a low level language such as C or Fortran.
- Improving the parallel performance of an application using MPI and/or OpenMP.
- Re-factoring code to take advantage of compiler vectorisation.
- Improving code performance by identifying and correcting performance bottlenecks related to data transfer and/or communication.
- Improve the usability of the application by adding support for outputting data using common interchange formats (such as netCDF or HDF5).
- Improving the performance of the code using CUDA or OpenACC on GPU based architectures.
- Optimising workflows for more efficient queue utilisation, improved job scripts, or use of containers for complex software stacks.
- Developing workflows to visualise large-scale datasets, including remote visualisation, scripting and high quality image and animation rendering.
- Develop a machine learning application (eg image recognition, language analysis, or other) that utilises research collections stored at Pawsey, or elsewhere.

Pawsey staff regularly assist and support research groups to stimulate capability and to grow leadership research computing activities in Australia.

## Uptake Project Process

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### Submission

Applicants should complete the expression of interest form and email to [submissions@pawsey.org.au](mailto:submissions@pawsey.org.au). To be considered in the current call, applications must be received by 5pm AWST on the 27<sup>th</sup> of July 2019. Applications may be submitted out of call after this date, but the review process will be more dependent on availability of staff effort.

### Initial Review

Applications will initially be assessed for eligibility, suitability, and impact:

- The **eligibility** criterion assesses whether the project meets the requirements outlined in the Eligibility section above.

- The **suitability** criterion assesses whether the project supports computational work that is appropriate for Pawsey resources, and if there is relevant staff expertise to support the project.
- The **impact** criterion assesses how the project will affect the quality and productivity of the computational research of the applicant.

Applications will be shortlisted based on eligibility and suitability; and ranked based on impact. Short listed applications will be matched with a Pawsey staff member as effort is available, who will conduct an in-depth review in consultation with the applicant(s).

### In-depth Review

During the in-depth review, Pawsey staff will work with the applicant(s) to acquire relevant software, workflow scripts and data. For software development projects, this will also include installation, initial profiling, and execution of relevant unit tests.

As part of this process, Pawsey staff will conduct work to ensure that:

- applicants are sufficiently available for consultation to progress the project;
- all source code, data, and unit tests required to support the project are provided;
- test cases run as expected and results can be verified;
- the proposed project work is appropriate based on initial profiling; and
- there is a path for code improvements to be adopted into production version(s).

The in-depth review process is expected to take several weeks, which may vary depending on staff availability and the complexity of the project.

If the review determines that the work proposed by a project is not feasible a report will be prepared for the applicant(s), which will detail the issues encountered and provide recommendations for future development.

Otherwise, a project plan will be developed by Pawsey staff in consultation with the applicants. Completed project plans will be provided to senior Pawsey staff for approval.

### Project Work

Pawsey staff effort will be made available to successful projects.


It is expected that applicants and Pawsey staff should meet regularly (at least fortnightly) to discuss the progress of the project.

### Reporting

Following the completion of the project, a brief report on the outcomes will be prepared by Pawsey staff in consultation with the applicants.

## Collaborative Work

Publications resulting from the collaborative work as part of a Pawsey Uptake Project should acknowledge the Pawsey Supercomputing Centre using the standard text detailed in the [Conditions of Use](#).



It is expected that each successful Pawsey Uptake Project will result in either joint publication(s) related to the technical aspects of the project in a relevant journal, conference or workshop; or research publication(s) with appropriate acknowledgements.

The applicants of successful uptake projects may also be asked to be featured as case studies for Pawsey.

## Further Information

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For further information, contact [help@pawsey.org.au](mailto:help@pawsey.org.au).