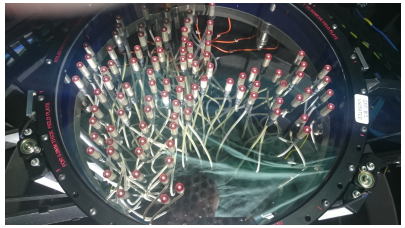
MACQUARIE University
SYDNEY·AUSTRALIA

AAO

THE FUTURE FOR AAO-MQ RESEARCH DATA & SOFTWARE

Background

The AAO has moved through a transition from being a government-funded research organisation to a project-driven organisation in the research sector. The main AAO campus consists of research and development, astronomical instrumentation, software development (hardware control and software pipelines), Data Central science platform, and astronomical research. This transferred to Macquarie University on July 1, 2019. The AAO is now a Consortium organisation with partners at Macquarie University (MQ), University of Sydney (USyd), Australian National University (ANU), and Australia Astronomy Limited (AAL). The Consortium model enables Australia to provide a single external-facing organisation for optical/infra-red astronomical instrumentation research, development, and construction. Embedded within AAO-MQ are the Data Central and software teams (Research Data and Software, RDS).



AAO TAIPAN Starbugs instrument. Instrument control software developed by the AAO-MQ RDS software team. Image credit: AAO-MQ.

Research Software

The AAO-MQ RDS software team has more than 40 years' experience in the development of telescope control software, instrument control software, and pipeline data reduction software.
The RDS software team has developed control software for instruments on Gemini, Vista, and VLT telescopes, for example. The team currently develops pipeline data reduction software for ESO and the AAT.

The team offers design and development services in the following areas:

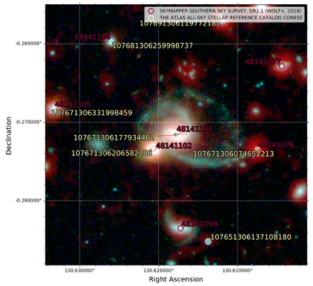
- Astronomical data reduction algorithms and software
- Astronomical instrumentation control and monitoring software
- Telescope control software
- Astronomical user software
- Bespoke software solutions for research teams

AAO-MQ Data Central

AAO-MQ Data Central science research platform currently provides the astronomical community access to Australian distributed, queryable, heterogenous optical data sets. The web-based tools and archive functionality enable data exploration, collaboration and science discoveries.
Data Central provides a stable, long-term storage solution alongside the query tools that provide an intuitive, accessible, and feature-rich interface to science teams with diverse user bases.
Working with the ANU SkyMapper team we are leading the development of an Australian Optical Data Centre.

The team offers the following data services:

- Full life-cycle data management for
  - Survey teams
  - Astronomical instruments
  - Observatories
- Research team facilitation software



Cutout service produces publication-quality single-band or RGB images with custom image scaling options, fits creation, plot source overlay from DC-hosted and remote catalogues, batch mode, contours and more, over 30 bands across the GAMA and DEVILS regions (with VHS data coming soon). Image credit: AAO-MQ.

Summary

We are an experienced, diverse, high-velocity set of teams working within a matrix environment. We adopt agile methodologies and software best practice throughout the entire project lifecycle.

The changing landscape in Australian astronomy has lead to the broader RDS team exploring and developing opportunities globally to provide astronomical software services and full life cycle data management services in order to develop a sustainable team environment.

www.rds.org.au

Dr Katrina Sealey
AAO-MQ Head of Research Data and Software
katrina.sealey@mq.edu.au