

## ASTRONOMY FOR DEVELOPMENT; APPROACHES IN ASIA

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### ABSTRACT

As task force members, we present the International Astronomical Union (IAU) Office of Astronomy for Development (OAD) and its task forces. Each task force calls for proposals every year and reviews the submitted proposals. From the point of view of “Astronomy for a Better World”, the vision of the OAD, our aim is to reach diverse people including those such as the visually impaired. Our efforts meet one of the goals of the OAD and some OAD-funded projects.

*Key words:* IAU OAD: “Astronomy for a better world”: Universal Design

### 1. IAU OAD – ASTRONOMY FOR A BETTER WORLD

The International Astronomical Union (IAU) has established the Office of Astronomy for Development (OAD) [1] in partnership with the South African National Research Foundation (NRF). The OAD was officially opened in 2011 at the South African Astronomical Observatory (SAAO) in Cape Town, South Africa. With the vision of “Astronomy for a Better World”, the OAD’s mission is to help further the use of astronomy as a tool for development by mobilizing the human and financial resources necessary in order to realize the field’s scientific, technological and cultural benefits to society. One of the roles of the OAD is to implement the IAU’s ten-year Strategic Plan [2].

The OAD functions as a global coordinating center, and at the same time, it has regional and bottom-up approaches. Because there are different countries and regions with different cultures and languages involved, barriers for communicating astronomy must be overcome. Therefore, there are several regional nodes and languages centers.

### 2. THREE TASK FORCES AND ANNUAL CALL FOR PROPOSALS

The OAD has established the three Task Forces (TFs): Astronomy for Universities and Research (TF1); Astronomy for Children and Schools (TF2); and Astronomy for the Public (TF3). The members are selected from various locations in the world with different skills, knowledge, experience, and culture. A profile of each task force member can be seen at the OAD website. Usuda-Sato is a member of TF3 and Tomita is a member of TF2. People from Asian and Pacific regions have

a presence in all task forces: three TF1 members (from China and Indonesia) out of eleven, two TF2 members (from Japan and Australia) out of nine members, and four TF3 members (from Hong Kong, Sri Lanka, China, and Japan) out of ten are from the Asian and Pacific regions.

Each task force works independently. The main role of the task force is to call for proposals annually, to review the proposals, and to report the review to the IAU Extended Development Oversight Committee (EDOC) with three lists (recommended projects, projects in a wish list, and rejected projects).

The OAD announced the first call for proposals in 2012 for 2013 projects. Since then, each task force has called for proposals every year. All proposals are submitted to the OAD website by the end of August. Though English is the working language of the OAD, translation support is available in seven languages: English, French, Spanish, Russian, Chinese, Arabic, and Portuguese.

Table 1 shows the number of submitted proposals and funded projects each year. In 2014, 134 proposals were submitted by August 31, 2014, and they are now being reviewed (as of October 2014) as candidates for 2015 projects.

Figure 1 shows the geographical distribution of the funded projects. In 2012, 18 projects were funded, including five projects in Asia. The reports of all 2012 funded projects that were implemented in 2013 can be read in the OAD’s first brochure, which can be downloaded from the OAD website [3]. For 2013, 23 funded projects including six projects in Asia are currently under way. Updates can be seen at the OAD website for each project funded.

Many task force members are not only reviewers of the proposals but also active participants in various projects



Figure 1. Funded projects in 2013 (balloon) and 2014 (circle). The 2013 and 2014 projects were selected in 2012 and 2013, respectively. Regional centers (square) are also shown. The original figure is presented on the OAD brochure.

Table 1  
SUBMITTED PROPOSALS

	2012	2013	2014
TF1	42	54	33
Funded	7	8	
TF2	94	113	62
Funded	5	8	
TF3	53	63	39
Funded	6	7	
Total	189	230	134

relevant to astronomy education and global networking, including the Galileo Teacher Training Project (GTTP), Global Hands-On Universe (GHOU), Universe Awareness (UNAWA), Astronomers Without Borders (AWB), and others. The members share new information and discuss new ideas, and sometimes develop a new project such as AstroEDU and a crowd-funding campaign for the Universe in a Box.

### 3. UNIVERSAL DESIGN IN ASTRONOMY

In addition to the OAD task force work, we are involved in efforts related to “Astronomy for a Better World” through the Universal Design Working Group (UDWG) of the Japanese Society for Education and Popularization of Astronomy (JSEPA). The WG was established in August 2006 and closed in July 2012. The purpose of the WG was to consider methods of sharing the joy of learn-

ing astronomy with diverse people: visually impaired people, hearing-impaired people, hospitalized children, children in special education, and so on. We have carried out various activities. One of our main achievements is the publication of barrier-free astronomical textbooks.

Dr. Shin Mineshige (Kyoto University) and Jun Takanashi (Mitukaidou 1st Senior High School) developed braille astronomy textbooks at three different levels: for university students, for middle and high school students, and for young children. The authors published not only braille books with tactile astronomical images but also audio files and electric versions. Using the electric version, people with low vision can read enlarged characters and/or white characters on black screens.

Figure 2 shows the tactile image of Jupiter from the textbooks. By simplifying the image, sighted people can also clearly understand the patterns of Jupiter. The members of the working group tried various approaches to different targets, and held conferences at the National Astronomical Observatory of Japan (NAOJ) headquarters in Tokyo in 2010 and 2013. Both times more than 100 participants including people with disabilities gathered. We held group discussions where we discussed specific topics in depth (Figure 3). The proceedings’ websites are available to the public with user-friendly designs for both sighted people and for screen-reader users [4].

At the conferences, we were able to collect resources and connect people with similar goals in Japan. Our efforts meet one of the goals of OAD and of some OAD-funded projects. For example, one of the funded

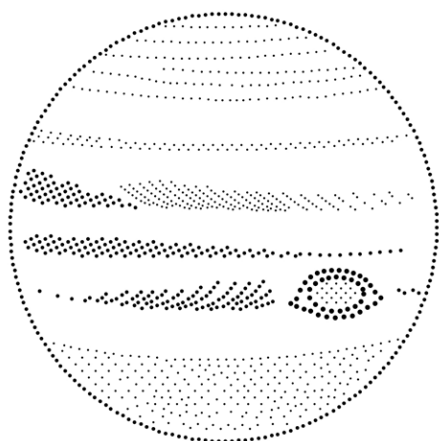


Figure 2. Tactile image of Jupiter on the braille astronomy textbook “The Universe and Us – Introduction of Astronomy, Junior Version”. The tactile map is made by Teiko Komatsuzaki. ©Shin Mineshige, Jun Takahashi, Dokusho Kobo 2011



Figure 3. Group discussion at the Universal Design Astronomy conference.

projects of TF2 in 2013 led by Dr. Amelia Ortiz-Gil in Spain developed an astronomical kit for the visually impaired [5].

We are also practicing various kid-friendly astronomy education activities at nurseries, preschools, kindergartens, and after-school day care clubs for primary school children (Figure 4). These activities include slide shows, communication sessions, crafts, and many other hands-on projects, and we are closely connected to the UNAWA project [6]. We have exchanged video letters between preschools in Hawaii, USA and in Japan. Children in both countries enjoyed the video letters and sang the same song “Twinkle Twinkle Little Star” without a language barrier.

#### 4. SUMMARY

Through OAD we encounter people from around the world with similar goals and approaches. It seems that astronomers and astronomy educators can work beyond borders and barriers, and the same resources and messages inspire people in different countries and regions. Various barriers do exist; however, we all look up at the same sky. Astronomy and astronomy education are unique tools for developing a prosperous life and a better world. In this sense, we would like to call all educators,



Figure 4. Activities at preschools. Interactive presentation by Tomita at Hikari Nursery in Japan (top) and video letter from Kaumana Baptist Church Keikiland in Hawaii, USA made by Usuda-Sato (bottom). The video letter was delivered to Hikari Nursery by Tomita.

practitioners, and researchers in the Asian and Pacific regions to share and exchange ideas, and to collaborate with each other on anything possible to achieve better Asian and Pacific regions and a better world.

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