

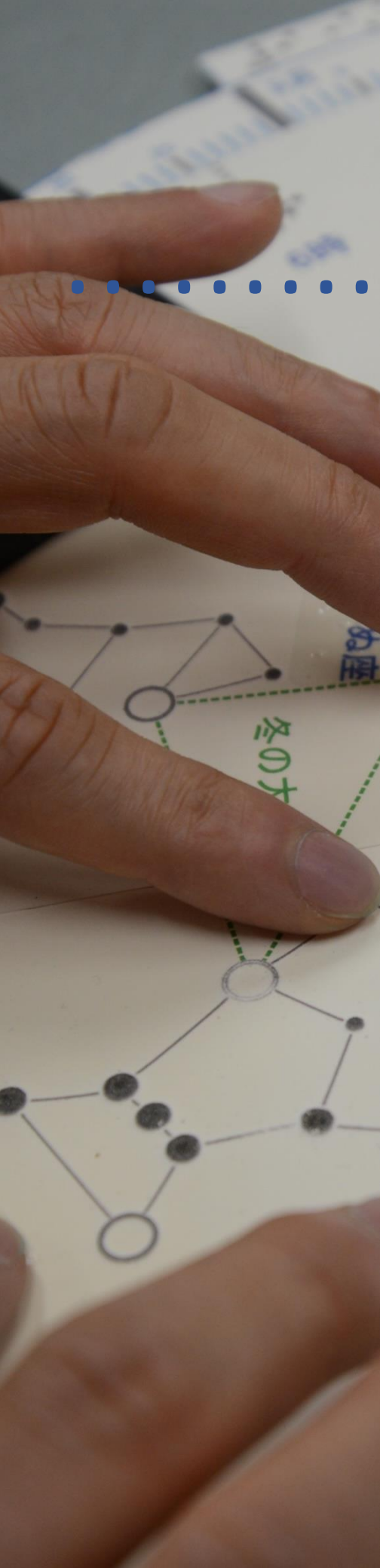
# The 3rd Symposium on Universal Design for Astronomy Education with Workshops for Educational Material Development

**September 24-26, 2016**

**National Astronomical Observatory of Japan (NAOJ)**

**Mitaka, Tokyo, JAPAN**

**Funded by:** National Astronomical Observatory of Japan (NAOJ) &  
Foundation for Promotion of Astronomy (FPA) & IAU Office for  
Astronomy Outreach



# .....Rationale

"Astronomy for Inclusion" is a program developed jointly by the IAU Office for Astronomy Outreach (OAO), National Astronomical Observatory of Japan (NAOJ) and the IAU Working Group of Astronomy for Equity and Inclusion (CC1 WG3). This program intends to **facilitate the implementation of inclusion programs for outreach professionals and educators** with the objective of produce and disseminate astronomy activities to people with disabilities, following an Universal Design approach. With "Astronomy for Inclusion" program, we hope to ensure inclusive and quality education for all and reduce inequality within and among countries (*Sustainable Development Goals 4 & 10, United Nations*). We hope to achieve this by increasing (1) the number of Astronomy programs and activities lead by science educators and (2) the number of resources produced, increasing the international pool of activities.

The program "Astronomy for inclusion" rises from several needs pointed by the community of science outreach professionals and educators gathered throughout the years. Astronomy as a science that captivates the imagination and interest of grownups and children alike has shown to be a good way to promote science literacy effectively. However, when we discuss activities and resources for audiences with special needs, many astronomy outreach professionals and educators struggle for (1) support in providing sustainable, inclusive programs; (2) with the feelings of insecurity, especially those without formal training on inclusion and the (3) lack of a community to turn to exchange ideas.

You can find further information on the Symposium

## Official Website:

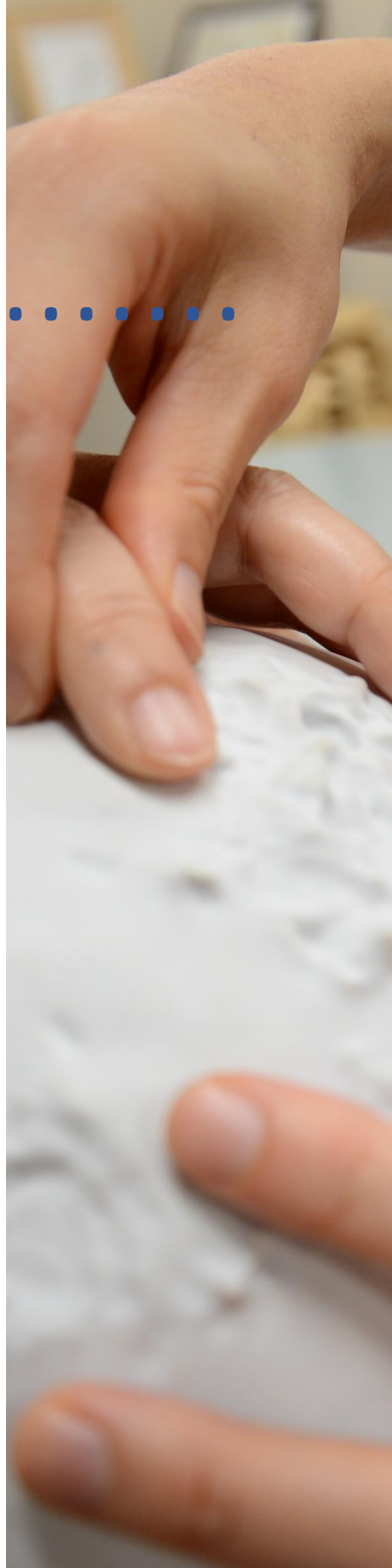
[http://prc.nao.ac.jp/fukyu/ud2016/index\\_E.html](http://prc.nao.ac.jp/fukyu/ud2016/index_E.html)

# Topics.....

During different workshops, science educators will work on activities and resources that will focus on using low-cost local materials, taking into particular account the cultural aspect in which each educational community is immersed. The activities and resources shared and produced are available under Open Access for other educators around the world can use them and replicate the experience in their countries, providing a sustainability and legacy to the international repositories and to the project itself.

We will cover the following topics:

- Universal Design;
- Exploring textures and the effectiveness of using low-cost materials,
- International networks & Astronomy programs for people with disabilities;
- Communication without using verbal words;
- Build up inclusive workshops and activities;
- Digital accessible tools.



# Program.....

(day 1 & 2 | official language Japanese with English translation)

## day 1.....

### September 24

9:15		Start Registration
10:00 (10 min.)		Opening / Shin Mingshige (Kyoto University)
10:10 (25+5 min.)		Astronomy for Inclusion (Invited Talk) / Amelia Ortiz-Gil (Astronomical Observatory of the University of Valencia)
10:40 (15+5 min.)		Inclusivity at NAOJ Mitaka Campus / Kumiko Usuda-Sato (NAOJ)
11:00 (15+5 min.)		Various Methods for People with Disabilities to Operate PCs – How to Increase Simple Operations at Low Cost / Toshimitsu Yamaguchi (Niigata University)
11:20 (15+5 min.)		Data Recognition Using Sounds – Sound-based Data-plotting Program “Splot” – / Shin’ichiro Uno (Nihon Fukushi University)
10:40 (15 min.)	Break	
11:55 (25+5 min.)		ICT Education Support for Students with Disabilities (Invited Talk) / Takeo Kondo (The University of Tokyo)
12:05 (25+5 min.)		Niko Niko Tomato – Do Whatever We Can Do, Create Solutions for What We Cannot Do (Invited Talk) / Emi Takaya (Kyoto University Hospital)
12:55 (65 min.)	Lunch	
14:00 (15 min.)		Short Assembly, Move to a Location of each Workshop
14:15 (60 min.)		Group Workshop I
15:15 (15 min.)		Break, Move to a Location of each Workshop
15:30 (60 min.)		Group Workshop II
16:30 (15 min.)		Break, Move to next Location
16:45 (30 min.)		Discussion at Large Seminar Room (Japanese) and at Seminar Room for Graduate Students (English)
18:00 (120 min.)	Banquet at Large Seminar Room	

## day 2.....

### September 25

9:00		Start Registration
9:30 (10 min.)		Opening / Shin Mingshige (Kyoto University)
9:40 (25+5 min.)		Multimodal Outreach to Enrich the Field of Astronomy (Invited Talk) / Wanda Diaz-Merced (IAU Astronomy for Development)
10:10 (15+5 min.)		Touch and Recognize the Entire World of Light with a Robot Arm (Including the Planetarium and the Real Celestial Sphere) / Sadao Hasegawa
10:30 (15+5 min.)		Astronomy Outreach for the Blind and Vision Impaired using Tactile Galaxy Images / Nicolas Jean Bonne (University of Portsmouth)
10:50 (15+5 min.)		Astronomy Class at a Hospital / Masatoshi Ichihosi (Tenpla)
11:10 (15 min.)	Break	
11:25 (25+5 min.)		The Frontier of the Search for Extra-solar Planets (Invited Talk) / Bun’ei Sato (Tokyo Institute of Technology)
11:55 (25+5 min.)		Creating a New Definition of Disability in the Universe - The blind may have a social disadvantage but can see beyond the sense of vision. (Invited Talk) / Kojiro Hirose (National Museum of Ethnology)
12:25 (60 min.)	Group Photo and Lunch	
13:25 (35 min.)		Self-guided Tour of Visitors’ Area (Optional)
14:00 (15 min.)		Short Assembly, Move to a Location of each Workshop
14:15 (60 min.)		Group Workshop III
15:15 (15 min.)		Break, Move to a Location of each Workshop
15:30 (60 min.)		Group Workshop IV
16:30 (15 min.)		Break, Move to next Location
16:45 (30 min.)		Discussion at Large Seminar Room (Japanese) and at Seminar Room for Graduate Students (English)
17:15 (15 min.)	Closing	



day 3 .....

9:00 (15+5 min.)

Kumiko Usuda-Sato &amp; Shin Mineshige

Lina Canas

9:20 (32+8 min.)

*Wanda Diaz-Merced*

10:00 (32+8 min.)

Amelia Ortiz-Gil

10:40 (20 min.)

## Coffee Break

11:00 (40 min.)

Part I / talks &amp; discussion

Samir Dhurde; Seo-qu Lee; Mei-Yin Chou

11:40 (60 min.)

### Lunch at Canteen in the Cosmos Lodge

12:40 (40 min.)

Part II / talks and discussion

Stephanie Tumamos, Yudhiakto Pramudya &amp; others

13:20 (15+5 min.)

*Yayoi Mashimo*

13:40 (60 min.)

### ***Workshop "Plan an Inclusion Program in Your Country"***

14:40 (20 min.)

## Coffee Break

15:00 (60 min.)

### ***Final Remarks and the Road Ahead***

16:00 (30 min.)

*Shin Mineshige, Kumiko Usuda-Sato, Lina Canas, Amelia Ortiz-Gil, Wanda Diaz-Merced*

# Invited Speakers .....



## .....Takeo Kondo

is an researcher of special education and an associate professor at Research Center for Advance Science and Technology, the University of Tokyo. Using the latest information-and-communication technology (ICT), he enthusiastically supports education for children with special needs. At this symposium he will present actual cases of children with special needs who developed their talents with the latest ICT.



## .....Emi Takaya

is a representative of "Niko Niko Tomato," a volunteer group at the Pediatric Department of Kyoto University Hospital. Seventy four people belong to Niko Niko Tomato and this group delivers a happy and prosperous daily life to each child in the hospital. At this symposium she will present their activities and her passion for the activities.



## .....Bun'ei Sato

is an associate professor at Tokyo Institute of Technology. As an observational researcher of extra-solar planets, he is well known for discoveries of planets around giant stars. At this symposium he will present the appeal of extra-solar planets and his adventures looking for an Earth-like planet with life.



## .....Amelia Ortiz-Gil

is one of the most renowned names in Universal Design and inclusion in astronomy outreach and education. She is the chair of IAU Working Group Astronomy for equity and inclusion and she will provide unique insights to all participants regarding resources - open source and free, in order to build sustainable inclusive programs.



## .. Wanda Diaz-Merced

is from Puerto Rico. She is a PhD in Computer Science and multimodal analysis of Astronomy Data. She has a great interest in developing ways to use the human ability to adapt to the data and her enthusiasm towards heliophysics. She has published numerous scientific publications on the exploration evidenced that the use of sound as an adjunct to visual display increases the sensitivity of traditional astronomers to events that may be masked to the eye.



## .....Kojiro Hirose

is a cultural anthropologist and an associate professor at the National Museum of Ethnology. He studies the history of blind people in Japan. Recently, he is also making efforts to disseminate "the tactile culture." At this symposium he will present his unique cosmic view: the Universe felt by haptic sense, not seen by visual sense.

# .....Workshops

## day 1

- A3 "Space Arc" Workshop (120 minutes)
- Presenter: Hiroaki Isobe (Kyoto University)
- Keyword: Trans-science

● Meet "Space Arc" – a space ship! If you migrate to another planet with the "Space Arc", what kinds of items, plants, and animals would you want to bring with you? And how do you plan a menu using these plants and animals? Through discussions in groups of 3-6, participants will recognize the importance of using science to make decisions and also realize that some choices have strong social and cultural components that will inevitably influence the answers.

- A5 Make a face of an alien (120 minutes)
- Presenters: Asuka Tosaka (Miraikan: National Museum of Emerging Science and Innovation) and Kojiro Hirose (National Museum of Ethnology)
- Keywords: haptic sense, imagination, invisible face, "disability" in outer space

● What kind of meaning and role does a face have? Sighted people see/show (not touch/be touched) faces, however, these faces also play the role of a tactile sensor. In this workshop participants will sculpt the "face of an alien" using clay. By touching his/her own face and by building the "face of an alien", participants will recognize the significance of haptic sense.

- A4 Touch the constellations (60 minutes)
- Presenter: Tetsuya Watanabe (Niigata University)
- Keyword: tactile planisphere (star chart), tactile constellation pictures

● Using "PIAF" the tactile image maker, participants will learn how to develop teaching materials for the constellations. PIAF is a machine which produces tactile graphics; it causes black lines and shapes drawn on capsule (heat-sensitive) paper to rise. Participants will also discuss about how to tailor/improve the activities in their own schools and countries.

- A6 Make Teaching Kits: The Phases of the Moon, the Motion of Mars, and Other Subjects in Handmade Materials (60 minutes)
- Presenter: Hiromi Funakoshi (Heartopia Anpachi)
- Keywords: teaching resources of astronomy, handmade materials to understand astronomy

● How do you teach Moon phases and the motion of the Moon in the classroom? In this workshop, the presenter will teach participants how to produce easy-to-make teaching materials which he has developed. They will also learn how to use these materials and how to explain things in a way that is easy for children at schools and science centers to understand.

# .....Workshops

## day 2

### B5 Tactile Astronomy (60 minutes)

Presenter: Shin Mineshige (Kyoto University)

Keywords: extensiveness of the Universe, the Sun, stars, planets, the Earth, the life, and myself

- The presenter has developed tactile versions of astronomical images such as stars, planets, and galaxies.
- Enjoy touching the images without seeing them, and imagine the Universe through the haptic sense.
- Participants will discuss about how to improve the tactile images and how to make a teaching program with them. They will also discuss about international collaboration.

### B7 Making a tactile planetarium from low cost materials (60 minutes)

Presenter: Lina Canas (IAU OAO/NAOJ)

Keywords: visual impairment, low-cost, textures, DIY

- In this workshop the participants will learn how to build low-cost tactile resources, focusing on the example of a tactile planetarium. We will discover how and where to find low-cost activities and repositories. At the end, we intend to address the first steps to develop a program for inclusion, tailored to a country's needs.

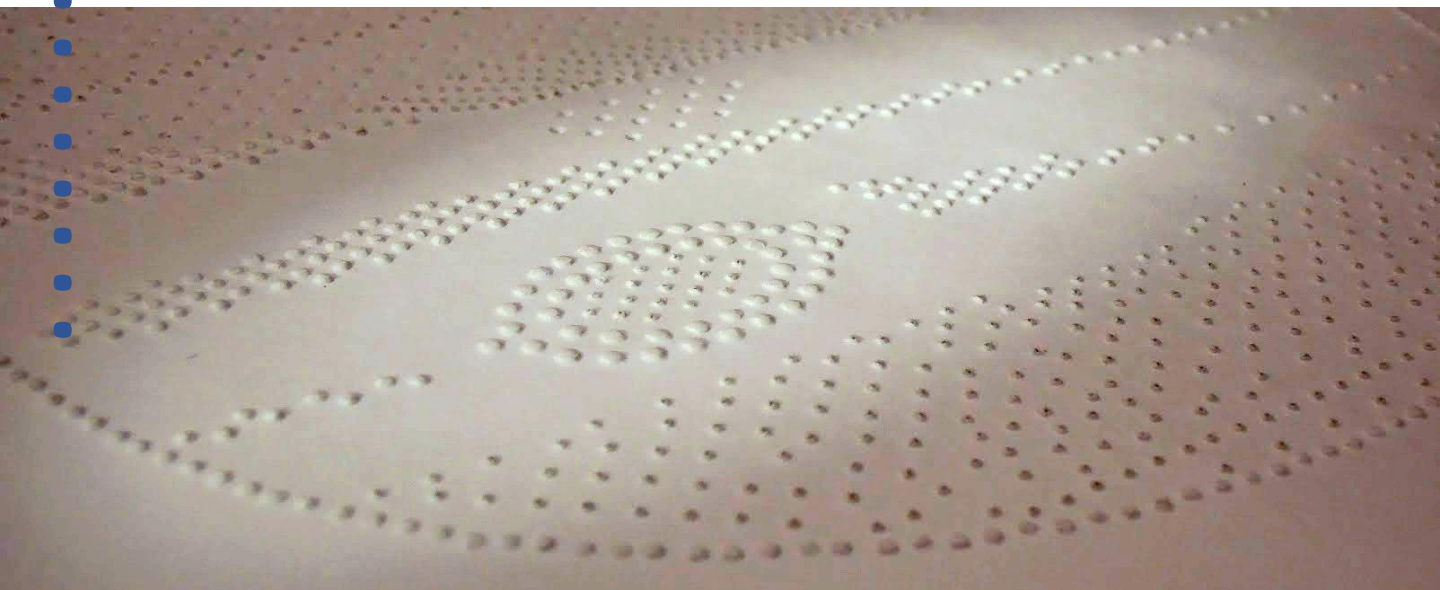
### B8 Exploring the Universe Led by Sign Language People (120 minutes)

Presenters: Haruka Suto, Ayana Hirose (Saitama Sakado School for the Deaf), Masami Kitamura (The Tsukuba Barrier-free Learning Consortium)

Keywords: silence, sign language

- In NAOJ's 4D2U (Four-Dimensional Digital Universe) Dome Theater, participants will express their feelings for the Universe without using verbal words. They will place earplugs in their ears and try to communicate with each other without making or listening to sounds. Based on their experiences in the workshop, they will discuss about how to communicate in silence.

Photo Credit: National Astronomical Observatory of Japan / Tactile resource credit to (c) Robot





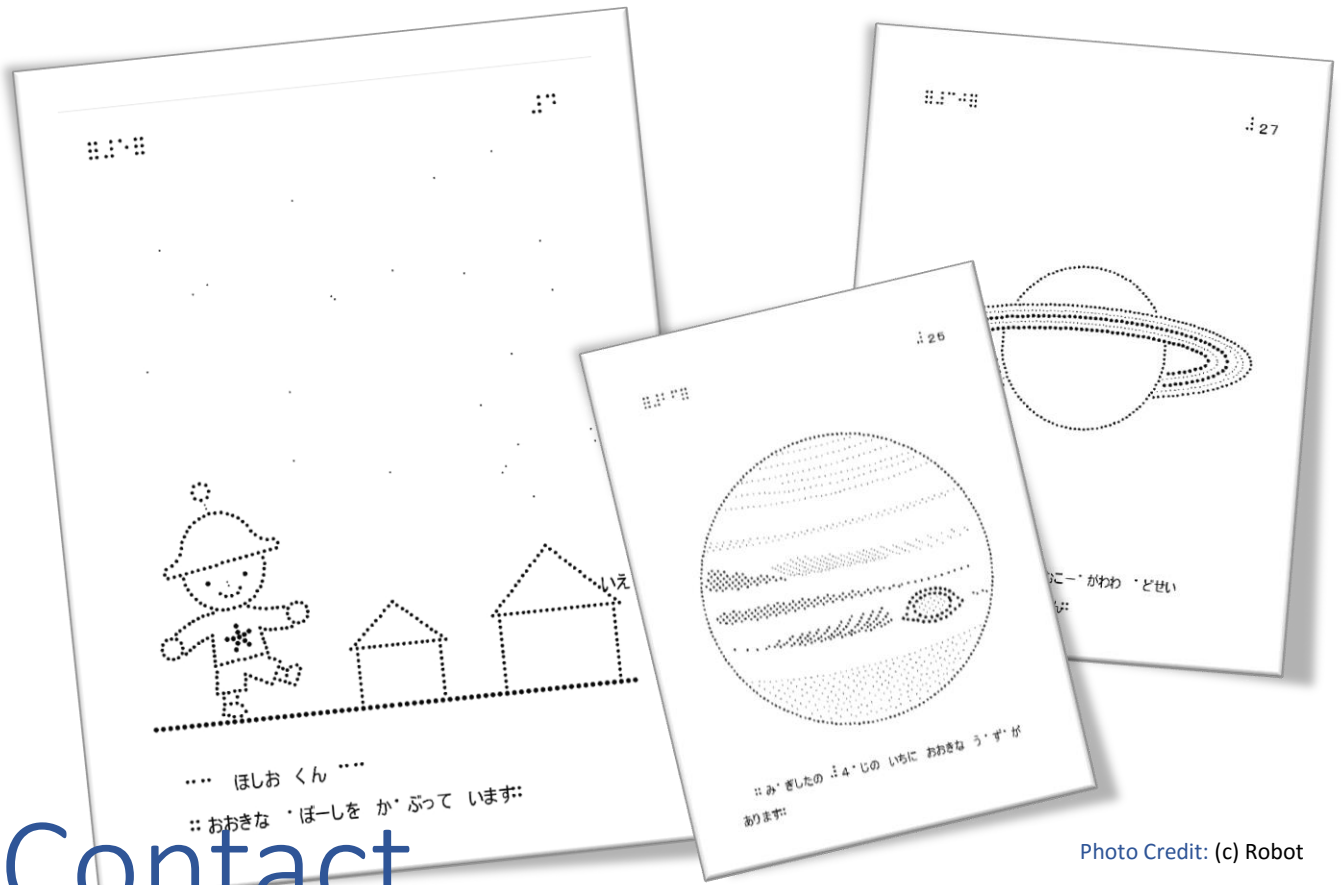


Photo Credit: (c) Robot

# Contact.....

## Lina Canas

Assistant Outreach Coordinator  
Office for Astronomy Outreach, International Astronomical Union  
Tel: +81-(0)422-34-3966 | Skype: linacanas  
lina.canas@iau.org | www.iau.org | <http://www.nao.ac.jp/en/>

## Kumiko Usuda-Sato

Public Relations Center  
National Astronomical Observatory of Japan (NAOJ)  
Tel: +81-422-34-3962 | [kumiko.usuda@nao.ac.jp](mailto:kumiko.usuda@nao.ac.jp)

## Shin Mineshige (Chair Organizing Committee)

Department of Astronomy, Kyoto University  
Tel: +81-75-753-3901 | [shm@kusastro.kyoto-u.ac.jp](mailto:shm@kusastro.kyoto-u.ac.jp)

