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Regional Co-operation

Keiichi Ishida
Institute of Astronomy, University of Tokyo, 2-21-1 Osawa, Mitaka, Tokyo 181 Japan

Abstract. A historical account of co-operation in astronomy for Japan, IAU activities in Asia, and recent regional co-operation are briefly reviewed.

1. Historical Co-operation in Astronomy for Japan

The first regional co-operation in astronomy for Japan is found in Nihon-Shoki, the old formal records of the Japanese government. It is found in the description of the events during 553 in the middle of the 6th century, that the Japanese government sent a delegate to Kudara (Paekche), one of the kingdoms in the Korean peninsula, and requested then to send books on Ephemeris and Astronomical phenomena and scholars thereof (Nakayama 1969). From then until the end of the 9th century, the Japanese government kept sending large missions to the Chinese kingdom around once every 10 years. Each mission was followed by a large number of students abroad, and they brought back enormous numbers of books from China. This was a typical regional co-operation among Asian countries.

In 1543, a Portuguese came up to Tanegashima, a small southern island, and sold two musket rifles to Japanese islanders. They saw rifles for the first time and manufactured about 600 similar rifles over several months before the Portuguese returned to his home country. This attitude of the islanders shows Japanese people were very much interested in new technology.

In 1613, four years after Galileo's astronomical discovery, a telescope was presented by an English delegate to the Tokugawa-Shogunate (1600-1867). Considering that the telescope could be an efficient weapon, the Shogunate decided to prohibit the making of telescopes for practical use in the whole territory. Japan closed her territory to Europeans, by seclusion, then for 200 years after 1641, to protect her territory from the Portuguese and Spanish kings, who declared that the whole world should be owned by them.

Nevertheless the Japanese still opened a window, and never closed their eyes to the world themselves. Dutch people were allowed to come to Nagasaki, a town in Kyuhshuh island, but no further. Many books were bought from a Dutchman at Nagasaki. In the early 19th century, Japanese scholars realized that the European view of the natural world was apparently superior to the domestic view developed by regional co-operation with Asian countries from the 6th century. This conclusion came mainly from governmental officials of Ephemeris and As-

tronomical phenomena in Tokugawa-Shogunate, which became, later, one of the core offices to found the University of Tokyo.

When Japan opened her territory to foreign countries, a large formal mission was sent out to twelve major countries all around the world to learn how to organize a modern nation. Excellent scholars were invited from various countries to found a national university with a contract for a period of a few years. Many of the top students educated by the foreign professors at the new university were sent as students abroad for several years, and they returned to their home university to become professors.

Tokyo Astronomical Observatory was founded in 1888 by combining three observatories of the Ministries of Navy, Home affairs, and Education, forming a research laboratory attached to the University of Tokyo. It was 20 years after the settling of the Meiji Government. In the Meiji-era when Japan opened her territory to foreign countries, every effort of the Japanese government was concentrated to build a modern nation to protect its country by themselves. Astronomy was needed for the adoption of a new calendar, for time keeping, and for measuring geodetic positions in the domestic land. All of these were related to positional astronomy. On the other hand, people have been very interested in astronomical phenomena and there have appeared many non-professional amateur astronomers. They have developed strong relationships with some of the professional astronomers by observing sunspots, variable stars, and shooting stars, and by discovering novae, comets, asteroids, and meteorites. Tokyo Astronomical Observatory moved from the center of the city area to Mitaka in the west suburbs in 1924.

During World War II, astronomers were organized into various research committees as in other countries. One of these was on the ionosphere for the propagation of radio waves, which encouraged inter-disciplinary discussions. After the war, the members spread out into various scientific research groups of astrophysics like radio astronomy, spectroscopy of the sun and stars, and others. Astrophysics attracted young astronomers and soon major groups of professional astronomers were formed. After 1949, Tokyo Astronomical Observatory founded branch observatories at Norikura Corona Observatory (1949), Okayama Astrophysical Observatory (1960), Dodaira Station (1962), Nobeyama Radio Observatory (1970), and Kiso Observatory (1974) distributed over the Japan island. All of these developments have been made possible by world-wide co-operation towards one country, Japan.

Space astronomy has been supported by a national institute, ISAS, the Institute of Space and Astronautical Science, which was separated from the University of Tokyo in 1981, to develop its own balloon, rocket, and satellite technology for scientific use for X-ray, gamma-ray, and infrared astronomy.

Tokyo Astronomical Observatory was reorganized to become the National Astronomical Observatory in 1988, and also separated from the University of Tokyo, to build an eight meter telescope, Subaru, on Mauna Kea, Hawaii, which will be completed in 1999.

Optical, radio, and space facilities are operated by individual institute units and utilized by all astronomers in any institutions. Actually many of astronomers are scientists who have been educated in astronomy departments, and in recent years a significant fraction of astronomers come from physics de-

partments and others. Astronomers are highly involved in various work shops and research programs. Active astronomers are encouraged to move from one university or institute to another, when a few new posts are produced for new projects. The number of Japanese IAU members is 349, 5% of the total in 1993. Japan is followed among Asian countries by China with 4% and India with 3% (IAU Inf Bull, no.70).

2. IAU Activities in Asia

International co-operation has become a worldwide tendency in this century in every field of human activity. The International Astronomical Union was formed in 1920 by seven countries, in which Japan participated, and the number of countries in the IAU is now 55 (including former Czechoslovakia, USSR and Yugoslavia). A Regional meeting supported by the IAU was first organized for European countries in 1972. In 1978, the first Asian-South Pacific Regional Meeting in Astronomy was held at Wellington, New Zealand, but there were only 11 Asian participants recorded in IAU Inf Bull, no.43.

The Second Asian-Pacific Regional Meeting was held in Bandung in 1981 with 120 participants from 21 countries. That meeting was followed by meetings at Kyoto, at Beijing, at Sydney and at Pune in India. The efforts of Asian astronomers and the IAU were extended to organize International Schools for Young Astronomers at Bandung in 1973 and 1983, in Malaysia in 1990, at Beijing in 1992, at Pune in 1994.

A number of IAU Symposiums and Colloquia have been organized in the Asian countries of China, India, Indonesia, and Japan in recent years.

3. Regional Co-operation

Regional co-operation became a world-wide tendency in many fields of human activity in the 1970s. Astronomy and our country were not an exception. One of the reasons is that astronomers have recognized that they need to talk with astronomers in neighbouring countries to go ahead with the further development of astronomy, which has been expected by the people and for which they have needed the support of the people.

There are several co-operative programs going on between Asian countries and Japan, today, along with more formal international co-operative projects like Yohkoh, an X-ray solar physics observatory, ISO, the Infrared Space Observatory, DSS, a Digital Sky Survey program, and others. Radio astronomers and others have created tight relationships between Korea and Japan. Scientists in solar physics, infrared and space astronomy have frequent exchanges of people between China and Japan, and are endeavouring to set up co-operative projects.

The exchange program in astronomy between Indonesia and Japan was started within a larger frame work of the general cultural co-operative programs with Southeast Asian and other countries, over a wide range of academic fields in the social and natural sciences. Necessary expenses are borne by JSPS, the Japan Society for the Promotion of Science.

This co-operation started in 1979 with Prof. Bambang Hidayat on the Indonesian side and Prof. Tomokazu Kogure on the Japanese side as coordinators

(Kogure and Hidayat 1985b). I have served as a coordinator on the Japanese side from 1986 to the present. The form of the co-operation is basically an exchange of scientists of both countries. The number of scientists mutually sent is agreed by the Joint Staff Meeting of DGHE, the Directorate General for Higher Education, Indonesia, and of JSPS, held once every a year and the whole program is reviewed every three years. The number of persons in the exchange has been maintained at 3 from each country each year, for a total period of 70 and 90 days per year from Japan and from Indonesia, respectively.

The first three year program started in 1979 under the title of 'A Spectroscopic and Photometric study of the Galaxy'. The program was carried out successfully. DGHE and JSPS decided to continue for another three years under the similar title of 'Galactic Structure and Variable Stars' (Kogure and Hidayat 1985a). As a result of the program, significant contributions to galactic astronomy were presented at the Second Asian-Pacific Regional Meeting at Bandung and at other meetings (Kogure 1986).

After a one year intermission, a restart of the co-operative program was proposed by the Indonesian side, and accepted by DGHE and JSPS. The titles were 'Evolution of Stars and Stellar Systems' in the period 1986-88 (Ishida and Hidayat 1989), and 'Evolution of Stars and Galactic Structure' in 1989-91 (Ishida and Hidayat 1992). To conclude each three year programme, Proceedings were issued. The third three year program is ongoing at present. Several Indonesian students have also been sent by various funds to study in graduate courses of astronomy. Up to 1993, they have earned three Doctor's degrees and four Master's degrees from Kyoto University, and two Doctor's degrees and four Master's degrees from the University of Tokyo. We expect them to work for the future of astronomy in Asia.

It is important for each side to know astronomy in the counterpart country of the other side to carry out co-operative programs successfully. Astronomy is based on her own long history like any other culture. I respect the efforts and thoughtful consideration of our colleagues in partner countries.

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