



Astronomy
Australia
Ltd.

Astronomy NCRIS Program Annual Business Plan 7
2020 – 2021

Funding recipient: Astronomy Australia Limited (AAL)
31 March 2020

Gravitational Wave Data Centre (GWDC)

Activity [NAME]:	Gravitational Wave Data Centre (GWDC)				
Objective of Activity	NCRIS funding is to support the operations of the GWDC, through FY2019/20 and FY2020/21. This project will establish the first internationally-recognised Gravitational Wave Data Centre (GWDC) in Australia. It will enable gravitational wave researchers in Australia to access data and receive a live stream from the advanced LIGO and Virgo detectors to facilitate real-time detections of close binary coalescences and perform parameter estimation as soon as practicable.				
Focus of Activity	Please indicate whether the focus of the Activity is 'national' or 'international'.	National:	Yes	International:	Maybe
Anticipated achievements and outcomes	(a) Real-time and offline processing of both time-critical and multi-epoch data streams from large-scale international facilities for users around Australia (b) Provision of petabyte-scale storage and retrieval facilities in close proximity to supercomputers (c) Optimisation of multi-processor, multi-core, multi-compute node supercomputers and mass storage devices with high input rates (d) Advanced use of machine (deep) learning/artificial intelligence algorithms for signal detection, astrophysical inference and visualisation (e) Provision of online science gateways (data portals and/or virtual laboratories) to facilitate ready access to data for analysis, discovery and verification of published results.				
Key challenges and risks	The key challenges and risk for the success of ADACS are: <ul style="list-style-type: none"> • Lack of funding sustainability may lead to lose the key GWDC data and computing experts. • COVID-19 may impact on the progress of GWDC project. • Mid-term review of the Australian Astronomy Decadal Plan may change GWDC service priorities. 				
Operational expenditure (Opex) resources	\$1,130,000 (For breakdown see attached spreadsheet)				
Capital expenditure (Capex) resources	\$0				
Anticipated duration of activity	This is an ongoing activity.				
Methodology	This project plans to closely align with those of the proposed SKA regional data centres as well as the activities of the Astronomy Data and Computing Services (ADACS) initiative. It aims to meet the data and computing needs of the national astronomy community in general.				

Deliverables	Deliverable		Due Date
<i>(In this section are listed the agreed milestones for the GWDC project and their due date)</i>	Optimisation of the “Bilby” parameter estimation software (developed at Monash) for use as the official parameter estimation suite for O3 and beyond		30 June 2021
	Complete the necessary work to enable live streaming of data from Advanced LIGO, MeerKAT and Parkes (ultra-wide band receiver) to OzSTAR		30 June 2021
	Port and optimise SPIIR on OzSTAR in readiness for O3 and beyond		30 June 2021
	Establish the official LIGO Tier 3 Data Centre status for OzSTAR and the GWDC		30 June 2021
	Complete a data storage facility upgrade to meet the needs for the local gravitational wave and general astronomy communities on OzSTAR for the next 3-5 years		30 June 2021
	<i>Note: only the key GWDC deliverables are listed here. For details, please refer to ODC Project Plan.</i>		
	KPIs	KPI	KPI target
	Number of users (and estimated breakdown of Australian vs international users)	400 Australian, 1000 international	30 June 2021 (full year figures)
	Facility downtime (broken down by planned downtime vs unplanned downtime vs time lost to bad weather, where relevant)	99.5% uptime 0.5% downtime (0.3% planned, 0.2% unplanned)	30 June 2021 (full year figures)
	Number of publications	20 per year	30 June 2021 (full year figures)
	KPI	KPI target	Due date
	Number and nature of outreach activities	2	30/6/2021 (full year figures)
	Number and nature of industry engagement activities	8 (engaging to look towards collaboration)	30/6/2021 (full year figures)

	Number and nature of international engagement activities	3 (conference, workshops)	30/6/2021 (full year figures)
	Number and types of commercial outcomes	0	30/6/2021 (full year figures)
	Co-investment data, including amount and source	In-kind \$130,000	30/6/2021 (full year figures)
	Staff employment on the project, including directly NCRIS-funded and in-kind resources	2.5 FTE (NCRIS funded) 0.35 FTE (in-kind)	30/6/2021 (full year figures)
	Number and nature of external consultative mechanisms	4 (workshops, surveys, meetings)	30/6/2021 (full year figures)
	Number of governance body meetings	2	30/6/2021 (full year figures)
Activity Budget is provided in the accompanying Excel spreadsheets			