Institute of Astronomy and Astrophysics, Academia Sinica

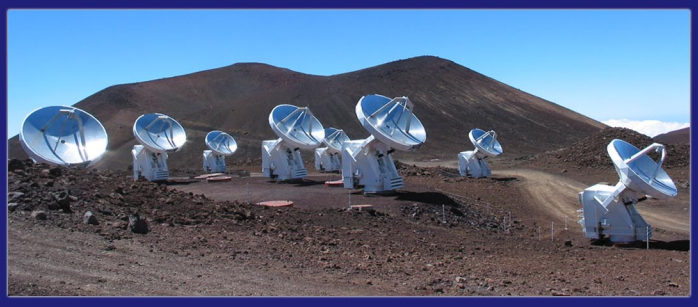
ABOUT ASIAA

The Institute of Astronomy and Astrophysics (ASIAA) was re-established in 1993 after approval by the Academia Sinica Council upon the recommendation of Academician C.C. Lin. The Preparatory Office was inaugurated with Prof. Frank H. Shu chairing the Advisory Panel, and with Prof. Typhoon Lee as the first director. Succeeding directors are Prof. Chi Yuan (1994-1997), Prof. Fred K.Y. Lo (1997-2002), Prof. Sun Kwok (2003 - Aug 2005), and Prof. Paul T. P. Ho (2002-2003, Sept 2005 - present). ASIAA currently has about 120 members, including research fellows, post-doctoral fellows, engineers and technical staff, research assistants, and administrative staff. Although the majority of staff of ASIAA is Chinese, it has members from many foreign countries, including Australia, Canada, France, India, Japan, Switzerland, U.S.A., and Vietnam.

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. ASIAA also sponsors international workshops and conferences on a regular basis. The goal of ASIAA is to become a research institute competitive with the best in the world.

Research Projects and Accomplishments

1. SMART (Submillimeter Array of Taiwan)



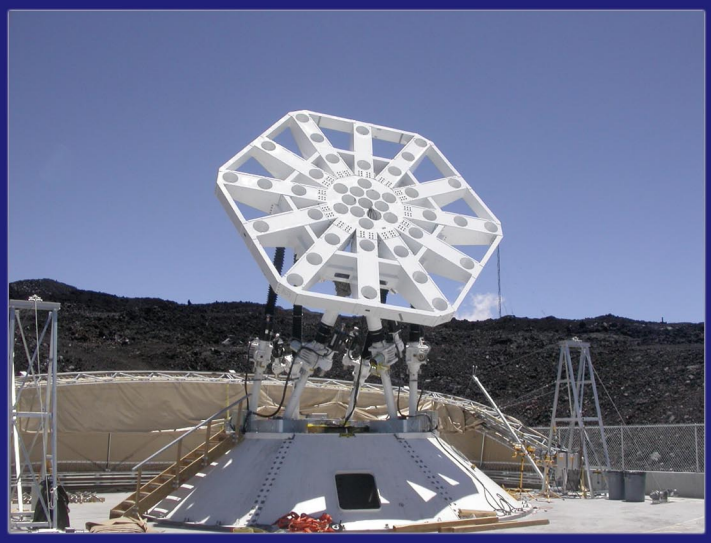
In 1996, Academia Sinica signed an agreement with the Smithsonian Institution to build two 6-m sub-mm radio telescopes to join the six built by Smithsonian Astrophysical Observatory (SAO) to form the world first sub-mm array (SMA) on Mauna Kea, Hawaii. The two high-precision telescopes built by ASIAA were completed in 2003 and are operating as part of the SMA to perform imaging and spectroscopy of molecular sources in the interstellar medium. The array was dedicated by President Yuan T. Lee and Secretary Larry Small in a ceremony held in November 2003 in Hawaii.

2. TAOS (Taiwan-America Occultation Survey)

TAOS is an observatory consisting of four fully automated 0.5m optical telescopes located on peaks near Jade Mountain National Park in Taiwan. It is a joint project with the Lawrence Livermore National Laboratory, the University of Pennsylvania, the National Central University, and the Yonsei University. The four robotic telescopes will automatically monitor 3,000 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 much large 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.

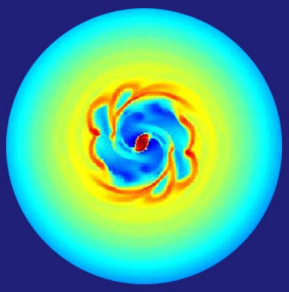
3. AMiBA (Array for Microwave Background Anisotropy)

AMiBA is a platform-mounted interferometer operating at 90GHz with up to 19 dishes of two possible diameters (0.6m, 1.2m) to measure the polarization of the cosmic microwave background and to detect clusters of galaxies at high redshift using the Sunyaev-Zeldovich effect. It is designed and constructed by ASIAA in collaboration with the National Taiwan University (NTU), funded in part by the MoE/NSC Research Excellence Initiative. A ground-breaking ceremony for this array was held on April 16, 2004 on the site on Mauna Loa, Hawaii. An array of 7 dishes is scheduled to be completed in 2006.



4. OIR (Optical and Infrared Astronomy)

Optical and Infrared Astronomy is one of the main topics of the second ten year plan for Taiwanese astronomy. Through the collaboration with Canada-France-Hawaii telescope, we gained access to the world class large telescope and facilities for various astronomical research. ASIAA also joined the development of the wide field infrared camera (WIRCam) which started to operate in late 2005.

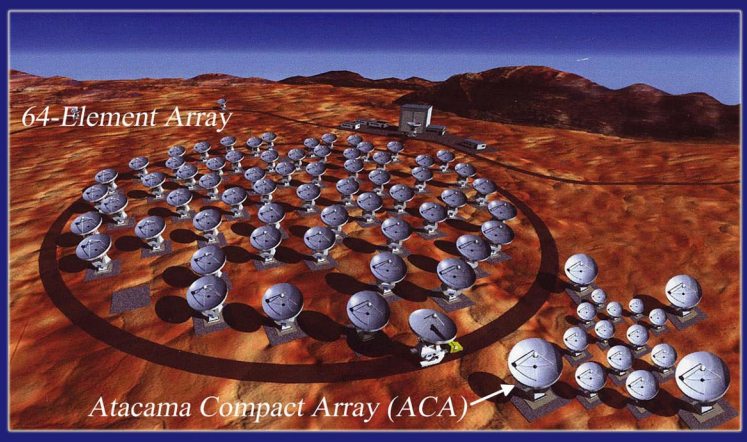


5. Theoretical Astrophysics

ASIAA has independently developed high-performance computational fluid mechanics and magnetohydrodynamics (CFD-MHD) codes, the Antares codes, for astrophysical problems. The CFD codes have been successfully applied to astrophysical disks. ASIAA also collaborates with Tsing-Hua University to establish the Theoretical Institute for Advanced Research in Astrophysics (TIARA).

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

In 2005, Academia Sinica signed an agreement with the National Institutes of Natural Sciences of Japan to join the ALMA project via Japan. The ASIAA will work with the 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-on project to the SMA. Open access by Taiwanese scientists to the Japanese portion of the ALMA observing time is secured with this project. The ASIAA will work on various aspects of the instrumentation program as part of this project.



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Picture credit: Mauna Kea: M. T. Chen, SMA: J. Baumann, AMiBA: Y. D. Huang, TAOS: D. Kinoshita, Theoretical Astrophysics: C. Yuan, ALMA: M. Ishiguro