

Australia's Optical Data Centre

Overview

Australia's Optical Data Centre (ODC) will provide an astronomical data ecosystem that brings together Australia's two key optical/infrared data centres – Data Central (AAO Macquarie) and SkyMapper (RSAA ANU) into one system. The over-arching goal of the ODC is to make all optical and infrared surveys conducted using the many different Australian facilities publicly available. This will maximise the scientific return on the substantial public investment that has been and will continue to be made in facilities such as the Anglo-Australian Telescope and SkyMapper.

ODC successes

1. Established momentum in delivering access to data from many different facilities
2. Highly intuitive user interface and dashboard for data access with value-add tools
3. Ability to query geographically distributed data (e.g. ESO, CASDA, MWA)
4. Access to data through IVOA services (e.g. TAP, Simple Cone Search)

Governance

The Optical Data Centre is currently establishing a Science Advisory Committee (SAC), with membership drawn from a broad cross-section of astronomical disciplines within Australia. The SAC will help guide the process of prioritising user requirements, which naturally will change as new data and technologies become available. The SAC will therefore facilitate the ODC to support new discoveries and maximise science benefits.

Project and Goals

The project can be divided into two main components:

1. **Data Management:** This is where the ODC will not just bring together legacy, currently ongoing and future surveys to allow cross-matching of complementary data in its holdings, but also help improve the productivity of survey teams by harnessing the power of the Virtual Observatory. This will provide users with an interoperability layer that brings together all types of optical and infrared data products (e.g. images, spectra, data cubes, catalogues, time-series) from Australian and international facilities. The technologies used and developed by Data Central are critical to this component. The ODC will also provide long-term access and stability for archival data from facilities such as the Anglo-Australian Telescope, UK Schmidt Telescope, the ANU 2.3m Telescope and SkyMapper.
2. **Tool Development:** Coupled with the management of these heterogeneous data sets is the development of tools to fully exploit them. These tools will allow users and teams to produce publication-quality multi-wavelength images, reduce and analyse transient and other time-critical data on-the-fly, share data with collaborators easily and efficiently anywhere in the world and publish high-level science data products back into the ODC.

As well as these components, we are fully engaged with the ESO Data group and have formed a partnership that combines the technologies used by Data Central with the IVOA protocols to develop cross-matching capabilities that will open up new opportunities for research. For example, an Optical Data Centre query would return a link to the relevant ESO science archive object viewer. The user could then access the ESO data from within the Data Centre. Similar technologies could also be used to provide access to LSST data.