K-12 ASTRO ASIA 2025

K-12 Astronomy Education Conference in Asia 2025

1-4 SEPTEMBER 2025

Princess Sirindhorn AstroPark, Chiang Mai, Thailand

Book of Abstracts

NARIT

UNESCO United Nations Educational, Scientific and Cultural Organization

ITCA

IAU International Astronomical Union

SEAORAD Southeast Asian Regional Office of Astronomy for Development

K-12AstroAsia 2025 Program						
Time	MON - 1 Sep		TUE - 2 Sep		THU - 4 Sep	
	Planetarium	Andromeda	Planetarium	Andromeda	Planetarium	Andromeda
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Contents

Oral Presentation / **13**

Physics-based space flight simulation game competition to promote space enthusiasm in classroom

Author: Matipon Tangmatitham[1]

[1] *National Astronomical Research Institute of Thailand (NARIT)*

"Space Youth Challenge" is a competition in which teams of 5 students use the game "Kerbal Space Program" to dream up their space missions and then execute them in-game in according to the laws modeled after real laws of physics. Participants get to put the knowledge they learn in schools from physics, celestial mechanics, newton's law of motions, vectors, torque, aerodynamics, etc. into practice. Over the 3 seasons of Space Youth Challenge we have received nearly 1,997 participants from 472 teams. The responses to the competition are overwhelmingly positive and have proven that video game can also be a powerful alternative to conventional formal education in schools on top of allowing artistic freedom and teaching basic video editing skills which is arguable one of the most important skills in this era.

Keynote Speaker / **14**

Top-Down and Comprehensive Approach to Astronomy Outreach in Thailand

Author: Matipon Tangmatitham[1]

[1] *National Astronomical Research Institute of Thailand (NARIT)*

For emerging countries, the challenges in initiating astronomy outreach where none currently exists is fundamentally different from simply expanding upon what's readily available. Outreach activities in developed countries tend to come from independent groups that can contribute independently towards the overall outreach initiatives in multiple aspects. However, reaching this "bottoms-up" stage from the ground up can take a long time. Recognizing the lack of most outreach infrastructures in Thailand 16 years ago, the National Astronomical Research Institute of Thailand (NARIT) has set outreach as one of its primary goals since its inception. Currently, NARIT operates a chain of five planetariums and about sixty full-time outreach staffs, both of which are among the largest in the world. Last year, NARIT has reached over 1.6 million participants who engaged with us in-person via various means in a fiscal year. This rapid rise in interests and enthusiasms in astronomy from the public is a testament to how effective this top-down and comprehensive approach to astronomy outreach can be in jump-starting a science interest in a developing country. Moreover, the overwhelming public support NARIT has garnered was vital in propelling forward many of its research infrastructure and serve as a reminder how Public Engagement can also be an ally and benefactor to the researchers.

Workshop / **15**

Use of Robotic Telescopes for School Students

Authors: Priya Shah[1]; Syed Najamul Hasan[1]

[1] *Maulana Azad National Urdu University, Hyderabad, India*

I shall present, in workshop mode, a complete presentation of the use of Las Cumbres Observatory Telescopes for School students. This will involve planning of observations, processing of data, and

analysis. For this, the analysis can be used using Virtual Observatory tools as well as Jupyter notebooks. Students can be taught both and depending on their coding skills, can be trained. This gives students the thrill of observations and a first hand experience of astronomy research.

Oral Presentation / 16

Astronomy Education in Schools in India

Authors: Priya Shah[1]; Syed Najamul Hasan[1]

[1] *Maulana Azad National Urdu University, Hyderabad, India*

In this talk I shall present our experience with astronomy education in schools. With the help of various kits on light, pressure, magnetism, and Newton's Laws, we explained various principles in physics that students have studied in schools and extended it to astronomy, ranging from the working of telescopes to rocket launching and others. We have also been training students with material for Astronomy Olympiads and helping them prepare for the exam by clarifying concepts and derivations. I have also been writing in a monthly newsletter where astronomy concepts and news are explained and discussed. Students are free to contact me to answer questions. Lessons learned and resources developed by us will be presented. (http://www.shristriastro.com/)

Poster Session / 20

The Experience of Teaching Using Satellite Communications (The Coronavirus Pandemic as an Example)

Author: turkieh jbour[1]

Co-author: Mohamed alassiry [1]

[1] *syrian astronomical association*

This may be the first time in history that the world has united around a single word and a single position: how to confront the coronavirus that swept the world in 2019. This imposed a new reality on us that we had never imagined. Therefore, we sought out everything that could help us, and we relied on satellite communications and modern technology that brought the distant closer, along with the internet, which has turned the world into a small village. But we never imagined that we would cease our normal activities, and that our children would stop going to school. The COVID-19 pandemic has imposed new challenges on us that we must adapt to. Perhaps the most significant problem facing the world is the closure of schools in all countries. However, the creation of new ideas has transcended borders. Many around the world have turned to creating educational platforms and developing various applications to support distance learning. Here, satellite communications and their development have become a new goal and purpose: to utilize them in education. They have even transcended borders. Any student can join a university-like class if they meet its requirements. They can even conduct experiments, operations, and tests from their home, while the university is located on the other side of the world. Because we in Syria lack many capabilities, and there are many obstacles imposed on us by the war, despite all the difficulties we have faced over the past ten years, our activities at the Syrian Astronomical Society have not stopped. How could they have stopped during the COVID-19 pandemic, given our lack of advanced equipment for satellite communications and satellite internet? We have shifted part of our activities to learning through social media such as WhatsApp and Facebook. We created WhatsApp groups for children aged 6 to 15, starting a new experience in Syria: remotely teaching space and astronomy using the simplest technologies and capabilities.
Our experience using communications technology and the information revolution to simplify and educate children about space and astronomy may be simple and modest, limited to applications such as WhatsApp and others. This science, considered one of the most demanding of practical applications, is a simple experiment with its tools compared to the experiences of other countries. However,

it has yielded an information-rich project focused on teaching children the foundations and principles of astronomy.
My research will be a message for the future: Using space, astronomy, and artificial intelligence technology and disseminating them in our Arab schools and universities, in light of what all countries are currently striving for, compared to global experiences such as Japan, China, Singapore, and others. This will enhance efforts to explore outer space and motivate our youth to experiment, innovate, develop thinking, and work within a team.
This adds a new dimension to education.

Oral Presentation / **22**

Beyond the Classroom: Government-Led Astronomy Education Outreach in the Philippines – Insights from PAGASA's Programs

Author: Girlie Cortez[None]

In the Philippines, the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) plays a crucial role in fostering scientific literacy and promoting astronomy across diverse communities. This paper examines the evolution of astronomy education and public outreach initiatives by PAGASA, highlighting its key programs before, during, and after the COVID-19 pandemic.

Before the pandemic, PAGASA conducted in-person seminars, planetarium shows, telescope viewings, and school-based lectures, with National Astronomy Week (NAW) as its flagship event. However, the pandemic in 2020 led to a temporary halt in activities, shifting outreach efforts to virtual platforms. During this period, PAGASA leveraged webinars, virtual telescope viewings, podcasts, and enhanced collaboration with international organizations like the International Astronomical Union – Office of Astronomy Outreach (IAU-OAO) to maintain public engagement, allowing for broader participation across the country. Post-pandemic, PAGASA successfully integrated both physical and virtual outreach, expanding its programs to include international projects/events such as Global Astronomy Month, Asteroid Day, Women and Girls in Astronomy, 100 Hours of Astronomy, and World Space Week among others.

This paper explores the evolution of PAGASA's astronomy outreach strategies, its collaborations with other government agencies and international organizations such as the International Astronomical Union (IAU), and its role in making astronomy education accessible, inclusive, and engaging for Filipinos. By examining PAGASA's experiences, this paper also provides insights in the importance of government support into the effective implementation of astronomy education and outreach initiatives, as well as transformative impact of astronomy outreach in inspiring future generations and fostering astronomically curious society in the Philippines.

Oral Presentation / **23**

STEM+A@Astronomy Project: Integrating Astronomy Education into Formal Science Curriculum by Engineering Design and Science Inquiry

Author: Exodus Chun-Long Sit[1]

[1] *IAU NAEC and Co-NOC Hong Kong, China*

Astronomy, as an interdisciplinary science, uniquely integrates fundamental concepts from various scientific disciplines, making it highly relevant and engaging for diverse audiences. However, its integration into national curricula varies significantly across countries, raising questions about its

optimal level and role within these frameworks. This presentation explores the challenges and opportunities associated with implementing astronomy education, focusing on the STEM+A@Astronomy project. By leveraging engineering design cycles and scientific inquiry, this project enhances learners' astronomical literacy and problem-solving skills, applying astronomical knowledge to real-world situations. The project aims to foster curiosity about night sky observation, space science, and planetary science through experiential learning and hands-on experiences, suitable for modular lessons in primary education. The discussion will address strategies for overcoming implementation barriers and maximizing the benefits of astronomy education in formal settings, highlighting the potential for astronomy to enrich STEM curricula globally.

Oral Presentation / **24**

Motivating Astronomy Education through Dark Sky Initiative on Design Thinking and Social Innovation Experiential Learning

Author: Exodus Chun-Long Sit[1]

[1] *IAU NAEC and Co-NOC Hong Kong, China*

In the context of Asia, where urbanization and light pollution pose significant challenges to astronomy education, innovative approaches are crucial for engaging students and fostering environmental awareness. This presentation showcases the ASTROx project, an interdisciplinary initiative that integrates dark sky education into science curricula through design thinking and social innovation. Led by the student dark sky team, ASTROx addresses real-world issues by leveraging outdoor classrooms, experiential activities, and hands-on experiences to raise awareness about urban light pollution. By focusing on community-based projects, students develop essential skills in science communication and advocacy, promoting the preservation of dark skies. This approach not only enhances astronomy education but also tackles regional challenges such as energy efficiency and environmental conservation, providing a model for sustainable and engaging classroom activities across Asia.

Poster Session / **25**

Teacher Training for Astronomy Education in Schools

Authors: Syed Najamul Hasan[1]; Priya Shah[1]

[1] *Maulana Azad National Urdu University, Hyderabad, India*

Science Education in India as well as globally needs to be engaging and model-based.
We have conducted various Teacher Training Workshops for teachers who are keen to find new and innovative ways of making science more engaging. These workshops enable transfer of learning, problem-based learning models, integratingscience and daily-life to bring quality science instruction to students from underprivileged minorities. We shall describe some of our workshops, both online and offline and discuss the lessons learned and future plans.

Poster Session / **28**

Astronomy as an Extracurricular in School

Authors: S.Pd Burhani[1]; Agustin Winarni[2]

[1] *Astronomy Club of Titian Teras*

[2] *Atronomy Club of Titian Teras*

Astronomy As a branch of the Science Olympiad that often sends students to the national level, it requires a good selection and coaching system.

1. Basic Information

Explain to students the selection and coaching system in the field of Astronomy. Providing motivation to prospective participants, that astronomy is a very important part of life

2. Student Selection

Selection of candidates for the Astronomy Olympiad team, in order to select students who have a good interest in astronomical science

3. Student Provision

Student briefing is a follow-up activity after the selection process is carried out. The material presented is physics for astronomy

4. Collaboration

Cooperation with professional trainers from Astronomy students and graduates in providing advanced astronomy material

5. Telescope Practice

Telescope practice is carried out every week. In addition, it also follows certain moments such as moon observation activities with NASA, InOMN

6. OSN Test

National Science Olympiad test, starting from district and provincial level, then successfully passing to national level

7. Winners

Astronomy Science Olympiad team, has proven itself to be the best in the school. proven by the achievement of 14 consecutive years of qualifying for the national level, some of whom are medal winners

link

Poster Session / 30

Rooftops for Astronomy, Geoscience, and Space Science Education

Author: Hoe Teck TAN[1]

[1] *School of Science and Technology, Singapore*

Rooftops offer a unique and accessible platform for promoting space technology and astronomy education in urban environments. As interest in space science grows, innovative educational approaches are crucial for inspiring future generations of scientists and engineers. Rooftops—often underutilized spaces—can be transformed into vibrant learning hubs equipped with telescopes, radio antennas, and interactive displays to bridge the gap between theoretical learning and practical experience. These rooftop observatories serve as cost-effective alternatives to conventional observatories while providing hands-on exposure to astronomy and satellite technology. Activities such as stargazing, observing celestial events, and learning to operate small satellite systems introduce learners to real-world applications of space science. Educational institutions can capitalize on these spaces for STEM outreach programs, promoting collaboration between schools, universities, and local communities. Additionally, the integration of space technology on rooftops contributes to

the development of remote sensing and environmental monitoring initiatives, fostering interdisciplinary learning opportunities. This approach not only sparks curiosity about the universe but also encourages students to explore emerging fields in aerospace, robotics, and astrophysics. By reimagining rooftops as educational gateways, we can inspire a new generation of space enthusiasts while democratizing access to astronomical knowledge and technological innovation.

Poster Session / 31

Alternative Conceptions of Senior High School Students to Astronomy Concepts

Author: JOSHUA MICOLE FELIZARTA[1]

[1] *Rizal Technological University / Bloomfield Academy*

Introduction

Filipino students are required to undertake the revised basic education curriculum (RBEC, or K–12 curriculum) from kindergarten up to senior high school set by the Department of Education (DepEd). Included in the revised curriculum are astronomy concepts that are taught at different grade levels in junior high school (from Grade 7 up to Grade 9). Topics in Grade 7 include the concepts of seasons and eclipses. Characteristics of asteroids, comets, and other members of the solar system are taught in Grade 8, while characteristics of stars and constellations are taught in Grade 9. (Department of Education, 2016)

The arrangement of topics in astronomy and other science concepts in elementary and junior high school is patterned using a spiral progression curriculum. This curriculum was promoted by Bruner. Bruner (1960) encourages different educational institutions to teach concepts first at a more simplified level, but as the learner progresses, those concepts will be relearned and they will add concepts that are more complex but related to the first one. Thus, concepts will have a gradual increase in difficulty. To assess the effectiveness of the curriculum, the Bureau of Educational Assessment conducts the National Achievement Test (NAT) for junior high and senior high school students. Based on the latest result of the NAT, the national result is 44.1% in the school year 2016–2017, which is lower compared to the 44.7% result in the school year 2015–2016. (Aguinaldo, 2019) However, scores in relation to astronomy concepts are not included. One of the perennial problems in curriculum assessment is the alternative conceptions of students.

Alternative conception is defined as the students' personal construct of knowledge that is different from the universally accepted scientific facts (Chhabra & Baveja, 2012). Also, Gilbert (1983) defined alternative conception as an idea or thought of a learner that is different from the socially agreed concept. If the student learned an alternative concept, it may be difficult to unlearn or change due to the high resistance of the learner to change it. (Novak, 1988) In recent years, there have been numerous studies that focus on identifying the difficulties students have in comprehending different astronomical concepts (Kharis, 2016). However, there is scarce literature on the alternative conceptions of astronomy concepts among students in the Philippines. Based on this, researchers would like to determine the different alternative conceptions of astronomy concepts taught to senior high school students during junior high school.

Methods

The researcher used a qualitative descriptive survey design. According to Calmorin & Calmorin (2007), this design is best suited to determining the degree of differences between the subjects. Also, the researcher will determine the variation of participants in different conditions and situations.

The participants of the study were the Grade 11 senior high school students. Grade 11 students were the participants because they already learned about astronomy topics in junior high school. Also, the researcher assumes that they have no astronomy concepts learned in their grade 11 subjects in science (Earth Science, Physical Sciences, Earth and Life Science, and DRRR) in relation to the chosen astronomy topics since those topics are not included in the curriculum guide of the said

subjects. The researcher employed stratified random sampling. Stratified random sampling used layering techniques. In each layer or stratum, the participants were selected randomly. (Calmorin & Calmorin, 2007).

The previous junior high school of each participant will be considered in this study. This is to make sure that the participants came from different junior high schools and to increase the variability of the answers. After classifying the students in stratification, the researcher will use systematic random sampling to select the students randomly.

The researcher used a guided or structured interview to determine the alternative conceptions of astronomy concepts among senior high school students. The researcher and the participant used video conferencing applications for the interview. The guided or structured interview consists of pre-formulated questions that will help the researcher answer the formulated problems. To answer the first question, the researcher will include two sets of questions. The first set of questions will assess the known understanding of the subject of eclipses (solar and lunar eclipses). The second set of questions will determine their understanding of seasons. For the answers to the second question, the research will include questions that will determine how the participants acquired those alternative conceptions. For the third question, the interview guide will consist of questions that will determine the factors influencing how they acquired those conceptions. These guided or structured interview questions were designed by the researcher. The researcher will also make a table of specifications for the questions. This will allow the researcher to align the questions with the required competency in astronomy in the science curriculum guide from the Department of Education. The questions from the interview guide were submitted to the research adviser to check and to give comments and suggestions. After that, the researcher seeks the guidance of astronomy professors at the Department of Earth and Space Science at Rizal Technological University to validate the content of the questions.

Results

The different results and analyses are presented in the order of sub-problems of this study, as follows: Senior high school students have alternative conceptions of different astronomy concepts covered by the curriculum guide for junior high school students.

In the concept of a solar eclipse, students have alternative conceptions if they explain the concept in verbal form rather than in diagram form. The alternative conceptions of students in drawing form are the Earth-Sun-Moon model and the Moving Sun and Moon model. For the verbal form, the alternative conceptions are: (1) solar eclipses happen at night; (2) the sun and moon are moving towards each other; (3) when the moon rotates, it covers the sun; and (4) the moon is blocking the path of the sun.

In the concept of a lunar eclipse, students also commit alternative conceptions if they explain the concept in verbal form rather than in diagram form. In the diagram form, the alternative conceptions of students are: (1) the moving moon and sun model; and (2) the earth-moon-sun model. Students also commit alternative conceptions if they explain them verbally. These are: (1) light emitted from the Moon was blocked by Earth; (2) the Moon disappeared during a lunar eclipse; (3) Earth came between the Sun and Moon; (4) the Moon blocked the sunrays reflected on the Earth; (5) the mechanism of a lunar eclipse was the same as that of a solar eclipse; (6) the Moon was blocking Earth's light; and (7) the Sun was blocking the Moon during the nighttime.

However, for Philippine seasons, there is no difference between the verbal and diagram forms. The alternative conceptions in drawing form are: (1) distance of the Earth from the Sun; and (2) local weather model. Also, students have alternative conceptions regarding the names of the seasons, like (1) rainy and summer, (2) winter and summer, (3) El Nino and La Nina, and (4) sunny, rainy, and typhoon. In verbal form, these are the alternative conceptions of students: (1) the northern hemisphere experiences a rainy and sunny season, while the southern hemisphere experiences winter and autumn; and (2) if the Philippines is not in the spotlight of the sun, then it is a rainy season. Otherwise, if the country is in the spotlight, then it is sunny or "tag-init" and (3) if the Earth is farther from the Sun, then it is rainy. If near, then it is summer; (4) the Philippines is located at the center of the equator; and (5) the Philippines is experiencing balanced day and night. Students acquired those alternative conceptions through the pedagogy of their teachers (length of instructional time, teaching methods), the surfing of the internet and social media, the personal experiences of the students, and the visual representation of the mechanisms of the astronomy concepts.

Conclusions

The results of the study led the researcher to conclude that senior high school students have alternative conceptions of different selected astronomy concepts that are included in their junior high school lesson. The researchers noticed that students gave more alternative conceptions if they explained the concepts in verbal form than in drawing form. This conclusion is true for the concepts of solar and lunar eclipses but not for Philippine seasons. Also, students gave a higher alternative conception of the mechanism by which lunar eclipses work than solar eclipses, both in verbal and in drawing form. Based on the responses of the respondents, the research also concludes that students acquired those alternative conceptions through the pedagogy of the teacher (which includes the length of instructional time and teaching methods), the use of the internet and social media as information sources, the personal experiences of the students, and the visual representation of those phenomena.

Oral Presentation / 33

Astronomy activities “for primary school students”

Author: Sarutaya Lunsakawong[1]

[1] *Trattrakarnkhun School Trat Thailand*

Background / Significance of the Project
In an era where science and technology play a crucial role in national development, instilling scientific knowledge and inspiration in young people is essential—especially in remote areas with limited access to educational resources. The astronomy activity “To Younger Primary School Students” was organized by secondary school students from the Astronomy Club of Trat Trakankhun School. Its aim is to promote astronomy education among primary school students in Trat Province.
Objectives
The activity aims to creatively convey astronomical knowledge, enhance analytical thinking and observational skills in primary school students, and develop the potential of secondary school students in their roles as event organizers and science communicators.
Activity Methodology
The activities were conducted at four rural schools: Wat Saitong School, Ban Tha Ruea Chang School, Wat Takang School, and Wat Runadittharam School. The event followed a hands-on learning station format, including solar observation with telescopes, astronomy dome setup and operation, star map usage, and astrophotography using DSLR cameras. The student organizers underwent preparatory training in relevant knowledge, equipment handling, and event management prior to the actual sessions.
Outcomes
The activities successfully engaged primary school students, who showed strong interest and enthusiastic participation. They gained a better understanding of astronomy through hands-on experiences. Meanwhile, the student organizers developed real-world skills in teamwork, communication, and scientific presentation—contributing to both academic and personal growth.
Conclusion / General Suggestions
In conclusion, the project effectively met its goals in both knowledge dissemination and student capacity building. Such initiatives should be continuously supported to broaden learning opportunities and strengthen educational collaboration among local schools in the future.

Poster Session / 34

Astronomy camp for students.

Author: Sharin Amthaisong[1]

[1] *Prathai school*

Astronomy Camp for Students is organized for students from kindergarten to high school. The objectives are: 1) To provide students with basic knowledge and understanding of astronomy. 2) To enable students to develop practical skills in astronomy. 3) To encourage students to have good interactions, work with others creatively and happily. 4) To make students have a better attitude towards astronomy and science.
For the students of the Astronomy Club who act as lecturers, students learn how to work and can develop themselves. They develop leadership skills, communication skills, and skills in working with others. Dare to express themselves in the right way, learn how to plan their work, solve immediate problems, be a public volunteer and more.
Astronomy camp for students includes daytime learning activities such as planetarium, solar system, star map, telescope. The night session includes a luminescent constellation activity, a real sky lecture, naked eye observation of celestial objects and observation of celestial objects through telescopes. There will be recreational activities throughout the camp. In 2024, we organized 21 astronomy camps for students.

Oral Presentation / 35

Charting the Local Constellations: Revisiting Astronomy Competencies in the K-12 and MATATAG Curricula

Author: Rizchel Masong[1]

[1] *De La Salle University*

Curriculum development plays a crucial role in shaping students' understanding and engagement with astronomy. With the upcoming transition to the MATATAG Curriculum, it is essential to revisit and critically evaluate the astronomy competencies outlined in the current Philippine K-12 system. This paper presents the challenges and concerns encountered in implementing astronomy education within the formal curriculum, particularly in the context of a highly academic-focused environment and intense societal expectations. Through comparative analysis, key gaps are identified between the K-12 and MATATAG frameworks, including the limited integration of experiential and inquiry-based learning opportunities.

Beyond national boundaries, strengthening astronomy education competencies is vital for advancing scientific literacy across the Southeast Asian region. As member states aspire to greater cooperation in science and technology, a robust and inspiring astronomy education framework becomes essential to nurture future researchers, innovators, and educators. The study also highlights how club activities, student research projects, and project-based learning can provide alternative avenues for students to explore their passion for astronomy beyond rigid curriculum structures. Emphasizing a more holistic approach, the paper advocates for an education model that balances academic standards with the cultivation of individual curiosity, ultimately preparing students not only for examinations but also for lifelong learning and scientific exploration essential to regional growth.

Oral Presentation / 36

Expanding Horizons – Inclusive Astronomy Education Programs in Visayas and Mindanao

Authors: Rizchel Masong[1]; Ayen Terry[2]; Gene Aaron Osorio[2]

[1] *De La Salle University*

[2] *Laniakea Ventures Opc*

In pursuit of fostering Accessibility, Diversity, Equity, and Inclusion in astronomy education, Laniakea Ventures Opc is leading efforts to promote space and astronomy learning in the Visayas and

Mindanao regions of the Philippines. Recognizing that societal, cultural, religious, economic, and physical barriers often limit participation in science, the initiative develops innovative, localized solutions to ensure that no one is left behind. Promoting astronomy education in the Southeast Asian region is essential to cultivating scientific curiosity, technological innovation, and regional cooperation, all of which are vital for addressing future global challenges.

By implementing inclusive educational programs, hosting mobile astronomy sessions, and collaborating with local communities, Laniakea Ventures Opc not only expands awareness of space science but also empowers historically underserved populations to take part in the global scientific conversation. Through these targeted actions, the organization advances its commitment to making astronomy education accessible and meaningful for all, demonstrating how community-driven efforts can bridge gaps, foster unity, and inspire a new generation of Southeast Asian space enthusiasts.

Oral Presentation / **37**

The Impact of Informal and Experiential Learning on Astronomy Awareness

Authors: Rizchel Masong[1]; Ayen Terry[2]; Gene Aaron Osorio[2]

[1] *De La Salle University*

[2] *Laniakea Ventures Opc*

Education in astronomy extends beyond traditional classrooms, with informal programs playing a pivotal role in inspiring lifelong learning and curiosity. This study discusses the impact of experiential learning through informal astronomy education initiatives, focusing on programs like Space Time PH, organized by Laniakea Ventures Opc. Drawing on feedback collected from diverse audiences, the results highlight how hands-on experiences—such as mobile planetarium shows, interactive lectures, and observation nights—significantly enhance participants' interest, understanding, and engagement with astronomy. Audience responses reveal that experiential learning not only strengthens foundational knowledge but also fosters a sense of wonder and accessibility, particularly among K-12 students in underserved areas. By showcasing these outcomes, this paper underscores the vital contribution of informal education in broadening astronomy awareness, demonstrating that immersive, community-driven experiences can complement formal education and cultivate a more astronomy-literate society.

Poster Session / **39**

A Simple Moon Phase Simulation Experiment

Author: Tatsuhiko Kitagawa[1]

[1] *Nanko Scientific Exploration Club*

The question, "What shape is the Moon today, and when and where can it be seen in the sky?" is a difficult one. In Japan, many adults might struggle to answer it. However, most of them know that the Moon's phases occur as a result of the Moon reflecting sunlight and orbiting the Earth. Some children even believe that different shaped moons exist in space and that a different Moon appears in the sky every day. Currently, knowledge of Moon phases is not widely useful for either children or adults. We believe this is an important topic for science museums.
This paper introduces a Moon phase simulation experiment, which has been well received when conducted at our science museum for audiences from young children to adults. Furthermore, performing this experiment in elementary and middle school classes would enhance students' understanding of Moon phases.
The fundamental principle of this experiment is that when sunlight illuminates the spherical Moon,

only the hemisphere exposed to sunlight appears bright. Using this foundational concept, this experiment aims to help participants understand the mechanism behind Moon phases.
When explaining Moon phases, we (especially adults) tend to describe the phenomenon based on the heliocentric positions of the Sun, Earth, and Moon in order to prioritize accuracy. However, at the science museum where this experiment was conducted, many visiting families include young children or elementary school students. For this reason, complex explanations were intentionally avoided. Instead, we designed a simulation that could be intuitively understood by both children and adults.
The experiment involves preparing a spherical Moon model, with one half painted yellow and the other half painted black. By placing this Moon model at various positions on a panoramic board depicting a terrestrial landscape, the appearance of Moon phases as observed from Earth can be replicated on a tabletop. The objective of this simple experiment is to help participants understand patterns in Moon phase changes. In other words, the experiment aims to help participants recognize the relationship between the Moon's apparent shape (phases) and its relative position to the Sun.
Given that the phrase "the apparent distance of the Sun and the Moon" may be difficult for young children to grasp, alternative expressions such as "the Sun and Moon appear close together" or "they appear far apart" were used. As a result, both young children and elementary school students were able to understand the concept with ease.
This simulation experiment emphasizes a ground-based observational perspective, allowing participants to experience where the Moon appears in the sky and in what shape. To simplify conditions, the experiment was restricted to the Moon at dusk. This approach allowed us to focus solely on the changing position of the Moon while keeping the positions of the Sun and Earth fixed, thereby enabling a straightforward understanding of Moon phases.
Finally, we propose the use of this simulation experiment in elementary and middle school science classes. Conducting the experiment of dusk and dawn hours allows students to observe how the Moon's phase changes as it revolves around the Earth.
School textbooks in Japan commonly show the illustrations of Moon phases as seen from space (far above the Earth). This experiment replicates the illustrations, so it can help students who may struggle with perspective shifts. As a result, students can develop a more intuitive grasp of Moon phases.

Oral Presentation / 40

Volunteer stars "Take children to explore the universe, foster relationships among school networks"

Author: Alongkorn kokaew[1]

[1] *Amnat Charoen school*

The activity of volunteer stars "Take younger siblings to explore the universe, foster relationships between schools" is an activity organized by the Astronomy Club of Amnat Charoen School. The objectives are 1) to enable students in the club to be speakers in organizing activities and disseminating knowledge of astronomy to participants. 2) to create inspiration and stimulate interest in learning activities in astronomy that gain hands-on experience in organizing astronomy activities. 3) to instill public awareness and leadership skills in volunteer students. 4) to strengthen relationships and good cooperation between schools in the network.
The results of the activity: There were 300 students in total who participated in the activity, consisting of students from 5 elementary schools and service areas in Amnat Charoen Province. There were 15 students from the Astronomy Club of Amnat Charoen School as speakers. The activity was divided into 3 periods: Period 1: Recreational activities to prepare and build relationships between seniors and juniors, starting with recreational activities to prepare by seniors from the Astronomy Club of Amnat Charoen School, the Saturn Ring activity: We will not be lonely anymore, learning basic electrical circuits. Period 2: Base activities: Practical astronomy activities. (Astronomical Activities) is divided into 6 bases as follows: Base 1: Planetarium and Zodiac constellations Base 2: Space Technology Base 3: Solar System Model (Planet Work) Base 4: Telescope: 10-inch Dobsonian Telescope Base 5: Planetarium: Be amazed and touch the stars in the sky during the day Base 6: Glow in the dark and Section 3: Astronomy Challenge: Summarize the activities, let the children be excited with the astronomy quiz game, debriefing activities, writing feelings, presenting thoughts or things learned by representatives of each group. In addition, teachers from many schools in Amnat Charoen Province contacted to coordinate for the club to provide services to children in the school,

which all activities received a lot of interest and excitement from the participants. It was a collaboration between students from both lower and upper secondary schools, allowing the students to learn how to work together and also inspiring each other during the activities.

Poster Session / 41

Volunteer stars spread knowledge by sharing astronomy on National Children's Day

Author: Sirinan Photphuthon[1]

[1] *Amnatcharoen school*

The activity "Volunteer Stars Spread Knowledge to Share Astronomy on National Children's Day" is an activity organized by the Astronomy Club of Amnat Charoen School. The objectives are to 1) spread knowledge and understanding of astronomy to serve the community and distribute opportunities, encourage people or individuals in the community to participate in astronomy activities widely and widely. 2) to provide opportunities for students in the Astronomy Club to practice teamwork skills, knowledge transfer, community service, and confident expression. 3) to create a sense of volunteerism among the youth, starting with sharing small knowledge to the younger ones and the community around the school. 4) to promote good relationships between schools, communities, and families through creative academic activities on the occasion of National Children's Day.
The results of the activity "Volunteer Stars Spread Knowledge to Share Astronomy on National Children's Day" at 10 service points in Amnat Charoen Province, with 2,500 participants, consisting of 15 activities: telescope caravan, space technology, planetary models, star mapping, fun star-picking, fun helicopter, interesting knowledge about Luna, astronomy corner, fun astronomy games, astronomical images, rainbow formation, 3D holograms, origami planets. Pee Dara Pa Plearn, Mek Nai Khot, which all activities received a lot of attention from the participants and all activities were successful according to the set objectives, both in terms of disseminating astronomical knowledge to the community, which promoted integrated learning and clearly created a sense of volunteerism among the youth. This activity not only provided knowledge on National Children's Day, but also inspired, created leadership roles for students, and created good relationships between schools and communities in a sustainable manner.
Keywords: Astronomy Network, Astronomy Activities, Astronomy to the Community

Poster Session / 42

Cosmic Blessings: Stargazing at the Temple

Author: Yanaput Intisaeng[1]

[1] *Maha Sarakham Secondary Educational Service Area Office*

This study introduces "Cosmic Blessings: Stargazing at the Temple," an innovative integrated astronomical activity developed within Thailand's rich social and cultural fabric. Our core aim is to move beyond typical celestial observation, instead seamlessly blending astronomical knowledge with the deep-rooted Buddhist beliefs and cultural practices central to Thai society. We've strategically aligned this program with significant lunar calendar dates: the full moon of the twelfth (Loy Krathong), sixth (Vesak Bucha), and third (Makha Bucha) lunar months. These specific times not only see optimal lunar phenomena influencing observation but also carry profound cultural symbolism, creating a meaningful synergy between scientific inquiry and our socio-cultural heritage.

A key challenge we've observed is that astronomical education often stays confined to formal classroom settings, struggling to reach the wider community. To address this, "Cosmic Blessings" uniquely leverages religious institutions—our temples—as primary activity venues. These temples, traditionally pivotal spiritual and social hubs, are transformed into effective "connecting mechanisms." They

link fundamental community units: homes (our primary social base), schools (educational pillars), and stargazing (astronomy) itself, as a powerful tool for scientific learning. This integration shows a nuanced understanding of Thai community dynamics. Our underlying premise is simple: homes, temples, and schools are vital interacting institutions that shape community members' lives at every level. By using astronomical activities to bridge these entities, we're fostering a truly holistic, informal learning environment that simultaneously boosts scientific literacy and participants' social and cultural development.

We run "Cosmic Blessings" from these temple hubs on optimal clear full moon nights, targeting local schoolchildren and broader community members. So far, we've successfully organized three events, engaging roughly 150 participants, which clearly demonstrates the program's effectiveness in drawing community involvement. This approach genuinely promotes participatory and intergenerational learning, ultimately strengthening local social networks. Looking ahead, we're excited to expand these activities to include monastic schools (Phra Pariyattidhamma schools) for Buddhist monks and novices, aiming to broaden our outreach and ensure even greater accessibility within the monastic community. In essence, "Cosmic Blessings: Stargazing at the Temple" stands as a unique informal astronomy education model. It truly emphasizes weaving scientific knowledge into our cultural and religious context, strategically uses existing religious institutions as central points, and connects fundamental community institutions to build sustainable learning and participation.

Poster Session / 43

"2nd Youth Stargazing Camp: Inviting You to Watch the Stars"

Author: Nopparath Namnao[1]

[1] *Ban PrachasukSan School*

Ban Pracha Suksan School has been part of the Astronomical School Network under the National Astronomical Research Institute of Thailand (Public Organization) since 2023. As part of its annual astronomy club activities for the academic year 2024, the school organized the 2nd Young Stargazers Camp: "Let's Watch the Stars Together." This is an annual event aimed at promoting astronomical education among youth.

This year, two other astronomy network schools also participated: Chiang Khrua Municipal School (Chiang Khrua Subdistrict, Mueang District, Sakon Nakhon Province) and Ban Phu Phek School (Phu Phek Subdistrict, Phanna Nikhom District, Sakon Nakhon Province).

Objectives of the camp:
To enhance students' knowledge and skills in astronomical processes.

To encourage students to make productive use of their free time.

To promote self-directed learning in developing students' astronomical potential.

To foster a positive attitude toward astronomy and space science.

Activities:
During the daytime sessions, students learned about stargazing using the Stellarium program, practiced reading star maps, used stargazing mobile applications, learned celestial navigation, compass use, and how to operate telescopes. They also observed the sun and explored a portable planetarium dome, along with gaining basic knowledge on telescope maintenance.

At night, students enjoyed storytelling about constellations and observed celestial objects with the naked eye and through telescopes.

Outcome:
According to post-event surveys, student participants expressed high satisfaction with the camp, indicating the event was both enjoyable and educational.

Keywords: 2nd Young Stargazers Camp, Let's Watch the Stars Together

Poster Session / 44

Astronomy SPK

Authors: Nisa Phanlapa[1]; Yadanan Katekaew[1]

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Astronomy SPK is an astronomy club in Satreephuket School that started with 3 students and 1 teacher who wanted to organize an activity to observe the partial solar eclipse that occurred on December 26, 2019. We helped each other buy solar glasses, help make simple sun-watching equipment, and use the school's telescope to organize the activity. They publicized it by word of mouth. It turned out that there was a lot of interest from teachers and students to join the activity. Therefore, the astronomy club was established in the school since the academic year 2020 onwards. Astronomy SPK is recruiting members who are passionate about astronomy, are motivated and ready to learn new things all the time in order to develop students to success according to their different aptitudes and needs in 3 subgroups: students interested in doing astronomy projects, students interested in taking the astronomy academic olympiad, and students interested in organizing astronomy activities.
The results of the continuous implementation up to the present have allowed students to continuously develop their potential as follows:
Group 1: Students can do an astronomy project on a topic based on their interests, such as factors affecting the error in the distance from the Earth to the Moon from the Lunar Occlusion of Venus using the Lunar Parallax method / a study of factors affecting the error in calculating the depth of impact craters on the Moon from First Quarter Moon photographs / factors affecting the twinkling of stars in cases where the observer is in a light-polluted area.
Group 2: Students can pass the selection for the Academic Olympics in Astronomy, Camp 2 in 2023, 2 people, and 2024, 2 people, and Earth and Space Science, 1 person.
Group 3 students have leadership skills and can organize astronomy activities for students from other schools, the public, and tourists in Phuket Province. As a result, Satreephuket School received the award for outstanding school performance in organizing astronomy activities for the community from National Astronomical Research Institute of Thailand (Public Organisation) last year.

Oral Presentation / 45

Students' Knowledge and Understanding of Basic Astronomy: A Comparative Study

Authors: Tshiamiso Makwela[1]; Samantha B. Brown-Sevilla[None]

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This study explores students' understanding of fundamental astronomy concepts using the Basic Astronomy Questionnaire (BAQ), a concise instrument designed to probe critical concepts for building a solid foundation in astronomy education, such as astronomical scales and sizes, the seasons, and gravity. Research indicates that students frequently hold alternative views about these topics (Rajpaul et al., 2014, 2018; Makwela et al., 2022), emphasising the need for systematic assessment.
The BAQ project is envisioned as a large-scale international comparative study, beginning with implementations in South Africa and Germany. By examining responses across different countries, the study aims to identify both differences and commonalities in students' comprehension of astronomy concepts shaped by language, curriculum design, educational approaches, and cultural factors. These insights will inform the development of more effective and context-sensitive strategies for astronomy education.
The research is conducted in collaboration with the International Astronomical Union's Office of Astronomy for Education (OAE) and its global network of National Astronomy Education Coordinators (NAECs), who are instrumental in reaching diverse student populations. While the primary focus is on secondary school students—an educational stage where conceptual frameworks are still forming—the BAQ was piloted with undergraduate astronomy students at the University of Cape Town. These students served as expert respondents, helping to evaluate the clarity and appropriateness of the questionnaire's language, content, and framing.

Ultimately, this project seeks to contribute to a more comprehensive understanding of how students across the globe make sense of core astronomy concepts and to promote pedagogical approaches that address persistent learning challenges in science education.

Oral Presentation / 46

Inclusion, Diversity, Equity, and Accessibility (IDEA) Initiatives in the 1st Philippine Space Science and Astronomy Research Conference (PSSARC)

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The Philippine Space Science and Astronomy Research Conference (PSSARC) will be held for the first time on August 8-12, 2025, at Adamson University, Philippines. This will be the first conference of its kind, wherein Filipino experts, researchers, scientists, and enthusiasts in space science and astronomy will gather together to create an avenue for building new connections, fostering novel opportunities for collaboration, and strengthening the Filipino astronomy community. One of the primary objectives of the conference is to introduce Inclusion, Diversity, Equity, and Accessibility (IDEA) initiatives, with the hopes of eventually influencing Philippine science education. This effort is both timely and relevant, given the current state of the Philippine education system. To foster a welcoming environment for everyone, we follow the color communication badge system as introduced by the Autistic Self Advocacy Network (ASAN), which will allow all participants to show their communication preferences during the conference without any initial verbal communication. Service dogs will also be permitted during the conference. Preferred gender pronouns (PGPs) are highlighted in each delegate's name tag. Lastly, Braille translations of signage for blind participants and a sign language interpreter for deaf participants will be present during the conference. We report our statistical analysis on our initiatives, highlighting the reception, challenges, benefits, and areas of improvement of such initiatives.

Oral Presentation / 47

Fostering Place-Based Astronomy Education in a Ubon Ratchathani Geopark: A Case Study of Lao-Ngam Pittayakom School

Authors: Paniwad Senked[1]; Chalongchai Saithong[2]

[1] *Lao-Ngam pittayakom School*

[2] *Lao-Ngam pittayakom school*

Lao-Ngam Pittayakom School, located within the Ubon Ratchathani Geopark in northeastern Thailand, lies amidst distinctive geological landmarks such as Sam Phan Bok, Pha Chan, and the Giant

Rock Pillars. This region's exceptional dark sky conditions (Bortle scale Class 1 at Pha Chan) and rich cultural-geological context make it an ideal setting for place-based astronomy education.
In December 2021, the school founded an Astronomy Club with three main objectives: (1) to inspire student interest in astronomy through voluntary, inquiry-based learning; (2) to integrate local natural and cultural resources into science education; and (3) to promote science citizenship and public communication through outreach activities.
The club has grown from 30 to 95 secondary-level members since its founding in 2021. It organizes regular stargazing sessions, observational field trips, astronomy outreach programs for elementary school and project-based learning activities at local dark-sky sites. The Pha Chan area has served as the venue for annual astronomy camps for three consecutive years since the club's establishment. Collaborative partnerships with the Ubon Ratchathani Geopark Office, the Provincial Administrative Organization and local Administrative Organization have significantly enriched these efforts.
Student-led projects have explored topics such as dark sky conservation and archaeoastronomy, drawing direct connections between local heritage and modern scientific inquiry. Notably, many alumni continue their astronomical pursuits at university level and return to mentor current members, creating a sustainable knowledge transfer cycle. To overcome budget constraints, the club fundraises through souvenir sales during outreach events.
Through participation in regional events—including meteor shower observations, astronomy camps, mobile planetarium programs, and astronomy-themed activities at festivals—students not only gain scientific knowledge but also develop skills in teamwork, communication, and civic engagement.
Looking ahead, the school plans to establish a permanent Astronomy Learning Center and build a local school network to coordinate annual astronomy outreach programs for surrounding communities.
This case study demonstrates how rural schools can empower students and bridge science with culture by leveraging place-based resources and community collaboration—fostering meaningful astronomy education under pristine dark skies.

Poster Session / 49

The Development of a Project-Based Learning Model Based on the ASTRO-KHURU Framework to Enhance Astronomical Research Skills of Secondary School Students

Author: Witchaphon Puangkaew[1]

[1] *Kuruprachasan School, Secondary Educational Service Area Office Uthai Thani Chai Nat, Thailand*

This study aimed to: 1) explore the development of a project-based learning model for astronomy integrated with the ASTRO-KHURU framework, 2) construct and validate the quality of the proposed instructional model, and 3) examine the effects of implementing the model by comparing students' post-learning abilities in planning and conducting astronomical research with the 70% benchmark, along with a qualitative analysis of their learning behaviors and research skill development.
The target group consisted of 30 upper secondary school students from Kuruprachasan School who voluntarily participated in the project "Astro Research Kick-off: Igniting Dreams, Building Young Astronomical Researchers." A purposive sampling technique was employed. The research instruments included: 1) the ASTRO-KHURU instructional model, developed from the integration of Project-Based Learning (PBL), systems thinking, and the PDCA cycle; 2) an astronomical research skills assessment; and 3) field note and reflection forms. Data were analyzed using descriptive statistics (mean and standard deviation), one-sample t-tests, and content analysis.
The findings revealed that 1) The ASTRO-KHURU Model comprises nine stages A: Activate Curiosity, S: System Thinking & Science Literacy, T: Teamwork & Topic Selection, R: Research Design, O: Observation & Operation, K: Knowledge Construction, H: Highlight & Presentation, U: Use of Feedback, and R: Reflection & Future Path—which support systems thinking, hands-on practice, and experiential learning in a structured manner, enabling full student engagement in the research process. 2) The model's appropriateness, as evaluated by experts, was at the highest level (Mean = 4.43, S.D. = 0.38). Its instructional efficiency was calculated at 78.92/82.67, exceeding the specified benchmark (75/75). 3.1) Students' post-learning astronomical research skills reached 88.37%, significantly higher than the 70% criterion at the .01 level. 3.2) The overall satisfaction level toward the learning model was high (Mean = 4.52, S.D. = 0.41), with the highest-rated aspect being "Inspiration for future learning and career in science" (Mean = 4.68). 3.3) Content analysis of students' reflections indicated

that 92% could clearly articulate their cognitive development, skills gained, and aspirations for pursuing further education in space science.
These findings indicate that the ASTRO-KHURU Model is an effective and sustainable instructional approach that fosters active learning and enhances secondary students' competencies in astronomical research.

Poster Session / **50**

Astronomy and opportunities for people in remote areas.

Author: Sampat Kaeoiam[1]

[1] *Wat Jomkiri Nakprot Municipal School*

The school received support from the National Astronomical Research Institute of Thailand (Public Organization) for telescopes and has used them to organize activities for students, both in terms of teaching and organizing astronomy camps to develop students to be leaders in disseminating astronomical knowledge to interested people. Students in the club organized astronomical phenomenon observation activities to distribute opportunities to people in the community and to remote communities. The mobile stargazing activity on the mountaintop was therefore initiated with the aim of providing everyone in remote areas of Thailand with equal access to astronomy. The activities organized were diverse, such as observing astronomical phenomena, learning about planetariums, coloring plaster planet models, making paper planet models, making Stellar Light Box activities, learning how to use star maps, and outdoor movie screening activities. Astronomy will allow everyone in remote areas to access and be equal. In addition to the number of people, the number of opportunities is also important because the stars in the sky belong to everyone.

Oral Presentation / **51**

Creating innovative media and astronomy learning resources in schools to inspire community activities.

Author: Sampat Kaeoiam[1]

[1] *Wat Jomkiri Nakprot Municipal School*

Science education in Thailand realizes the importance of organizing science learning that is modern and on par with international standards, aiming to achieve the greatest results for students. The organization of learning should promote students to develop their natural abilities and their full potential in line with their interests and aptitudes, taking into account individual differences through various methods. The school has created innovative media and astronomy learning resources in the school to inspire learning in the community. Within the school, a good environment is created that is conducive to learning, with learning resources for organizing astronomy learning activities, such as an astronomy classroom, a stargazing area, an astronomy corner, and teaching media for use in astronomy teaching, such as a telescope, a model of planets made of plaster, a solar system made of cardboard, and a mold of craters on the moon, Stellar Light Box, to create variety and create interest for students who love astronomy activities and to support students who are interested in participating in such activities. There is also a plan to operate and develop astronomy learning resources in the school to support services from those who are interested, and to use the innovative media to organize activities that inspire learning astronomy in the community

Poster Session / **53**

Astronomer Volunteers: A Journey from Students to Astronomy Communicators

Author: Ananpol Sudsap[1]

Co-authors: SMANCHAN CHANDAIAM [1]; BOONYARIT CHOONHKIT [1]; LADDA DEESUAN [1]; KITSANA LAMSOMBAT [1]

[1] *National Astronomical Research Institute of Thailand (Public Organization)*

Astronomy for students is not merely about enhancing scientific and astronomical knowledge; it also serves as a platform to develop students into science or astronomy communicators. This study focuses on the role of Astronomy Communicator Volunteers, aiming to explore the transition of students from participants in volunteer activities to effective communicators of astronomical knowledge to the public. The research emphasizes real-life experiences gained through astronomy-related activities, training programs, and communication through various channels such as exhibitions, online media, and public outreach events.

Findings reveal that volunteering as astronomy communicators significantly contributes to the development of communication skills, planning abilities, teamwork, and confidence in presenting scientific knowledge to others. Moreover, it inspires students to pursue further studies or careers in science and astronomy. This highlights the importance of nurturing students not only as learners but also as future science communicators in society.

Poster Session / **54**

Astronomy Activities Engage Hight School student

Author: Faikham Phuedphud[1]

[1] *Renunakhonwittayanukul ìschool*

The implementation of astronomy activities in upper secondary school classrooms aims to promote students' enthusiasm and joyful learning in astronomy, develop fundamental knowledge and understanding through hands-on practice, and foster positive attitudes toward astronomy while inspiring students in science education.
The activities conducted throughout the semester included solar system simulation (Planet Walk), moon phase modeling, learning the principles of telescope operation, constructing constellation circuits using copper wire and LED lights, creating celestial sphere models, making and using star charts, solar observation through telescopes, measuring sunspot sizes, measuring object distances using the parallax method, calculating the depth of lunar craters, and simulating comet formation.
The results of implementing these activities revealed that students became more engaged and experienced joyful learning. They demonstrated enthusiasm in their studies, gained understanding of fundamental astronomical concepts through hands-on activities, and developed sustained inspiration for science learning. These activities created effective learning experiences and concretely promoted the development of students' scientific thinking skills.

Oral Presentation / **55**

Leveraging Local Libraries for Astronomy Education: Promoting Scientific Literacy Through Public Outreach Programs in Valenzuela City, Philippines

Author: Mark Anthony Aguilando[1]

Co-authors: Cheska Mae Culo [1]; Jose Alexis Elimanco [1]; Rhobee Rhames Reyes [1]; Ryan Andrew Doña [1]

[1] *Valenzuela City League of Astronomy Enthusiasts (V-CLUE)*

Public libraries serve as vital hubs for learning, especially for students. However, in the Philippines, only three percent (3%) of the total number of public libraries mandated by law are operational and accessible to the public, based on the 2018 status report on Philippine Libraries and Librarianship by the National Library of the Philippines (NLP). Moreover, none currently offers astronomy-related activities for the general audience in a monthly basis. This presentation aims to showcase the programs and activities conducted by Valenzuela City League of Astronomy Enthusiasts (V-CLUE) in partnership with the Valenzuela City Academic Center for Excellence (ValACE), a local library in Valenzuela City. The initiative was developed in alignment with the ValACE's program called *See the World – Free Telescope Viewing (FTV)*, which offers the public opportunities to observe celestial objects in the night sky from within the city. This effort supports the primary goal of V-CLUE: *to engage the public in astronomy*. Activities include monthly public lectures, hands-on workshops, and Astronomy for Kids (AFK) program, which is specifically designed to introduce children to astronomy through age-appropriate activities. Initial observations revealed varying numbers of participants present at each event, suggesting that public engagement depends largely on interest and awareness. Therefore, by leveraging local libraries as platforms for astronomy education, this initiative demonstrates that localized, low-cost astronomy education programs can be effective tools for learning. It provides valuable insight into how astronomy can be taught, learned, and experienced in non-traditional and informal educational settings.

Poster Session / 56

Astronomy for Yong Minds

Author: Faikham Phuedphud[1]

[1] *Renunakhonwittayanukul ìschool*

Abstract (1)
The "Astronomy for Young Minds" project is an extracurricular outreach initiative designed to bridge the gap in science education by bringing astronomy learning opportunities to students in small rural primary schools. These schools often lack access to qualified science teachers, educational materials, and observational tools. Led by members of the school's astronomy club, the project targeted under-resourced schools in nearby districts, providing hands-on, engaging activities during daytime sessions.
The program featured a wide variety of activities, including a mobile planetarium dome, star map usage, solar system exploration, solar observation using telescopes, balance and motion experiments, glow-in-the-dark demonstrations, binocular usage, art-based astronomy activities, and educational games. The aim was to spark curiosity, encourage observation skills, and promote scientific questioning among young learners.
As a result, students from more than five rural schools gained access to astronomy resources they had never experienced before. Participants showed high levels of enthusiasm and engagement across all activities. The planetarium dome emerged as the most popular feature, followed by telescope-based solar observation. The project demonstrates an effective model for making science accessible and inspiring future interest in astronomy among young students in underserved areas.

Poster Session / 57

Promoting Astronomy Learning Through Project-Based Learning for Senior High School Students

Author: Faikham Phuedphud[1]

[1] *Renunakhonwittayanukul ìschool*

Promoting astronomy learning through project-based approaches represents a significant educational strategy that enhances analytical thinking skills, inquiry-based learning, and hands-on learning experiences among senior high school students, who possess the potential for systematic research and investigation.This project commenced with teachers participating in basic astronomy project development training to strengthen their knowledge, understanding, and appropriate project-based learning methodologies. Subsequently, teachers transferred this knowledge through practical workshops for interested student groups, with open enrollment and selection processes for ready participants.
Learning activities encompassed diverse topics combining both theoretical and practical components, including studies of lunar orbital eccentricity, lunar distance measurement, calculations of meteor crater depths on the Moon, parallax observations, and ancient astronomy studies.Students selected projects aligned with their individual group interests, employing critical thinking processes and hands-on implementation in data collection design, analysis, and conclusion drawing. These processes promoted self-directed learning, collaborative teamwork, and the development of scientific skills alongside 21st-century competencies.
This project inspired students and provided opportunities to recognize the significance of astronomy in real life, while preparing them for future academic pursuits and career development.
Keywords: Astronomy, Project-based Learning, Hands-on Learning, Workshop

Poster Session / 58

ASEAN Star Odyssey : Mission Under the ASEAN Sky

Author: Natthawat Najaiyen[1]

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ASEAN Star Odyssey : Mission Under the ASEAN Sky is an integrated learning activity that blends the astronomical folklore of ten ASEAN countries with hands-on sky observation and the design of celestial coordinate systems. Framed by the principles of experiential learning, it emphasizes active student engagement, critical thinking, and creative communication.

The core concept relates indigenous star myths—such as the “Crocodile Star” (Big Dipper) in Thailand, the “Seven Maidens” (Pleiades) across multiple ASEAN cultures, Vega–Altair in Vietnamese legend, and the Southern Cross in Brunei—to precise astronomical data. Students will identify these constellations in the night sky and construct a celestial sphere using the horizon-based (altitude–azimuth) coordinate system, thereby fostering both cultural understanding and scientific literacy through a station-rotation model.

The specific learning objectives are :

1. Students will describe the content and cultural significance of each ASEAN country’s star myth.
2. Students will accurately connect each myth’s narrative to the constellation’s position and seasonal visibility in the sky.
3. Students will apply the altitude–azimuth coordinate system to design a celestial sphere depicting the mythic constellations.

The flagship activity is the Celestial Sphere Design station. Participating students create a circular representation of the sky, delineate the horizon line, mark the cardinal directions (North, East, South, West) and the zenith, and then plot the mythic constellations using measured altitude and azimuth angles. This exercise solidifies their understanding of coordinate systems and their ability to apply astronomical information.

The lesson unfolds as follows : first, the teacher sets the stage by presenting evocative images and soundscapes of key constellations. Next, students form small teams and receive an “ASEAN Star Passport,” which outlines four mission stations: (1) Storyweaver—read and summarize the star myth; (2) Star Mapping—use a mobile app to locate the constellation and sketch its pattern; (3) Celestial

Sphere Design—construct the horizon coordinate sphere and plot the constellation; and (4) Quick-Pitch—deliver a concise, timed presentation. The lesson concludes with each team reflecting on their Passport entries and sharing one key insight.

Assessment comprises verification of completed Passport tasks, evaluation of the celestial sphere's coordinate accuracy, observation of clarity and engagement during the Quick-Pitch, and peer feedback.

By the end of this module, students will have developed cross-cultural awareness of how ASEAN communities interpret the same star patterns, acquired practical sky-mapping and coordinate-plotting skills, honed design thinking through their celestial sphere constructions, and strengthened their communication abilities. Moreover, they will be inspired to pursue further astronomical study while appreciating ASEAN's rich folkloric heritage in balance with scientific inquiry.

Oral Presentation / 59

Astronomy in a primary school in Bangkok

Author: Derrick Lim[1]

[1] *Natureverse Thailand*

This presentation summarizes my astronomy teaching experience at a primary school in Bangkok. The school has a recently upgraded planetarium and astronomy teaching in the school was combined with the usage of the planetarium. An astronomy curriculum was introduced, focusing on basic astronomy knowledge, planetarium usage and emphasizing hands-on activities. The curriculum was tailored to suit primary school students, incorporating storytelling, interactive simulations, and basic stargazing to foster curiosity about the universe. In addition, the Seestar S30 was also used to demonstrate operations and functionalities of a telescope. The upgraded planetarium was observed to significantly increase student engagement, with interactive sessions proving particularly effective in sustaining interest among young learners. Teacher training improved confidence in delivering astronomy content, though challenges arose due to limited prior exposure to the subject among educators. Barriers included time constraints within the school schedule and the need for ongoing professional development to maintain teaching efficacy. Simplified activities, such as constellation mapping and model-building, were most successful, while complex topics like astrophysical concepts proved less effective for younger age groups as expected. This case highlights the potential of modernized facilities and targeted training to enhance astronomy education in primary settings, while underscoring the need for age-appropriate content and sustained support for educators to overcome implementation challenges.

Oral Presentation / 60

Innovating Astronomy Education via Internet Telescopes: Practice and Outreach

Author: Kouichi Toda[1]

[1] *Toyama Prefectural University*

We are working on a project named Internet Telescope Project (ITP, https://www.kitp.org/). The purposes of our project are the development of Internet Telescopes (ITs) and the spread of astronomical education using them.
ITs are small telescopes with cameras that are operated by a browser user interface via the Internet and are available for free. We installed them at various locations in Japan and other countries. It means that "anyone" can observe the night sky from "anywhere" and at "any time".

We report the development of a new system for our ITs using the INDI Library, an open-source software for controlling astronomical equipment. The new system allows us to install various telescopes and cameras more easily than the previous one and makes it easier to set up ITs. We introduce the ITP schoolwork bank. This is a web-based system for preparing and releasing instructional plans for the use of ITs in school science classes, and it is also available for free. By sharing this bank with school teachers, we aim to develop it into more user-friendly instructional plans for various educational settings. We also report recent outreach activities using ITs. Although many science events were canceled due to the coronavirus pandemic, we exhibited ITs at some events face-to-face or remotely.

Poster Session / **61**

Eyes on the Universe: ”Internet Telescope Project” in Action

Author: Kouichi Toda[1]

[1] *Toyama Prefectural University*

Internet Telescopes are small telescopes installed at various locations in Japan and USA, which are remotely controlled via the Internet. “Anyone” can view the night sky from “anywhere” and at “any time”. We are working on the project named “Internet Telescope Project” (https://www.kitp.org/). The purposes of our project are the development of an Internet Telescope and the dissemination of astronomical education through its use. In this presentation, we will introduce the system and network of the Internet Telescope Project, a recently installed one located in Hiratsuka, Japan. We will also report on some applications of the Internet Telescope in astronomical education, specifically the results of seminars held as an extra lesson for high school students in Japan.

Workshop / **62**

Live observing with a radio telescope - the PULSE@Parkes program

Author: Robert Hollow[1]

[1] *CSIRO, Space and Astronomy*

In this workshop participants will (subject to operational availability) use Murriyang, the 64m Parkes radio telescope operated by CSIRO in Australia live and remotely to observe pulsars. We’ll emulate what happens in a typical live observing session of PULSE@Parkes, a free, long-running education program aimed for high school students. Sessions can be run in person or online which allows for increased accessibility and equity of access for schools across Australia. We’ll explore how students can analyse their data and how they interact with our astronomers and graduate students. Ways in which the program can be linked to areas of a science curriculum are presented. Common student questions and pedagogical challenges are discussed. Possibilities for other groups to develop live observing or programs with real data will be raised.

Oral Presentation / **63**

The Edible Astronomy

Authors: Boonyaporn Khamsin[None]; taweerak Thunphuttha[1]

[1] *Prommanusorn Petchburi School*

The Edible Astronomy is an innovative educational workshop designed to make astronomy more accessible and engaging through the medium of food. Developed by the PBESA astronomy club, this program transforms complex astronomical concepts into interactive culinary experiences. Each activity combines science with creativity, allowing participants to explore the universe through taste and imagination.
Highlights include the Galaxy Drink, which explores the colors of galaxies through a vibrant beverage; Delicious Constellations, where sausages represent stars and magnitudes; and Astro Luk Chup, a twist on the traditional Thai dessert shaped into planets and meteorites. Other creations like the Mercury Mango Sorbet and Sweet n' Sour Jupiter reflect planetary characteristics through flavor and presentation.
This initiative not only raises funds for the club but also fosters curiosity and scientific thinking in a fun, memorable way. Future expansions aim to introduce more space-themed dishes, continuing to blend astronomy with culinary art.

Oral Presentation / 64

Dissecting Cultural differences in Learning: How to promote engagement in lecture-based environment

Author: Matipon Tangmatitham[1]

[1] *National Astronomical Research Institute of Thailand (NARIT)*

Literatures in Astronomy Education often assume that students and classrooms globally are similar and we often discuss best classroom practices as if they are universal. Often times, it is implied that all it takes is just translating classroom materials in native language and then the success could be replicated. However, this couldn't be further from the truth. Even though we all share the same biological basis, the culture that we were raised and the culture of the classroom that we inhabit in can be drastically different. Here, we attempt to discuss the challenges behind adapting one learning culture into another. More specifically, classroom across Asia tend to be much more one-directional and often times not enough emphasis is being put into engaging students to ask questions. Even though it can definitely be argued that there would be clear benefit in allowing the students to think more critically and allowing their beliefs and understanding to be open to challenged, many who has attempted such feat in an Asian classroom might agree that it is easier said than done. In this talk, the author attempts to share upon his experiences and discusses some of the "hacks" in which we can slowly get students to become more familiar with "active" learning style in the classroom culture that are not accustomed to one.

Poster Session / 65

Contested Constellations: Diverse Indian Perspectives on Orion, Taurus, and the Pleiades, with a Focus on Mizoram

Authors: Malsawmtluanga T[1]; Lalrintluanga Sailo[2]; Malsawmtluangi N[3]

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[3] *Government Kolasib College, Kolasib 796081, Mizoram, India*

The bright stars of Orion and Taurus, with the shimmering Pleiades cluster (M45) at their heart, create one of the most stunning and easily spotted patterns in the Northern Hemisphere's winter sky. But these stars are far more than just points of light; for countless ancient and indigenous cultures around the globe, they held deep meaning, woven into their myths, traditions, and understanding of the world. How people saw these stars differed greatly, shaped by their own unique beliefs, environments, and ways of life. In India, this part of the sky is especially significant, known

in Vedic traditions as the lunar mansion Kṛttikā (the Pleiades) and its neighbouring constellations. This study focuses specifically on the people of Mizoram in Northeast India. As a Tibeto-Burman community with a rich and distinct heritage, Mizoram offers a valuable perspective that hasn't been widely studied yet. We explore how Mizo stories, folklore, and everyday knowledge interpret Orion, Taurus, and the Pleiades – looking at how they were used for finding direction, timing planting and harvests, and explaining the cosmos. This work shines a light on the amazing variety of ways Indians have understood the night sky, showing Mizoram's cultural astronomy as a key piece in understanding humanity's deep and varied connection to the stars.
Keywords : Mizo Ethnoastronomy; Orion-Taurus-Pleiades Complex; Northeast India; Celestial Interpretation; Indian Astronomical Diversity.

Poster Session / **66**

Smart telescopes as an astronomy teaching tool

Author: Derrick Lim[1]

[1] *Natureverse Thailand*

The advent of affordable smart telescopes has the opportunity to revolutionize astronomy education by enabling accessible, hands-on observation experiences. This presentation explores the use of the ZWO Seestar S30, an automated smart telescope controlled via a smart device, as a powerful tool for teaching astronomy. Capable of alt-azimuth or equatorial alignment, the S30 automatically targets and images celestial objects, including the Sun (with a solar filter), Moon, wide double stars, open and globular clusters, nebulae, galaxies, and even quasars. Its alignment process provides a practical lesson on Earth's rotation and axial tilt, while its ability to capture stars down to a theoretical limiting magnitude of 12–18 (depending on sky conditions) supports observations from moderately light-polluted areas (Bortle 5). The built-in H-alpha filter enables narrowband imaging, even in severe light pollution. While the S30's resolution limits detailed double-star observations, alternatives like the ZWO Seestar S50, Dwarflab Dwarf III, Vaonis Vespera, or Celestron Origin offer enhanced capabilities. By facilitating variable star and deep-sky observations, the S30 fosters citizen science through organizations like the AAVSO. This presentation highlights practical experiences using the S30 to engage students and amateurs, demonstrating how smart telescopes bridge accessibility and scientific discovery in astronomy education.

Poster Session / **69**

The Power of an Astronomy Club in a City Boarding School: Inspiring Students Beneath a Hidden Sky

Author: Sholravee Sungthong[1]

Co-author: Pimpitcha Uythavornying

[1] *Office of the Private Education Commission : OPEC*

Vajiravudh College(VC), an all-boys boarding school located in the heart of Bangkok, is situated in an urban environment where light pollution and air quality pose significant challenges to astronomical observation. In response, the VC Astronomy Club was established to promote informal and extracurricular astronomy education among students through hands-on, inquiry-based experiences that extend beyond the standard curriculum.

Leveraging the residential structure of the school—which allows students to remain on campus throughout the academic term—the club offers continuous opportunities for engagement. Activities include daytime and nighttime telescope observations, water rocket competitions, exhibitions, and student-led astronomy camps. A strong emphasis is placed on student leadership development

through training in both theoretical knowledge and the practical use of astronomical equipment. These students serve as peer educators and facilitators in outreach initiatives.

In alignment with the goals of inclusive science education, the club also serves as a platform for community outreach. Student members are trained as junior science communicators and lead activities aimed at expanding public access to astronomy, particularly for underserved populations such as students with special needs and elderly communities. The school campus is increasingly being opened as an accessible learning space for the public, allowing urban residents to engage with astronomy despite environmental constraints.

Through these initiatives, Vajiravudh College aims to become a model for how schools in densely populated areas can integrate astronomy education with civic engagement, helping to make the universe accessible to all—regardless of location or background.

Poster Session / 70

Urban Skies, Bright Minds: Transforming Astronomy Education in Bangkok's Boarding School

Author: Sholravee Sungthong[1]

Co-author: Pimpitcha Uythavornying

[1] *Office of the Private Education Commission : OPEC*

Vajiravudh College, a prestigious all-boys boarding school located in the heart of Bangkok, faces environmental limitations that challenge conventional astronomy education—particularly light pollution, PM2.5 air quality, and urban obstructions. To overcome these constraints, the school has implemented an active learning approach that blends classroom instruction with experiential and outdoor learning. Students from Grades 4 to 12 participate in hands-on activities such as modeling cosmic expansion, studying stellar spectra, using planispheres and planetarium software, and exploring real astronomical tools like binoculars and telescopes. The boarding schedule, which alternates every two weeks between school and home, allows for both daytime and nighttime learning modules to be conducted in immersive blocks.

To enhance engagement, the school integrates external workshops from national institutions such as the National Astronomical Research Institute of Thailand (NARIT), providing access to real-life models, demonstrations, and mobile applications that stimulate deeper understanding. Astronomy learning is also creatively woven into other school programs—for example, in the Scout curriculum, students use astronomy apps and equipment to complete missions like locating treasure chests aligned with constellations, culminating in constructing solar masks and observing the Sun during the day.

These integrated strategies not only make astronomy accessible in an urban environment but also ignite long-term curiosity and excitement among students. By combining digital tools, observational practice, cross-curricular design, and authentic learning experiences, Vajiravudh College offers a replicable model of how urban schools can create deeply engaging and effective astronomy education—even under light-polluted skies.

Poster Session / 71

K.S. ASTRO-INNOVATOR: Sky of Dreams – An Astronomy Innovation from Kuruprachasan School to Primary Classrooms by Secondary Students

Author: Witchaphon Puangkaew[1]

[1] *Kuruprachasan School, Secondary Educational Service Area Office Uthai Thani Chai Nat, Thailand*

Abstract
The activity "K.S. ASTRO-INNOVATOR: Sky of Dreams – An Astronomy Innovation from Kuruprachasan School to Primary Classrooms" was developed with the objective of integrating the subject Earth, Astronomy, and Space with analytical thinking, innovation development, and knowledge transfer. The program engaged upper secondary students as designers, developers, and facilitators, transferring astronomy knowledge to primary school students in partner schools. The project employed an Active Learning approach, divided into six phases: 1) Igniting Curiosity – Exploring the Universe in the Classroom, 2) Inspiring Ideas – Astronomy for Whom?, 3) From Concept to Creation – Innovation Development, 4) Trial and Refinement – Peer Testing, 5) Real-World Application – Secondary Students Teaching Primary Learners, 6) Conclusion and Community Astronomy Exhibition.
Results showed that the program successfully expanded active learning practices to 12 partner primary schools, involving 23 teachers and 142 primary students. The entire initiative was designed and implemented by 156 secondary students from Kuruprachasan School. These students demonstrated significant development in analytical thinking, problem-solving, innovation creation, and leadership skills. Meanwhile, primary students showed improved understanding of astronomy content, developed a positive attitude toward science, and were inspired to further learning. Teachers in the partner schools were able to adapt and apply the model in their own classrooms, contributing to the enhancement of instructional quality and the establishment of a sustainable astronomy learning network. This initiative thus serves as a model for learner-centered education that effectively fosters 21st-century skills and aligns with national goals of improving educational quality and building a lifelong learning society.
Keywords: Astronomy, Educational Innovation, Knowledge Transfer, Active Learning

Poster Session / 72

EFFECTIVENESS OF 5E-FLIPPED CLASSROOM IN FACILITATING HIGHER ORDER THINKING SKILLS IN LUNAR AND SOLAR ECLIPSES AMONG YEAR 6 PUPILS

Author: Nirmala Jeyaraman[1]

[1] *SK Taman Midah 2*

Abstract
Previous studies and government documents made it abundantly evident that implementation of astronomy in primary-level especially in the context of the Malaysian curriculum comes with several challenges and concerns. Topics such as Lunar and solar eclipse in year 6 are intangible and can be hard for children to visualize. Furthermore, cognitive development at the primary level is often not mature enough to grasp such abstract concepts easily. In line with that, the aim of this research is to study the effectiveness of 5E-Flipped Classroom approach on tendency of students to acquire High Order Thinking Skills (HOTS) focusing in astronomy related topics. The basis of theoretical foundation of the study is based on Constructivist Theory by Vygotsky views. It is a quantitative study, data collection was obtained through questionnaires, which were distributed randomly to students selected from Bangsar zone Kuala Lumpur. The data obtained from the research will be analysed using descriptive and inferential statistics. The objective of this study is the 5E-Flipped Classroom enhance students' HOTS in the dimensions of problem solving, critical thinking and creative thinking. The items measured in the questionnaire are also evidence that the 5E-Flipped Classroom strategy impacted students to use the technology and proclivity to communicate and cooperate with peers, contributing to students' engagement. Mixed method which are quantitative and qualitative data collection methods will be the focus of the research. Therefore, this study concluded that students can acquire HOTS in astronomy topics by integrating an appropriate pedagogical approach.

Keywords: 5E-Flipped Classroom, Astronomy, Engagement, High Order Thinking Skills

Workshop / **73**

Venus & Astronomy

Authors: Prasad Adekar[1]; Debashis Sarkar[2]

[1] *Inter-University Center for Astronomy & Astrophysics, India*

[2] *TOI*

Background
Why a planet like Venus only visible during the evening or early morning and not at midnight from most parts of the earth? This question has been posed to teachers and students alike. Though this is not exactly a difficult question to answer if teachers & students approach the problem in a systematic way by understanding the position of the planet in the solar system and considering its rotation and revolution, but for many years more than 90% students and teachers we encountered have been unable to grasp this idea and reach to a proper answer. This can be explained on board and cleared, but we came up with an effective paper activity which was later turned into a hard acrylic model that had a tremendous success rate not only explaining the venue problem but also helping in understanding the terms/concepts of "greatest eastern & western elongation, superior & inferior conjunction, opposition, eastern, western quadrature, and retrograde motion.

Purpose
I wish to do a proper workshop where all participants will make the paper activity, and while doing this, they can clearly understand the concepts/terms (Most will be astronomers/astronomy educators, so they will know the concepts) and use this **"working paper model"** as an activity to teach their students in different areas and countries. This will help in the exchange of many ideas and may lead to newer activities and designs in the future and can be included as part of the astronomy syllabus.

Note: This activity is ready and tested from our side with teachers and students in workshops we conduct at the Inter-University Centre for Astronomy and Astrophysics (IUCAA), so this can be directly used as part of the astronomy syllabus.

If I could get an advanced idea about the number of participants, I will bring the activity material from India. This is a paper activity, and we have one made of acrylic for demonstration purposes.

Oral Presentation / **74**

KornKT: Astronomy Outreach via Social Media

Author: Kornthong Wiriyasawetkul[1]

[1] *KornKT*

Nowadays, social media platforms have become essential for astronomy outreach, deeply changing the way the marvels of the universe are communicated to the public.

This abstract examines how social media contributes to a broader involvement with and comprehension of astronomical ideas. An instance of effective multi-platform astronomy communication is the work of 'KornKT, who utilizing tactics like leveraging visual storytelling, using stunning visuals and brief videos to clarify intricate subjects, and rendering astronomy accessible and captivating for a variety of audiences.

Poster Session / **76**

Constellation of Cards

Author: Prasad Adekar[1]

[1] *Inter-University Centre for Astronomy and Astrophysics, India*

Background
An newbie to astronomy may usually begin his journey in astronomy through Night sky observation sessions and observing through a telescope. In this naked-eye sky observation, knowing the constellations and their shapes is important at the beginning of the journey. Later on, knowing important stars (bright stars in constellations) and observing deep sky (Messier objects) becomes an important task with the handling of the telescope.
To aid this learning process, I have designed a game of cards that will effectively help in learning and remembering the sky (shapes of constellations, names of bright stars related to constellations, and deep-sky objects).

Purpose
This game of cards helps in step-by-step learning of the night sky. This game is designed to aid learning and is not a substitute for teaching. The game has 5 main levels, and each level has sub-levels, which makes it a 23-level step-by-step learning aid.

Out of 5 levels, the first 4 levels have 5 sub-levels, and the 5th level has 3 sub-levels, including a grand finale. Sub-levels are divided into zodiacal & non-zodiacal constellations with one final mixed level before you move to the next main level.

This game was first designed in online mode to go for a testing phase, which is completed successfully, and now it's made as a physical card game, which makes it much more interesting, and as usual, it's competitive.

I will be demonstrating both online and offline mode play with the participants, and even participants can play among themselves just after the presentation.

I will provide an online link to everyone so they can play anytime. For offline physical cards, I will bring a limited number of sets to play with the participants.

This game has the potential to be included in astronomy curriculum, though it requires at least 3-4 months of proper sky observation practice to be an effective aid to strengthen the observations. **This game has to be used during the training and practice period to be most effective.**

Poster Session / **77**

Innovating Earth and Space Exploration Education: Overcoming Challenges and Advancing Best Practices through Project-Based Learning in Malaysian Lower Secondary Science Classrooms

Author: THILAGAVATHI ARICHANAN[None]

This study explores how Project-Based Learning (PBL) can transform the teaching of Earth and Space Exploration topics within the Malaysian lower secondary Science curriculum, specifically focusing on Form 1 (Earth's rotation and revolution) and Form 3 (space exploration and satellite technology). Despite these topics' potential to inspire scientific curiosity and critical thinking, their implementation is often hampered by challenges such as limited teacher expertise in astronomy, lack of hands-on resources and digital tools, and environmental constraints like light pollution and weather conditions that hinder real-time observation.Using a qualitative approach, data was collected through teacher interviews, classroom observations, and analysis of student project outputs. The study highlights how PBL strategies—such as student-designed models of the solar system, simulated satellite launches, and digital storytelling of space missions—foster deeper understanding, creativity, and engagement. Best practices include the integration of technology-based tools (e.g., astronomy simulation apps and AR platforms), cross-curricular STEM collaboration, and partnerships with local science centers and observatories. Findings reveal that PBL addresses content-related challenges and enhances

21st-century skills such as problem-solving, communication, and teamwork. The study concludes by advocating for structured teacher training, curriculum flexibility, and institutional support to scale up PBL in astronomy education across Malaysian schools.

Poster Session / **78**

Enhancing Student Competency through Astronomy Camp Leading to Planetarium-Based Public Outreach in Mueang Soem.

Author: Ekkachai Chanta[1]

[1] *Soemngamwitthayakhom School*

The "Astronomy Camp for Enhancing Student Competency toward Planetarium-Based Outreach for the People of Mueang Soem" was organized with the objective of fostering knowledge, practical skills, and the ability to organize astronomy-related activities among student leaders of the astronomy club and other interested students at Soemngam Witthayakhom School. The project aimed to build confidence among student leaders in conducting astronomy activities at their own school and in expanding these activities to schools within the educational network. A key focus was delivering astronomy outreach through a mobile planetarium, supplemented with activities and resources from the National Astronomical Research Institute of Thailand (NARIT). The camp included various components: astronomy lectures, hands-on workshops on constructing simple angle-measuring instruments, and rotating activity stations such as telescope setup training, "whispering through the telescope," star myths, planetarium sessions, stargazing apps, naked-eye night sky observation, telescope-based celestial observation, morning sky watching, constellation image quizzes, and STEM-based landing module activities. The camp was supported by experts from the Astronomy Club of the Faculty of Science, Chiang Mai University, and Grade 12 student leaders who previously completed the NARIT Astronomical Society camp. The evaluation of participants' opinions and satisfaction revealed that both project implementation and individual camp activities received the highest level of satisfaction. As a result, the astronomy club student leaders were able to independently organize and lead outreach activities, extending their efforts to network schools, including Lampang Kanlayanee School (Mueang District, Lampang Province), Anuban Soemngam School, Sanpong Witthaya School, and Ban Pong Paeng School (Soemngam District, Lampang Province).
Keywords: Astronomy Camp, Student Competency-Based Learning, Astronomy Club.

Oral Presentation / **79**

Challenges in Online Astronomy Education: Misi Luar Angkasa.id

Authors: Fera Gustina Purwati[1]; Dwi Yoshafetri Yuna[None]; Karina Randani[None]; Epa Lesmana[None]

[1] *Misi Luar Angkasa.id*

Misi Luar Angkasa.id (MLA) is a startup dedicated to bridging the gap in astronomy education for children in Indonesia by connecting them with experts, including ITB astronomy graduates and field professionals. MLA has successfully conducted 14 online classes, three hybrid excursions to Bosscha Observatory, and astronomy workshops, collaborating with Bosscha Observatory, ITERA, Apa di Langit, Pustakalana and BAMANTARA EEPISAT PENS. However, online astronomy education faces challenges, including varying student comprehension levels, limited interaction hindering student engagement in virtual settings, and the need for broader outreach to increase participation. We hope by implementing interactive learning strategies, effective engagement techniques, and robust promotional efforts, MLA can enhance the impact of online astronomy education and reach more young learners passionate about space exploration.

Oral Presentation / 81

From Misconception to Acquisition: Using Mobile Science Outreach to Address Common Astronomy Misconception in Underserved Philippine Regions

Author: Gene Aaron Osorio[None]

Astronomy has long been a cornerstone of space science, igniting one's curiosity and critical thinking through explorations to unlock the mysteries of the universe. With numerous concepts and understanding in the space domain emerging, several astronomy misconceptions, such as definition of constellations, concept of black holes, nature in gravity in space, persists among mid-learners, particularly in underserved regions where access to quality science education and visual learning tools is limited. This study aims to address these common misconceptions through a mobile science outreach initiative, SpaceTime Events and Exhibits, implemented in underserved communities in the Philippines.

The outreach will integrate a transportable digital dome and a guided astronomer talk within a five-station science learning program. These informal educational tools are designed to provide immersive, experiential learning that complements classroom instruction. To assess the effectiveness of the intervention, students will complete pre- and post-event diagnostic assessments focused on specific astronomy misconceptions. The anticipated findings are informed by prior studies in informal science education, suggesting that visual and interactive learning experiences lead to greater conceptual change than traditional methods alone.

This research contributes to broader global education goals by presenting a scalable model for improving astronomy education in low-resource settings. Insights gained from the study aim to inform strategies for integrating informal learning into national science education frameworks, particularly in developing countries across the Global South, where equity gaps in STEM remain a pressing concern.

Poster Session / 82

Empowering the Next Generation of Astronomers: A Decade of Astronomy Education and Olympiad Development in Malaysia

Author: Wooihou Chan[None]

Over the past twelve years, my journey as an international high school teacher specializing in A-Level Physics and Astronomy has been dedicated to advancing astronomy education and fostering student excellence in Malaysia, Thailand and beyond. In 2013, I initiated Malaysia's participation in the International Olympiad on Astronomy and Astrophysics (IOAA), laying the groundwork for sustained national involvement in this prestigious competition. Since then, I have trained over 50 outstanding students from diverse schools in advanced astronomy and astrophysics, leading the Malaysian team to achieve 6 bronze medals and 6 honorable mentions.

As the founder and leading teacher of a few astronomy clubs that engaged over 500 students, I sparked widespread interest in the universe.

My rigorous training programs emphasize theoretical lessons, and problem-solving, preparing students for practical telescope operation and observations skills. As a Planetarium Manager at an international school, I managed interesting planetarium shows and delivered interactive sessions, inspiring students and the public through STEM outreach initiatives.

This presentation will share my journey in building a competitive astronomy education framework, addressing challenges like resource constraints and cultural perceptions of science. These insights align with K-12 Astro Asia's mission to unite Asian educators in sharing innovative practices and regional perspectives. I will discuss strategies for engaging students in astronomy and fostering international collaboration, drawing parallels with Thailand's advancements in astronomy education.

Oral Presentation / 83

The Process of Uncovering the Secrets of Nearby Astronomy : An Active Learning Activity Set to Foster Analytical, Computational Thinking, and Investigative Skills

Author: Pachareeya Chonhai[None]

This set of activities was developed for the astronomy elective course offered since 2022 to upper secondary school students in the Science-Mathematics program at Satthasamut School. The primary goal is to enhance students' skills in analytical and computational thinking, observation, and inquiry within the field of astronomy, helping them recognize its relevance to everyday life and foster a deeper interest in astronomical learning.

In the previous academic year, the activities combined project-based learning and lesson analysis from research studies. However, limited foundational knowledge and varying academic levels made comprehension difficult for many students. In the current academic year, the teacher has redesigned the learning activities to better align with students' contexts. The content scope was structured around accessible observational astronomy topics, sequenced from the study of the Moon, planets in the Solar System, introductory exoplanet studies, to basic sky observations. The activity set was developed under the concept of active learning, encouraging students to engage in hands-on activities and apply analytical reasoning, computational thinking, observation, and inquiry skills.
The activity set, titled "The Process of Uncovering the Secrets of Nearby Astronomy," spans 30–35 hours and is aimed at Grade 10–12 (equivalent to M.4–M.6) students. It comprises four learning units:
Unit 1: The Moon
- Lunar phases and moonrise/moonset times
- From Lunar Eclipse to Earth's Size Estimation
- Measuring lunar crater sizes
Unit 2: Planets in the Solar System
- Exploring our solar system
- Kepler's laws: planetary motion
- Kepler's laws: calculating planetary masses
Unit 3: Exoplanets
- Analyzing exoplanet data
- Methods and resources for studying exoplanets
Unit 4: Basic Sky Observations
- Celestial coordinate systems
- Identifying stars
Evaluation results indicated that the activity set successfully enhanced students' skills in computational thinking, analytical reasoning, observation, and inquiry. Over 52% of the students demonstrated high proficiency in these process skills. Satisfaction surveys showed that 92.9% of the students significantly expanded their astronomical knowledge. Individual interviews further revealed that the activities broadened students' perspectives on astronomy, made the subject more engaging, and inspired them to pursue further learning in the field of astronomy.

Oral Presentation / 84

FLY ME TO THE SUN: A Game-Based Learning Innovation for Solar System Education

Author: Nidawan Changtong[1]

[1] *Sankhampheang school*

"FLY ME TO THE SUN" is an educational board game developed as part of an extracurricular astronomy club initiative to promote understanding of the Solar System. Rooted in game-based learning and the 5E instructional model, this project enhances student engagement and science literacy through interactive play and collaboration.

Students explore planetary features, simulate space travel, and collect resources by answering astronomy-related questions. The storyline casts players as space travelers journeying toward the Sun, with learning objectives embedded in the mechanics. The game is supplemented with pre- and post-classroom activities, including collaborative research and presentations on planetary science.

The project was implemented with Grade 11 students at San Kamphaeng School. Results showed a significant increase in post-test scores (from 11.3 to 15.98 out of 20), and 98.8% of students reported high satisfaction. The game also demonstrated strong potential as both a classroom tool and an extracurricular activity.

This initiative illustrates how student-designed games can foster creativity, scientific inquiry, and 21st-century skills, making astronomy education more accessible and enjoyable.

Oral Presentation / 86

Empowering Young Minds through the Abdul Jabbar Astronomy Workshop: A Model of Informal STEM Learning in Bangladesh

Authors: Shafayet Rahman[1]; Farseem Mannan Mohammedy[2]

[1] *National Outreach Coordinator Office – Bangladesh (NOC-BD), IAU Office for Astronomy Outreach (IAU-OAO)*

[2] *National Outreach Coordinator, NOC-Bangladesh Office, IAU Office for Astronomy Outreach (IAU-OAO)*

Since 2009, the Abdul Jabbar Astronomy Workshop has emerged as a flagship program of the National Outreach Coordinator (NOC)-Bangladesh Office under the IAU Office of Astronomy Outreach (OAO). Named after one of Bangladesh's pioneering astronomy educators, this initiative aims to foster interest and foundational understanding of astronomy among higher secondary and undergraduate students through informal STEM education methodologies.

Held annually, usually in the capital city Dhaka, and now distributed across multiple regions—including Chattogram and Rajshahi cities—this workshop integrates engaging theoretical sessions with interactive, hands-on activities, fostering a participatory learning environment. Leveraging informal learning pedagogies highlighted by Alexandre et al. (2022), the program emphasizes collaborative exploration, critical thinking, and sustained student engagement beyond conventional classroom settings. Session topics include cultural astronomy, positional astronomy, planetary science, stellar astrophysics, introducing sky-observing softwares and telescopic observations, astrobiology, and cosmology, delivered by an international array of experts and educators, both offline and online.

The workshop curriculum is further enriched by the guiding framework of the Big Ideas in Astronomy—a globally endorsed set of 11 core concepts developed by the IAU to help educators communicate key astronomical principles. These Big Ideas and their nested elaborations offer a coherent structure for planning learning outcomes and designing outreach content aligned with evolving scientific understanding.

A notable feature of this Workshop is its measurable impact. Utilizing pre- and post-workshop assessments, significant improvements in participants' conceptual grasp and scientific reasoning have been documented, echoing the findings of Trott & Weinberg (2020) who identified transformative outcomes associated with participatory and action-focused pedagogies. Furthermore, aligning with findings from Contente & Galvão (2022), the workshop demonstrates enhanced cognitive and metacognitive competencies among students through interdisciplinary problem-solving activities.

Driven by the enthusiastic efforts of national volunteers, translation teams, and regional astronomy societies, this Workshop series exemplifies a scalable model of informal STEM learning capable of bridging educational gaps and promoting widespread interest in astronomy. Over the decades, we have incorporated pedagogical research results to continuously improve the workshop deliverables.

This paper details the workshop's structure, impact evaluation methodologies, encountered challenges, and insights from organizing multiple editions, underscoring the significance of informal, inclusive, and community-driven astronomy education in developing nations.

Poster Session / 87

Astronomy Camp On Tour (under the Project to Support and Promote Student Clubs and Reduce Study Hours)

Author: Pitsamai Seeponsaen[1]

[1] *Kuruprachasan School, Secondary Educational Service Area Office Maha Sarakham, Thailand*

Rationale

The Basic Education Core Curriculum B.E. 2551 (2008) is aligned with the National Education Act B.E. 2542 (1999), Section 6, which states that education must aim to develop Thai people into fully-rounded individuals—physically, mentally, intellectually, ethically, and culturally—so that they can live happily with others in society. The curriculum emphasizes a learner-centered approach, encouraging students to grow into morally upright, competent individuals capable of thriving in the modern world.

Astronomy Camp On Tour is an alternative form of science learning that enables students to understand and apply astronomical knowledge to everyday life. It fosters new insights, develops critical thinking skills, and cultivates interest in science for the future. The program incorporates hands-on learning activities, scientific thinking processes, and experiments. It blends astronomy, science, and environmental education outside the classroom through real-world observation, such as celestial object tracking and learning about astronomical phenomena, structured in learning stations.

This active learning approach inspires curiosity and a scientific mindset among students, sparking behavioral changes toward a greater interest in astronomy and its connection to daily life. Through experiences like stargazing with telescopes, students enjoy both educational value and teamwork-building fun.

Based on activities conducted with students from the Science, Mathematics, and Technology Special Program, as well as regular students of Chiang Yuen Pittayakhom School in Maha Sarakham Province (under the Maha Sarakham Secondary Educational Service Area Office), it was found that many students lack fundamental understanding and skills in astronomy. This is primarily due to insufficient access to appropriate equipment, making it difficult to fully implement a student-centered learning approach. Therefore, this camp offers a valuable opportunity for students to gain hands-on experience with real equipment, engage with knowledgeable instructors, and enhance their interest and enthusiasm. It also helps identify talented students who can represent their schools in astronomy-related competitions.

Moreover, many primary and secondary schools in the Chiang Yuen Pittayakhom service area still lack access to astronomical knowledge and technology, as well as adequate teaching materials and equipment. This has resulted in low student awareness, interest, and skills in astronomy.

To address this gap, the Science and Technology Learning Area of Chiang Yuen Pittayakhom School has initiated the Astronomy Camp Project, in line with the Basic Education Core Curriculum. The project aims to instill scientific thinking processes in lower and upper secondary students, extending opportunities, knowledge, and modern astronomical techniques to network schools in the area. This initiative allows students to gain first-hand experience, broaden their worldview, enhance their scientific skills, and apply their learning meaningfully in everyday life.

1. Objectives

1.1 To enhance students' knowledge, understanding, and process skills in the field of astronomy.

1.2 To provide students with hands-on practice using telescopes and astronomical equipment, including real-sky observation.

1.3 To foster enjoyment and engagement in learning through scientific inquiry, teamwork, and collaborative living.

1.4 To establish an astronomy network among schools within the service area.

1.5 To cultivate a positive attitude toward learning science and astronomy among students.

2. Targets
2.1 Quantitative Targets
2.1.1 100% participation rate from 200 students, including students from Chiang Yuen Pittayakhom School and partner schools within the service area.
2.1.2 At least 70% of participating students will achieve a passing score on the overall activity-based assessment.
2.1.3 Participating students will express a satisfaction level of "very good" regarding the program activities.

2.2 Qualitative Targets
2.2.1 Students will demonstrate increased knowledge and improved process skills in astronomy.
2.2.2 Students will gain hands-on experience using telescopes, astronomical tools, and conducting real-sky observations.
2.2.3 Students will enjoy the learning experience, engage in scientific thinking, develop teamwork skills, and learn to live harmoniously with others.
2.2.4 Students will develop a positive attitude toward studying science and astronomy.
Achievement of Objectives
A total of 253 students from four primary schools participated in the Mobile Astronomy Camp. Through a variety of engaging activities, students gained diverse knowledge and were inspired to develop a deeper interest in astronomy.
Participant satisfaction was rated between "good" and "very good," with an average score of 4.60, indicating a very high level of satisfaction with the overall experience.enter link description here

Oral Presentation / 88

ITCA Teacher Training Workshop: Expanding Access to Astronomy Education Through International Teacher Training

Author: Rujida Kuramarohit[None]

Astronomy education has received more interest in recent years. However, there are still increasing demands for access to professional astronomical resources, and gaps in accessibility is still a recurring problem in many regions around the world. To help bridge this gap and promote equal access to educational opportunities, the ITCA Teacher Training Workshop was developed for an international audience. The primary objective of this workshop is to equip educators—the vital component in passing on knowledge to future generations—with practical tools, accurate content, and inclusive approaches to improve astronomy instruction in diverse classroom settings.

Many educational systems in various regions still rely on traditional, passive learning methods that have difficulties in keeping up with the needs of today's learners. As such, hands-on and active learning activities, connecting astronomy to real-life experiences relevant to teachers and students, were key to the workshop. For instance, reconceptualizing familiar phenomena through an activity comparing themselves to the Earth to learn the moon phases more clearly. Realizing the vast scale of the solar system simply by walking through a scale model, without leaving the ground. The materials used in all activities are widely available and easily adaptable with local resources—ensuring that teachers could confidently bring these activities into their own classrooms. The workshop has been conducted with collaboration with local partners across Southeast Asia, including Laos, Myanmar, Malaysia, Timor-Leste, Singapore, Indonesia, and Vietnam. It has also expanded to other regions, such as Nepal and Botswana.

The participants gained effective and accurate methods for communicating astronomy in a simple and accessible manner, and they were inspired by unique experiences and fresh ideas that they can apply and implement in their instructional contexts—passing on knowledge from generation to generation. These outcomes help ensure that astronomy can connect people across borders in a sustainable way. Future collaborations with interested partners from around the world are welcomed, with the aim of continuing to encourage educators globally, aligning with NARIT's mission "Leave no one behind."

Poster Session / 89

Astronomical Activities Inside and Outside the Classroom to Enhance Astronomy Learning Skills Through a STEM Approach.

Author: boonyarit Choonhkit[1]

[1] *National Astronomical Research Institute of Thailand (NARIT)*

The Nakhon Ratchasima Regional Observatory provides services such as planetarium shows, astronomy exhibitions, and stargazing activities with telescopes for schools, organizations, and the general public. Due to the high number of visitors and the limited capacity for group visits to the planetarium and exhibitions, we have designed activities and produced astronomy media as alternatives. These activities aim to enhance astronomical learning skills, inspire interest, and develop skills in using astronomical equipment through a STEM approach. They align with existing astronomy curricula in schools, covering topics such as the occurrence of day and night, the changing seasons, Moon phases, the Sun's rotation, measuring star distances using parallax, calculating crater sizes on the Moon, the solar system model, zodiac constellations, celestial sphere rotation, H-R diagrams, stellar evolution, and telescope usage.
Schools can choose activities based on their available time. For the general public, family-oriented sessions are available twice a month on Saturdays. Feedback indicates that the observatory has been able to accommodate an increasing number of schools with over 150 students. Sometimes, smaller schools with fewer than 50 students also show interest in supplementary activities. According to satisfaction surveys, students have gained more knowledge, enjoyed the activities, and improved their skills in using astronomical equipment.

Keynote Speaker / 90

An Overview of Formal and Informal Astronomy Education in Taiwan: Current Status and Challenges

Author: Hao-Yuan Duan[1]

[1] *Taipei Astronomical Museum*

This talk will give an overview of astronomy education in Taiwan, covering both the formal school curriculum and the informal outreach efforts led by the Taipei Astronomical Museum.

Astronomy is included in Taiwan's 12-year basic education curriculum, revised in 2019 to emphasize interdisciplinary and competency-based learning. However, the current structure presents several challenges: content is split between physics and earth science, instructional time is limited—especially in junior high—and topic arrangement across grade levels lacks coherence. In some cases, the same concepts appear repeatedly without clear progression. A shortage of teachers with formal astronomy training adds to the problem.

To address these issues, a working group of educators and science education scholars was formed to review the curriculum and propose improvements. Key directions include reassigning basic topics like moon phases and the solar system to more appropriate grade levels, reserving abstract topics such as galaxies and cosmology for senior high, and strengthening both observational practice and teacher training. This talk will also introduce Taiwan's curriculum framework and share international comparisons to encourage collaboration.

On the informal side, this talk will introduce the work of the Taipei Astronomical Museum. Established in 1996 and operated by the Taipei City Government, the museum's most prominent feature is its planetarium, which boasts a 25-meter diameter hemispherical dome—the largest in Taiwan—with a seating capacity of 304. The planetarium combines a digital projection system with a Zeiss optical system to present immersive star shows, each concluding with a live constellation tour. The museum also includes a three-floor exhibition hall (each floor covering approximately 10,000 square

meters), a 3D theater, the Cosmic Adventure ride, and two public observatories—one of which offers daily solar observation.

Beyond these facilities, the museum is also deeply committed to outreach activities, with a focus on engaging students from elementary to junior high school, as well as promoting lifelong learning for adult and senior audiences. These initiatives aim to spark curiosity and interest in astronomy, support science learning beyond the classroom, and make the Taipei Astronomical Museum a key educational resource across all age groups. The audience will gain insights into the museum's programs and facilities and explore potential collaborations with the institution.

Oral Presentation / 92

The ASEAN Astronomy Camp (AAC) 2025

Author: yadanan inta[None]

The ASEAN Astronomy Camp (AAC) 2025, was Designed to enhance astronomical learning and cultural exchange among youth aged 15-19 from across the ASEAN region.It also aims to stimulate interest in astronomy and science careers, which can inspire youth to pursue these fields and to provide a valuable opportunity to promote cultural exchange and grants access to astronomical resources and facilities in other regions. This helps young individuals to learn about and respect diverse backgrounds. Crucially, it also serves to build valuable international networks and relationships among participants, potentially leading to future collaborations. This year, the camp attracted significant international interest, receiving 317 applications. A total of 42 participants were selected from over 11 nationalities across Asia, including Thailand, Vietnam, Myanmar, Cambodia, Malaysia, Singapore, Indonesia, the Philippines, India, Bangladesh, and Japan. The camp took place from March 11-14, 2025, at the Princess Sirindhorn AstroPark in Chiang Mai and Doi Inthanon, renowned as one of Thailand's best stargazing locations. Apart from many engaging activities, participants had the unique opportunity to visit advanced astronomical observatories and laboratories, among the most sophisticated in Southeast Asia. and NARIT's advanced engineering and innovation laboratories at the AstroPark headquarters. This allows for the participants to explore their interest along with learning of many other career options related to astronomy. A core highlight of the camp was the cross-cultural exchange, where diverse young participants shared their astronomical fascination and built friendships under Thailand's night sky. This unique opportunity to learn and connect over shared scientific interests also empowered participants in their personal discovery journeys. The camp atmosphere was vibrant and dynamic; despite language differences, participants quickly formed bonds, developing communication skills, forging new friendships, and gaining novel experiences through a rich variety of astronomical activities.
The ASEAN Astronomy Camp (AAC) 2025 was more than just an astronomy camp, It was a long-term investment in nurturing the next generation of astronomy leaders from the region to the global stage. It stood as clear proof that astronomy has the power to connect people across cultures, ignite curiosity, and propel lifelong learning into the future.
keyword: AAC 2025, ASEAN, International

Oral Presentation / 93

Outreach Sarabhai: Making space more accessible in the extremes of India and beyond

Author: Sibsankar Palit[1]

[1] *LIFE-To & Beyond Foundation*

India is the land of unity in diversity. It offers unique challenges when it comes to delivering quality, affordable, and accessible astronomy education to students, especially in its most remote and marginalized regions. Inspired by the vision and efforts of Dr. Vikram Sarabhai, the father of the

Indian space program, the LIFE-To & Beyond Foundation came up with the Outreach Sarabhai initiative in 2022 that seeks to bring space to the mainstream discussions. Some of our efforts help bridge the accessibility gap in astronomy and space education through space-themed online events, targeted physical outreach workshops, inclusive pedagogy, and innovative partnerships. We foster experiential and inquiry-based approaches to learning. The program integrates hands-on activities, local language (like Hindi, Bengali, Tamil, and more) resources, and community engagement to foster scientific temper and curiosity among students from diverse backgrounds. For the last 3 years, we have been involved in collaborative efforts with organizations such as the Pratham Education Foundation and pilot studies with the Astronomical Society of India (ASI), Homi Bhabha Centre for Science Education (HBCSE) and International Astronomical Union (IAU) impacting more than 500 rural and tribal kids physically across the remotest parts of India states including West Bengal, Chhattisharh, Maharashtra, Rajasthan, and Uttar Pradesh. Grassroots outreach experts enable the deployment of astronomy kits and training in linguistically and culturally relevant formats, ensuring that physical, economic, and societal barriers are addressed. Special emphasis is placed on including girls, students from rural and tribal areas, and those from other underrepresented communities, thus embodying the principles of accessibility, diversity, equity, and inclusion. The outcomes demonstrate that with adaptive strategies and sustained effort, astronomy and space can become a gateway to STEAM learning and empowerment, even in the extremes of India. This model offers valuable lessons for the broader Asian context, underscoring the importance of localized, inclusive outreach in building a scientifically literate and equitable society.

Poster Session / **94**

NARIT Public Night: Enhancing Lifelong Learning Through Astronomy

Author: Siwarut Ploydang[1]

[1] *National Astronomical Research Institute of Thailand (NARIT)*

One of the primary goals of NARIT's outreach is to offer hands-on experience in astronomy to the public. Apart from the special astronomical events and specialized camps, the staple part of this program is serviced to the public via our 'NARIT public night' through our observatories for the public every Saturday Night. At Princess Sirindhorn Astropark, we do not only aim to educate and offer stargazing experience to the public, but we also hope to be part of the community. The 'NARIT public night' event is to give an opportunity for people to observe a lot of celestial objects through different kinds of telescopes. Moreover, visitors will get knowledge of astronomy by NARIT's staffs. We explain the basic techniques for observing the night sky. While the main activity remains observe celestial objects through telescopes, various activities are also supplemented to cater to participants of different age groups and backgrounds. Awards and points system is also implemented via smartphone to offer the participants something to look forward to for a revisit. It has been proven that these methods are quite effective at retaining participants and becoming part of the community since the vast majority of visits came from repeating visitors.

Oral Presentation / **95**

Empowering Science Educators in Valenzuela City, Philippines Through Workshop

Author: Mark Benedick Topinio[1]

Co-authors: Moreen Lamsen [1]; Querubin Timogan [1]

[1] *Valenzuela City League of Astronomy Enthusiasts (V-CLUE)*

Empowering teachers and educators is vital in building a strong foundation through meaningful and engaging teaching strategies. This empowerment plays a key role in enhancing student learning

while nurturing adaptive, globally competitive learners. Astronomy training allows science educators to create dynamic learning experiences, where students engage with complex concepts about the universe, fostering scientific literacy, curiosity, and critical thinking. It also equips educators to instill enthusiasm and knowledge to others through effective educational methods and practices. However, in many schools across Valenzuela City, Philippines, science equipment, especially telescopes, is underutilized. Often, these tools are simply stored or displayed in the laboratories without being actively used. Additionally, some teachers lack the ability and training to assemble, maintain, or operate telescopes. Although many are well-versed in theoretical concepts, there remains a gap in integrating laboratory equipment into classroom instruction. Hence, the Valenzuela City League of Astronomy Enthusiasts (V-CLUE), in partnership with the Valenzuela City Academic Center for Excellence (ValACE), a local library in the Valenzuela City organized a teacher's training as part of the celebration of National Astronomy Week (NAW) 2025. This initiative featured an engaging telescope workshop for science teachers from selected schools in the city. Through this training, educators gained practical skills and developed their competence to conduct telescope-based activities. Beyond addressing the underutilization of equipment, the workshop emphasized the importance of equipping educators with hands-on experience and support, enabling them to incorporate the skills gained into their teaching practices. Thus, empowering teachers enhances their understanding of astronomy, enriches students, and helps instill curiosity to the next generation of space explorers. This effort serves as a headway toward transforming idle equipment into powerful educational tools that bring astronomy to everyday classroom experiences.

Oral Presentation / **96**

NARIT Astronomical Society (NAS), Astronomy club network for High school student in Thailand

Author: jessada Keeratibharat[1]

[1] *NARIT*

Astronomy club in Thailand was not very widespread in schools and establishing one can be challenging. NARIT Astronomical Society (NAS) is a series of astronomy camps specifically tailored with the goals of facilitating the establishments of astronomy clubs in schools in mind. Participants get to learn relevant skills in amateur astronomy, exchanging their ideas and creating a sense of community with peers who share similar interests.
Over the 10 years that NAS has been organized, we have trained over 500 participants from 50 astronomy clubs and 50 schools.
With the addition of NAS Virtual Camp Online, we were able to expand our reach and create a virtual meeting space where over 3,000 members were able to exchange ideas and develop their own to be implemented in their own clubs.
In the result overing 10 years of NAS, we can experience that the Astronomy club is an efficient first community in school for students to get their first exposure to Astronomy in several aspects in terms of practical knowledge, astronomy project and public outreach. By Creating an annual specialized training program, NAS was able to take the lead into creating a community where astronomy clubs across Thailand are able to justify their existence and have a lasting place where they can freely communicate, engage, and learn from each other.

Workshop / **97**

DIY Planetarium

Authors: jessada Keeratibharat[1]; Khomsan Thuree[1]

[1] *NARIT*

Planetarium has always been a powerful learning tool to get students engaged in astronomy. However, planetariums are cost prohibitive. In this workshop, we offer a cost effective solution in which

a DIY planetarium can be made using sections of triangular cardboards held together by paper clips. Participants will together learn how to construct and finish building a cardboard dome and then setting up a projector reflecting off a spheric mirror onto the dome. The spheric mirror projection can be used in conjunction with freeware such as stellarium or openspace. This system can be used to supplement classroom and education, play fulldome movies, or used as an alternative way to display or attract crowds during science week or traveling exhibit. This DIY planetarium is the same setup NARIT has been distributing to over 130 participating schools since 2022.

Oral Presentation / 98

CAAS : the Conference on Astronomical Activities in School

Author: jessada Keeratibharat[1]

[1] *NARIT*

Thailand is one of the few countries with astronomy as part of the required curriculum in secondary schools. As a result, there are many astronomy teachers in Thailand. With increasing interest in astronomy, there are now more than ever many astronomical activities, both formal and informal in schools. In order to support the growing interest, the Conference on Astronomical Activities in School (CAAS) was established. In this annual conference, teachers can gather to share the activities they have accomplished with their peers. This is aimed to be a venue in which best practices in astronomy education are shared, reinvigorate their passion, provide incentives and inspiration for now and upcoming teachers, and teachers can learn new activities via workshops. Moreover, by awarding outstanding achievements made by the teachers in this conference, this allows for ways in which teachers are recognized and awarded for their arduous work.

Poster Session / 99

KAENG Sky Near Me

Author: Mr.Saharat Kaewnaihin[1]

[1] *SESA Chan Trat*

The “KAENG Sky Near Me” project, is organized by the Kaenghangmaewpittayakarn School Astronomy Club, aims to promote basic astronomy education among primary school students in Kaeng Hang Maew District. The project encourages students to explore the night sky from their own homes or schools, inspiring curiosity and self-directed learning through hands-on activities. It also provides Astronomy Club members with opportunities to develop their knowledge, leadership, teamwork, and organizational skills, which are beneficial for future education and career paths.
The activities, conducted from July 2024 to March 2025, followed the POLARIS Model and included topics such as moon phases, using star maps, observing planets and celestial objects through telescopes, light painting, zodiac constellations, solar observation, and micro:bit robotics which is the basic of Aerospace studies. The target group was 2,450 primary students in the district. The project was evaluated through participation, student-created work, satisfaction surveys, and feedback through lesson study from organizers to improve future implementations.
The results showed that participating students became more familiar with the sky in their local area, developed positive attitudes toward astronomy, gained knowledge and skills applicable to both academic learning and daily life.

Poster Session / 100

Smartphone Astronomy: Observing the International Space Station

Author: Narong Metpada[1]

[1] *Chiangmai University*

This paper presents a hands-on educational activity that explores practical astronomy and physics through the observation and analysis of the International Space Station (ISS) using smartphone photography. By taking advantage of modern smartphone cameras' ability to capture bright objects in the night sky, the activity connects direct observations of the ISS to key physics concepts, including celestial coordinate systems, apparent magnitude, circular motion, and gravitational acceleration. The procedure involves predicting ISS flyovers, recording video, analyzing frames to measure angular velocity, and calculating the ISS's orbital speed and the gravitational acceleration at its altitude. The results show reasonable accuracy, and the discussion highlights factors affecting precision, such as the observer's position relative to the ISS orbital plane. This activity demonstrates how everyday technology can support meaningful and engaging STEM exploration.

Oral Presentation / 101

A study of students' basic concepts of astronomy using an Astronomy Diagnostic Test (ADT)

Author: Chaiyapong Ruangsuwan[1]

[1] *Khon Kaen University*

To enhance astronomy outreach activities, this research investigated the baseline conceptual understanding of secondary school students in northeastern Thailand. We administered the Astronomy Diagnostic Test, Thai version (ADT-TH v2.1), to 168 students in a science-focused program at a large secondary school prior to their participation in a 'Sci-School Lab' outreach event hosted by the Faculty of Science, Khon Kaen University. The ADT-TH, adapted from the CAER ADT v2.0, is a 21-item multiple-choice instrument validated for the Thai context. Analysis of student responses revealed significant misconceptions. Over 50% of students answered correctly on only three concepts: the relative distance of celestial objects, the center of the universe, and the relationship between a star's color and temperature. Notably, the concept of weightlessness was the most challenging, with only a 3% correct response rate. These findings provide a clear diagnostic of student difficulties and are being used to design targeted, hands-on activities for the Sci-School Lab program. The validated ADT-TH will also serve as a pre/post-test instrument to measure the effectiveness of these new activities.

Poster Session / 102

A Study of Learning Achievement and Satisfaction Using the 5E Inquiry-Based Learning Integrated with Indigenous Astronomy Activity Sets in Science Subject for Grade 4–6 Students

Authors: Arif Dueramae[1]; Nurai Ngasaman[2]; Nareemas Chehlaeh[3]

[1] *Chao Thai Mai School (Dome–Thaksin Anusorn), Phang Nga Province*

[2] *Ban Koh Klang School, Krabi Primary Educational Service Area Office*

[3] *Prince of Songkla University*

Astronomy education at the elementary level often lacks connection with students' cultural and lived experiences, particularly in regions with distinct ethnic identities. This study aimed to examine learning achievement and student satisfaction using the 5E inquiry-based learning model integrated with indigenous astronomy activity sets developed from the "Laboon" legend of the Moklen ethnic group in Ban Thap Pla, Phang Nga Province. The participants were 70 Grade 4–6 students at Chao Thai Mai School (Dome–Thaksin Anusorn), 38 of whom (54.29%) were Moklen. The activities were implemented during regular science classes and followed the 5E instructional phases: Engagement, Exploration, Explanation, Elaboration, and Evaluation. Lessons incorporated cultural elements, including storytelling, questioning, constellation design, and student presentations. Research instruments included a pre- and post-test and a satisfaction questionnaire. The results revealed that the average pre-test score was 40.25%, which increased to 85.15% after the intervention. Student satisfaction was rated "very high" ($\bar{X}$ = 4.67, SD = 0.32). These findings suggest that integrating indigenous astronomy with inquiry-based learning effectively enhances science understanding and supports culturally relevant education, especially for learners in remote and ethnic communities

Oral Presentation / 103

The Transformative Role of the Astronomy Olympiad Framework in Advancing Astronomy Education in the Southernmost Provinces of Thailand

Authors: Nareemas Chehlaeh[1]; Nusreen Masae[2]

[1] *Prince of Songkla University, Pattani Campus*

[2] *The Waeng District Office, Narathiwat Province*

This study aims to investigate the transformative impact of the Astronomy Olympiad framework in advancing astronomy education in Thailand's five southernmost provinces—Pattani, Yala, Narathiwat, Satun, and Phatthalung—where access to advanced science education has long been limited. Set against the backdrop of socio-political complexity, cultural diversity, and educational disparity, Olympiad-related activities have played a crucial role in reshaping how astronomy is taught, valued, and integrated into local school systems. Using qualitative methods, including in-depth interviews with science teachers, students, and school administrators, as well as field observations and group discussions with Olympiad participants, the research reveals that the Olympiad has evolved beyond a competition into a catalyst for educational development. Teachers identified it as a turning point that motivated them to pursue professional training, update teaching practices, and collaborate with peers across schools. Several schools introduced astronomy clubs, training sessions, and selection systems to support student participation. For students, the Olympiad transformed astronomy from an abstract subject into an exciting, hands-on experience. Many gained their first exposure to observational tools, scientific reasoning, and the dynamics of academic competition, which for some became a pathway to further studies and careers in science. Administrators, in turn, began to view Olympiad participation as a metric of institutional quality, prompting broader support for astronomy education. In the absence of the Olympiad framework, astronomy would likely remain marginalized due to a lack of expertise, equipment, and standardized materials. The Olympiad fills this gap by providing structure, motivation, and recognition, elevating astronomy into a meaningful component of science education in the region. In conclusion, the Astronomy Olympiad has emerged as a powerful vehicle for systemic change. It fosters teacher development, student engagement, and institutional collaboration, offering a model for how localized academic programs can effectively enhance science education in underserved and culturally complex regions.

Poster Session / 104

Hands-on Astronomy Activity on the Solar System for Small Rural Classrooms: Active Learning and Problem-Based Learning with the C.I.R.C.L.E Model

Author: Urairat Promhong[1]

[1] *Nong Thom Witthaya School,*

Nong Thom Wittaya School is a small rural school in Sisaket Province, in the lower northeastern region of Thailand. The school faces limitations in teaching materials, equipment, and budget for conducting practical astronomy learning. Most students perceive astronomy as distant and irrelevant to their daily lives.

This project was therefore designed to develop a set of hands-on astronomy activities using local and recycled materials. The goal is to help students understand fundamental astronomy concepts and connect them to real life in a concrete way. The activities adopt Active Learning, Problem-Based Learning (PBL), and the C.I.R.C.L.E Model, which consists of six steps:
Connect (linking to the problem) → Investigate (exploration) → Reflect (information analysis) → Create (building models) → Link (presentation and discussion for real-world application) → Evaluate (self-assessment and feedback).

The activities focus on three key components:
(1) Solar System Orbit Model: To help students understand the structure and relationships between the Sun, planets, and orbital zones, while developing systems thinking and spatial analysis skills.
(2) Sun Cutaway Model: To help students analyze invisible components such as sunspots and solar wind, and logically explain their effects on Earth.
(3) Space Weather Pathway Model: To help students visualize the connection from the Sun to Earth's magnetic field, GPS signals, communication systems, and high-voltage power grids, which enhances problem analysis and solution design skills.

The results from Semester 1 of the 2025 academic year are as follows:
• Behavioral Outcomes: 100% of students worked in groups and successfully built models, with all groups presenting and exchanging ideas.
• Academic Achievement and Learning Progress: The average pre-test score was 2.75 and increased to 8.00 after the activities. 100% of students scored at least 70% on the post-test, meeting the knowledge (K) criteria. The average Normalized Gain (g), used to measure learning progress, was 0.73, indicating significant improvement.
• Higher-Order Thinking Skills: 88.89% of students demonstrated creative thinking, while 77.78% showed complete problem-solving abilities.
• Student Satisfaction: The average satisfaction score was 4.65 out of 5, at a high to highest level. Students reported that the activities helped them better understand astronomy and connect it to real-life contexts.

Additionally, the activities include Peer Review using a rubric and Exit Tickets to ensure meaningful learning and provide feedback for students' self-improvement. Student feedback was also used to improve the activities' effectiveness.

Despite requiring minimal budget (Low Cost), this approach can deliver High-Impact learning outcomes by making abstract astronomy content easier to understand and relate to real-world situations.

This approach demonstrates that astronomy education can be implemented creatively, inclusively, and accessibly, even in small rural classrooms with limited resources. It can also be further developed and adapted to other topics in Earth and Space Science at the upper secondary level under the IPST curriculum, as well as expanded to other subjects to increase Low-cost High-impact learning opportunities for rural classrooms in a sustainable way.

Keywords: Active Learning, PBL, C.I.R.C.L.E Model, Low-cost, Astronomy Education, Rural Classroom

Keynote Speaker / 105

An over view of astronomy formal education in Japan and its challenges

Authors: Akihiko Tomita[1]; Shio K. Kawagoe[2]; Yumiko Oasa[3]

[1] *Wakayama University*

[2] *The University of Tokyo*

[3] *Saitama University*

We will provide an overview of astronomy education in the school curriculum in Japan, recent attempts at STEAM education and their relation with astronomy education, and teacher training at universities that support formal education. We will also mention the efforts of the Astronomical Society of Japan. There are challenges that we are currently facing. These include the lack of science classes in the lower grades of elementary school, astronomy education is not offered at continuous grade levels from elementary school to high school, and the low choice rate for the elective subject of Earth Science in high school which leads to only a small number of students being exposed to astronomy in the upper secondary education. In addition, there remains a large gender gap in Japan in the STEM fields. We will also discuss measures to address these issues.

Oral Presentation / **106**

The NARIT Astronomical Teacher Training and Workshop

Author: Thanakrit Santikunaporn[None]

NARIT has organised "The Astronomical Teacher Training and Workshop" to train teachers teaching in school, especially those who teach in science and astronomy. Astronomy is the subject included in Thai Basic Education Core Curriculum in 2008. The ultimate goal of this particular training is teachers are able to use astronomy to inspire students on their interests in science, as well as to have good scientific procedures, and search for more knowledge. The training is divided into three levels with various objectives. The Basic level; inspiring teachers to acquire the fundamental knowledge, use astronomical activities to teach students in astronomy and science. The Intermediate level; teachers can gain more skills for astronomical observing and some ideas to produce projects and basic research in astronomy. The Advance level; teachers try creating the astronomical projects with their students, with NARIT direct supervision to completion. These trainings are organised by the Public Outreach Department at NARIT, with cooperation from IPST (the Institute for the Promotion of Teacher Science and Technology of Thailand). The Basic level took place in 2010, with over 8,000 teachers. The Intermediate level began in 2011, with up to 465 teachers. The Advance level began in 2012, with 30 teachers, and initiated over 270 astronomical projects.

Oral Presentation / **107**

NARIT 10" Dobsonian Telescope Distribution Project

Author: Khomsan Thuree[1]

[1] *NARIT - National Astronomical Research Institute of Thailand (Public Organization)*

With the success of NARIT's public outreach program and teacher training workshops, there are now, more than ever, a rapid increase in the interest in astronomy. In order to expand upon this interest, we must train and provide support to those teachers who has potential to reach wider audiences. For the past 10 years, NARIT has been distributing 10" Dobsonian to participating schools over all 77 provinces in Thailand. Applications from schools are selected based on the schools' past activities. These telescopes are on loan from NARIT at no additional cost. Moreover, participants must go through training workshop to be able to utilize all the equipments on the telescopes. A system of progress report not only ensure that the telescopes are in constant use, but also serve to promote updates and sense of community among our teacher network and has been proven to be effective at reinvigorating interests and keeping up activity.

Keynote Speaker / **108**

Democratizing Astronomy in Nepal

Authors: Manisha Dwa[1]; Suresh Bhattarai[2]

[1] *Nepal Astronomical Society (NASO)*

[2] *Nepal Astronomical Society*

As every human on the Earth shares a same sky, astronomy is a subject that binds all. In case of Nepal, Astronomy is still a new concept for many people who thinks it is beyond their reach due to several stereotypes like economy, gender and different capabilities.
Nepal Astronomical Society (NASO) had been a working since more then a decade and a half in brining people close to the sky with the power of Astronomy and helping students dream of reaching the Mars and beyond. Thus, my work will present the events NASO had been doing past these years in making astronomy accessible to the Nepali students and public via different capacities. Furthermore, it will focus more on the recent events like 1st Asian Regional IAU Shaw Workshop, 2024; Project Lilac (an approach to bring astronomy to girls from Muslim community, Hearing Impairments, Queer group, Physical disabilities, domestic violence); Project ACEN and Inclusive universe (an approach for visually impaired students). Also, it will highlight on the outreach activities NASO is conducting throughout Nepal and its impact, and on Women in Astronomy Nepal (WIAN).

Oral Presentation / **109**

Research-based learning as an alternative to classroom education

Authors: Sawatkamol Pichadee[None]; pranita sappankum[None]

Astronomy is a globally recognized field that captivates people of all ages, fostering an enthusiasm for science and technology. The National Astronomical Research Institute of Thailand (NARIT) has a main mission to carry out, support, and promote the development of astronomy and astrophysics through research and astronomy activity. NARIT's Astronomy Research-Based Learning Workshop offers an alternative to formal education in the classroom. By conducting a research in astronomy, students not only learn relevant skills in astronomy but also get to explore scientific process and gain valuable skills in critical-thinking, both of which are severely lacking in the current learning culture in Thailand. For many students, this workshop offer them a chance to understand better about astronomy as a career as they perform research using real data from robotic telescopes, learning astronomical softwares, working under supervision of real astronomers. However, the workshop also put emphasis on them coming up with their own original questions as they strive to find answers about astronomical events in their everyday lives. Teachers are also proven to be important to this process and also offer a means in which a progress can be passed on between school years. As such, workshops aimed at training astronomy project advisors have also been crucial. To further promote and support the research-based extracurricular activities, NARIT has also established the Thai Astronomical Conference (TACs) to promote astronomy among young people via astronomical research projects. Over the last decade, TACs have facilitated the participation of over 500 research projects. In the last three years, TACs has also recognized students' potential to further their research tasks by awarding medals to excellent participants, motivating them to continue looking into and innovating in the field.

Workshop / **110**

Making a Comet: An Engaging Hands-On Experience for Astronomy Education

Authors: pranita Sappankum[1]; sawatkamol pichadee[None]

[1] *NARIT*

It can be challenging for K–12 students to understand comet composition and behavior through traditional lectures. Hands-on, inquiry-based activities are crucial for transforming abstract astronomy concepts into concrete, unforgettable experiences. In this workshop, students will construct a model of a comet to visualize its composition, structure, and behavior as it orbits the Sun. This engaging and affordable activity's main objective is to help students understand the roles of ice, dust, and gas in a comet's nucleus and tail.
The project includes a straightforward recipe for creating a comet model using common materials like dry ice, water, sand, and corn syrup. Participants will be guided through mixing these components to form the comet's "nucleus" and observing as the dry ice sublimates and forms a "tail" as it turns into a gas. This modeling technique can effectively teach concepts like sublimation, coma, and tail development, and the effects of the solar wind. As they watch, predict, and discuss changes in the model comet, students will also foster scientific inquiry, teamwork, and critical thinking.
This educational activity is perfect for K–12 educators and can be easily modified for students at any level. By engaging students in this simple but powerful simulation, teachers can transform the abstract idea of comets into an enjoyable, memorable, and scientifically sound learning experience for students from upper elementary to high school. We will provide a step-by-step guide and safety measures for implementing this project successfully in the classroom.

Poster Session / 111

Astronomy Day in Schools project: a wide range of astronomy activities shared by global network and Thailand schools

Author: Akihiko Tomita[1]

[1] *Wakayama University*

The Astronomy Day in School project has been continued by a Working Group, Astronomy Education Research & Methods, of the IAU Commission C1, Astronomy Education and Development, since the March Equinox of 2021 as a forum for online astronomy education practices, sharing of teaching materials and school-to-school communication on a quarterly basis on the occasion of equinox and solstice. The communication program was initiated by a teacher association in Iran. There, club activities, community activities, STEAM materials, extra-curricular activities, student research activities and everyday classroom innovations have been presented by many students from many countries, and Thai schools have presented a wide range of activities. In this poster, I would like to present a summary of the results so far and invite participation from the Asian region in future programs.

Poster Session / 112

The design of astronomy terms in Thai sign language

Author: Pisit Nitiyanant[1]

[1] *NARIT*

"Sign language" is not the universal language, but there are differences in many countries and territories. The astronomical terms in sign languages also have differences in various regions. Astronomy is one of the branches in science class in schools for deaf people. But in the case of Thailand, there are lack of astronomical terms in Thai sign language and variation between regional schools for deaf.

NARIT is aware of this problem and conduct "the design of astronomical terms in Thai sign language" by consideration and discussion between 3 parties: NARIT (with astronomical outreach staffs), teachers from the network of Thai schools for deaf and National assosiation of the deaf in Thailand (deaf

people & Thai sign language expert). The result is 59 astronomical terms in Thai sign language. The author wish that the process of this design will be the guideline and inspire for the design of astronomical terms in other sign languages in other countries.

Oral Presentation / 113

NARIT Youth Camp: Entry-level astronomy camp for young adults

Author: Farprakay Jiarakoopt[1]

[1] *NARIT*

17 years ago, "Astronomy Camp" was a relatively new concept in Thailand, with most youth having no prior experience in astronomy. The National Astronomical Research Institute of Thailand (NARIT) recognized this gap and organized "NARIT Youth Camp" (NYC) under the theme "Play, Learn, and Stargaze." The goal is to foster a positive attitude towards learning astronomy among Thai youth by allowing them to use astronomical equipment themselves and introducing them to career paths in astronomy through professional astronomers. This helps broaden their view of astronomy as a realistic career option and provides guidance for future educational choices.

Currently, NARIT has been running the camp for over 17 years, starting alongside its establishment. To date, 3,030 participants have completed the camp out of over 20,000 applicants from across Thailand. Data from the past three years (2018-2020; 5 camps) shows that many participants have developed a greater interest in science or engineering fields after attending the camp, often continuing to engage with NARIT activities. Some even pursue careers directly related to astronomy, indicating that the camp effectively promotes sustained interest in astronomy among the youth. Many of new NARIT employees nowadays have been alumni to the NYC, which is a testament to how effective NYC was at fostering a good impression in astronomy.

Workshop / 114

Astronomy activities on a cloudy night

Author: Farprakay Jiarakoopt[1]

[1] *NARIT*

Many people have faced the issue of organizing stargazing activities on cloudy nights when viewing the stars isn't possible. If you're unsure what to do next, consider incorporating activities that might offer participants alternatives and show off their arts and crafts skills to the fullest.

One such activity is "Constellation Maker." Participants will build an electrical circuit using LED bulbs, which represent stars in a constellation. Each LED will emit light according to the actual spectrum type of stars in that constellation. Once the circuit is complete, the LEDs will light up, mimicking the appearance of a constellation in the night sky.

Another engaging activity is the "Stellar Light Box." Participants will learn about the positions and arrangements of key constellations by drilling holes in a box according to their positions. When illuminated from inside, the light shining through the holes will resemble a star-filled night sky. This activity is budget-friendly and especially effective for nighttime sessions.

Workshop / 115

Powers of Ten: From Atoms to the Universe - Sorting Card Game

Author: Matipon Tangmatitham[1]

[1] *National Astronomical Research Institute of Thailand (NARIT)*

Astronomy is the field that deals with numbers that are "astronomical" and often hard to comprehend for students. One of the most powerful tools to get the students to appreciate how big these astronomical objects and distances are by use of a scale model. In this activity we introduce the idea of a card game, a sorting task, and making use of everyday objects to represent the astronomical scales in the way that a layperson can comprehend, and learning details from atoms to the universe in the way that is not only informative, but engaging and fun.

Poster Session / **116**

Samaesan Star Party: Bringing Astronomy to the Community

Author: PINIT SOBANTAO[None]

The "Samaesan Star Party: Bringing Astronomy to the Community" was held on October 21–22, 2024, at Chao Samut Resort, Samaesan Subdistrict, Sattahip District, Chonburi Province. The event aimed to promote astronomy and inspire public engagement in space science through collaborative and educational activities. It was organized with two main objectives:

To provide a platform for informal networking and exchange of ideas among members of the astronomy education network and private sector representatives.

To host a Star Party for the general public in Samaesan and neighboring areas.

The program for teachers and private sector participants included informal discussions and the sharing of astronomy outreach experiences. For the public, the event offered a variety of interactive and hands-on activities, including telescope-based celestial observation, a mobile planetarium, Stella Light Box, light painting, glow-in-the-dark activities, and astronomy lectures.

This initiative not only sparked scientific curiosity among community members but also strengthened collaboration between educational institutions and private organizations in advancing astronomy outreach at the local level.

Poster Session / **117**

The doer never gives up, the helper never abandon

Author: Nuttaphong Noploha[None]

Astronomy project-based learning in schools plays a vital role in fostering curiosity and inspiring students with a passion for the cosmos. It provides students with hands-on experience and cultivates scientific skills across all domains. Despite the fact that, in past years, astronomy projects at Rajavinit Secondary School had seldom achieved notable success, failure was never seen as a deterrent by either students or teachers.

On the contrary, each setback became fuel for renewed determination and growth. It is this unwavering spirit that has led to tangible progress in the 2024 academic year, with astronomy projects now increasingly qualifying for competitive platforms and exhibitions. These small yet meaningful achievements keep the flame of astronomy research alive in our school community.

We believe that as long as students persevere, teachers will continue to support them. And as long as that shared hope persists, the future of astronomy projects will shine even brighter.

Poster Session / **118**

Academic Development Camp (Astronomy) Project, Primary 5, Year 2025 Nong Bua Wittayayon School

Author: watchara Leewang[1]

[1] *Nongbuapittayakarn School*

The Academic Astronomy Camp Project for Primary 5 students in the academic year 2025 at Nongbua Wittayayon School was organized with the main objective of inspiring young learners to expand their horizons in the field of astronomy. The camp utilized experiential learning, hands-on activities, and engaging scientific exploration to spark curiosity and interest in space and the universe. The program featured five core activities: 1. Lunar Phase, 2. Telescope, 3. Planetarium, 4. Planet Walk, 5. 3D Solar System Model A key highlight of the program was the active involvement of high school students from the school's Astronomy Club, who served as youth presenters. Their role aimed to foster leadership, communication, and knowledge-transfer skills, while acting as inspirational role models for the younger students. This peer-led learning approach promoted sustainable interest in science, especially astronomy, across student generations.
According to post-camp evaluation and observation forms, 94.52% of Primary 5 students expressed increased interest in stars and astronomy after participating in the camp.
Among the Astronomy Club presenters, 70.58% reported that they gained valuable experiences in teamwork and problem-solving during real-time situations.
Observational assessments also indicated that Primary 5 students participated actively and enthusiastically in all activities, while the Astronomy Club students fulfilled their roles as youth presenters responsibly and professionally.

Oral Presentation / **119**

Inspiring resources and events in extracurricular astronomy activities

Author: Ivo Jokin[1]

[1] *Director and astronomy teacher*

The report will present 25 years of experience in extracurricular astronomy activities, conducting regional, national and international events with students and teachers. Projects and resources to support astronomy education will be shared, as well as some ideas for organizing and conducting events to popularize astronomy.
As a member of the Board of the European Association for Astronomy Education (EAAE) and coordinator of the International Children's Cartoon Competition "Our Beautiful Universe", the results of this competition and the opportunities for participation will be presented.

Poster Session / **120**

Management and organization of Aldebaran astronomy club

Authors: Pimmada Laovaraphun[1]; Techathum Techa[2]; Boonsong Henngam[3]

[1] *Piboonbumpen demonstration school*

[2] *piboonbumpen demonstration school*

[3] *Piboonbumpen Demonstration School*

The Astronomy Club of Piboonbumpen Demonstration School has been established for 12 years, with a well-structured and systematic approach to management. Our Grade 11 students take the lead in organizing activities, supported by a clear system of responsibilities, including a club president, vice president, secretary, treasurer, and other members who all play essential roles. Grade 12 students serve as advisors, providing guidance based on their experience.

Our club emphasizes utilizing each member's unique talents in every activity, allowing them to gain hands-on experience in their fields of interest. Furthermore, by sharing responsibilities, our members develop a strong sense of accountability and teamwork, which significantly enhances both their astronomical knowledge and management skills.

Our primary goal is to make astronomy more accessible and engaging for others. We organize various activities, some of which are initiated entirely by our members. For example, the Astronomy Assembly brings together senior members, current members, and prospective members to exchange experiences. This event fosters closer bonds between junior and senior members, creating a more relaxed and supportive working environment. Such activities are crucial in ensuring the club's longevity and steady, sustainable growth.

We also organize volunteer activities, where our members contribute to society by hosting camps for schools in suburban or rural areas. These camps include recreational activities, academic workshops, facility improvements, sundial construction, and more.

In addition, our club creates astronomy-related media, both in print and online, collaborates with external organizations, and hosts our most significant annual event: ASTRO FEST — our large-scale stargazing activity. This event attracts over 2,000 guests each year.

Besides these activities, every member conducts an individual astronomy project, which varies based on their interests and goals. These projects aim to foster students' potential, proficiency, and passion, while also contributing to academic advancement. Members are free to select their project topics and learning methods, with guidance from teachers and senior members.

Our Astronomy Club is managed by our members, utilizing their individual skill sets. Through our activities, every member can grow and improve — both as astronomy enthusiasts and as capable, responsible individuals — under the name of Aldebaran Astronomy Club, Piboonbumpen Demonstration School, Burapha University.

Poster Session / 121

The Development of a Celestial Sphere Learning Tool for Visually Impaired and General Users

Authors: Kantaphat Rungrueang[1]; Khunnapat Saravich[2]; Boonsong Henngam[None]; Suphalak Thanmanuwong[3]

[1] *Piboonbumpen Demonstrationschool burapa university*

[2] *Piboonbumpen Demonstration School, Burapha University*

[3] *Piboobumpen*

This study focuses on the design and development of a celestial sphere model that simulates the positions and movements of constellations, intended for both visually impaired individuals and those with normal vision. The device is suitable for visually impaired users with at least lower secondary education and for the general public who can distinguish directions. The design follows the Western cultural representation of constellations. The developed celestial sphere is designed for self-guided learning, allowing users to manually adjust and control its movements according to specific learning needs.

The model consists of a celestial sphere indicating the north and south celestial poles, a sta

The model was tested with a group of visually impaired students from Redemptorist Vocational S

Oral Presentation / **122**

The integration of generative AI in Astronomy club activity

Author: Pannasorn Pawarejthitiboon[None]

Nowsaday AI technology takes an important role in our daily lifes. It makes our lifes easier than in the past. We can collect many data from all over the world by only using our fingertips or we can even summarize a long article in few seconds. We can also generate things using a generative AI only by input an appropriate promt. From the ability of AI mentioned above, it's a cool idea to integrate AI technology in school activities. I firstly tryout this idea in a school Astronomy club by giving the club members a challenging topic such as composing a song which includes constellations that we can observe in winter or creating an interesting game in Astronomy theme. After that let them share their works with others to give feedback. From the learning processes, the students can combine their Astronomy knowledge and their imagination to make a creative work. Moreover, they can critisize others' works in a creative way. In the result, the students in Astronomy club will get not only the contents but also the creativity and happiness.

Poster Session / **123**

Small and affordable radio telescope for high school level radio astronomy

Authors: Natthanicha Buddeewong[1]; Puwarit Buddeewong[2]; Boonsong Henngam[None]

[1] *Piboonbumpen demonstration school Burapha University*

[2] *Piboonbumpen Demonstration School Burapa University*

Nowadays, Thailand's Earth and Space Science curriculum includes the study of astronomy across various wavelengths and space technologies. However, most teachers use lecture-based learning rather than activity-based learning, resulting in a lack of interest from students. Additionally, due to the high cost of radio equipment, radio astronomy instructional materials have not been well developed.

For this reason, we are interested in building a small radio telescope using a Ku-band TV dish with a diameter of 35 cm, installed on an equatorial mount for easier Sun tracking. We use an LNBF (Low Noise Block Downconverter Feedhorn) to guide the signal through an RG6 coaxial cable to a satellite finder, which displays the intensity of the signal. Since the intensity of radio signals is directly proportional to voltage, we use an Arduino UNO R3 and Python to measure the voltage and convert it into digital values, create a strip chart, and export the data to a .CSV file. This exact build costs around 850 THB or 28 USD, and the components used are easy to find on online marketplaces.

From the development and testing process, we found that the satellite finder can visualize the difference between strong and weak signals, but the Arduino cannot yet display an accurate strip chart and data. In the future, we plan to use an ADC (Analog-to-Digital Converter) to convert the analog signal to a digital signal, improving signal reading on the Arduino UNO R3. We also plan to create a manual, test different methods of data collection, and allow students to tryout the system, provide feedback, and help refine the equipment further.

Oral Presentation / **124**

Educational Web Application for Exoplanet and Habitable Zone Modeling

Authors: Nutcha Reunmool[1]; Krit Promsanuwong[2]

[1] *Thoengwittakom school*

[2] *Thoengwittayakhom School*

Understanding the concept of the habitable zone (HZ) is one of the core principles of astronomy, yet existing tools for modeling it remain largely inaccessible at the K–12 level. Most platforms require coding skills, professional software, or are too abstract for meaningful engagement. Despite the HZ being part of many national science curricula, there is a lack of interactive media designed specifically to support conceptual understanding and visualization in the classroom.

To address this gap, we developed a browser-based educational tool to help students visualize and explore planetary habitability. Designed to support project-based learning in the Solar System, Habitable Zone, and Exoplanet units of the Earth and Space Science curriculum, the platform enables students to investigate how stellar and planetary parameters influence whether a planet can support life.

Students can explore over 4,000 confirmed exoplanetary systems, identify potentially Earth-like planets, and analyze their placement within the habitable zone. A Hertzsprung–Russell diagram provides stellar context, while simulation tools let students create custom systems and observe how changing stellar or planetary inputs alters habitability outcomes.

The application sources data from the NASA Exoplanet Archive using the Table Access Protocol (TAP) and calculates HZ boundaries using the Kopparapu et al. (2014) climate model. The inner and outer limits are defined using the conservative thresholds of the runaway greenhouse and maximum greenhouse criteria, respectively.

Visuals are rendered using Matplotlib and D3.js and delivered through modern web technologies including Next.js and TailwindCSS—all via a fully browser-based platform that requires no installation or specialized software, allowing students to access it from any device or operating system.

The platform is currently used by tens of thousands of users worldwide and has shown strong potential as an educational tool for student-led projects in astronomy classrooms. It is freely accessible at www.exoplanetvisualizer.com.

Poster Session / 125

The design and construction of a sundial from a paper model prototype to a 3D printed

Authors: Thipa Jamsaibua[1]; Wattanasiri Lakham[2]; Boonsong Henngam[None]

[1] *Piboonbumpen Demonstration School, Burapha University*

[2] *Piboonbumpen Demonstration School, Burapha University*

The purpose of this project is to design and build a sundial that can be used for astronomy activities in school. It also helps students practice designing and creating new ideas using astronomy as the main subject.

A sundial is an astronomy tool used to tell time during the day by using the shadow created by sunlight. The shadow falls on the base of the sundial, and we can read the time from the numbers or symbols marked on it. To design a sundial, we need to understand the path of the Sun, called the "ecliptic path," which shows that the Earth's axis is tilted at 23.5° as it moves around the Sun. Students also need to know basic ideas about the celestial sphere.

The Astronomy Club of Piboonbumpen Demonstration School, Burapha University, has developed various types of sundials including Equatorial Sundial, Horizontal Sundial and Polar Sundial, each designed uses based on its unique characteristics. These designs have been adapted into paper models that serve as accessible and easily distributed educational tools. With only basic materials such as pencils, cardboard, erasers, rulers, and glue, any school can create and assemble them on their own. Since students have experimented with making paper model sundials, in addition to giving them knowledge in astronomy and design, which is a part of the engineering, architecture and product design processes, which are complete STEAM EDUCATION activities, it also fosters imagination and helps develop small muscles, which are essential for children. However, paper models still have many limitations that make them unsuitable for use in astronomical activities or projects, such as users being unable to assemble the models correctly according to standards, which may result in inaccurate data when used. Or the paper is not strong enough to be used in outdoor activities in windy or wet areas. Therefore, the creators have developed the clock model to be more suitable for the context of use.

The Astronomy Club of Piboonbumpen Demonstration School, Burapha University has developed a paper sundial models into 3D printed sundial models, which makes these sundials suitable for use in astronomical activities, teaching or real projects. It also trains students in the club to have skills in designing and creating innovations using astronomy as a base.

After students were given the goal to design astronomy tools and make paper models, many of them were able to create sundials that followed correct astronomy principles. Their work showed creativity and could really be used in astronomy activities. These models can also be shared with other schools for learning and teaching.

Keynote Speaker / **126**

Teaching the Known Universe

Author: Shannon Schmoll[1]

[1] *Michigan State University and International Planetarium Society*

Planetariums are one of the most crucial tools for teaching astronomy. It allows us to recreate a night sky anywhere at anytime so students can make observations and participate in the practice of science. It allows us to transport people to different places in the universe and offers spatial context to help people understand complex topics. Humans are also diverse in their identities and what will "hook" one person's interest will inspire a yawn from someone else. Luckily, astronomy overlaps with so many other aspects of the human experience from other STEM subjects to art, law, agriculture and more. As planetariums have evolved, it has allowed us to more easily make those connections to other topics. This presentation will explore how planetariums are effective tools for teaching astronomy and how they have evolved to be sandboxes that allow students to explore everything we know about in our universe.

Poster Session / **127**

Comparative study of Geodesic dome structures for small planetarium design in schools

Authors: Suphalak Thammanuwong[1]; Boonsong Henngam[None]

[1] *Piboonbumpen Demonstration School, Burapha University*

This study aims to analyze and compare two types of geodesic dome structures for application in small-scale planetariums designed for educational use in schools. The comparison focuses on two

dome types: the Ribbed Dome and the 2v Geodesic Dome, both with a diameter of 4 meters. Each design was engineered so that no single component exceeds 1.10 x 1.60 square meters in size, allowing for convenient transportation by standard vehicles in support of mobile astronomy outreach activities.

The analysis includes structural design, prototype construction using corrugated cardboard, and comparative evaluation in terms of usability, ease of assembly, and material efficiency. The Ribbed Dome demonstrated flexibility in adapting to material limitations, ease of construction based on the horizontal coordinate system, reduced labor requirements, and minimal material waste.

In contrast, the 2v Geodesic Dome offers greater structural strength and a more modern appearance. However, it involves more complexity in both the assembly process and material preparation. Nevertheless, the triangular structure of this dome contributes to its durability and potential for long-term use. The findings of this study serve as a guideline for selecting dome designs that align with material and labor constraints while supporting educational goals and practical applications in schools—particularly for mobile planetarium activities that enhance astronomy learning.

Poster Session / **128**

Fostering Positive Attitudes and Understanding of Astronomy through Planet Walk Activities in Students in Three Southern Border Provinces of Thailand

Author: Basree Maseng[1]

Co-authors: Kiflan Dolah ; Rusnee Saelaemae

[1] *Astronomy student, Department of Physics and Materials science, Faculty of Science, Chiang Mai University*

Students in the three southern border provinces of Thailand, especially students in private schools teaching Islamic and general education, have begun to give importance to the Academic Astronomy Olympiad subject. However, there has been no promotion of classroom activities that will enhance the understanding of the size of the universe, which is difficult to imagine, and may result in negative attitudes toward the astronomy subject. Therefore, the researcher introduced the solar system model activity (Planet Walk) with integrated learning management (Integration Instruction) to a sample group of 40 high school students studying in private schools teaching Islamic and general education who were interested in taking the Academic Astronomy Olympiad examination. The research instruments were 1) Attitude measurement form towards studying astronomy, 2) Understanding of the distance of the solar system. The results of the research found that 1) Attitude towards astronomy was at the highest level 2) Understanding of the distance of the solar system was at a high level. Therefore, integrated learning management created a basic model that could enable students to have a good attitude and be able to understand and imagine the greatness of the universe.

Workshop / **130**

Astronomy Beyond the Visible Spectrum

Author: Thanakorn Aungkavattana[1]

[1] *National Astronomical Research Institute of Thailand (NARIT)*

Electromagnetic waves are fundamental to astronomy, and visible light is just a tiny part of the entire electromagnetic spectrum. Therefore, to truly understand the physical properties of celestial objects, visible light alone is not sufficient. This workshop is designed to help participants visualize the “invisible light” that surrounds us—such as infrared, ultraviolet, and radio waves—using simple tools that can be found at home. These activities will help students grasp the concept of light beyond

the visible spectrum and pave the way toward understanding multi-wavelength astronomy, where astronomers study celestial objects across different wavelengths beyond visible light.

Keynote Speaker / **131**

K–12 Astronomy Education in the Republic of Korea: Trends and Transformations within the National Curriculum

Authors: Jungjoo Sohn[1]; In-Ok Song[2]

[1] *Korea National University of Education*

[2] *Korea Science Academy of KAIS*

This presentation explores the historical changes and recent trends in astronomy education in the national curriculum of the Republic of Korea. We conducted a comprehensive analysis of science and astronomy content in the Korean national curriculum from 1945 to 2023. Our findings indicate that the curriculum has continually adapted to societal demands for practical knowledge and advancements in astronomical research. While core topics—such as celestial motion and the physical properties of stars—have remained relatively consistent, the most recent 2022 curriculum revision reflects significant pedagogical shifts. Notably, there is a reduction in traditional content like coordinate systems, alongside an increased emphasis on inquiry-based activities utilizing digital tools. However, the integration of a cosmic perspective and connections to Education for Sustainable Development (ESD) remain limited within astronomy education. In response to curriculum changes, we also present practical examples of teacher training programs designed to enhance the professional capacity of astronomy educators. These insights aim to contribute to the global discourse on effective approaches to curriculum reform and teacher development in science education.

Oral Presentation / **132**

Taoyuan Astronomy Carnival as a Platform for Science Education and Public Engagement

Authors: Jen-Kai Hsu[1]; Chun-Chi Wang[2]; Hsiao-Cheng Chou[2]; Ian-Lin Lai[1]; Pei-Hsin Chen[2]

[1] *Graduate Institute of Astronomy, National Central University*

[2] *Taiwan Top Science Student Project, National Central University*

AE4ALL (Astronomy Education for All) is a nationwide science education initiative in Taiwan that aims to foster interest and understanding of astronomy across all age groups. Anchored at the National Central University (NCU) Observatory, the program brings together academic and community resources through exhibitions, workshops, and interdisciplinary collaboration to promote astronomy education.

As one of its core outreach efforts, the Taoyuan Astronomy Carnival has been held annually since 2022. Hosted by NCU, the event promotes science education while positioning Taoyuan as a key center for astronomy outreach in Taiwan. With a strong focus on interactive displays and hands-on learning, the carnival encourages participation across generations and cultivates curiosity through experience-based engagement.

The 2024 theme, "Traveling to Mars," introduces the Martian surface and atmosphere using 3D models and high-resolution topographic data, inviting visitors to consider future exploration and habitation. The 2025 exhibition, "Our Sun," focused on solar activity and its influence on Earth and space weather. It was held at the Taoyuan Public Library, a central and accessible venue intended to broaden public participation.

AE4ALL has also developed partnerships with schools and libraries across Taiwan. Notably, it has collaborated with the NCU Library and Dazhu Branch Library to host astronomy-themed book exhibitions and organize public science lectures. These efforts aim to deepen public understanding of the universe and demonstrate
sustainable, community-based models for astronomy education.

Public Lecture / **133**

Unlocking the Secrets of the Universe with the SKA

Author: Shivani Bhandari[1]

[1] *SKAO*

The SKA is set to become the largest and most powerful radio telescope on Earth, with one part being built in Western Australia and the other in South Africa. When complete, it will let us explore the Universe in more detail than ever before—listening to cosmic signals across vast distances and times.
In this talk, we'll take a journey through the incredible science the SKA will make possible: from mapping the birth of the first galaxies and probing the mysteries of black holes, to detecting the faint whispers of pulsars and using them to test Einstein's theories. We'll see how it will help answer big questions about our cosmic origins, the nature of dark matter, and even whether life exists beyond Earth.
We will also explore how the SKA is being built and commissioned right now, with engineers and scientists carefully testing and integrating its thousands of antennas to bring this extraordinary telescope online. You'll get a behind-the-scenes look at how this global scientific instrument is coming to life, step by step.

Keynote Speaker / **134**

Testing Efficacy of astronomy curriculum: A baseline survey

Author: Aniket Sule[1]

[1] *IAU*

Most countries include a limited astronomy content in their high school science curriculum. It is expected that this exposure will be enough to effectively introduce astronomy to students. However, in the experience of most teachers, students fail to retain key concepts from this curricular topic. In 2023, an ambitious pan-India survey was administered with more than 2000 participants to quantify knowledge retention among students. The survey was carefully designed to be as universal as possible, to enable its adoption in other countries across Asia and Africa. I will discuss the design principles of this survey, a quick summary of the insights gained through it and how this survey can become a handy tool for other astronomy educators.

Keynote Speaker / **135**

Leveraging the potential of astronomy in formal education

Author: Tshiamiso Makwela[1]

[1] *Office of Astronomy for Education*

The International Astronomical Union's Office of Astronomy for Education (OAE) focuses on advancing astronomy education at the primary and secondary school levels. Yet astronomy's relevance extends far beyond the discipline itself. This talk highlights efforts to professionalise astronomy education in schools through the Teacher Training Programme (TTP).

The TTP is designed to strengthen teachers' astronomy knowledge while contributing to broader STEM education and capacity-building initiatives. It follows a collaborative professional development model that brings together a National Astronomy Education Coordinator, an astronomer, and a local teacher. This partnership blends scientific expertise, pedagogical knowledge, and community engagement.

The TTP adopts a bottom-up approach, tailoring training to local contexts and fostering the adaptation and translation of resources provided by the OAE. Building on lessons learned from earlier TTP projects and insights from the global curriculum survey, the OAE has developed the Astronomy Teacher Training

Transparency Standards (AT3S) — a framework that offers a more standardised and transparent approach to designing and implementing astronomy-related teacher training worldwide.

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Astronomy Learning According to the Basic Education Core Curriculum of Thailand: Challenges and Concerns

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The Basic Education Core Curriculum of Thailand establishes astronomy as one of the science subjects taught from primary through secondary school. The goals of astronomy education differ across grade levels. For example, primary school students focus on fundamental scientific investigations to explore astronomical phenomena in their surroundings. In lower secondary school, the objectives shift to understanding more complex astronomical phenomena and applying knowledge from other scientific disciplines to explain these phenomena through scientific investigation. For high school students, the aim is to comprehend even more intricate phenomena using scientific knowledge and reasoning, enabling them to lead informed and safe lives.

To effectively implement the national curriculum at the school level, it is essential to develop various resources for both students and teachers, including activity materials, textbooks, and teacher training programs.

Unlike other areas of science, astronomy often faces a shortage of teachers with foundational knowledge, which can lead to a lack of confidence in teaching the subject. Additionally, the limited career opportunities in astronomy may cause teachers to prioritize other sciences over it.