The Astro-WISE Information System

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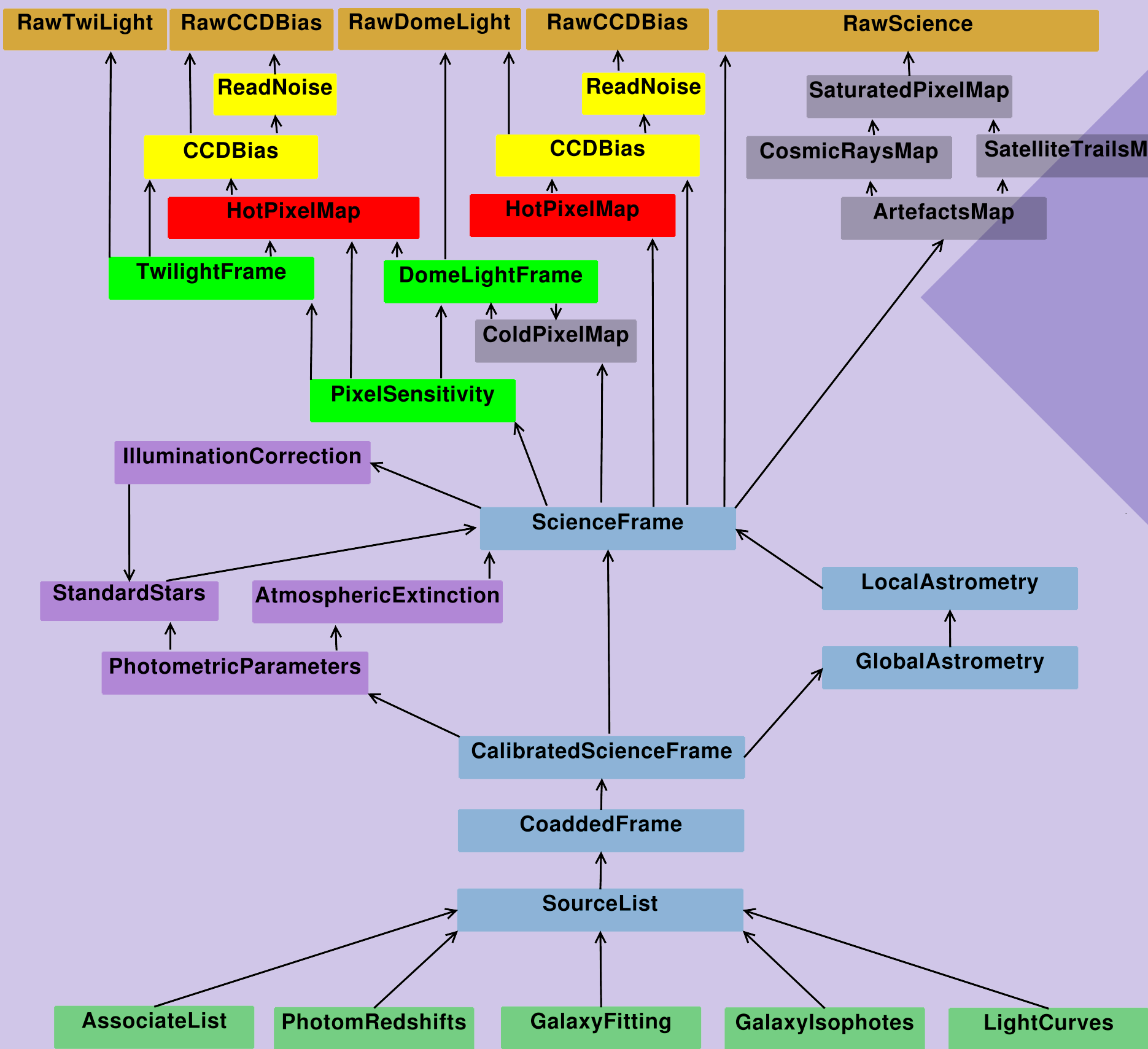
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Astro-WISE means Astronomical Wide-field Imaging System for Europe. The system was initially developed to support the data processing of the Kilo Degree Survey on the Very Large Telescope Survey Telescope (VST). Astro-WISE is a scientific information system which allows to process data, control quality of the data, publish and browse data for a number of instruments. Astro-WISE is an all-in-one system: the user has an access to data storage and processing facilities from his personal installation of the Astro-WISE user environment or from the Astro-WISE web services. Astro-WISE allows to the user to run a standard data processing pipeline or develop a user-defined code for the data processing. Astro-WISE incorporates a number of astronomical software tools, including SeXtractor, Swarp, Galfit, Galphot, Mdia, VODIA.
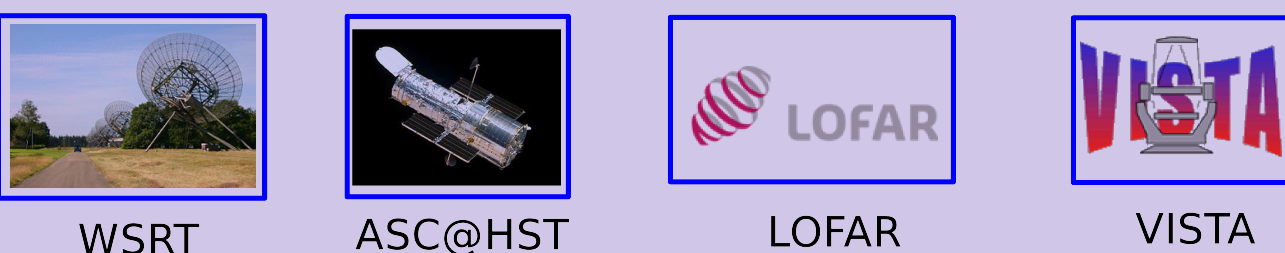
Astro-WISE common data model binds all data items to provide the user with complete data lineage allowing to trace each bit of information. The user can trace back all reduced and raw images used to build a catalog along with calibration files and processing parameters from the catalog itself. Each data item in Astro-WISE can be reproduced. Each data item in Astro-WISE is an instance of the corresponding class which incorporates methods for processing of the data, quality control parameters, processing parameters and links to data items used to produce it.

SUPPORT INSTRUMENTS with DATA PROCESSING from RAW IMAGES

OmegaCAM@VST, WFI@2.2m, LBCBLUE@LBT, SUP@SUBARU, WFC@INT, LBCRED@LBT, MEGACAM@CFHT

The Astro-WISE approach allows data from many instruments to be processed, including OmegaCAM, WFC, WFI, Megacam, all in the same environment with the same pipeline. A user can calibrate instrument itself with CalTS and Quality Control services of Astro-WISE. Astro-WISE provides users with a number of surveys and catalogs which can be combined with the data processed by user.
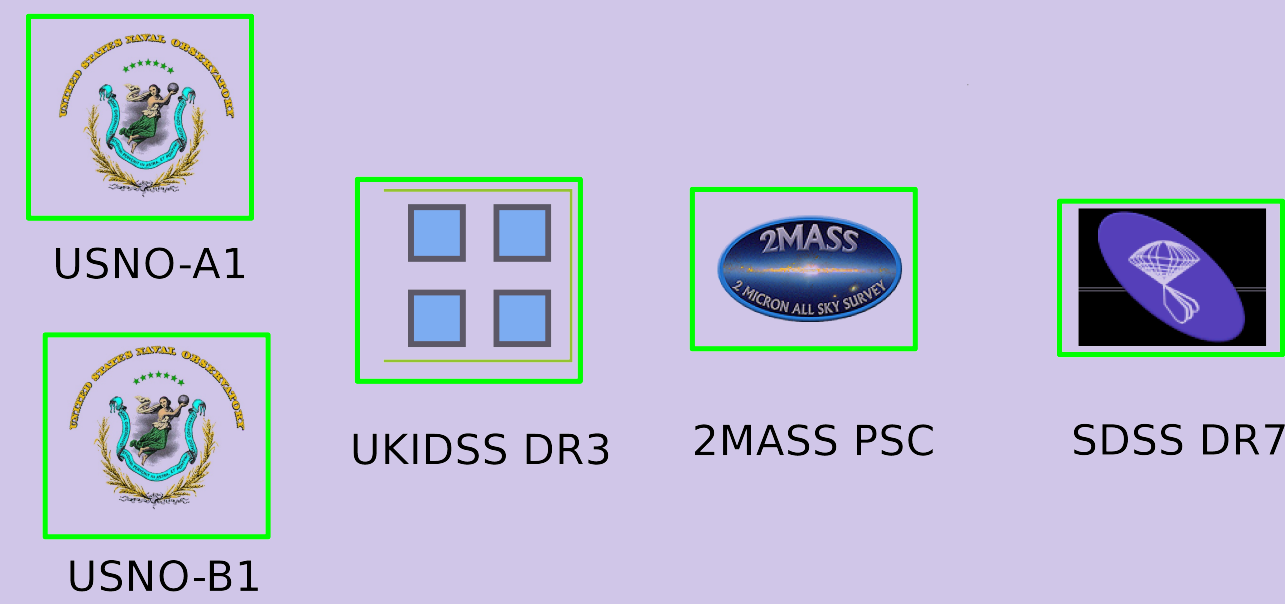
SUPPORT INSTRUMENTS with DATA PROCESSING from REDUCED IMAGES

WSRT, ASC@HST, LOFAR, VISTA

PROVIDE ACCESS TO SURVEYS AND CATALOGS

USNO-A1, UKIDSS DR3, 2MASS PSC, SDSS DR7, USNO-B1
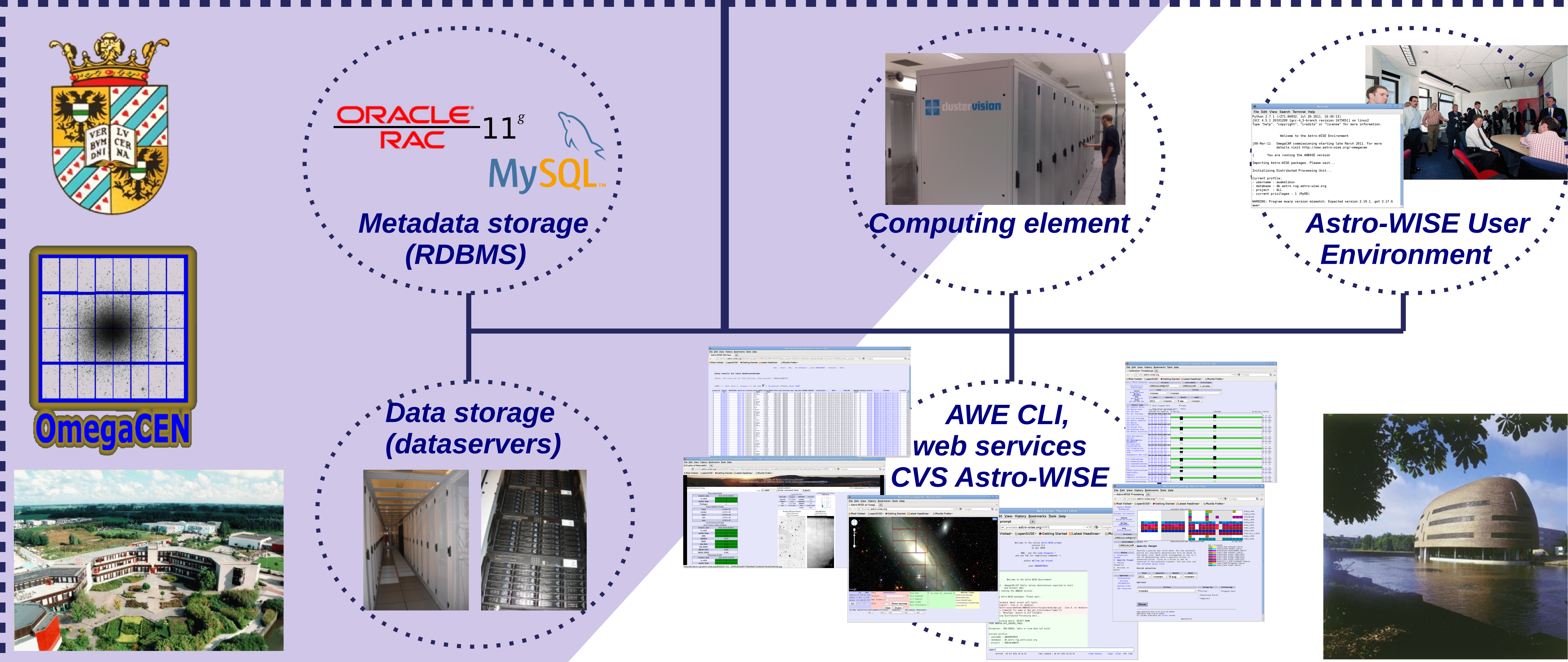
Astro-WISE is a federated system distributed over Europe. Currently nodes of Astro-WISE are installed at University of Groningen, Radboud University Nijmegen, Leiden University (The Netherlands), Bonn Argelander-Institut für Astronomy, Universitäts-Sternwarte München (Germany) and Observatorio Astronomico di Capodimonte (Italy). Each data item in Astro-WISE is stored as a file with a unique filename registered in the metadata database. Astro-WISE allows users to share data in projects forming groups responsible for the data processing of the data for particular instrument or survey.

In 2011, Astro-WISE has a storage capacity of 1.6 PB of data and processing capacity of 10 Tflops distributed over the Astro-WISE partners. In addition users of Astro-WISE can employ processing elements of BiGGrid.

Astro-WISE node in full deployment consists of metadata database, computing element, data storage element (dataservers), web services and Astro-WISE user environment

ORACLE RAC 11g / MySQL
Metadata storage (RDBMS)

Computing element

Astro-WISE User Environment

OmegaCEN

Data storage (dataservers)

AWE CLI, web services CVS Astro-WISE