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The two elements of SMA built by Taiwan.

One of the TAOS 0.5m telescopes in its enclosure.

AMiBA on top of Mauna Loa in Hawaii.

Brief History

Established in 1993, ASIAA was inaugurated with Prof. Frank H. Shu chairing the Advisory Panel, and with Typhoon Lee as the first director. Succeeding directors are Chi Yuan, Kwok-Yung Lo, Sun Kwok, and Paul T. P. Ho. ASIAA currently has about 130 members. Research topics carried out at ASIAA range from solar system studies to cosmology, with our staff making use of many of the frontier ground-based and space-borne observing facilities. The goal of ASIAA is to become a research institute competitive with the best in the world.

Research Projects and Contributions

1. The SAO/ASIAA Submillimeter Array (SMA)

In 1996, Academia Sinica signed an agreement with the Smithsonian Institution (SI) to build two 6-m sub-mm radio telescopes on Mauna Kea, Hawaii. Together with the other six built by the Smithsonian Astrophysical Observatory (SAO), they form the first sub-mm array in the world. Since then, ASIAA has built up a technical staff to construct the high-precision telescopes, and a scientific staff to make good use of the unique facility. In November 2003, the SMA was dedicated on Mauna Kea by President Y. T. Lee and SI Secretary Larry Small. In 2004, the first scientific results were published as a special volume in the Astrophysical Journal Letters.

2. The Taiwan-America Occultation Survey (TAOS)

TAOS is an observatory consisting of four fully automated 0.5m optical telescopes located on peaks near Jade Mountain in Taiwan. It is a joint project between ASIAA, National Central University, SAO, and Yonsei University. TAOS began regular operations in 2005. The four robotic telescopes automatically monitor 1,000 stars every clear night using the occultation technique to search for small Kuiper Belt objects. This will allow detection of bodies smaller than those discovered by direct imaging with larger optical telescopes. As the Kuiper Belt is a probable source of short period comets, TAOS will provide important new information on the outer Solar System.

3. The Y. T. Lee Array for Microwave Background Anisotropy (AMiBA)

AMiBA is a platform-mounted interferometer sited on Mauna Loa in Hawaii to measure the structure and polarization of the cosmic microwave background and to detect clusters of galaxies at high redshift. It is designed, constructed, and operated by ASIAA, with major collaborations with National Taiwan University (NTU) and Australia Telescope National Facility. AMiBA has deployed the initial 7-element interferometer. A dedication ceremony was held in October 2006, with President Y. T. Lee and NTU President S. C. Lee presiding. Science operations have started. An expansion to the 13-element configuration is underway, with deployment and testing in 2008.

4. The Optical and Infrared (OIR) Instrumentation Program

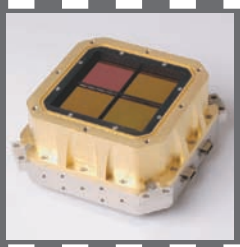
In order to support follow-up observations of high-redshift clusters detected with the AMiBA project and to train the next generation of OIR astronomers, ASIAA negotiated for 68 nights of observing time on the 3.6m Canada-France-Hawaii Telescope. Contributions from ASIAA are in the form of financial and technical support for the development of the Wide Field Infrared Camera (WIRCam). In 2005, the WIRCam was installed on CFHT, and commissioned. Building on our experience with TAOS, the WIRCam project further developed the capability at ASIAA to build world class OIR instruments.

5. Theoretical Astrophysics

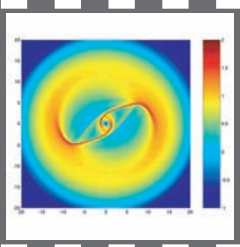
ASIAA has independently developed high-performance computational fluid dynamics and magnetohydrodynamics (CFD-MHD) codes, named Antares, for astrophysical problems. The CFD codes have been successfully applied to astrophysical disks. ASIAA also collaborates with National Tsing Hua University to establish the Theoretical Institute for Advanced Research in Astrophysics (TIARA) for research on star formation and compact object, and training students.

6. Atacama Large Millimeter/submillimeter Array - Taiwan (ALMA-T)

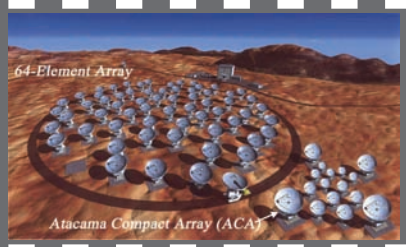
In 2005, Academia Sinica signed an agreement with National Institutes of Natural Sciences of Japan to join the ALMA project via Japan. ASIAA will work with National Astronomical Observatory of Japan (NAOJ) in the construction and operation of this array being built in Chile. The ALMA is the largest ground-based astronomical facility in the world, and is the follow-up project to the SMA. ASIAA will work on various aspects of the instrumentation program as part of this project, including integrating the ALMA-Japan receiver systems.



WIRCam detector arrays.



Numerical simulation of NGC1300.



Conceptual image of ALMA.
(picture credit: NRAO, ESO and NAOJ)