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8/23 - 8/27

GHOU 2023

Global Hands-On Universe Program Book

Kagoshima University / Online

*Kagoshima Where Polaris is
Seen in Low Sky*

北辰、斜めにさすところ

Global Hands-On Universe Conference 2023 プログラムブック / Program Book

Kagoshima Where Polaris is Seen in Low Sky

北辰、斜めにさすところ

主催：鹿児島大学 天の川銀河研究センター
会期：2023 年 8 月 23 日（水）～27 日（日）
会場：鹿児島大学 / オンライン

GHOU Conference 2023

プログラムブック

目次

Program 3

Abstracts 6

Information

鹿児島市電 電停から鹿児島大学へ/

Tram Station To Kagoshima University.....42

会場/Venue.....43

鹿児島大学周辺のアクセス/Transportation.....44

社交イベント案内/Social Events.....44

会場付近の食事処/Restaurants.....45

Participants.....46

Sponsorship.....48

プログラム Program

Programme 2023/8/23-8/24

プログラム

	std dul	0:15										
date	JST		UTC	talk ID	type	title	site	given name	sir name	lang	country	
2023/8/23	10:00	10:45	1:00	93	oral	Extraordinary Progress on GHOU Resources! Now it is time to Share Them with the World! And a proven means to effective sharing has been given to us!	f2f	Carl	Pennypacker	E	US	
2023/8/23	10:45	11:00	1:45	tea break								
2023/8/23	11:00	11:15	2:00	108	oral	"Little Scientists" of the young Z-generation boarded the GALAXY CRUISE	f2f	Akihiko	Tomita	E	Japan	
2023/8/23	11:15	11:30	2:15	80	oral	Star Formation Board game Project: Report on the development of a board game to promote astronomy	OL	Hibiki	Miura	J	Japan	
2023/8/23	11:30	11:45	2:30	110	oral	Status report on our outreach activity: "Tenmon Performance Project"	f2f	Rina	Kasai		Japan	
2023/8/23	11:45	12:00		21	oral	Development of Tabletop Planetarium Named "AMATERASU" Useful Tools as Active Learning	f2f	Hideyuki	Nakano		Japan	
2023/8/23	12:00	12:15	3:00	tea break								
2023/8/23	12:15	12:30	3:15	121	oral	The glossary of astronomy released by Astron. Soc. Japan	f2f	Toshihiro	Handa	E	Japan	
2023/8/23				Lunch								
2023/8/23	14:00	15:00	5:00	keynote1								
2023/8/23	15:00	15:15	6:00	tea break								
2023/8/23	15:15	15:30	6:15	117	oral	Sustainable Development of Astronomy in Sri Lanka: from outreach to research	f2f	Thilina	Heenatigala	E	Japan / Sri Lanka	
2023/8/23	15:30	15:45	6:30	117b	oral	Exploratory Assessment of Public Engagement Activities at Japanese Research Institutions	f2f	Thilina	Heenatigala	E	Japan / Sri Lanka	
2023/8/23	15:45	17:00	6:45	tea break								
2023/8/23	17:00	17:15	8:00	68	oral	Cosmos to Classroom - Space Education Practice in Pakistan	OL	Yumna	Majeed	E	Pakistan	
2023/8/23	17:15	17:30	8:15	68b		SPACE MAILS	OL	Yumna	Majeed	E	Pakistan	
2023/8/23	17:30	18:30	8:30	Faulkes	WS		OL	Fraser				
2023/8/24	10:00	10:15	1:00	84	oral	Physics in Transport systems - raise interest on physics for all students	f2f	Toshihiro	Handa	E	Japan	
2023/8/24	10:15	10:30	1:15	92	oral	Astronomy research by students using small instruments	f2f	Naoki	Matsumoto		Japan	
2023/8/24	10:30	10:45	1:30	113	oral	Planetarium 100th Anniversary Project Planetarium Children's Paintings	f2f	Kenji	Oura	J	Japan	
2023/8/24	10:45	11:00	1:45	tea break								
2023/8/24	11:00	11:15	2:00	118	oral	Kagoshima Astronomy Association's Activities to Promote Astronomy.	f2f	Toshihisa	Maeda	E	Japan	
2023/8/24	11:15	11:30	2:15	124	oral	Research and education experience using the SaCRA telescope for teacher training undergraduate students	f2f	Yumiko	Oasa	J	Japan	
2023/8/24	11:30	11:45	2:30	72	oral	Satellite Radio Reception Experiment Using Software-defined Radio as Teaching Material	f2f	Hideki	Uchiyama	E	Japan	
2023/8/24	11:45	12:00	2:45	96	oral	Folklore Constellations and Cultural Exchange	OL	Megumi	YAMAUCHI	J	Japan	
2023/8/24				Lunch								
2023/8/24	13:00	14:00	4:00	keynote2								
2023/8/24	14:00	15:00	5:00	126b		Improving Lives, Communities, and Societies with Astronomy	OL	Mike	Simmons	E	USA	
2023/8/24	15:00	15:15	6:00	tea break								
2023/8/24	15:15	15:30	6:15	103	oral	SN 1054, was a God interfering on European civilization ? History and astronomy.	f2f	ESTELLE	FAYE	E	France	
2023/8/24												

Programme 2023/8/25-8/26

プログラム

2023/8/25	10:00	10:15	1:00	68	oral	Cosmos to Classroom - Space Education Practice in Pakistan	f2f	Yumna	Majeed	E	Pakistan	
2023/8/25	10:15	10:30	1:15	68b		SPACE MAILS	f2f	Yumna	Majeed	E	Pakistan	
2023/8/25	10:30	10:45	1:30	79	oral	Stargazing for Young Minds: Investigating the Efficacy of Astronomy Education Programs for Children	f2f	vasoya	Nimishkumar	E	India	
2023/8/25	10:45	11:00	1:45	tea break								
2023/8/25	11:00	11:15	2:00	16	oral	Introducing "SORA"; starry sky simulation software that transcends date, time, and location!	f2f	Hidehiko	Agata	E	Japan	
2023/8/25	11:15	11:30	2:15	16b		A Drop of Rain Falls on the Gobi Desert - a Trial of Astro-Ecotourism	f2f	Hidehiko	Agata	E	Japan	
2023/8/25	11:30	11:45	2:30	112	oral	Sharing the Wonders of Astronomy as a Post-Graduate Student	f2f	Sena	Matsui	E	Japan	
2023/8/25	11:45	12:00	2:45	119	oral	History and recent progress of the science live show Universe	f2f	Kazuhisa	Kamegai	E	Japan	
2023/8/25				Lunch								
2023/8/25	13:00	14:00	4:00	keynote3								
2023/8/25	14:00	15:00	5:00									
2023/8/25	15:00	16:00	6:00									
2023/8/26	10:00	10:30	1:00	ex	WS	mini Univere	f2f	Toshihiro	Handa	J	Japan	
2023/8/26	10:30	11:00	1:30	ex	WS	NoA	f2f	Ichiro	Chikami	J	Japan	
2023/8/26	11:00	12:00	2:00	120	WS	Tenmon Performance Project	f2f	Rina	Kasai	J	Japan	
2023/8/26				Lunch								
2023/8/26	13:00	14:00	4:00	102	WS	DART mission to Dimorphos, the Didymos' moon	f2f	MICHEL	FAYE	E	France	
2023/8/26	14:00	15:00	5:00	111	WS	Twinkle Twinkle Little Star, How I Wonder What You Are?	OL	Imroz	Khan	E	India	
2023/8/26	15:00	16:00	6:00									
2023/8/26	16:00	17:00	7:00									

アブストラクト

Abstracts

"Little Scientists" of the young Z-generation boarded the GALAXY CRUISE

Akihiko Tomita, Wakayama University, Japan

Kumiko Usuda-Sato, Subaru Telescope, National Astronomical Observatory of Japan, USA

Abstract

Five students of “Little Scientists” from the 5th to the 7th grades, both male and female, in Kaizuka City, Osaka Prefecture, “boarded” GALAXY CRUISE, a citizen astronomy online program using the deep images taken by the Subaru Telescope Hyper Suprime-Cam. Kaizuka City, a calm and compact city in Japan, began the “Little Scientists” program in fiscal year 2022 for young students led by university professors and others in the fields of astronomy and others, intending to train young students to become future professionals in these fields. The astronomy course was held at the telescope museum “Zembei Land” in Kaizuka City. The work of all the Little Scientists on GALAXY CRUISE was excellent. Though they were among the youngest of the GALAXY CRUISERS, they quickly became accustomed to the operation, which was not surprising since they are the digital generation. They classified many galaxies successfully. They were also inspired by the wonders of the universe through galaxy images. We will introduce various episodes of the “Little Scientists.”

Global Systems Science and Legacy HOU Curriculum

A. Gould, University of California Berkeley, USA

Abstract

The original HOU High School curriculum was developed by TERC in the 1990s. It was revised and lives on as one of the Global Systems Science (GSS) high school books, titled "A Changing Cosmos" available for free at

<https://gss.lawrencehallofscience.org/a-changing-cosmos/>

GSS, as 21st century online curriculum materials, has "Stay Current" pages that are updated weekly. As in the original HOU curriculum, there are reading materials as well as investigations for students to pursue.

Effective methods for Astronomy educational programs in a multilingual region

Amoghavarsha. N, Indian Institute of Astrophysics, India
Punith R, Indian Institute of Astrophysics, India
Niruj Mohan Ramanujam, Indian Institute of Astrophysics, India
Seetha. S, Raman Research Institute, India,
Annapurni Subramaniam, Indian Institute of Astrophysics, India

Abstract

The Indian Institute of Astrophysics has constituted an education and public outreach committee called COSMOS EPOC for the upcoming state-of-the-art planetarium in Mysuru. The outreach committee has been conducting various events in Mysuru and the surrounding region to develop scientific temper, promote interest in Astronomy and Science, provide exposure to Data analysis and experiments, and propagate rationality and critical thinking among students and the general public.

Various events and programs have been organised to attract diverse audiences, ranging from young children to adults with varying levels of scientific knowledge. Talks by eminent scientists, Citizen Science for Astronomy (with HoU India), Night sky watches, Radio programs (in association with Radio Manasa), visit to both rural and urban schools, etc. are a few important programs and while visiting rural schools, the outreach team ensures to have programs in the regional language (for example, models, posters, etc.) to have an effective impact on the audience. COSMOS has also started initiatives to create multilingual astronomy-related educational materials to reach out to every cross-section of society. Also, conducting special events like Eclipse Watch, Asteroid Day, Zero Shadow Day, and the Astronomy Quiz has attracted people irrespective of age. The outreach team at COSMOS continuously assesses the impact and effectiveness of educational programs and outreach efforts. Hence, we would like to present the practices that we have adopted in our outreach events.

Planetary Defense by Citizen Scientists: Measuring Impact of the NASA DART Asteroid Deflection Mission Using Open Science and Robotic Telescopes

A. Nath, MonitorMyPlanet.com, Canada

Abstract

Asteroid collision risks are real and unpredictable, and impacts could be catastrophic - making planetary defense an intergenerational challenge. The availability of cheap computing, open communities and open datasets means citizen scientists can assist in finding unknown asteroids, collecting information on near-earth or potentially hazardous asteroids, and supporting planetary defense test missions aimed at deflecting asteroids that may likely impact Earth one day.

On 26 September 2022, the NASA Double Asteroid Redirection Test (DART) Mission successfully impacted asteroid Dimorphos (a satellite of the Didymos binary asteroid system) to test planetary defense. To independently measure the outcomes of the kinetic impact, custom algorithms using Python and its libraries were developed to determine the change in the orbital period of asteroid Dimorphos around Didymos and measure the length of the ejecta tail arising from the impact.

It included algorithms for data reduction, selection of comparison stars, optimum aperture size for differential photometry, and measuring rotation and orbital period before and after the impact.

The time-series observations of the Didymos asteroid system (before and after the impact) were gathered using a network of robotic telescopes in Australia, Canada, Chile, and even from space using the Canadian satellite NEOSat. The entire project has been made open source to encourage youth scientists, especially girl students, to pursue observational and computational astronomy.

The raw time series data has been uploaded to the Asteroid Lightcurve Data Exchange Format (ALCDEF) database. At the same time, the Python algorithms and training modules have been published as open source on GitHub. The time-series observations have also been shared with the NASA DART Mission team.

The algorithm is being expanded to provide citizen scientist support to the upcoming Chinese and Japanese Hayabusa2 SHARP planetary defense missions to 30-metre asteroids. Every citizen scientist is now a planetary defender.

Extraordinary Progress on GHOU Resources! Now it is time to Share Them with the World! And a proven means to effective sharing has been given to us!

- 1) Rosa Doran, Nuclio, Lisbon, Portugal
- 2) Myrta Villanueva, Univ. of Antofagasta, Chile
- 3) Sue Samuels, Broadway Dance Center, New York, United States
- 3) Carolina Escobar, Helios, Venezuela
- 5) Elizabeth Villanueva, Gee-Whiz Astronomy, Chile
- 6) Bonnie Thurber, ISTEM, United States
- 8) Brian Kruse, Astronomical Society of the Pacific, United States
- 9) Dan Peluso, University of Southern Queensland and SETI Institute, United States
- 10) Colleen Megowan, American Modeling Teachers Association, United States

Abstract

Over the last decades, an extraordinary effort by members of GHOU from many nations have created an extraordinary set of data, telescopes, activities, assessments, and perhaps most importantly -- proof that GHOU can make a huge difference in childrens' and teacher's lives. Every study I have been involved with shows important gains in some or all of the following -- teachers' confidence, students' math skills, students' scientific self-efficacy, knowledge of astronomy, increased skill and confidence with information and communications technology. Let me stretch your imagination a bit -- imagine if a being from another planet visited us, and took a hard look at GHOU. I am positive they would be deeply puzzled why such materials are not in every classroom and after-school setting in the world. But aliens aside, I look at GHOU, and see that we have all created a masterpiece. Congratulations! Why have we not spread GHOU ubiquitously -- Is it not, as Cassius said to Brutus in Shakespear's play Julius Caesar -- "The fault lies not in our stars, but in ourselves." (This is a bit heavy -- but some fault must lie on my shoulders, not necessarily any other GHOU'er.) Simply put, I would like to see more of us working together to have more workshops (including Zoom workshops!), set up more after school programs (Zoom too!), and make GHOU ubiquitous around the world. We have shown that we can train teachers effectively using Zoom over the Internet. We have shown that we can run after school programs over the Internet with Zoom. Such programs operate at a fraction of the cost of our old face-to-face methods, and there is little reason we cannot reach more and more people on a regular basis. This is such an exciting time for all of us, and I want many of you to join me in spreading the goodness of GHOU even more now! I know we can all usher in to our Planet a Golden Era of Astronomy Education, and inspire and help people all over the World!

Introducing Astronomy through Erasmus+ Projects

C. A. Oancea, Colegiul Național "Octavian Goga" Sibiu, Romania

D. Borovnica, Os. Sveti Sava Kikinda, Serbia

Abstract

Although Astronomy is not a subject taught in schools, we tried to bring some Astronomy themes for the participating students in our Erasmus+ Project called "Measure me Up!".

Some of the activities were measuring the Earth's circumference using Eratosthenes' method, building Sundials, using the ESERO kit to find out the best material to build a space ship.

Estrella de las Americas collaboration

C. Escobar García, HELIOS GTTP

Abstract

Stars of the Americas is focused on providing astronomical education solutions for teachers and students with the objective of reducing the existing education inequalities by providing access to technological tools and encouraging citizen science through constructing key partnerships promoting women's and girls' participation in and leadership in science learning.

Is a joint collaboration Memorandum of Understanding between National Astronomy Education Efforts in Latin America, the United States, and the Global Hands-on Universe Association (GHOU).

Citizen Science Exoplanet Detections with the Unistellar Network and Improving K-12 Science Education with the Astronomy Modeling Pedagogy

Daniel O'Conner Peluso, SETI Institute & University of Southern Queensland, USA

Franck Marchis, SETI Institute & Unistellar, USA

Carl Pennypacker, UC Berkeley & Lawrence Berkeley National Laboratory, USA

Colleen Megowan-Romanowicz, American Modeling Teachers Association (AMTA), USA

Thomas M. Esposito, SETI Institute, Unistellar, & UC Berkeley, USA

Paul A. Dalba, SETI Institute, UC Santa Cruz, & Heising-Simons 51 Pegasi b Fellow, USA

Ian Weaver, SETI Institute, USA

Lauren Sgro, SETI Institute, USA

Abstract

Citizen science exoplanet observations with the SETI Institute Unistellar telescope network results provide high S/N detections that routinely measure transit depths of $\gtrsim 1\%$ and contribute to the exoplanet research community for confirming exoplanets and updating orbital parameters. Citizen scientists operate small ~ 10 cm digital consumer Unistellar Enhanced Vision Telescopes and consist of over 10,000 users around the world of various backgrounds, which include teachers and students. Astronomy Modeling with Exoplanets (AME) is a workshop for high school teachers. AME was built from the Modeling Instruction pedagogy, a research-based method of teaching physical science that improves out-of-field teacher motivation, self-efficacy, and competence and student engagement and competence. With AME, astronomy activities are meant to simulate those of a professional astronomer and are inquiry-based, data-driven, and student-centered. Teachers and their students conduct astronomical observations, perform photometry on astronomical data sets, and include more astrophysics in their high school level courses than in many college-level introductory astronomy courses. Preliminary results from AME have shown improved teacher motivation, self-efficacy, competence, and student engagement.

Are planets really aligned ?

E. Rollinde, FHO - LDAR/CYU, France

Abstract

The Solar System may be described from different point of views. From Earth, we see a projection of the movements of planets in the background of stars. An alien looking from above the Solar System sees planets moving around the Sun... Those views shift from real life observations to cultural scientific models. I will make a brief historical review of the models of the Solar System, and then a brief review of current conceptions that may be observed in the educational system. I will then propose one way to present those models in a nice way using eyes observations and a Human Orrery. I will then focus on the question of “alignment of planets” that is often expressed in the media as a great opportunity for observation. Using the different points of views, I will discuss in which way planets are or are not aligned, and how this connects with mathematical and kinematics notions that are in most curricula. All along this presentation, I will show how this topic may be handled at very early age as well as in high school, using either simple scale models or more complex mathematical properties.

Engaging Communities through Astronomy: Best Practices for Outreach in Isolated Areas

El Mehdi Essaidi, Asif n Ait Bounouh Association for Culture and Awareness, Morocco

Abstract

This abstract presents the best practices employed by the Asif Astronomy Club in bringing astronomy education and awareness to isolated communities in the Little Atlas Mountains. With a focus on fostering scientific curiosity and cultural appreciation, our initiative has successfully engaged children in these remote areas through hands-on workshops and interactive learning experiences. By partnering with the Belgian initiative, Stars Shine for All/SSVI, we have been able to provide resources and opportunities that these communities would otherwise lack.

Our workshops combine theoretical knowledge with practical observations, allowing children to explore the wonders of the universe firsthand. Through the use of telescopes, educational materials, and engaging activities, we spark their interest in astronomy and inspire them to pursue scientific careers.

In addition to astronomy education, we emphasize cultural awareness by incorporating local folklore and traditions into our workshops. This holistic approach fosters a deeper understanding of the connections between science and culture, strengthening community ties and promoting inclusivity.

The outcomes of our efforts have been remarkable. Children who previously had limited exposure to astronomy now demonstrate a heightened interest and knowledge in the subject. Our interactive teaching methods have facilitated deeper learning experiences and enabled children to grasp complex astronomical concepts with ease.

The success of our initiative lies in our commitment to accessibility and sustainability. By establishing the Asif Astronomy Club and utilizing social media platforms such as Facebook, we have been able to reach a wider audience and maintain engagement beyond the workshops. This continuous connection helps reinforce learning and encourages ongoing curiosity about the universe.

Our presentation will share these best practices, highlighting the impact on the participating communities and providing insights for other organizations and educators interested in promoting astronomy education and outreach in isolated areas. By leveraging the power of astronomy and cultural appreciation, we believe that every child, regardless of their geographical location, should have the opportunity to explore the wonders of the universe and be inspired to reach for the stars.

Activity of Mauritanian Association for Astronomy

Ely .C. Ould Mohamed Navee, Mauritania
M. V. Belbellah Univercity Naouakchott, Mauritania

Abstract

The purpose of the AMA (Mauritania Association for Astronomy): the efforts of the Association will be intended for the propagation and popularization of the sciences of the Universe, to facilitate the ways and means to all those who wish to undertake astronomical observations and research in a spirit of tolerance and objectivity.

The purpose of the Association is to promote scientific activities related to Astronomy in general in Mauritania.

SN 1054, was a God interfering on European civilization ? History and astronomy.

Estelle FAYE, F-HOU, France
Suzanne FAYE-BOURDET, as a scientific adviser, F-HOU, France

Abstract

A supernova appeared in 1054, that Japonese, Chinese, Arabs and may be Amerindians saw, but that not any european people seem to have seen! Why?

Two ways of looking up at the sky, either to understand the world beyond our prejudices, or to subordinate the narrative to particular interests.

A political, historical and astronomical investigation.

STEM+A@Astronomy: Integrate Astronomy into Science Education with Innovative Approaches

E. C. L. Sit, IAU National Astronomy Education Coordinator, HK

Abstract

Science communication in school formal education or informal education will easily face difficulties because some targeted audiences might have some special educational needs that we might have to provide accessible activities or interactive opportunities to share astronomical knowledge and popular science information.

STEM+A@Astronomy is a project which aims to share science knowledge through interdisciplinary approaches, such as integrating science with art and reframing astronomy communication into learner-centered strategies by forced association. The project has been launched in different ways, such as STEAM learning experience, Astro-Music composition, ASTROx transmedia science communication, and hands-on design thinking workshops (service learning on natural science) to provide multi-sensory experience with the reference from psychological studies of Multiple Intelligence and Diversifying Learning.

SciSnap! & AstroSnap! : Letting your students perform astronomy experiments and program their own simulations in a simple online graphical environment

F. V. Hessman, Institute for Astrophysics & Geophysics, Univ. Goettingen, DE

E. Modrow, Institute for Computer Science, Univ. Goettingen, DE

Abstract

The graphical online programming environment Snap! is used all over the world by middle and high school students and undergraduates as a simple and fast means of learning how to program.

Most often, the projects are simple computer games or media shows, but as Snap! matures, the fact that it contains a powerful programming model (functional or object-oriented) and a powerful and easy to use turtle and sprite graphics engine means that it is increasingly being used to solve "real" programming problems by a wide range of students that normally wouldn't learn "real" languages like python.

With the inclusion of our SciSnap! libraries in the standard Snap! edition (similar to the numpy/scipy packages of python in focus), Snap! can be used to program everything from symbolic mathematics and graph theory to SQL databases and to display the results as scientific plots.

AstroSnap! is a new package that pushes the image processing capabilities of SciSnap! to the point that astronomical imaging experiments (e.g. measuring exoplanet transits) can be performed within a finished Snap!-application.

AstroSnap! is easily configured to work in any language (English and German out of the box).

Combining simple astronomical image processing with the ability to program numerical and graphical simulations (e.g. exoplanet transit lightcurves or 2-D N-body simulations) gives students the full range of tools needed to perform modern astronomical science projects in the same manner as professionals.

Star Formation Board game Project: Report on the development of a board game to promote astronomy

Hibiki Miura, Japan, Meisei University

Masao Fukase, Japan, Miyabi Games

Harufumi Tamazawa, Japan, The University of Tokyo/Kyoto City University of Arts

Abstract

(in japanese language)We are working on projects to develop contents that will allow users to become familiar with astronomy by themselves, with the aim of promoting astronomy. One of the most effective ways to disseminate science is to integrate different fields. In our project, we focused on board games because they have mass appeal. While players understand rules and enjoy playing on their own initiative, the level of interest in the subject is also expected to rise. There have been a variety of astronomy-themed products. However, some of them only emphasize educational aspects without very high convenience (entertainment), while others focus on entertainment without accurate astronomical expertise. In our case, we have made it entertainment-oriented, and, at the same time, allowing a bidirectional approach through the intervention of researchers. We chose star formation processes as the game theme, which have many patterns and are easily reflected in game development. The structure of the game is such that those who understand the rules of the game can easily understand the knowledge of star formation, and those who have knowledge of star formation can easily understand the rules.

In this presentation, we report on the progress of the development of the board game on the subject of star formation.

Introducing "SORA"; starry sky simulation software that transcends date, time, and location!

H. Agata, NAOJ, Japan

S. Nakajima, NAOJ, Japan

T. Toyoda, AstroArts, Japan

N. Takabatake, Natural Science Advertisement and Outreach Agency, Japan

T. Nagai, Natural Science Advertisement and Outreach Agency, Japan

Abstract

SORA is a free web application that allows anyone to easily observe celestial objects.

Unlike conventional applications, SORA does not require any OS or device type. It can be used from any digital device, including Internet-capable smartphones, tablets, and laptops.

SORA is one of the best tools for beginners to find planets and constellations, as well as software to support discovery learning and problem-based research using an astronomical telescope, because it can display the starry sky visible in the direction of the screen by working with the position sensor built into the tablet or smartphone. SORA is currently available only in Japanese version, but why don't you use SORA in your GHOU activities?

<https://nao.jpn.com/sora/>

Satellite Radio Reception Experiment Using Software-defined Radio as Teaching Material

H. Uchiyama, Shizuoka University, Japan

T. Matsudaira, Shizuoka University, Japan

A. Sugiyama, Shizuoka University, Japan

K. Imai, National Institute of Technology, Kochi College, Japan

Abstract

We propose to use satellite radio reception experiments as teaching materials, especially for high school physics. In this experiment, radio waves from a satellite in low Earth orbit are received by a directional antenna at hand. Through this experiment, students can quantitatively learn physical phenomena such as Keplerian motion and the Doppler effect, which are studied in high school. At the same time, students can realize that various technologies, including artificial satellites, are linked to the science they learn in school. This experiment can be carried out relatively easily by using software-defined radio and the cardboard antenna developed for the KOSEN-1 CubeSat. We will introduce this teaching material and an example of its use in a high school class.

Development of Tabletop Planetarium Named "AMATERASU" Useful Tools as Active Learning

K. Kurumi, Setagaya Yahata Junior High School, JPN

Abstract

We tried to downsize so that multiple planetariums can be used simultaneously in the classroom. By using this in group activities, we aimed to develop small stellar balls and half dome which students can manipulate themselves and experience planetarium commentators. In order to examine the effectiveness of this teaching material "AMATERASU", we conducted class practice for college students that create a planetarium program and have the commentator experience with this teaching material. From a questionnaire and written responses, it became clear that acquiring new astronomical knowledge by program creation, participating in group activities actively participate in activities, knowing the interest of astronomy, motivation to learn.

"The Universe experiencing itself"

J. Robberstad; Westen Norway University of Applied Sciences, Norway

Abstract

We are the Universe experiencing itself – The GSO approach to astronomy through creativity

Who am I? Why am I here? Eternal questions people have pondered through the ages when gazing at the starry night sky.

The core of STEAM education is a collaboration between science and arts. The fields have several common denominators: curiosity and creativity, experimentation. They not only complement each other but need each other. We are one of few species with a proven consciousness, who are creative and can cooperate with strangers. If we combine these we get a Conscious Creative Collaboration, we recognize an amazing super-power.

The core of education is helping people in their life-long stride for meaning-making. Our innate yearning for a deeper understanding of ourselves and our surroundings may be nurtured through a creative, in-depth, transdisciplinary meaning-making of education.

The Global Science Opera aims to empower young students in their learning-process. We are all the sum of our thoughts, knowledge, emotions and experiences, gathered through all our senses and stored in our memories. By immersing with the material, embodying the knowledge, engaging in the skills, empowering ourselves in the co-creative process and by recognizing our students as whole human beings, we embrace the learning-process whole-heartedly. As remnants of stardust is integrated as building blocks in our bodies, education should recognize that we are the universe experiencing itself.

"Citizen Science in Space Education Exploring the Universe with LCO Deep Sky Images Honoring Van Gogh

Jeane de Fátima Moreira Branco
Josina Nascimento

Abstract

"Citizen Science in Space Education Exploring the Universe with LCO Deep Sky Images Honoring Van Gogh" Ending Brain Week on March 30th and 31st, 2023, we will honor Van Gogh, his beautiful work of art "The Starry Night" We will present the Galaxies, Nebulae and star clusters captured by the Telescope, provided by the Las Cumbres Observatory through the Deep Sky Images Project "100 Hours for 100 Schools", a 0.4 meter telescope system. Images will be exclusive to this event. We will make available the Helmet of the Brain and its curiosities Van Gogh and Deep Sky Pictures tour research. Vote for the most beautiful picture of Deep Sky and Van Gogh. Participation on XII International Brain Week

Night sky observations with the public: contributions from research and practice to the training of guides

Joana B. V. Marques, Instituto de Astrofísica e Ciências do Espaço, Universidade de Coimbra,
Coimbra, Portugal

João Retrê, Instituto de Astrofísica e Ciências do Espaço, Faculdade de Ciências da
Universidade de Lisboa, Portugal

Abstract

Observations of the sky are gateway activities in astronomy. They are organised by observatories, science centres, amateur astronomer's associations, research centres, schools, etc, reaching thousands of people all over the world. The impact of these activities can be very significant since many times it is the first contact people have with astronomy and its community. Institutions train new guides to do these observations with the public in a more or less organised way or rely on experienced ones. In this talk, and as a result of a dialogue between practice and research, we reflect on the skills of guides conducting observations with the public and systematise the most significant knowledge and tools that should be explored during training. For this we bring together the results from research on public observations of the sky in Portugal and the best practices resulting from the experience of conducting these observations and training guides. Through this dialogue, we analyse the guided practices of observing the sky, highlighting that there are different dimensions involved in these activities – emotional, scientific, technical, etc. Taking into account all these dimensions can be beneficial when training new guides, but also when planning and evaluating observational activities. With this research we contribute to the reflection about astronomical observations with the public, a subject not given the deserved attention so far.

History and recent progress of the science live show Universe

K. Kamegai, NICT / NAOJ, Japan

Abstract

The science live show Universe is a regular program at the Science Museum in Tokyo that has been performed for more than 27 years since its launch in 1996. Its unique feature is that real scientists in astronomy, chemistry, and other fields act as "navigators" to the visitors, directly presenting the latest scientific attractions by using immersive scientific simulations and visuals. In addition to the navigators, a few undergraduate or graduate students, called "Chimons," work as assistants during each live show. Sometimes a researcher is invited as a guest to give a short talk about his or her research. The navigator for each show selects a few pieces of original content from the many available and adds the latest news to produce the content of the show. The assistants operate the simulation software and perform all other tasks involved in operating the live show. More than 100 students have worked as assistants, some of whom have become researchers, teachers, or science communicators after graduation.

Much of the simulation software and content used in the live shows has been originally developed by "Chimons" students and researchers as navigators. One of the unique contents is live astronomical observations using time difference and the Internet in collaboration with HOU-related US astronomical observatories.

During the COVID-19 pandemic, the Science Museum was closed, and the online live show was performed. The real live shows were able to restart in October 2021. However, some aspects were not performed as they were before the pandemic. We will present a historical overview as well as recent developments in this presentation.

An Astronomical Play - Journey of IHOU

K. A. Kothari, India Hands-on Universe, Manthan Educational Programme Society, India

Abstract

The presentation will be a sharing of different approaches of astronomy communication, outreach and activities carried out by IHOU and associated organizations in the year 2022 and 2023. This would involve sharing about the following key approaches focusing on astronomy: Asteroid search campaigns, village awareness campaigns, night sky observation, solar observation, workshops, school activities, birthday parties and astronomy clubs.

Planetarium 100th Anniversary Project Planetarium Children's Paintings

Kenji Oura, Renacity Kanoya, Japan
Takeshi Inoue, AKASHI MUNICIPAL PLANETARIUM, Japan
JAPAN PLANETARIUM ASSOCIATION

Abstract

This year marks the 100th anniversary of the opening to the public of the modern optical planetarium produced by Carl Zeiss at the Deutsches Museum. In commemoration of the planetarium's 100th anniversary, the Japan Planetarium Association has been calling for and working to promote planetariums and astronomy.

The "National Planetarium Children's Painting Contest," which was held ahead of this year's event, invited children to submit their own paintings of planetariums and other astronomical objects, and 900 entries were received.

We would like to show you some of the entries on the day.

(A 5-minute video introducing the children's paintings will be shown.)

Presented in Japanese

The presentation will be 5 minutes long + 5 minutes of video

Equitable access to Education in Africa in a digital era.

Mbuso Ngcongco, University of South Africa

Abstract

Abstract:

In Africa, the pursuit of equitable access to education faces significant challenges, including limited financial resources and persistent social ills. This abstract examines the critical importance of inclusive innovation in addressing these specific barriers to ensure equitable access to education in the context of the digital era.

Financial constraints pose a significant hurdle to achieving equitable education in Africa. Limited public funding for education often results in insufficient resources to provide quality education for all. The digital era presents an opportunity to mitigate this challenge by leveraging technology to deliver cost-effective and scalable educational solutions.

Additionally, social ills such as the digital divide, gender inequality, poverty, crime, corruption and conflict (DIP3C) further exacerbate educational disparities in Africa. Girls and women, in particular, face significant barriers to education due to cultural norms and lack of access to resources. The digital era presents an opportunity to address these social ills by providing alternative learning pathways that accommodate diverse needs and circumstances. Flexible online learning programs, community-based initiatives, and targeted interventions can empower marginalized groups and ensure their participation in educational opportunities. Moreover, fostering inclusive and supportive learning environments that address social issues such as discrimination, violence, and inequality is essential for promoting equitable access to education.

However, beyond this normal narrative, new and innovative approaches need to be developed for Africans, in a user centric approach that involves Africans. One such approach deals with question of teaching digital skills without digital devices. Digital devices perpetuate crime by attracting criminal elements to device owners. This poses a threat to solutions such as digitising schools and providing children with digital devices.

This paper examines several innovative techniques towards "low cost, high quality unstealable computing devices" (LHUCD). It examines innovative methods that appear to be effective and plausible. Some of these methods have already been tried and tested post Covid in the African context. Some of these solutions include the use of recycled waste materials, reusable energy and permanent physical structures as educational aids.

In conclusion, equitable access to education in Africa's digital era necessitates targeted interventions to overcome limited financial resources and address persistent social ills. By leveraging on innovation, technology, fostering inclusive environments, and implementing innovative financing models, Africa can strive towards a more equitable education system that empowers all learners, regardless of their financial means or social circumstances. This comprehensive approach holds the potential to transform lives, foster economic development, and create a more just and prosperous future for the continent.

Folklore Constellations and Cultural Exchange

Megumi YAMAUCHI, individual, JAPAN

Abstract

(in Japanese language)

People in different countries and regions enjoy the night sky. Local constellations have uniqueness of local culture and people.

Since 2011, I have been working privately to share the fascination of the Ainu constellations. In addition to Japan, I have conducted workshops in Taiwan, Hong Kong, and other foreign countries.

Enjoying the cultural differences with the people I met there. To notice new ideas from old legends. It is really fun to enjoy the starry sky beyond national borders. In my oral presentation, I would like to share my experiences of my activities and how they can be used for astronomical outreach in the future.

DART mission to Dimorphos, the Didymos'moon

Michel Faye, Louis-Le-Grand High School, Paris, FRANCE

Suzanne Faye-Bourdet, F-HOU, FRANCE

Abstract

DART mission to Dimorphos , the Didymos'moon/ Michel Faye (About 30 minutes)

An asteroid, Didymos (=Twin) and its moon Dimorphos = having two forms). A NASA mission, DART (= arrow), a “Double Asteroid Redirection Test”: NASA's DART spacecraft crashed into asteroid's moon Dimorphos, and successfully changed Dimorphos orbit. That is considered as an historic test of planetary defence.

We shall calculate the deviation of Dimorphos's orbit, by using a transit method and a calculation with Kepler's laws. For that, we shall use the NASA curves giving the twins (Didymos-Dimorphos) relative brightness over time, before and after DART impact.

Astronomy for Equity: Opportunities for the Unserved Through Astronomy

Mike Simmons, Astronomy for Equity

Abstract

Astronomy for Equity (A4E) creates programs providing opportunities for communities beyond the reach of organizations that support underserved communities. These “unserved” communities that are isolated by geography, poverty, disability, and prejudice will never have opportunities that many others take for granted. Astronomy for Equity creates new programs using existing resources and the legions of volunteers in astronomy worldwide to provide these opportunities. As examples, A4E has begun an educational remote observing in partnership with Las Cumbres Observatory that provides research project experience for students in Libya and Afghanistan. Along with its own program, A4E will recruit students for programs wishing to extend their reach. A community is being created for astronomy for the blind and visually impaired, an area with many experts, resources developed by groups from small clubs to NASA facilities, and enthusiasts but little to no transfer of knowledge, methods, or resources to other volunteers. Telescopes are being provided where they are otherwise unobtainable, including to astronomy students in Ukraine and middle school astronomy clubs in Libya. Many more programs are planned, all focusing on making existing activities and resources accessible to those who would otherwise never have these opportunities. Programs are all collaborations based not on geographic location but on interest and need, and building on experience with previous programs and organizations.

Cosmic Kid's Club - A web portal to engage students in informal astronomy education

M. Mitra, STEM and Space, India
H. Verma, STEM and Space, India

Abstract

STEM and Space have created an educational space web portal for students - 'Cosmic Kid's Club', with the objective to promote informal education, skills and an interest in space at the school level. The portal engages students in a very entertaining way, which will enable them to absorb concepts easily without feeling that they are in a formal classroom.

The portal is designed to make learning entertaining, and self motivated. It is a club which students can join and navigate to any of the offerings. The major offerings are 'Reading, Videos, Challenges and Self paced workshops'. The reading section offers a range of space concepts presented through very engaging storybooks and comics, created in house with experts. Short and entertaining videos address popular concepts and questions related to space, again made in collaboration with experts. Activity and workshops can be accessed as self paced instructional videos, through which students can follow along at their own pace. Regular challenges, a leaderboard and webinars keep students engaged and motivated to come back and explore.

The platform is membership based and works on a credit based system and credits can be earned. Students get credits at the completion of certain tasks, such as reading a book or viewing a video and then completing a quiz. Members will also be offered webinars, interactions with scientists and masterclasses.

We believe this form of self paced and entertainment based portal may successfully engage students in space and astronomy and encourage informal learning. In this talk, we will address how this aims to promote Astronomy learning and we will demonstrate the portal.

Astronomy & Public Outreach Activities as a Tool for Revealing Students' Knowledge and Alternative Conceptions of Human Resource Development in Indonesia

M. Toyib, Universitas Airlangga, Indonesia

Abstract

Astronomy is a powerful tool in human scientific capacity building, attracting and inspiring young people to scientific careers, and bringing knowledge and wisdom to the community. Those mentioned crucial reasons have urged almost every community including Indonesia to realize how important it is to develop astronomical research, education, and outreach activities in the country.

Therefore, astronomy plays a special role in public science communication. It serves, most conspicuously, as a general science 'catcher', not at least for young people. It offers a conceptual framework for understanding the world, and at the same time, due to the multidisciplinary nature of astronomy, enables both the description of specific scientific concepts and illustrates a practical application of the scientific method. This wide-spanning field of inquiry offers a host of possibilities for public interrogation. Through public outreach activities organized by the Indonesian astronomy community, it opens opportunities for developing fascinating, whole students' knowledge and activities.

At this conference, I will present how public outreach activities related to astronomy attracts a wide spectrum of students and may serve as a powerful vehicle for improving public awareness and understanding of science which will lead to alternative conceptions of human resource development in Indonesia.

Best Practices for Dark Sky Outreach Through Art and Science: Urban Advocacy Against Light Polluti

M.R.Khan, Cosmic Tribe, Pakistan

Abstract

Light pollution has emerged as a significant environmental concern, affecting urban landscapes globally. To combat this issue, effective public engagement and outreach are crucial in raising awareness and advocating for responsible lighting practices. This study explores the evolution of dark sky outreach through the synergistic combination of art and science. The art performance titled "Sentient of Lights" serves as a powerful tool to highlight the impacts of light pollution on various species, fostering contemporary phygital identities and giving voice to affected creatures. By integrating technology into costume design, inspired by these species, the study challenges traditional approaches to textile and costume production. Through interdisciplinary public engagement initiatives, this urban advocacy initiative empowers the public with accurate scientific information and encourages active participation in preserving natural darkness. The study highlights best practices for dark sky outreach, emphasizing the importance of public awareness and engagement in the fight against light pollution and the preservation of biodiversity in urban environments.

Astronomy High! A Dance to Share the Beauty of Dance and the UniverseSue

Ballet Fatima Astronomy, Antofagasta, Chile
Sue Samuels, Broadway Dance Center, New York, United States
Juan Bruce, Colegio Medico, Chile
Jonathan Harris, Permier Academy, England
Petros Stergiopoulos , Athens, Greece
Juanito Alliu, Teatro Municipal, Antofagasta, Chile
Eric Portilla, Teatro Municipal, Antofagasta, Chile
Alexis Mamani, DDE, Univ. of Antofagasta, Chile
Eric Barra, Desportes Unvesity of Antofagast, Chile

Abstract

Over the last decade, our team in Antofagasta and the University of Antofagasta (Deportes UA and DDE) has presented a beautiful "Dance of the Universe" Dance/Musical in the Teatro Municipal in Antofagasta, Chile. We assembled wonderful dancers, choreography, costumes, music (often original), great theatre lighting and technology, support from Teatro staff Eric Portilla and Juan Alliu, and developed a core conviction that such beauty fusing dance and the Universe has a place in the culture of the world. Now these ideas have evolved, with the help of new collaborators Sue Samuels and long-time collaborators Jonathan Harris and Petros Stergiopoulos. We are close now to finishing all of the dance and music for "Astronomy High," and are deep into rehearsals, preparing for a premier this fall. The theme of Astronomy High is that Dancers from the mythical "Astronomy High" in Chile get excited about Astronomy, and want to share the beauty of the Universe, fused with dance. The dancers then travel our planet to get other people excited about the Universe.. They hope people can realize their common origin in the Stars, and with good fortune, might try to treat each other a bit better. We now have assembled choreography, dancers, music , and plot for about 15 scenes, and a total performance length of about 50 minutes. After our premier this fall, we hope to share this production on Youtube, and make our choreography and music available to all in GHOU!

Astronomy research by students using small instruments

N. Matsumoto, Keio Senior Highschool, JAPAN

Abstract

The author teaches an elective course for 12th grade in which students conduct research activities by making astronomical observations. Observations are also made using school facilities, but continuous observations are difficult, and COVID-19 has made it difficult to use school facilities at night. Therefore, we have tried to conduct research using small instruments that can be lent to students, digital videos that students have at home, and smartphones. In this presentation, we will report on the students' research.

Stargazing for Young Minds: Investigating the Efficacy of Astronomy Education Programs for Children

N. H. Vasoya, Center of Toy Science, Children's University, Gandhinagar, India

Abstract

Astronomy education for youngsters has been shown to increase scientific curiosity and comprehension of the cosmos. This research examines youth-focused astronomy education programmes. The study examines how these programmes improve children's scientific attitudes, astronomical knowledge, and involvement. Using pre- and post-program evaluations and participant observations and interviews, the study uses a mixed-methods approach. The research includes a varied sample of 8–12-year-olds from schools and informal learning settings with astronomy programmes. Astronomy education improves children's learning, according to study. Participants improved their astronomy knowledge and passion. Qualitative data showed that the programmes' hands-on and participatory character engaged and entertained youngsters. The report also highlights characteristics that affect youth astronomy education programmes. These include using age-appropriate materials, storytelling, and interactive activities to inspire wonder and interest about the universe. This study has consequences beyond astronomy education for kids. Understanding the success of these programmes may help educators, curriculum developers, and policymakers create more engaging and meaningful scientific education projects. We can inspire a generation of scientifically literate and curious young people to work in STEM disciplines and advance research by encouraging their interest in astronomy and science. This article shows how astronomy education may engage young brains. The research emphasizes the need of incorporating astronomy into school curriculum and advocates the use of interactive and engaging instructional methods to inspire future astronomers, scientists, and critical thinkers.

Institutional outreach - a multi-pronged approach by IIA

Chrispin Karthick, Indian Institute of Astrophysics, India
Vikranth Pulamathi, Indian Institute of Astrophysics, India
Vishaak K. B., Indian Institute of Astrophysics, India
Srishti Sharma, Indian Institute of Astrophysics, India
Amith Gowtham, Indian Institute of Astrophysics, India

Abstract

Indian Institute of Astrophysics recently set up a Section for Science Communication, Public Outreach and Education, which has full time staff and interns. This makes it possible to formulate a structured outreach program catering to different audiences and needs.

In this talk, I will talk about outreach programs at our remote observatories, collaborations to introduce astronomy among marginalised communities (based on gender, economic status, etc), public exhibitions that reach 10000s of people, programs for high school students to introduce them to research, working with colleges, multi-lingual outreach, etc.

Since we are a research institute with multiple observatories and astronomers, we have been able to use both research and instrumentation work to popularise astronomy among students. We have also integrated our observatories into our programs in various ways.

We have created the "Hanle Dark Sky Reserve" around our observatory in the Himalayas, which combines astro-tourism among the nomadic community in the region with preserving dark skies for research. This is unique in having strong support from the local government. We are also building the world's first LED Dome planetarium, and a strong outreach program is associated with this.

In summary, I will discuss the advantages of having a full time outreach staff at a research institute and present some of the novel activities we have been engaged in.

The LCO Robotic Telescopes as an Educational and Research Tool

Priya Hasan, Maulana Azad National Urdu University, Hyderabad, India

Abstract

Robotic telescopes like the Las Cumbres Observatory provide students as well as professional astronomers with a hands-on experience on the use of telescopes as well as immediate access in the case of transient events like supernovae, kilonovae, exoplanet transits, etc. In this talk, I will first cover the use of LCO as an educational tool in the study of stars, HR Diagrams and star clusters. Also how students can participate in various ongoing programs like Exoplanet Watch, Supernova Hunters, etc. I shall also cover the important role these telescopes have played in the most recent observations of the supernova SN 2023ixf in M101 and the importance of such networks of global robotic telescopes in astronomy.

The culture and tradition of astronomy in South Indian state of Karnataka

1. Punith R, Indian Institute of Astrophysics, India
2. Dr. B S Shylaja, Jawaharlal Nehru Planetarium, India

Abstract

One of the main aspects of the COSMOS project recently established in Mysuru by Indian Institute of Astrophysics (IIA) is to identify manuscripts and artefacts related to the history of astronomy. To begin with we have initiated work to collect, digitize and catalogue them. There are many astronomy related materials in Kannada (the regional language) in and around the Old Mysore province. In the quest of above documents we found the manuscripts at various archival collections at the institutes such as Oriental Research Institute of Mysuru, Kuvempu Kannada Adhyayana Samsthe, University of Mysore, Mysuru, Maharaja Sanskrit College, Mysuru, and some private collections. The astronomy manuscripts in ORI are already classified and published in the Volume-9 entitled Jyothisham and we have already identified around 40 manuscripts. Some of them are Vasista Siddantha Goladhyaya (describes about the motion of sun, moon and planets), Ganitasarasangraha, (A treatise on mathematics, of 9th century), Grahana-nirnaya (on eclipses), Nakshatranighantu (on stars), Surya Grahana (solar eclipse), Chandra-grahana (lunar eclipse). We are in the process of digitizing and deciphering the text into Unicode format and intend to render it as accessible on the public domain. This will bring to light the development of astronomy and will be of great help for students of history of astronomy. We plan to present a couple of examples

Status report on our outreach activity: “Tenmon Performance Project”

R. Kasai, Kagoshima University, Japan

Abstract

"Tenmon Performance Project (TPP)" is an outreach activity by Kagoshima University students to explain astronomy to the public through "hands-on" experiences in an enjoyable way. Here, Tenmon means Astronomy in Japanese.

At TPP, we choose topics we are interested in. They require understanding basic physics and astronomy, which are studied in high school and university, in the Japanese official education curricula. However, our audience may cover wide range of age groups, from pupils to adults. To solve this gap, we have to develop methods based on the HOU philosophy such as open-end activities and real-time PC simulations. Some techniques we used are presented at the previous GHOU conferences. We should leave from the traditional lecture style; we made it in the participatory style.

We have made TPP since 2017. Two topics we chosen in these years are "Kepler's Second Law" and "morphological classification of galaxies".

In March 2023, our TPP was held at the Kagoshima municipal science hall. We made two activities on "environment to keep the human life" and "Feel the size of the universe".

In this presentation, I will talk about the history of TPP, and the details of the last TPP.

Tenmon Performance Project

R. Kasai, Kagoshima University, Japan
T. Yamaguchi, Kagoshima University, Japan

Abstract

Actual Tenmon Performance Project (TPP) is shown at the venue. TPP is instructed in Kasai's another presentation in GHOU2023. Presentation will be made in Japanese language.

Sharing the Wonders of Astronomy as a Post-Graduate Student

Sena A. Matsui, Nagoya University, Japan

Abstract

I am a Post-Graduate student specializing in Astrophysics at Nagoya University in Japan, researching the formation and evolution of the Milky Way and dwarf galaxies within the Local Group. Alongside my research, I am deeply interested in education and aspire to become a researcher working in a Japanese planetarium(planetarium director). Through interactive workshops, public lectures, and talk shows at planetaria, I have worked to make complex astronomical concepts accessible and exciting to diverse audiences. Although many undergraduate and post-graduate students are interested in science communications, few are actually engaged in them. The 51st Summer School for Young Astronomers and Astrophysicists, Japan, General Session "Outreach in the 2020's!" questionnaire, 83 % of the respondents answered that they were "very much" or "yes" interested in science communication activities, while only 25 % answered that they were "active" or "had been active in the past. However, I believe that graduate students can influence career choices and life in the future by sharing their experiences in astrophysics with high school students and younger. In this presentation, I will share my experiences in science communication. In addition, I will discuss what science communication is that graduate students can do.

Iranian Ancient Heritage as a Bridge between Astronomy, Art and Education

Shahrzad Mirsoltani, Kargahe Setare project, Iran

Abstract

Humans have been looking at the night sky since ancient times. traces of celestial objects can be seen in historical works left by ancient people. For example we can recognize the visualization of the moon, sun, constellations and planets in these historical works. These representations of celestial bodies can be found in different parts, of the world, different civilizations and in different historical time periods. The important point is that these representations are closely related to the art, history and culture of that area.

Iran is one of the most ancient civilizations in the world. Many of Iran's ancient heritages have been exhibited in the world's largest museums from the past to the present day. Many of these heritages are still located inside Iran and due to the lack of online access to images and information related to them, sometimes they remain little known in the world.

About three years ago, I started a research in the field of finding the representation of astronomical objects in the heritage of Iran. Along with the heritage of Iran which are located in the world's great museums, and in which motifs and representations of astronomical objects have been recognized, I tried by doing field research in museums inside Iran and visiting ancient places of Iran, I tried to find representation of celestial objects in heritages inside the country.

I tried to cover objects related to different historical time periods and also I tried to find representations and astronomical motifs in in different type of historical works and objects. Although this work was very difficult due to the lack of resources in this field, but with the help of professors of the research institute of history of science, university of Tehran and also because of the collaboration I had with a project in this field at the max-planck institute for the history of science, I was able to advance the steps of this research to this day.

Many different outputs can be expected from this research but my ten years experience of being an astronomy educator specially for children, led me to make a connection between the output of this research and astronomy education. We have always used various images, simulations, and models of astronomical objects for teaching astronomy to our children. our children's books illustrators generally use default formats and common illustrations in all countries to illustrate children's astronomy books.

I thought to myself, instead of doing this, we can teach astronomy to children or we can write astronomy books for children, instead of using the usual and repetitive images, we can be inspired by the representation of astronomical objects in our heritage then we can create educational material and new generation educational illustration for our students.

In this way we can bring indigenous astronomy to the classroom. we can introduce our children to the history, culture and the way their ancestors looked at the night sky and the celestial body. In fact we can protect our heritage, which is linked to the nature of the night sky, under the pretext of astronomy education and pass it on to the next generation. As you can see, by carrying out this project, we established a bridge between history, astronomy, art and education.

In this talk in the first step, I'll try to define the representation of heavens, and in the next step we will have a journey into the heart of Iranian ancient heritage which are linked to celestial objects and in the final step we will show how we use this material in astronomy education. by doing this job we will show how we can make a connection between history, astronomy, art and education and also we will have the opportunity to introduce Iranian ancient heritage to the world.

The glossary of astronomy released by Astron. Soc. Japan

T. Handa, Astronomical Society of Japan / Kagoshima University, Japan
H. Agata, Astronomical Society of Japan / National Astronomical Observatory of Japan
S. Okamura, Astronomical Society of Japan / the University of Tokyo, Japan
M. Noda, Astronomical Society of Japan / Nagoya City Science Museum, Japan

Abstract

Since 2018 Astronomical Society of Japan (ASJ) has released an online glossary of astronomy. The target users are researchers, students, mass-media reporters, and all public citizens. All of them can use it at free of charge. All items are written by first class Japanese researchers on astronomy and space sciences. Although it is based on the printed version released by ASJ, it has more than 3000 topics now and still growing. The main contents are text-based but some of them are attached by images, graphics, and movies. It is currently written in Japanese language. However, due to rapid improvement of online machine translation software, people can understand the contents with a help of such software. We will talk the short history of the glossary and its current status.

Physics in Transport systems - raise interest on physics for all students

T. Handa, Kagoshima University, Japan

Abstract

In Japan, many students learn physics only for entrance exam of universities and believe it is independent of daily life. To improve the situation I have given a lecture on physics in transportation system, which many boys and girls are interested in since 2014. Their short reports tells me many of them can understand that classroom physics gives a basis of modern daily life. Major topics in the lecture are following: electric power, heat engine, friction, circular motion, slop, material physics, mechanical structure, signals, buoyancy & lift, propulsion & thrust, navigation, and orbital motion. I will show some of the actual slides and gimmicks.

Teaching astronomy to children through social media

Terkieh jbour, Damascus University, syria

Abstract

During the Covid-19 pandemic, all schools around the world were closed and distance learning was resorted to, and despite the bad conditions that Syria suffered from war, our activities in the Syrian Astronomical Association did not stop and we resorted to methods that suit this pandemic, so we created WhatsApp groups to teach children astronomy and space science from age of 6 to 15 years and posted an ad on the Facebook website of the Syrian Astronomical Association.

Through this research, I will present the steps of our experience, the mechanism of its implementation, development and results as an example of distance learning during the Covid-19 pandemic.

Sustainable Development of Astronomy in Sri Lanka: from outreach to research

Thilina Heenatigala, Earth-Life Science Institute (ELSI) Tokyo, Japan

H.D.S Amaradasa, University of Ruhuna, Sri Lanka

Kalawila Vithanage. S P, University of Ruhuna, Sri Lanka

Abstract

Sri Lanka has produced about two dozen astronomers since the 1960s, and all graduated from foreign universities. Though students locally are keen on pursuing astronomy, as a developing country (not an IAU member), the opportunities and resources in astronomy are extremely limited. Fundamental science is not viewed as an attractive career path. However, as in many cultures and societies, astronomy remains a core topic of interest for the public at large. Since the days of the Apollo programme, there has been an active astronomy outreach at the school and public level, then led by the Ceylon Astronomical Association, which created a domino effect of school astronomy clubs, which are still active to date. The International Year of Astronomy in 2009 (IYA2009) boosted the outreach efforts, inspiring quite a few locals to pursue a career in astronomy despite the challenges.

Ten years later, after the IYA2009, while the outreach efforts continued, some Sri Lankan astronomers focused on developing astronomy education and research at the university level. The first step was to partner with Las Cumbres Observatory (LCO) and get access to the telescope network. This partnership with LCO helped build the first active research group in Sri Lanka, which published the first scientific paper where all authors are from Sri Lanka. The research group consists of university lecturers and students from the undergraduate and graduate levels. The research initiative is currently being expanded into other universities in the country and with further support from LCO.

This talk presents perspectives on how astronomy outreach paved the path for formal education and research in a sustainable way. It will also present the future roadmap to set up the first graduate programme and call upon the regional astronomy community for support in the endeavour.

Kagoshima Astronomy Association's Activities to Promote Astronomy.

T. maeda, Kagoshima Astronomy Association, Japan

Abstract

The Kagoshima Astronomical Society is a circle of astronomy enthusiasts established in 1985. It currently has about 60 members and continues to publish a journal, hold astronomical observing sessions, provide mutual training for members, and engage in other activities to promote astronomy. We will present our practical activities to promote astronomy in the community.

Research and education experience using the SaCRA telescope for teacher training undergraduate students

Yumiko Oasa

Abstract

Astronomy serves as a gateway to various academic fields.

Astronomy is also helpful in fostering interdisciplinary views and scientific thinking skills, since it is based on many fields of natural science and uses a wide range of scientific disciplines such as physics, chemistry, mathematics, computer science, and statistics as research tools.

I will introduce our various efforts in order to develop scientific thinking skills and the ability to identify and propose solutions to issues through the research and educational experiences in astronomy for undergraduate students.

Moon Over Us

Bonnie Thurber

Abstract

This is a discussion about how the Moon Over Us works and why. In this project, students become cultural astronomers. They take a survey about the moon; draw images or take digital pictures of the moon twice a week or more at approximately the same time each evening for one month to get the full cycle. After posting their images with time, date, latitude, and longitude, students research and compare each others' images of the moon; create Padlets that include poetry, history, beliefs, stories, and research. Students use dialogue, comments, and discussion to share their valuable insights. The project ends with a final survey and sharing reflections. Students receive Moon Over Us Web Badges and certificates for completing Challenges in the project. Students also receive a certificate for completing all sections of the project and the final survey.

Cosmos to Classroom - Space Education Practice in Pakistan

Yumna Majeed, IAU Office of Outreach, Pakistan

Abstract

In Pakistan's Astronomy and Space Sciences field, a lack of awareness was observed in educational institutions and among the public, from outdated curricula in schools that made science uninteresting for students to the militarization of space agency that led to no jobs in the country's space sector. Furthermore, there were no public observatories, planetariums or science museums for students or the public to visit, nor role models or space-career counselling centres where students could progress their professional space careers.

In 2016, a space education and awareness campaign was initiated by Yumna Majeed, then 18y/o medical student and aspiring astronaut. Two years later, Exploration was created as a volunteer-run organisation with Ms Yumna as a student ambassador and national coordinator for US and Europe-based space organisations. The mission was to raise awareness about Astronomy among Pakistan's public and promote Astronomy and Space Sciences as a subject and career among students. The target audience was narrowed down to primary and secondary schools.

Since Astronomy is an observational science, using art mediums to engage students in themed activities proved to be a good technique. Teaching methods included presentation-based STEM lectures, day and night sky observation sessions via telescope, hands-on activities, and space-art and storytelling sessions. To build a sustainable model for the organisation and keep the outreach inclusive and diverse, private schools were charged to cover the material cost, subsequent funding enabling the same sessions to be conducted free of cost at low-income schools, trusts and orphanages.

Currently, there's high demand for Space Science workshops, and Exploration reached over 88 schools and impacting 9500+ children. Schools started to celebrate World Space Week, universities initiated Space Clubs and authorities and the national space agency started to address space as part of the course curriculum.

A Drop of Rain Falls on the Gobi Desert - a Trial of Astro-Ecotourism -

H. Agata, NAOJ, Japan

K. Sawada, Wakayama University, Japan

B. Chinzorig, Nart Adventures LLC, Mongolia

Tsolmon Renchin, National University of Mongolia, Mongolia

Abstract

Since the IYA2009 (International Year of Astronomy 2009), NAOJ staff have often had the opportunity to travel to Mongolia and think about nature and human life... We have visited Mongolia seven times, including our second trip to the Gobi Desert in May 2023.

This trip was an ecotourism and astrotourism activity, planting saplings in the desert during the day and gazing at the stars at night....

The potential of astro-ecotourism will be discussed.

SPACE MAILS

Yumna Majeed, IAU Office of Outreach, Pakistan

Abstract

The COVID-19 pandemic has disrupted education, resulting in increased drop-out rates for students without internet access and challenges for those who do. Exploration, a space-education organisation, launched the Space Mails initiative in Pakistan to address this issue. The aim was to promote astronomy education and engage students and schools in astronomical activities during lockdown. Space Mails involved sending letters to students that answered space-related questions and provided educational resources, including creative lesson sheets, astronomy activities, and other materials. Students enthusiastically received the mail and gifts that sparked their interest in learning something new.

To expand the project's reach to underserved communities with limited internet access, the Space Mails team plans to develop a printed series of newsletters filled with informative news, fun facts, and creative games related to astronomy. Each newsletter will feature a space-themed poster on one side and content on the other. This approach will establish a sustainable project model where schools and families can pay a small registration fee to receive monthly newsletters, enabling low-income schools and underserved communities to access them for free.

Space Mails is an innovative approach that encourages learning and engagement in astronomical activities at schools and at home, particularly for children who want to explore non-digital activities post-pandemic and have limited or no access to the internet. Overall, Space Mails is an innovative solution that can help address the education disruption caused by the pandemic, promote interest in astronomy, and enable greater access to educational resources in underserved communities

Astronomy during the war in Syria

Terkieh jbour, Damascus University, Syria

Abstract

I will talk about astronomical activities and teaching space sciences and astronomy in Syria during the war period from 2011 until today, and how to focus on the importance of astronomy in creating sustainable development and encouraging children and youth to practice their hobby in astronomy and develop it through research and the link between the theoretical information in the curricula with application Practical, and cooperation with national, international and Arab bodies interested in the development of astronomy around the world.

Exploratory Assessment of Public Engagement Activities at Japanese Research Institutions

Thilina Heenatigala, Earth-Life Science Institute (ELSI) Tokyo, Japan

Kelin Li, Tokyo Institute of Technology, Japan

Research and teaching activities are measured through established indicators and at the highest priorities of research institutions. In contrast, Public Engagement (PE) activities are often carried out as ‘goodwill’ exercises. This study looks into engagement practices at Japanese research institutions and assesses the need for performance indicators. The study evaluated data collected through surveys and interviews from figureheads at twenty research institutions in Japan. The analysis reveals a strong need for standardise practices for Public Engagement. This talk presents the learnings from the analysis and potential pathways to move forward by standardising Public Engagement activities.

鹿児島市電 電停から鹿児島大学へ

工学部前電停から会場の稲盛会館(口頭発表会場 8/23-25)および理学部1号館(ワークショップ会場 8/26)正面玄関までの経路は以下の通りです。



稲盛会館まで

1. 工学部前電停で市電を降り、道路を渡ります。コンクリートの球体があるガラス張りの建物が、会場の稲盛ホールです。
2. 一番近い門から大学内に入ります。

鹿児島大学理学部1号館まで

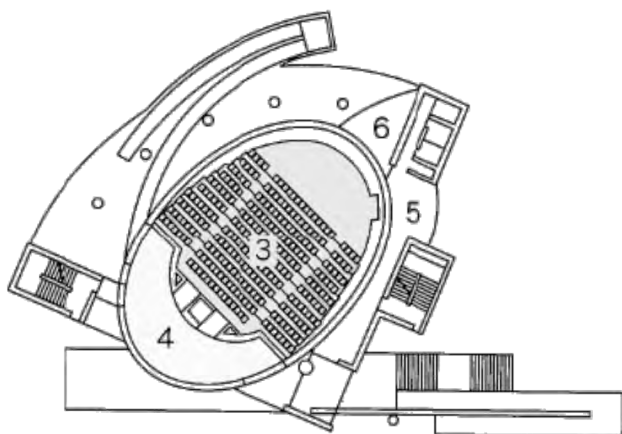
1. 道路を渡り、上記の稲盛会館を左に見ながら桜島方向に向かいます。
2. 最初の信号を左に曲がった門から大学内に入ります。右側に大学の図書館が見えます。
3. ヤシの並木を進むと右側に見える屋上にドームがある建物が理学部1号館です。
4. 進むと、左側に正面玄関があります。ここから建物内に入ります。

会場

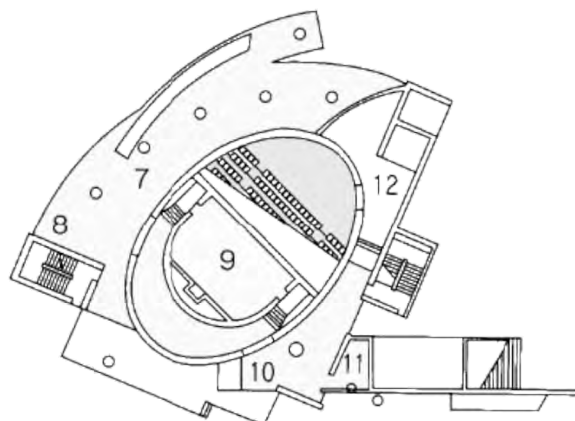
会場は鹿児島大学の稲森会館です。
建物の外観は下の写真の通りです。



講演会はこの会場の2階キミケサホール（平面図の番号3）で行われます。



ポスター発表は1階のホワイエ（平図面の番号7）で行われます。

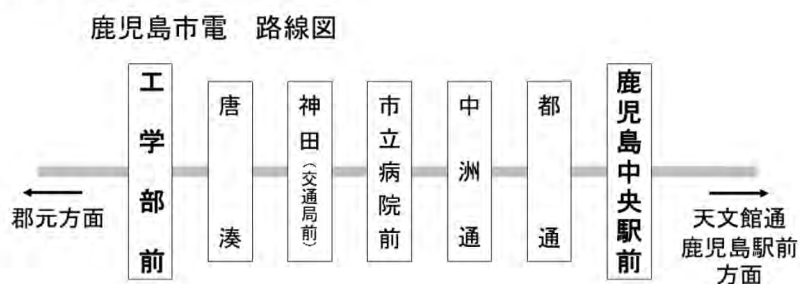


鹿児島大学周辺のアクセス

鹿児島大学（工学部前）→鹿児島中央駅

1. 電停（路面電車停留所）「工学部前」へ向かう。
2. 「鹿児島市電2系統 鹿児島駅前行」の市電に乗る。

*所要時間 約10分 *料金 170円



鹿児島中央駅→鹿児島空港

「鹿児島空港行」の空港連絡バスに乗る。

*所要時間 約40分 *料金 1400円

*非予約制です。満席の場合は次便に乗車することになります。

社交イベント案内

GHO� 2023 では、以下のイベントを開催いたします。

懇親会・見学会は、事前申込者対象です。

日付	イベント	詳細
8/24	観望会 19:00 – 20:30（予定）	* 費用 無料 * 会場 鹿児島市国際交流センター
8/25	懇親会 18:00 – 20:00（予定）	* 事前申込者対象
8/26	H2A ロケット 発射見物会	* 費用 無料 * 打ち上げは 9:34 を予定
8/27	見学会	* 事前申込者対象

会場付近の食事処

鹿児島大学近くの食事処です。お昼休みの時間が限られているため、事前に目星をつけておくことをお勧めいたします。

エリア	店名	備考
学内	フードカフェ KADAI	8/23～25 は 10:30～17:00 8/26 は 10:00～15:30
	鹿児島大学生協ガロア	8/23～26 は閉店期間中
	鹿児島大学生協中央食堂	8/23～26 は 11～14 時
	鹿児島大学生協教育食堂	8/23～26 は閉店期間中
	ヴェジマルシェ'19	8/23～26 は 11～15 時と 18～20 時
荒田	薩摩製麺所	
	出水田食堂	
	ふく福	
	ひでもも屋	
	TheSnooup トマラー	
	Komugico 鹿大前	
	麺屋はる	
	太一商店 騎射場店	
	中華料理 長城	
	寿庵	
	Ruposhi Bangla	
	車や	
	カクテルと油そば ジョークール(JOE-COOL)	
	うなぎのふじ井	
郡元	麺処 恭や	
上荒田	麺屋ばってん親父	
	ダイニング徳や	

各食事処の場所については、LOC 作成のマップをご参照ください→

(<https://www.google.com/maps/d/viewer?mid=1El9vbJ6HTcL0QGJs3jszSVqgjGinKV0&usp=sharing>)



出席者 Participants

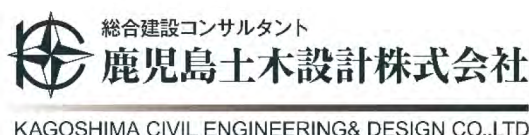
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鹿児島大学天の川銀河研究センター

Global Hands-On Universe
Conference 2023
プログラムブック/Program Book

Kagoshima Where Polaris is Seen in Low Sky
北辰、斜めにさすところ

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Thank you!
No.26



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画像提供：鹿児島相互信用金庫

Program Book of Global Hands-On Universe Conference

Conference website
<https://handsonuniverse.org>