

First Name	Last Name	Poster Title	Abstract	Autor Organisation
Morcos	Abd El Fady	Activities in Egypt in the Frame Work of NOC	<p>Since three years NOC activities had been started in Egypt. The rate of our activities increased than the previous date by supporting us by NOC publications and contacts. Our activities nowadays cover many ranges. We concentrate during the interval from 2015 till now on public elementary lecturers in different fields of astronomy and cosmology, in different places e.g. in public libraries, public and professional societies besides Helwan and Kottamya observatories and different Universities. On the other hand, a team of lecturers at different ages and different scientific backgrounds from different organizations, visit schools and universities giving simple and professional lectures. Training and courses about different topics of astronomy and practical workshops were done at Astronomy Department in National Research Institute of Astronomy and Geophysics, Kottamya observatory, Kottamya Center of Scientific Excellence for Astronomy and Space Science and Scientific Society of Astronomy & Space in Egypt - SSASEgypt , for Different Faculties students and high schools students. Conferences for two days and one-day meetings were held. Open area observations at different deserts were done also at both of Helwan and kottamya observatories. The observatory was opened for free for popular in astronomical special events. We made the area of contact through social media as Facebook and internet sites wider. Many TV and Radio programs were presented. A lot of simplified astronomical books were published and distributed for free. In the end, we got the chance to held ISYA to hold in Egypt during the interval from 26 March 2018 to 12 April 2018. It is worth of mentioning that Egypt is planning to build a new telescope in too near future.</p>	National Research Institute of Astronomy and Geophysics (NRIAG)
Ibrahim	Alaa	Students as Content Creators of Creative Astronomy Outreach	<p>Outreach enriches education and lifelong learning, fulfills the broader impact of research, and strengthens the ties between educational/research institutes and their constituents, including society, alumni, and future students. Its impact includes motivating the next generations of scientists and engineers, enhancing STEM education outside traditional classroom setting, and being a catalyst to augmenting the science and technology workforce, a key factor to a competitive society. For nearly a decade and through project-based and community-based learning, students in introductory astronomy courses in Egypt become content creators of creative astronomy outreach material that are disseminated through visits to public schools, community centers, and during stargazing events. The projects range from building hands-on demonstrations to producing educational videos that communicate essential concepts in astronomy, challenge myths and misconceptions, and enhance the overall scientific literacy of the audience. The experience offers mutual benefit to students and the audience. Besides, it inspires new forms of activities that advance the practice of outreach itself, e.g. moving from Outreach 1.0 (Taking science events to the community at public) to Outreach 2.0 where the interaction between the outreach practitioners and the local community inspires new collaborative forms of outreach. References [1] The 95 Percent Solution, John H. Falk and Lynn D. Dierking, American Scientist 98(6):486493, 2010[2] Celebrating the Culture of Science, John Durant and Alaa Ibrahim, Science, Vol. 331, Issue 6022, pp. 1242, 2011[3] Bridging the Gap between Scientists and Society in the Arab World, Alaa Ibrahim, Nature Middle East, doi:10.1038[4] Our Community-Based Learning Projects, Vimeo.com/Science2Society</p>	Zewail City of Science and Technology

Alves-Brito	Alan	Explorers of the Universe: university and school creating new pathways.	The project "Explorers of the Universe: university and school creating new pathways" is an Outreach Program (popularization and scientific communication) from the Department of Astronomy of the Institute of Physics at the Federal University of Rio Grande do Sul, in Porto Alegre, Brazil. Launched in 2012, the project has an interdisciplinary, interinstitutional and interprofessional character. The goals are twofold: (i) to promote the training of Physics undergraduate students, especially future teachers of the Brazilian basic education system and (ii) to contribute to the scientific literacy of school students of Porto Alegre and its Metropolitan Region. The program is focused on young people living in regions of high social and economic vulnerability. It intends to improve the quality of education and to articulate the school-university dialogue by proposing new educational public policies. Workshops and activities promoted by the Program aim to integrate the outreach actions to the teaching and basic research programmes at the University, where undergraduate students have the opportunity of creating and executing thematic workshops. The Program encourages undergraduate students to: practice creative thinking through science; develop the passion for the dark-sky observing; and develop scientific argumentation alongside different agents (teachers, school managers, pedagogues, social workers) in formal and non-formal learning environments.	Federal University of Rio Grande do Sul
Yacob	Alemye Mamo	Highlights of NOC Ethiopia's Major Activities	In Ethiopia the pace of Astronomy and Space science development is improved from time to time. The Currently established Ethiopian Space Science and Technology Institute (ESSTI) under the Ministry of Science and Technology (MOST) along with Ethiopian Space Science Society (ESSS) are the two main actors that play a great role in development of Astronomy and Space Science in Ethiopia. NOC Ethiopia is therefore playing a key role in coordinating and accelerating the efforts made by such an organization and other educational bodies in the country in communicating Astronomy and Space science at large to the public. The poster is therefore depicts the major outreach activities that are performed in the country.	East African Regional Office of Astronomy for Development(EAf-ROAD)
Hojaev	Alisher S.	Essay on astronomy outreach issues	Outreach and wide popularization of astronomy among broad community, cooperation of professional astronomy researchers with amateur astronomers and citizen-science projects in astronomy are really important in era of globalization and significant growth of scientific discoveries and extremely large data flow (Big-data) in all fields of astronomy. The draft overview is presented on astronomy science and outreach in Uzbekistan from ancient to now and further including the new trends (triune complex of the scientific park, boarding school and professional research institute for astronomy, astronomy and aerospace summer camps, mass-media, etc.). The ideas are proposed to increase the outreach issues of open astronomy for public.	UB Astronomical Institute of UAS
Bieryla	Allyson	The Future of Astronomy Education: A Teaching Tool for Visually Impaired Students	Astronomy education and observational astronomy labs, in particular, have been lacking resources to accommodate students with visual impairments. We have adapted our observational astronomy lab at Harvard University to accommodate students with a visual impairment. Using sound and thermoform printing technologies, we have capabilities to allow student's with a visual impairment to participate in labs at the same time as the other students. In particular, we developed a device using arduino technology that converts light to sound. We tested this device during this past summer's total solar eclipse and streamed the data live on the Internet for people around the world to experience the event. We are now adapting our arduino device to incorporate color using RGB filters. This device will produce different timbres for different wavelengths of light that can then be used to distinguish different temperatures. The device is handheld, easy to program and inexpensive to reproduce (< \$50). It is also fitted to mount on a telescope for nighttime observing. The design schematic and code will be open source and available for download.	Harvard University

Jones	Amy	SDSS efforts on inclusion for bridging different communities	<p>The Sloan Digital Sky Survey (SDSS) IV is an international astronomy collaboration that has been in the forefront of addressing issues of inclusivity within the collaboration. Many of the things learned in SDSS can be applied to IAU activities and efforts. SDSS IV originally created two committees, one focused on women and the other on minorities, and two years ago these joined to form COINS, the committee on inclusion in SDSS. Part of the charge is to conduct a yearly or bi-yearly demographics survey to assess the inclusiveness within SDSS. To help increase minority participation within SDSS and astronomy, we had the FAST (faculty and student teams) Initiative and REU (research experience for undergraduates) programs. Additionally, there are many efforts to help younger members feel welcome and participate, currently with a focus at the collaboration meetings. We have drafted several documents, including how to make a meeting more accessible and inclusive, best practices regarding code of conduct, best practices for running telecons, and meeting chairing guidelines. I would like to share what has been successful for SDSS which would be useful for the IAU and bridging different communities.</p>	University of Alabama
Sosa	Andrea	Astronomy Outreach Activities in Uruguay	<p>Uruguay is a small country, in the southern-east part of South America, with a valuable tradition in Astronomy education and outreach, as well as in research on planetary sciences. In this poster I present some of the most remarkable outreach activities recently done, in progress, or to be done during 2018. As an example, on September 2, 2016, was inaugurated the Astronomical Observatory of the "Centro Universitario Regional del Este", in Rocha, under my responsibility. This is the only university observatory in Uruguay, and is devoted to support educational courses on Astronomy for school and highschool teachers, to perform some research projects for students and teachers, and to coordinate public activities for the observation and explanation of astronomical events. We teach courses on fundamental astronomy, astro-photography (with and without telescope) for general public, and most recently, we collaborate in a course on archeo-astronomy, and on the role of Astronomy in Culture. We also continue promoting the public awareness about preserving the darkness of the night sky. There are of course other institutions in Uruguay that contribute to outreach, like the Department of Astronomy at the Faculty of Sciences in Montevideo, the Municipal Planetarium of Montevideo, the Observatorio of Montevideo (which belongs to Secondary Education), the "Inspeccion Nacional de Astronomia", the Amateur Association of Astronomy, the Uruguayan Astronomical Society "Sociedad Uruguaya de Astronomia", etc. Since Astronomy is still a program course in the schools and highschools, some teachers also contribute to outreach, by doing activities with their students beyond the program. This poster paper is intended to present an actual and comprehensive review of the specific national activities of the main institutions and individuals involved in Astronomy Outreach in Uruguay, supported on statistical and quantitative data, with some evaluation of the present and future impact of such activities.</p>	Centro Universitario Regional del Este, Universidad de la Republica

Bernagozzi	Andrea Ettore	LIGHT, WATER, LIFE: THE SEARCH FOR NEW WORLDS IN THE GALAXY. AN EDUCATIONAL PROJECT AT REGIONAL LEVEL IN ITALY	<p>Progetto Diderot, devised, proposed and realised by the Fondazione CRT of Turin (www.fondazionecri.it), is one of the leading high-level educational initiatives in Italy. During the school year 2017-18, it included for the first time a project line devoted to astronomy, thanks to the collaboration with the Astronomical Observatory of the Autonomous Region Aosta Valley (www.oavda.it). The topic is one of the most intriguing fields in current science: the search for alien worlds and their comparison with the Solar System. This entails a multidisciplinary approach that exploits the fascination of cosmos to span fields as diverse as maths, physics, chemistry, Earth sciences, biology, as well as history, philosophy, literature and the arts. From November 2017 to April 2018, the activities of the project have reached more than 6.000 students in the Italian regions of Piedmont and Aosta Valley. The proposed activities are: Teaching Unit 1: "Let's colour the planets", for the primary school (age 6-10) Teaching Unit 2: "Let's pack the suitcase for space", for the middle school (age 11-13) Teaching Unit 3: "A thousand billion planets", for the secondary school (age 14-18) An optional follow-up activity has also been proposed to middle and secondary schools; it asked the students to lay down a scientific report. The project required a sizeable logistic and educational effort in order to organise the activities held in hundreds of classes during 6 months, and to figure out the best strategies to pass down the scientific contents. Our presentation describes the project's origin, how the contents have been devised, the methods developed to impart them, and the feedback got from the students. In the next school years, the project is expected to collect valuable information about the relationship between the school and research domains and to help us assess the impact that astronomy-based activities have on school curricula.</p>	Astronomical Observatory of the Aosta Valley
Choudhuri	Arnab	Popularizing "Non-Glamorous" Areas of Astrophysics like Solar Physics	<p>Astrophysics is a branch of science which excites popular imagination and there has been a glorious tradition of popular science writing on astrophysics by both research astrophysicists and outreach professionals. Of late, however, we see a tendency which I find disturbing. While popular science books keep being written on certain glamorous areas like cosmology and black holes at an ever-increasing rate, many other important areas of astrophysics have been grossly neglected by popular science writers in the past few years. When the first popular science book on the phenomenology and the science of the 11-year sunspot cycle written by me:</p> <p>https://www.amazon.co.uk/Natures-Third-Cycle-Story-Sunspots/dp/0198807643/</p> <p>was published by Oxford University Press in the hardback priced at 25 GBP, I thought that nobody would buy a popular science book at this price. To my complete surprise, the book nearly sold out in two years and a paperback had to be printed. This shows that there is a demand for popular books on non-glamorous areas of astrophysics. Based on my experience with my book, I shall discuss how popular science books on such areas should be written. In my opinion, it is rather important to pick a central thread and develop a storyline around it, rather than presenting many topics in a piecemeal manner. I shall also argue that it is important for research astrophysicists to take part in such initiatives, as it can sometimes be difficult for outreach professionals to decide the right storyline.</p>	Indian Institute of Science

Sekhar	Aswin	Challenges with Gender, Immigration and Diversity for Astronomers from Developing Countries	<p>Firstly, in the present global immigration climate, astronomers (and scientists in general) from the developing and less privileged countries face various exterior challenges when it comes to travel, migration and funding. These factors affect early career researchers as well as permanent staff in multiple ways. Some pivotal issues in this regard will be presented. Secondly, a comparative study with respect to gender gaps in astronomy from multiple cultures will be discussed. Latest statistics show that gender parity figures are much better in Latin American, Eastern European and South East Asian cultures compared to the more prosperous Western cultures. Thirdly, it would be interesting to find the broader reason and logic for such gender gap variations amongst diverse cultures from different parts of the world. All these exercises aim to contribute towards the wider inclusiveness and bridging diversity elements amongst astronomers from different parts of our planet. Reference: Sekhar A. 2018, Letters to Editor, Nature (accepted) Sekhar A. 2017, Contributed Talk to Inclusiveness and Diversity Session, European Planetary Science Congress, Riga, Latvia (kindly funded by Europlanet RI)</p>	CEED University of Oslo
Muench	August	Improving the accessibility of research articles at the American Astronomical Society	<p>There are many contributors to the creation and production of an astronomy journal article. All of these contributors, from the author themselves to the preprint platform to the journal production editors and staff must grapple with how to make the final research available to the broadest segment of the astronomy community and the public. In this talk (or poster) I will describe the approach of the American Astronomical Society to improve the accessibility of the articles published in its Journals. I will review our work with our publishing partner, the Institute of Physics in response to the AAS's Working Group for Accessibility and Disability's 2016 Recommendations, "Improving Accessibility of Astronomical Publications" and will provide a current status update of authoring and access tools for the astronomical literature. This topic may also be relevant to FM15 if the SOC feels that the contribution has broader synergies with the OAD efforts.</p>	American Astronomical Society
García	Beatriz	NASE and the Cultural Astronomy: the rescue of the "every day" Astronomy	<p>Astronomy is a discipline that involves several areas of knowledge, Physics, Chemistry Mathematics and, ultimately, Biology, seem to be the most important. However, from the past of the human being this discipline has developed as a cultural manifestation and is part of the collective unconscious. Therefore, it is one of the sciences to which people approach more easily, without taking into account the exact or natural sciences that sustain their concepts.</p> <p>Astronomy is present in everyday life, we measure time, observe the phases of the Moon, orient buildings to take advantage of sunlight or improve heat exchange with the environment, we refer to Universal Time, the zero meridian or the equinox. Astronomy is part of the culture and as such, should be rescued. NASE explores the potential of cultural astronomy in the middle level classes through the training of teachers who become mediators between scientists and students.</p> <p>In this presentation we present the achievements of the inclusion of topics of Cultural Astronomy, Astronomy in the City or Arqueoastronomy in the NASE courses from the rescue of the records of native peoples or present in the cities where the workshops have been given, after almost a decade of continuous development of the Program in 23 countries around the world.</p>	Pierre Auger Observatory highlights

García	Beatriz	The Pierre Auger Observatory: impact of the interactive approach to communicate the Science with the public	<p>The Pierre Auger Observatory is the biggest facility in the world devoted to the detection and study of ultra high energy cosmic rays. Ever since its start, at the end of XX century, the Observatory was focussed not only to work at the frontiers of the scientific knowledge but also to serve as a reference on education and outreach. Within the frame-work of the Design Thinking, a proposal from Stanford University in the 1970s, the tools of the trans-media storytelling or multi-platform storytelling and the available applications, including enhanced reality, are used in the redesign of the Visitor Center of the Observatory in Malargue, Argentina. In this presentation, we will show how to attract visitors to the new Visitor Center and analyze the impact of this interactive new approach to communicate the Science with the public.</p>	Pierre Auger Observatory highlights
García	Beatriz	NOC activities at Argentina	<p>Note: This presentation is on behalf of Pierre Auger Collaboration</p> <p>The past four years, the Argentinean NOC developed an intense activity and specific actions to perform outreach activities in all the country. Part of the actions were devoted to collect information from different groups and amateur associations and to concrete some special activities such as Workshops, educative programs, Light Pollution campaigns collecting data about the night sky quality and preparing the base for the 2019 eclipse, which will be visible in the central part of Argentina. In this presentation we show this work in which participated amateur and professional astronomers</p>	Instituto en Tecnologías de Detección y Astropartículas
Htun	Boothee Thaik	NOC activities at Myanmar	The poster present the NOC activities at Myanmar	Myanmar Astronomy & Science Enthusiasts Society
Liu	Boyang	TeachForAstro: A Chinese Practice of Astronomy Ambassadors' Concept	TeachForAstro is an NGO founded by the author in 2014, as a Chinese version of the Astronomy Ambassadors Programme of AAS. It aims at connecting astronomers with curious young minds in local schools and supporting the astronomy teachers behind them. During the past 4 years, it has developed over 50 partner schools in Beijing, China, making it one of the largest astronomy education organization in China by far. TeachForAstro has also devoted a lot of efforts in Western China in collaboration with other education NGOs, as well as developed collaborations with institutes in the US and Australia, in order to narrow the astronomy education resource gap laid between developing and the developed regions. With the recent development of Chinese Astronomy, now TeachForAstro is seeking for wider connections with the world to better serve the communities both domestic and abroad.	UWA/ICRAR
Reylé	Céline	NOC activities at France	The poster present the NOC activities at France	Observatoire de Besançon

Cui	Chenzhou	Data-driven Astronomy Education and Public Outreach	IAU Inter-Commission B2-C1-C2 WG Data-driven Astronomy Education and Public Outreach (DAEPO) was launched officially in April 2017. With the development of many mega-science astronomical projects, for example CTA, DESI, EUCLID, FAST, GAIA, JWST, LAMOST, LSST, SDSS, SKA, and large scale simulations, astronomy has become a Big Data science. Astronomical data is not only necessary resource for scientific research, but also very valuable resource for education and public outreach (EPO), especially in the era of Internet and Cloud Computing. IAU WG Data-driven Astronomy Education and Public Outreach is hosted at the IAU Division B (Facilities, Technologies and Data Science) Commission B2 (Data and Documentation), and organized jointly with Commission C1 (Astronomy Education and Development), Commission C2 (Communicating Astronomy with the Public), Office of Astronomy for Development (OAD), Office for Astronomy Outreach (OAO) and several other non IAU communities, including IVOA Education Interest Group, American Astronomical Society Worldwide Telescope Advisory Board, Zooniverse project and International Planetarium Society. The working group has the major objectives to: Act as a forum to discuss the value of astronomy data in EPO, the advantages and benefits of data driven EPO, and the challenges facing to data driven EPO; Provide guidelines, curriculums, data resources, tools, and e-infrastructure for data driven EPO; Provide best practices of data driven EPO. In the paper, backgrounds, current status and working plans in the future are introduced. More information about the WG is available at: http://daepo.china-vo.org/	National Astronomical Observatories, CAS
Walker	Constance	Cultivating Talented Youth with Big Data Teen Astronomy Cafés	The Education and Public Outreach group at the U.S. National Optical Astronomy Observatory has designed an outside-of-school education program to excite the interest of talented youth in future projects like the Large Synoptic Survey Telescope (LSST) and the NOAO Data Lab - their data approaches and key science projects. Originally funded by the LSST Corporation, the Teen Astronomy Café program cultivates talented youth to enter Science, Technology, Engineering and Math (STEM) disciplines and serves as a model to disseminate to observatories worldwide. One Saturday a month during the academic year, high school students have the opportunity to interact with expert astronomers who work with large astronomical data sets in their scientific work. Students learn about killer asteroids, the birth and death of stars, colliding galaxies, the structure of the universe, gravitational lenses, dark energy, dark matter, and more. The format for the Saturday science cafés has been a short presentation, discussion (plus food), a computer lab activity and more discussion (with pizza), in particular about careers. They last about 2.5 hours and have been planned by a group of interested local high school students, undergraduate student coordinator, graduate students, presenting astronomers, program director and evaluator. For example, high school youth leaders help ensure an enjoyable and successful program for fellow students. They help their fellow students with the activities and help evaluate how well the science café went. Their remarks shape the next science café and improve the program. The experience offers youth leaders ownership of the program, opportunities to take on responsibilities and learn leadership and communication skills, as well as foster their continued interests in STEM. We will discuss outcomes and lessons learned from the dozen science cafés implemented thusfar, plans to disseminate the program to other IAU observatories and plans to expand the program locally.	National Optical Astronomy Observatory

Walker	Constance	Globe at Night: Citizen Science Assessing the Darkness of our Skies	Globe at Night (GaN) encourages citizen-scientists worldwide to record the brightness of the night sky. During ten-days per month of moonless evenings, children and adults match the appearance of a constellation with star maps of progressively fainter stars found at www.globeatnight.org/webapp/ . In the 12 years of the program, over 175,000 observations from 180 countries have been contributed to the campaign. The GaN (open) database is a source of research projects. With GaN, citizen-scientists measured the darkness of the daytime sky for the total solar eclipse (TSE) in the USA in 2017. (Plans are forming for the TSE in Chile in 2019.) Students conducted research to understand the lesser long-nosed bats' avoidance of city center at night. On-the-fly mapping enables citizen-scientists to see contributed observations immediately. The 12 campaigns per year offer 4 ways of taking measurements. The online app for data submission is in 28 languages. STEM activities allow young children and problem-based learning activities for older students to experience real-life scenarios: role-playing sea turtles hatching (misdirected by lights on shore) or analyzing an ISS image of Houston to estimate the wasted energy, cost and carbon footprint. In-situ and on-line workshops have been given on using GaN in all its capacities, as well as for the activities. Our Facebook page exists to encourage dialogue and bring cutting edge news. To entice interest, we had monthly newsletters and serial podcasts starring the Dark Skies Crusader. GaN has been part of special campaigns like with the National Park Service and the National Geographic BioBlitz. Partnerships also include SciStarter (working with participants), Fieldscope (working with data analysis), and STARS4ALL (working with other light pollution initiatives). We have built a community of practitioners in various ways worldwide and plan to continue to help reduce the effects of light pollution through awareness and action.	National Optical Astronomy Observatory
lubowich	donald	Methods to increase the audiences, promote Citizen Science projects, and include women and underserved groups in astronomy outreach programs	I created programs can be adapted for different cultures. My NASA-funded Music and Astronomy program at 70 free/low-cost outdoor concerts, festivals, fairs was assisted by 15 amateur astronomy clubs (60,000 people; 50% families; 65% female; 20% seniors; targets underserved by type of music and location). There were telescopes, hands-on activities, posters/banners, information about science museums, and hands-on citizen science projects. Yo-Yo-Ma, the Chicago or Boston Symphony Orchestras, Ravi Coltrane, Phish, Blood Sweat and Tears, Deep Purple, James Taylor, and Wilco performed at some events. Astronomy Festival on the National Mall (co-sponsored by the White House, 2010) had the participation of astronomy clubs, universities, museums, and scientific institutions (AAAS, AAS, AGU, APS, Carnegie Science, Chandra, NASA, NASM, NOAO, NRAO, NSF, STScl, USNO; 30,000 people, 8000/year; largest in the US). Astronomy for very ill/severely injured children (undergoing surgery, chemotherapy, medical treatment) and their families (low-income/poverty-level; minority) at Ronald McDonald Houses (350; 80 countries, 250 in the US) and hospitals (NASA & IAU funded). RMH charities give free/low-cost lodging for the children and their families (50% low-income/poverty-level; 50% African-American or Hispanic; 60% are female in US). I trained their staff so the program can be sustained without an astronomer. My astronomy float in the 2009 NYC Columbus Day Parade honored Galileo and IYA2009 with telescopes, "Galileo" and an "astronaut". Seen by hundreds of thousands and on TV, (many families and females). Astronomy at summer camps for low-income/special needs children. Super Bowl Star Party (targeting females) can adapted to soccer matches at parties, parks, and stadiums. Halloween star party attracts girls in costume. Edible astronomy demos with chocolate chips, cookies, marshmallows, popcorn, candy (Starburst and Twizzlers), and bagels can be adapted for the blind and visually impaired.	Hofstra University

Daou	Doris	Partnerships in Public Outreach with Planetary Defense and Near Earth Objects	NASA and its partners maintain a watch for Near-Earth Objects (NEOs), asteroids and comets that pass within Earth's vicinity, as part of an ongoing effort to discover, catalog, and characterize these bodies and to determine if any pose an impact threat. NASA's Planetary Defense Coordination Office (PDCO) is responsible for: Ensuring the early detection of potentially hazardous objects (PHOs) - asteroids and comets whose orbits are predicted to bring them within 0.05 astronomical units of Earth's orbit; and of a size large enough to reach Earth's surface - that is, greater than perhaps 30 to 50 meters; Tracking and characterizing PHOs and issuing warnings about potential impacts; Providing timely and accurate communications about PHOs; and Performing as a lead coordination node in U.S. Government planning for response to an actual impact threat. The PDCO collaborates with other U.S. Government agencies, other national and international agencies, and astronomers around the world. The PDCO also is responsible for facilitating communications between the science community and the public should any potentially hazardous NEO be discovered. In addition, the PDCO works closely with the United Nations Office of Outer Space Affairs and the Committee on the Peaceful Uses of Outer Space to support international collaborations on Near Earth Objects. The PDCO is NASA's representative as a leading member of the International Asteroid Warning Network (IAWN) and the Space Missions Planning Advisory Group (SMPAG), multinational endeavors endorsed by the United Nations for an international response to the NEO impact hazard, established and supported by the space-capable nations. In this paper, we provide an overview of the office's many and varied planetary defense endeavors. In this presentation, we will discuss strategies for communicating with the Public and opportunities for more collaborations for a global and a national communications effort.	NASA Headquarters
Zuniga Hernández	Emilio	NOC activities at Nicaragua	The poster present the NOC activities at Nicaragua	The Association of Amateur Astronomers of Leon, Nicaragua
Mohammedy	Farseem	NOC activities at Bangladesh	The poster present the NOC activities at Bangladesh	Bangladesh Astronomical Society
Marchis	Franck	Unistellar eVscopes: Smart, Portable And Easy-To-Use Telescopes For Exploration, Interactive Learning, And Citizen Astronomy	Unistellar has developed the eVscope, a compact telescope that amplifies light so users can finally see hundreds of nebulae and galaxies directly through its eyepiece. It can also pinpoint and identify objects in the sky, making amateur astronomy fun and more accessible to the public. Thanks to its sensitivity, the eVscope is a powerful tool capable of generating data that can be used by scientists to search for transient events like supernovae, near-earth asteroids, and comets. Because of the larger field of regard provided by a constellation of small, smart telescopes, our network could provide additional data to the few existing large telescopes. Unistellar initiated a partnership with the SETI Institute to identify and develop scientific applications for our network of telescopes. We will summarize the technology behind the telescope and its real-time data processing, then show several applications, including asteroid occultations, lightcurves and astrometry of asteroids accessible to the users. Finally, we will discuss Unistellar network's potential to make citizen astronomy a reality by offering all users (newbie or experienced) a tool to explore the night sky with a powerful and reliable instrument while they contribute to scientific investigations.	SETI Institute & Unistellar

Langston	Glen	Experience with Student-Constructed Telescopes for Radio Astronomy	Our group has designed, documented construction and operated Radio Telescopes intend for use by high schools, colleges, hobbyists and other Science Aficionados. We present our experience with college freshmen that built two telescopes during a two-week summer program. The students operated the telescopes, which they named Alexander and Bess. Their experience was mostly successful, and we learned how to improve documents describing construction and operation. We're incorporating lessons learned into revised documentation, published on the web at: https://opensourceradiotelescopes.org/wk	National Science Foundation
Maravelias	Grigoris	AstroReg: a world-wide astronomical registry	In the era of automated information, astronomers still waste a considerable amount of time looking for the correct contact details (e.g. mail, phone) of another researcher. Often the information found at institute websites are not up-to-date, incomplete or -incredibly- totally missing. When this is the case, one has to go through a tedious search to find the proper contact details, typically looking for the reference mail in the latest publication of a given astronomer. Except that sometimes the astronomer has changed address in the meanwhile, or did not report a contact mail. To overcome such unfortunate issues, we introduce AstroReg: a world-wide registry for astronomers providing instant access to the basic and updated information necessary to contact any astronomer at any institute. While submissions by astronomers themselves are favored (a process taking less than a minute), the database can be populated automatically by searching the public available information (and the corresponding profiles can be edited at a later step). Once queried, AstroReg provides the few basic (public) contact information (name, current affiliation, mail). Our goal is to include every single astronomer in the world and keep it updated as part of their CVs. The database will serve the community in two more ways: (a) constitute the first and most complete census of the astronomical community, (b) allow the formation of groups/associations (e.g. to support national or gender-wise demands for rights). Future features of the AstroReg platform could offer synergies with other platforms to enhance the profile/CVs of the partiipants, and collaborative tools for communication (e.g. proposal submissions).	Foundation for Research and Technology-Hellas (FORTH), University of Crete
Maravelias	Grigoris	A paradigm to develop new contributors to Astronomy	One of the most regular activity of amateur clubs is scientific outreach, a paramount channel to disseminate scientific results. This is performed typically through talks given either by professional scientists or amateurs with significant knowledge of their subject to a rather passive audience. The advance of technology has provided all the tools that can help amateurs to actively participate in the scientific output. What is missing often is the proper guidance. To address that within the Greek amateur community the Hellenic Amateur Astronomy Association materialized a training program (free of charge and open accessed) to develop scientific thought and the practical capabilities for amateurs to produce valuable results. The program run from November 2014 to May 2015 and each session (month) was dedicated to a particular field: the Sun, variable stars, comets, planets, artificial satellites, meteors. For each session a professional and/or an experienced amateur astronomer was leading the course consisting of: (i) a theoretical part with talks on the highlights of the field and the necessary observing techniques, (ii) a hands-on session, where the participants were actively involved in obtaining observations, data reduction, and final analysis. In total about 100 participants gained significant experience with respect to the observational procedures and the scientific methodology.	Foundation for Research and Technology-Hellas (FORTH), University of Crete

Rojas	Gustavo	Bridging the gap: Astronomy outreach in the corporate world	Astronomy is perhaps the branch of science that most fascinates the general public, with its fantastic images and mind-boggling questions. Astronomers have potential to be role models of our technological-driven society. Yet, with very few notable exceptions, scientists are very far away from being celebrities. One of the reasons is that the astronomical community does not interact on a consistent basis with large companies that drive public opinion and media focus. Vesper Assessoria is a startup that aims to bridge the gap between the academic and corporate world. We approach companies and media conglomerates presenting renowned astronomers as potential role models, influencers and motivators. If athletes and artists can do it, why can't we? By bringing astronomers to the spotlight, Vesper helps to foster the interest of companies in astronomers and astronomy in general, which in turn leads to fundraising opportunities. We'll focus on four successful cases: a former Hubble fellow that shared the experience of working with Hubble in the "all-hands" event in Google Brazil office; the involvement of Brazilian Astronomy Olympiad in the internship selection process of IBM Brazil; the participation of the author in the largest Brazilian advertisement fair; and the partnership with Canal Nostalgia, a top-10 Youtube channel.	Vesper Assessoria
KAYIHAN	H. Aziz	Gamification and Drama as a Technique to Teach Astronomy to Primary and Secondary School Students	Children like to run and scream during school hours thus creating chaos. That is an alternate way they experience the universe around them. Chaos is in a way a big part of our universe, as it is our children's life. This chaos is a way for them to tell that they want to be more involved in the process. Presenting them with games and fun activities contributes greatly to their education and learning experience. Astronomy is yet another course, children can learn through games and drama. Games create challenge, this is a way for children to prove themselves among others and drama create teamwork and involvement. Combining the two, by gamifying the topics, presents a much more effective method for teaching astronomy and space sciences. In this study, we present the ways and methods through which astronomy is better carried to children and how classrooms can suddenly turn into magical space funfairs for them. Yet, educational systems are a part of the challenge as an obstacle on the way.	Antalya Sinav College
Harris	Hannah	Wikipedia for Astronomy: Improving a global resource for education and outreach	Wikipedia is a common reference for students, scientists, the public, and anyone interested in astronomy. Due to its ubiquity when searching for information online, it is often the first resource a curious reader will encounter. Accurate astronomy-related content on Wikipedia enriches public understanding of astronomy, supports factual science journalism, and provides quality astronomy information in diverse languages. For astronomers, communicators, and educators, it matters what astronomical information is on Wikipedia, and whether or not that information is accurate and understandable. This poster summarizes the current state of astronomy on Wikipedia and how that information can be improved.	IAU OAO / Leiden Observatory
Yamaoka	Hitoshi	Astronomical Activity in Japan (NOC report)	Japanese people have been engaged the astronomical activity very well. There are more than 300 planetariums, and also are many public observatoies with >1.0m aperture telescope. These facilities are very good place to meet together with astronomy fans. Every research intitutes make efforts in educating and popularizing astronomy and space sciences. Two domestic monthly commercial-based astronomy magazines are published, as well as the other science magazines written in Japanese. Under such situation, the role of NOC would be concentrate to connect them with the international activities. NameExoWorld contest was the first such case. Name proposals from Japan were numerous, and we got 4 official names which were greatest number in the world. But it needed to get over the language vareer. With Japanese language, we set up the instruction web page for every procedures. wrote many articles, made many lectures and so on. However, we got a small number of vote at that time. We discuss the reason why we could not reach people who could vote, and the strategy for the next chance.	National Astronomical Observatory of Japan

VILLICANA PEDRAZA	ILHUIYOLITZIN	Citizen Science and the virtual observatory with college students	The Citizen Science Astronomy (CSA) as a collaboration of scientists, software developers and educators, is an excellent project to motivate college students to be young scientist. In order to introduce the students to be part of the citizen science we teach in the astronomy classes to the students how can they can study and analyze the astronomical objects. We are trying to combine the Citizen Science and the Virtual observatory. Some of the students are not from STEM, but they are introduced in the real life of a scientist and the problems that we have in our careers, in special with financial support of the projects, and one day they can be motivated to help the science projects and invite more people like them. Here we present an experiment from around a year with college students using the Citizen Science and the Virtual Observatory.	NEW MEXICO STATE UNIVERSITY (DACC)
Acharya	Jayanta	NOC Activity in Nepal	Nepal is least develop country lies in between two big country India and China. Despite the favorable climatic and geographical conditions, research and development of the astronomy in Nepal is very limited.To increase the astronomical awareness there should be activities in School and Public Places. Our activities aware not only to children but also to the school teachers parents and locals people in a practical way. If a children is interested in astronomy he/she continue their study in astronomy. They conduct research and development in this field.In this poaster we are showing how are are doing Astronomical activities and increasing interest for the students for the future astronomer.Key words: Astronomy, School,	Balmikee Campus
Matthews	Jaymie	SPACE SUITE -- Telling a 10-billion-year-long story in 1 min 20 sec	The four-part challenge: (1) Capture the attention of a television viewer or web surfer and hold it for a couple of minutes. (2) In that time -- with images, few words of text and rarely narration -- teach and inspire them about astronomy and space. (3) Synchronise it all with classical music. (4) Achieve steps (1) -- (3) on a budget of 4000 euro per episode.The 30-episode solution: SPACE SUITE. Commissioned by Knowledge Network (the provincial educational television network of British Columbia, Canada), Space Suite segments cover everything from the life story of our Sun (condensed into 1 min 20 sec), the mythology and science of the aurora, galactic collisions, our fascination with Mars, stellar nucleosynthesis, light pollution, to astronomical art, and more.With mostly text which could be translated into any language, and music which is universal, Space Suite is a cost-effective format for astronomy education of all ages on many different platforms around the world. Become an audience for Space Suite and find out how you could compose your own series of space-astronomy 'music videos'.	University of British Columbia

Determann	Jörg Matthias	The International Astronomical Union and the Arab World: Bridging Communities in Science and Outreach	<p>Over the last hundred years, the International Astronomical Union has played a crucial role in bridging communities and developing space science and outreach in the Arab world. Algeria was, as part of France, a founding member of the IAU in 1919. Egypt joined the Union in 1925, and other Arab countries followed suit in the second half of the 20th century. Lebanon first joined in 1954, Iraq in 1976, and Morocco and Saudi Arabia in 1988. Individual IAU members were also important, especially for countries such as Iraq, which at times were at the margins of the international scientific community. In 2010, no Iraqi institution, but seven individual astronomers were still members of the IAU. Especially active was Athem Alsabti, who had first joined the union in 1976. After leaving Iraq during the late 1990s, he became part of the IAU's Program Group for the World-Wide Development of Astronomy. In honour of his work, the IAU named the asteroid 10478 Alsabti after him in 2001. The collaboration between IAU members on different continents has been essential for outreach and the training of astronomers in the Arab world. Zdenek Kopal at the University of Manchester attracted many students from Egypt, Iraq, and Libya between 1950s and 1980s. Kopal and his colleagues initiated the International Schools for Young Astronomers, which have been supported by the IAU. In 1967, the University of Manchester hosted the first of these schools with twelve students, including two from Egypt. Subsequently, Egypt and Morocco each hosted two International Schools for Young Astronomers between 1981 and 2004. While military conflicts and light pollution have formed significant challenges, increasing numbers of science museums, booming amateur clubs and arid mountains in the region provide opportunities for future outreach. Collaboration with local science fiction societies could further contribute to fascination for astronomy among people with limited access to planetaria or telescopes.</p>	Virginia Commonwealth University in Qatar
Diamond	Joseph	The new age of big data astronomy... digital assets!	<p>The Square Kilometre Array (SKA) project is an international effort involving 20 countries on 5 continents to build the world's largest radio telescope, and with that comes its own challenges of processing, storing and distributing large amounts of astronomical data. However, a smaller challenge of its own is coordinating a global communications effort, and the management of the digital assets a global, distributed project like the SKA produces. How to obtain assets from different countries and partners? How to ensure they meet the required high-level quality? How and where to store them? How to share them with partners around the world and distribute them to various audiences? Building on the theme of how organisations develop and coordinate astronomy information and the dissemination of their resources, this talk focuses on the increasing need for communications teams to adopt Digital Asset Management (DAM) systems to gather and manage increasing amounts of diverse resources and media products and distribute them to relevant stakeholder groups. DAM systems can also help streamline workflows and improve the communications & efficiency of distributed communications teams to maximise productivity.</p>	Square Kilometre Array Telescope

xiao	jun	Rediscover the cultural relics of Beijing Ancient Observatory	<p>Last year we have a project to collect the data of the cultural relics in Beijing Ancient Observatory. This project Beijing Planetarium consists of three parts: three-dimensional scanning modeling, traditional rubbing (Stone Rubbing) and two-dimensional high-definition heritage photography, which classifies the overall shape, components, astronomical information, decorative details and other elements of the cultural relics, targeted for three-dimensional data acquisition processing, rubbing and two-dimensional high-precision and multi-angle data collection and processing. In this Project, all the ancient instruments are 2 meters higher and too large to High precision 3D scan. Hand-held scanners & High-Precision Structured-light scanners were applied to acquire geometry information to fulfill relics document requirement. Meanwhile, for the requirement of High-fidelity color information preservation, this Project has also used IBMR (Image-Based Modeling and Rendering) technology to acquire textures. Color information from Single Lens Reflex camera, geometry information from structured-light scanner, the 3D scanner has assured the precision of geometry, color information is transferred with baking technology. The digital document is focused on high-fidelity, high-precision from beginning to end. 5 months, 8 Main instrument & More than 20 relics have been successfully scanned and digitalized with advanced computer graphic technologies. Models are finally processed as Unity 3D scenes to display and basic interaction. Based on the results of the data collections of Ancient Observatory cultural relics by Beijing's municipal financial projects, we could rediscover the cultural meaning of astronomy instruments in ancient observatory, and understand the Chinese traditional concept of harmony between human and nature deeply. This will strengthen the depth and breadth of management, research, and scientific popularization of the collections in Beijing Ancient Observatory.</p>	
Leung	Kam Cheung	NOC activities at Hong Kong	The poster presents the NOC activities at Hong Kong	Hong Kong Astronomical Society
Tsinganos	Kanaris	Activities during the year 2019 for IAU100 in Athens/Greece	<p>The activities for IAU100 will be organized in the Athens metro area in Greece before and during the European Researchers' Night on 27-28 September 2019. They will be part of the International Astronomical Union's (IAU) 100th anniversary celebrations in 2019. The venues which will participate are the Observatory of the University of Athens (UoA), The Planetarium of the Evgenidis Foundation, the National Observatory of Athens (NOA), the Stavros Niarchos Foundation Cultural Center, Several Schools in the Athens area, e.g. the Arsakeia-Tositseia schools. Activities will include: Preparation of a leaflet with the program of the various activities, Public outreach talks and lectures popularizing recent results of modern astronomy to the general public and covering the main areas of contemporary astrophysics and space physics, Observation of the night sky at the participating Observatories, School visits, in Athens wherein researchers will visit selected top schools of the Athens area in the Spring of 2019 to create awareness among the students about the potential of astronomy and encouraging them to consider astronomy and space science as a career choice and also perform in the schools simple astronomy experiments to increase the excitement for science, Hands-on astronomy activities corner, for children and families at the premises of the National Observatory of Athens (NOA) and the Stavros Niarchos Foundation Cultural Center using the facilities and experience of the expert personnel of the visitor centers of NOA, Creation of a dedicated web site at the official site of the Hellenic Astronomical Society (Hel.A.S.), and also announcements at the web sites of the UoA and NOA, Activation of contacts with newspapers, magazines and TV and mailing lists of the amateur astronomers, Organisation of a special edition of the Hel.A.S. journal Hipparchos for IAU100.</p>	University of Athens

Czart	Krzysztof	Astronarium TV series as an example of cooperation between astronomers and media	Global video series produced by the IAU presenting astronomy in every member country? Maybe this idea is worth considering? We would like to present and inspiring example for other national societies gathered in IAU for developing TV series about astronomy in their countries and maybe also for the global video series by the IAU. "Astronarium" is a TV series in Poland about astronomy and space produced together by the Polish Astronomical Society (PTA) and the Polish Television (TVP). Over 50 episodes has been broadcasted since 2015 with audience many of them exceeding million viewers (per single episode). It is also available at YouTube with over 2 million views. Scientists (astronomers) often know from their experience that it is not easy to cooperate with journalists, especially from large, general media, like television. In "Astronarium" we succeed to break the barrier between these two "worlds". Very often if scientist appears in TV it is in the context of a news or as a part of a "show" program. In Astronarium astronomers have chance to talk more about their work that in typical TV appearance of scientist. Our cameras have shown over a dozen scientific astronomical institutes in Poland and all over the world and about 100 scientists had a chance to present their research. We are also looking for volunteer translators among astronomers for subtitles for various languages. Astronarium is available at www.astronarium.pl and www.youtube.com/AstronariumPL .	Urania - Postepy Astronomii
Czart	Krzysztof	AstroGPS - database of all astronomy and space related events with a mobile app	There are various systems of events coordination on a global scale (for example supported by the IAU) or on national level. We would like to present the AstroGPS system which is about to start in Poland in 2018. AstroGPS is a mobile app and a web portal with database of all events related to astronomy and space which are organized in the country. These are events on nationwide, regional or local level, like conferences, workshops, prelections, astro shows, science festivals, emissions of radio or TV programs, contests, astro picnics, astro camps and many other events. AstroGPS has three main groups of users: society of people who are interested in astronomy and space, organizers of events and media (journalists). It can be very helpful also for schools and teachers. For all these groups it might help in their functioning and activities in astronomy-space related areas. AstroGPS can be inspiration for similar national systems in other countries or in future be a part of a global system of this kind in astronomy and space science.	Urania - Postepy Astronomii

Canas	Lina	<p>Communicating Astronomy with the Public (CAP) Conferences series provides an open platform to exchange opinions and experiences regarding the latest challenges in communicating astronomy with the public. Seeing CAP as an ideal opportunity to bring the international astronomy community to Japan and to directly experience the most recent national and Asian advances in the field, the National Astronomical Observatory of Japan (NAOJ) and Fukuoka City, continuing the efforts made in the past years in Astronomy communication in the country, embarked on a journey to host CAP 2018 edition in Japan. The organization wanted to give something back and contribute to a more significant percentage of Asian participants in the CAP by directly supporting young participants from Asia-Pacific countries and by having a national organizing committee that disseminated CAP conferences throughout Japan, increasing national participation. The relationship established between different national and international stakeholders involved in outreach and astronomy communication increased the visibility, reach and interest of the international community in participating in the meeting. Maximizing the overall participant experience by using the potential of providing a unique cultural intake that Japan has to offer and how it can broaden horizons and extend it to a valuable professional experience. As a language barrier is still a divide to the internationalization of many Asian programs, CAP 2018 was presented with all the benefits a face-to-face meeting can provide: strengthening relations and meeting new professionals in astronomy communication from Japan and the Asian community. CAP 2018 edition is one of the most diverse and largest CAP conferences ever organized and the work carried by the Local Organization on planning and implementing, framing it in the Asia-Pacific context, focusing on the needs of the region and creating a chance to make a difference in Astronomy communication for years to come.</p>	IAU Office for Astronomy Outreach (OAO) / NAOJ
Canas	Lina	<p>IAU and the Public: IAU Office for Astronomy Outreach (OAO) Communications</p> <p>The IAU OAO communications comprehend a set of ongoing tasks that contribute to the IAU direct interaction with the public. Its primary goal is to support the current outreach activities around the world by disseminating, promoting and encouraging outreach-related activities from and to the IAU. Examples of these tasks are managing the IAU Public Enquiries and FAQs, the IAU Social Media, the IAU Astronomy Outreach Newsletter, and the IAU Themes. The IAU OAO is in charge of answering public enquiries for IAU-related affairs, via email and IAU Social Media channels (Facebook and Twitter), thus allowing the IAU to build a dedicated dialogue with the public by using direct channels such as emailing, messaging, commenting, tweeting or retweeting. The IAU Social Media intends to promote public awareness of the IAU activities by sharing upcoming IAU conferences and symposia, information about the IAU Scientific Bodies activities, and updates from the IAU Office of Astronomy for Development (OAD) and the IAU OAO. The IAU Astronomy Outreach Newsletter is a community generated digital publication curated by the IAU OAO team to improve community building and disseminate commendable efforts, such as astronomy outreach and education activities and resources around the world. The IAU Themes featured on the IAU website, encompass the most popular topics related to astronomy and the IAU, triggered by the most frequently asked questions (FAQs) that the IAU has received over the years. The IAU OAO utilizes a set of digital platforms and their data analysis tools to manage the content and community response. How data is gathered from the different tools available, the importance of indicators and their subsequent analysis, are steps considered for each of these channels in order to maximize our audience reach, influencing the overall communications strategy of an organization such as the IAU.</p>	IAU Office for Astronomy Outreach (OAO) / NAOJ

Marchetti	Lucia	Cape Town's Iziko Planetarium & Digital Dome : a cutting edge platform for big-data science & public engagement at 360 degrees	The recently inaugurated Iziko Planetarium and Digital Dome is the most advanced digital planetarium on the African continent. This multi-functional, world class facility not only provides immersive multi-sensory edutainment and a platform for artistic production - it is also aimed to be used for cutting-edge scientific research and to optimise South Africa's eResearch and data visualisation capacity. This digital full dome theatre provides audiences with an unequalled experience of animation and 360 degrees cinema; as well as making virtual exploration of the Universe, the inner workings of the human body, or the intricacies of an atomic structure possible. In addition, learners and educators from primary to tertiary levels will benefit from computer generated imagery that makes interactive teaching and visual learning possible; providing an unparalleled and accelerated learning experience. In my talk I will give an overview of the capabilities and goals of this cutting edge facility in the local and international context. In particular, as a professional astronomer working with the planetarium to implement new practices for data visualisation and research I will show how this platform can also be used as an effective public engagement platform at 360 degrees.	University of Cape Town
Sundin	Maria	Two studies using space sports in education and outreach - Sailing on Titan and equestrian sports on Mars	Numerous people are interested in space and many are interested in sports. Combining these subjects can be one way to create curiosity for astronomy and science far beyond the reach of either subject by itself. The idea of space sports most likely originated in science fiction. Since, we have had real examples such as golf on the moon or an astronaut playing baseball in the ISS. Apart from adapting sports from Earth to space, developing new sports could become a reality in the future e.g. in weightlessness. As soon as you leave the Earth, every sport will change. Probably, everyone who is interested in a certain sport will find this intriguing. Discussing why can lead to a deeper understanding of physics and astronomy. Two concept studies within space sports have been done by our team. (1) Sailing on Titan and (2) Equestrian sports on Mars. The studies have been presented as popular science papers, in radio/TV, at sports conferences, during outreach talks, for teachers and in university courses. The purpose of this paper is to present short versions of these two studies, and the experience gained from using them in education and outreach. A second purpose is to create a discussion of further possibilities of using space sports to reach new groups with astronomy and science. For different reasons some people find astronomy far from their liking or feel that it has nothing to do with their lives. Using interdisciplinary aspects such as art, history, myths, navigation, psychology or music as an introduction to astronomy can work quite well as a starting point for more learning or as a key to enthusiasm. Space sports fits well in this context. Due to the interdisciplinary nature of the topic, the project has been done by a team with highly different backgrounds. Included in the team are researchers and professionals in astrophysics, hydrodynamics, marine technology, practical philosophy, space art, equestrian sports and a former world champion in Star boat.	University of Gothenburg
Isidro	Mathieu	How to ensure different organisations in different countries join forces to communicate one project	The Square Kilometre Array (SKA) project is an international effort involving 20 countries on 5 continents to build the world's largest radio telescope. One of its many challenges is coordinating a global communications effort to maximum effect and impact, both for the project as a whole and for its individual partners. With those partners in different timezones & continents with different interests, how do you ensure a joined-up approach across all project communications? Building on the theme of Finding Common Purpose and Implementing Coordinated Action, we will explore how we manage a global science & engineering partnership with communications colleagues spread over 20 timezones to best leverage local communications opportunities and support one another's strategic objectives while ensuring a strong brand and unified message for the project. Focusing on lessons learnt, we will discuss ways of working and workflows and highlight successes and challenges of some of the communication campaigns we have undertaken in the past five years.	Square Kilometre Array Organisation

Fitzgerald	Michael	Our Solar Siblings: Connecting students, teachers, scientists, amateurs and projects through robotic telescopes	Our Solar Siblings (OSS, www.oursolarsiblings.com) is an astronomy education project based in Australia but accessible internationally. It has five main goals (authentic use of science data by students, student understanding of the universe, student understanding of science, student attitudes towards science and enabling student research). These are addressed with three main approaches, A) facilitating in-class use by everyday teachers, B) Direct and indirect mentoring of student research projects and C) providing support and development for other similar projects and approaches around the world. The first two approaches have been covered in detail elsewhere before, but in this presentation, the third approach is presented as a model in bridging different communities and connecting scientists and teachers for education and outreach purposes. Our Solar Siblings (OSS) openly provides materials, mentoring, guidance, self-paced training material and support to multiple endeavours across the globe as well as access to a customized data product pipeline for optical data designed to provide accessible, usable, science-grade data to teachers and student researchers. Frequently, customized add-ons or forks from this pipeline are created to facilitate new ideas and/or streamline the administration for non-OSS projects. OSS's more-than-citizen-science project, the "Local Lyrae Survey" will be presented, the follow-up projects for Kepler eclipsing binaries and TESS exoplanets undertaken by other projects but supported by OSS and the Pro-Am partnerships that are being developed through increasing the data quality and homogeneity of multiple streams of amateur data is presented. How research scientists have been involved at a high level in all of this will also be outlined as well as the simple portal that facilitates research scientist outreach and teacher usage of robotic telescopes.	Edith Cowan University
AlAssiry	Mohamad	NOC activities at Syria	The poster present the NOC activities at Syria	Syrian Astronomical Association
Wolk	Nancy	Touching the Stars: Lessons learned in 3D printing parts of the high energy Universe	Scientists, amateur astronomers, and communicators have been using Chandra's two-dimensional images, along with Chandra videos and podcasts, as an aid in discussing X-ray astronomy with non-experts since Chandra's launch in 1999. With new research techniques, however, we have begun mapping X-ray data (along with other multiwavelength data) of astronomical objects in three dimensions. Holding a 3D print can be an invaluable tool to learn about otherwise unreachable phenomena and data for people of all ages and of varying interests and abilities. In this talk, we will detail our lessons learned in 3D printing, from best practices for reaching blind and visually impaired audiences, to technical advice on print resolution and size, to our new adventures in powder-based printing in full color.	Smithsonian Astrophysical Observatory

Kusakabe	Nobuhiko	Outreach activities of Astrobiology Center of Japan	<p>As a result of developments in extrasolar planet observations, astrobiology research to explore “Life in the Universe” and uncover its mysteries has become a pressing subject. Astrobiology Center (ABC) of Japan, established in 2015, advances this field by combining disciplines, promotes research into extrasolar planets and life both outside and within the Solar System, and develops observational instruments for these purposes. For public, “Life in the Universe” is one of the most attractive topic. Many science fiction movies show various shapes aliens. However, real astrobiology researches are quite far from such aliens shape and most public people do not know such actual astrobiology research. Therefore, ABC needs to tell actual astrobiology research field. At first, we have opened the astrobiology center official website since 2015 (http://abc-nins.jp). In the website, thirteen topics related astrobiology and exoplanet researches have been released until now. We organized and participated various outreach programs such as visiting lectures, public talk, symposiums and open campus based on some Astrobiology researches. For example, one of a new topic is photosynthesis on a habitable exoplanets. Plants on exoplanets are quite attractive topic. From biology side, we talked about photosynthesis system such as reaction wavelength and efficiency under another Sun’s spectrum. From astronomy side, we talked about various exoplanets, habitable zone, their assumed environment and climate. We talked about both of these topics on some events. On the other hand, for children, we held exoplanet and alien drawing events. In such events, we explain some exoplanet parameters such as size, gravity and temperature. Then children drew freely their own planets and aliens based on scientific exoplanet environment. I summarize ABC public outreach activities. Our activities would be effective for people who are interested in not only astronomy but also biology.</p>	Astrobiology Center
Gomes	Nuno	Dark Skies Rangers: a flagship to bridge the gap between schools and communities	<p>A large network of European schools is currently being created in the framework of the Open Schools for Open Societies (OSOS) H2020 project. The main goals of OSOS are to enable schools to become hubs for science communication in their local communities, to be incubators of exploration and invention, to be accelerators of innovation and to promote open schooling. Dark Skies Rangers (DSR), one of the flagships of OSOS, is a project focused on fighting the light pollution and giving back starry skies to the worldwide populations. It tries to create awareness for the impact of light pollution in our economy, in security, in ecosystems and in human health, thus meeting the goal of protecting dark and quiet skies of the IAU Strategic Plan for the 2020-2030 decade. DSR is being used as an accelerator for OSOS, i.e., an idea that facilitates the transition from a traditional teaching system to an open schooling model, where students identify problems within their local communities and carry out scientific projects with the aim of solving them. In this talk we will present OSOS and will focus on DSR, describing several examples of how communication efforts being implemented in Portuguese schools are affecting the behaviour of local communities, authorities and policy makers towards the creation of awareness for the problematic of light pollution, and designing innovative solutions.</p>	NUCLIO - Núcleo Interativo de Astronomia

Fagbemiro	Olayinka	BRIDGING THE GENDER GAP IN STEM THROUGH GIRLS' ASTRONOMY CAMP, ABUJA -AN OAD FUNDED PROJECT	<p>This project addressed first, the challenge of lopsidedness in the elementary school enrolment. We decided to host an astronomy camp for girls because of the issues associated with girl-child education in northern Nigeria. The term 'girl-child' refers to a female between the ages of 6-18 years. The gender apartheid places the girl-child in a disadvantaged position, where her potentials are suppressed and self-actualization is not achieved. The girl therefore, becomes a victim of a pre-existing socio-cultural male exaggerated superiority. Furthermore, on the account of gender, girl-children are subjected to all multiple forms of oppression, exploitation and discrimination. Girl-child education has then become a major issue of concern in most developing countries of the world today, especially in sub-Saharan Africa, where a large number of young girls do not attend school. According to UNICEF (2007), the global figure for out-of-school children is estimated to be 121 million, out of which 65 million (approximately 53.8%) were girls and over 80 percent of these girls live in sub-Saharan Africa. The northern Nigeria have the country's worst girl child education, highest female illiteracy, highest adolescent girl marriage, highest under 15 child bearing, and highest risk of maternal death and injury. The scorecards underline the links between poor educational attainment for girls, forced marriage of underage children, and under age child bearing. The project encouraged the female children to aspire to STEM just as much as their male counterparts and also to encourage parents to enrol their female children and also aspire for them to be great scientists in the nearest future just like many of the female instructors that participated in the project. The focus is on the female children in other to bridge the gap the exists between male and female children enrolment particularly across the northern part of Nigeria.</p>	National Space Research and Development Agency (NASRDA)
Figueiró Spinelli	Patrícia	The Girls' Day at the Museum of Astronomy	<p>As it is widely known, the percentage of women in the so-called hard sciences is significantly lower than the number of men. Science and gender equality are both vital to achieve sustainable development throughout the world. As such, United Nations Educational, Scientific and Cultural Organization (UNESCO) is encouraging worldwide efforts to overcome gender disparities. The Girls' Day at the Museum of Astronomy and Related Sciences (MAST, Portuguese acronym) in Rio de Janeiro, Brazil, is one of such initiatives. It has the aim of discussing about the persisting inequality in science with its participants, bringing women scientists and girls together as well as presenting the beauties of science through astronomy outreach activities. In its four editions, the attendance of the event was very satisfactory and the discussions raised in during the promoted roundtables were inspiring. These debates were transmitted on-line and followed by hundreds of viewers. In this talk, we will discuss the most important aspects of the events and lessons learnt. We will also reflect upon the role of science museums in creating equitable experiences for its public, including contemporary discussions in its agenda without losing the evidence of how our culture and knowledge evolve.</p>	Museu de Astronomia e Ciências Afins
Shah	Priya	The Open Universe and Data-driven Astronomy	<p>Activities related to access to astronomical facilities and data could offer an effective, entry-level path for outreach and astronomy education. The Government of Italy proposed the Open Universe initiative that was adopted by the United Nations Office of Outer Space Affairs. Education in astronomy is a key method to promoting rational thinking and the scientific method. We shall discuss how new methods using available data need to be used for outreach and education to help visualize and understand actual data. We shall show, using GAIA DR2 data, how present data analysis and visualization tools can be used to identify star clusters, moving groups and runaway stars. Thus, with this example, real data can be used to understand stellar dynamics in the galaxy.</p>	Maulana Azad National Urdu University

Nguyen-Luong	Quang	Seeking for partnership to construct an astronomical observatory in the remote area of Vietnam	Tay Nguyen University is a local university in Buon Ma Thuot, Daklak, a highland part of Vietnam which as mountain peaks up to 1200-1600 m and a large portion of clear sky nights per years. Having 20000 students and 4000 students in the Science and Technology department, it deserves to have its own astronomy department. We are actively developing a plan to build an observatory in Tay Nguyen university for educational and training purposes. We currently have some partnership in development but we are still actively looking for new ones, especially in curriculum development and financial support. In this talk, I will describe the challenges that the project is facing and also the help that we are looking for. Detail of the project can be found here: cita.utoronto.ca/~qnguyen/FLO.html	University of Toronto
Venugopal	Ramasamy	Astronomy outreach for supporting the underserved and dispossessed	Astronomy and Space topics hold a universal fascination. Astronomy is deeply rooted in various cultures around the world. Thus astronomy outreach can (and has) been a bridge to indigenous communities and underserved populations. Astronomy outreach has also been deployed in war ravaged regions to instill a sense of oneness that emerges from the astronomical perspective. Exposure to astronomy topics serve to inspire people and leads to an uptake in science and STEM subjects. So, astronomy outreach campaigns to remote regions are also effective tools of education. The IAU Office of Astronomy for Development (OAD) has supported various outreach projects that used astronomy to support the underserved and dispossessed. Examples include using astronomy to bring solace to students in earthquake affected regions, to bring together children from different sides of a conflict region, to educate remote, underserved communities, tactile astronomy to teach visually impaired children and astronomy for economic empowerment of remote communities (astro tourism). The OAD Regional Offices provide a readymade structure to deploy such efforts around the world according to local conditions. I will be sharing some of the experiences of coordinating these projects on behalf of the OAD.	IAU Office of Astronomy for Development
Gelderman	Richard	Interactive Planetarium Presentations that Support a Personal Understanding of the Cosmos	Hardin Planetarium is one of the many science museums around the globe that provide an important forum for supporting informal educational opportunities for those who otherwise have turned away from science. We collaborate with international partners interested in live, interactive presentations that are explicitly designed to actively engage people who don't otherwise connect with science education opportunities. People never recognized as academic achievers are typically the ones most appreciative of highly interactive presentations. Examples of our most successful initiatives include planetarium shows founded on audience participation. Our Star Stories version of the seasonal night sky tour never mentions the "accepted" constellation names from any culture, but instead has them connect the stars into patterns from their imagination. Groups of audience members share the story they come up with about the pattern they see in the stars, and the planetarium leader weaves each story into a uniquely original star-hopping connection of that evening's sky. Audience members in our Lives of the Stars show choose any star in the evening sky, whereupon the planetarium leader shares some particular information about that object and how it ties into broader astrophysical explanations of cycles of stellar evolution in our Galactic neighborhood.	Western Kentucky University's Hardin Planetarium
Walsh	Robert	Activities of UK IAU National Outreach Coordinator 2018	This poster will outline some of the major outreach and public engagement activities undertaken in the UK in 2018.	University of Central Lancashire

Walsh	Robert	Blackpool PIER (Physics: Inspire, Engage, Research)- working with low science capital communities in the UK	<p>The seaside resort of Blackpool, Lancashire, UK holds a unique place in the affections of British people. Known for its iconic landmarks of the Blackpool Tower and Pleasure Beach, a busy summer season is followed in autumn by the Blackpool Illuminations, attracting over 4 million visitors. However, government statistics reveal Blackpool as England's fourth most deprived area, with soaring deprivation measures. In particular, the percentage of pupils achieving good school exit exam grades is declining and is substantially below the UK average (40% compared to 65% nationally). Consequently, it is estimated that only 12% of young people will enter higher education. Blackpool is a prime example of a region with exceptionally "low science capital". The concept of science capital is a science-related form of cultural and social capital employed as a theoretical lens for explaining differential patterns of aspiration and educational participation in science amongst young people (Archer et al, 2015, J Res Sci Teach, 52: 922). This work will outline the 1st year results of an ambitious 3 year longitudinal public engagement programme with a specific cohort of young people as they are followed from their last year in primary school (10/11 years old) through to their early years in secondary education (12/13). Funded by the UK's Science and Technology Facilities Council Leadership Fellow programme, this work consists of school visits and community events plus trips to specialized facilities at the University of Central Lancashire (UCLan). With overall aims to improve the experience of astronomy for this targeted cohort and to inspire them through activities that increase their exposure to and enhance their confidence in engaging with STEM, the approach to relationship building with the cohort will be discussed. Also the evaluation of any improvement of their science capital metrics in the first year of interventions will be explored and compared to other external benchmarks.</p>	University of Central Lancashire
Hollow	Robert	Building a Radio Astronomy Community	<p>Universities around the world are looking for programs to differentiate themselves from others and to equip their students for the challenges presented by new technologies and facilities. With the advent of new radio telescopes such as the Square Kilometre Array and FAST and the massive data sets such facilities will produce opportunities to expose, engage and train students are becoming important. In response to this need and building on the success of the innovative PULSE@Parkes education program for high school students CSIRO Astronomy and Space Science in Australia have been developing a new program; OPTIMUS. OPTIMUS (Observing with Parkes, Training and Introduction, Module for University Science) is a flexible package providing undergraduate and postgraduate students a hands-on introduction to radio astronomy observational techniques and data analysis, using pulsars initially as the context. It includes background educational material, tutorials, a virtual machine to allow students to install a complete package of relevant software tools, access to data and telescope time on the 64m Parkes radio telescope plus support and observer training. Initial topics for the program include pulsar timing and the search for gravitational waves, but will in time incorporate other topics within astronomy and astrophysics. We outline the approach taken in developing the program and describe some of the tools produced. Various ways in which users can engage with the program are identified and we discuss how the program has evolved in response to extensive engagement with potential stakeholders around the world. The program provides a model for other institutions to provide effective training and for them to partner and build a global community.</p>	CSIRO Astronomy and Space Science

Massey	Robert	RAS200: Sky & Earth: Engaging diverse partners and diverse audiences with astronomy: a new approach to public engagement	In 2020 the Royal Astronomical Society will celebrate its 200th anniversary. As part of our preparations, we inaugurated the £1 million outreach and engagement programme “RAS 200: Sky and Earth”, with the explicit aim of working with diverse audiences and partners and engaging citizens who would not normally consider astronomy and geophysics as something “for them”.RAS 200 is a “bottom up” scheme, which has encouraged organisations and community groups to propose ideas to the Society. Over the course of two rounds (2014-15 and 2016-17), RAS 200 has provided funding of £30k - £100k to each of fifteen national and community-based projects, including two Celtic cultural festivals, as well as “underserved” audiences such as young people not in employment or training, and prison inmates.I will discuss these projects in more detail, describe the successes and challenges of this model, and how the IAU and other partners might draw on our work.	Royal Astronomical Society
Doran	Rosa	Astronomy Education and Outreach 2030	We all grew up listening to the classical statement: “The world changed so much”. Well, this has never been more true than in recent times. The same cannot be said about the way we educate and build the science literacy and in particular astronomy literacy of inhabitants of this planet. In the digital era information is something that surrounds us and is available at anytime and anywhere. Schools have to become a hub for the future of communities and communities have to be a strong nest for future generations. Astronomy has always been the trigger for changes, the unifying truth below and above all of us. Nonetheless it is not always recognized as a strong aggregator of science literacy opportunities, as source of change and innovation that often dictates innovation paths for the future. In this presentation we would like to share a few innovative ideas that can put astronomy in the centre stage by building from its legacy and moving towards the jobs of the future. We know that 80% of the jobs in 2030 are not invented yet, that 50% of existing jobs will no longer exist by then. Now is the time to plan the role of Astronomy by building on its existing legacy and paving the way for future generations. In this presentation we intend to present the open schooling movement that is emerging in Europe. Schools are becoming beacons for their local communities and by using the Design Thinking strategies their communities are becoming strong partners in the design of future generations.	NUCLIO - Núcleo Interativo de Astronomia
Hayashi	Saeko	Bridging the Gap of How One Feels about Large Facilities	When you share common interest, you get friends. When you share common concerns, you become friends. When you sit together, you get better understandings. Even with people who have different views, we can work things out. That is what I believe, even when faced with strong oppositions against a proposal for a large facility to be built outside of my own country. And this is what I experienced - sitting in the same room, embrace the opportunity to face each other, I did find the overall concept is common. Then how can we build common “ground”? The key is embedded in how we view the long -term future. Sometimes you encounter this argument, “not in my backyard” about the construction of big buildings or facilities. Then if the new project does not come to one’s neighborhood, that situation might lead to the loss of the livelihood there. I would like to discuss examples I witnessed which helped interactions between groups of opposite views. I do not have the desired outcome yet, but I believe the mutual understandings is one important key to make it come.	National Astronomical Observatory of Japan

Dhurde	Samir	Bringing billions together under the Sun	Networking together astronomy communicators and the more than a billion people in the country is a major task in the role of the IAU NOC India. We present the activities that were conducted in India during the last year. Since India is a tropical country, sharing climactic as well as social conditions with about 100 countries close to the Tropics, accounting for 40% of the world's population, the activities we present, could thus be relevant to many others. In particular we focus on the "Zero Shadow Day" activity which brings forth amazing and enabling outreach possibilities on the days when the sun's rays are perpendicular at noon. Being inexpensive and appealing to all age groups, these provides a good chance to talk about astronomy and do some daytime activities even in remote places. The sharing and suggestions would appeal to astronomy communicators from many parts of the world, to come together under one simple, but not commonly celebrated event.	Inter-University Centre for Astronomy and Astrophysics (IUCAA)
Hunt	Sharon	Digital Archives as an Outreach Resource: The Role of the Observatory Librarian	Digital archives are an increasingly important resource for astronomy outreach in this digital age. They allow for the preservation and wide dissemination of the information found in images and documents and serve as an important knowledge repository for outreach professionals, research astronomers, and the public. Observatory librarians can play an important role in outreach activities through the creation and maintenance of these archives. To be useful, information must be organized, described, and made accessible. As specialists in the organization and retrieval of information, librarians offer many skills: familiarity with organizational schemes; practice describing materials through metadata, finding aids, and indexes; proficiency in assessing the needs of diverse communities; an understanding of individuals' information-searching behaviors; and the capability to design effective user interfaces to databases. The National Optical Astronomy Observatory (NOAO) has a large collection of historical materials—reports, newsletters, photographs, films, correspondence, brochures, videos, guides—illuminating our nearly 60-year-long history and our programs. The observatory librarian in conjunction with outreach personnel is digitizing and organizing these visual and textual materials into digital archives accessible through our website. This digital archives project will enhance access to our informational materials and assist us in extending our outreach activities to diverse communities through digital means.	NOAO

Kawagoe	Shio	Development of stargazing party for local elementary school students	Chiyoda Ward Kudan Secondary School has a 15 cm refracted telescope. School science teachers of Kudan secondary school wanted to organize stargazing parties using the 15 cm refracted telescope for public, especially local elementary school students. However, no one knew how to use the telescope. In order to organize the stargazing parties for the local elementary school students, the teachers requested the cooperation with some astronomers and graduates of a Kudan high school astronomy club. The first stargazing party was held for the Kudan secondary school students in October 2009, in order to train the staffs of the stargazing parties for the elementary school students. At this party, there was not only observation of stars but also lectures on how to use the telescopes and astronomical simulation software. In November 2009, we organized the stargazing party for the local children. In order to look for participants, we informed the public through posters and the homepage. The participants of this event limit 10, because the participants take a lecture from real astronomers as active learning. At this event, we decided 10 participants by drawing lots, because there were 24 applicants. A few of the students who participated in the first stargazing party helped this event as a staffs. We have held about 70 stargazing parties for the local children since 2009. The number of applicants is 5062. Recently, the students who participated in the stargazing parties when they were elementary school students are enrolled in Kudan secondary school. Some of them join as a staff of the stargazing parties. Furthermore, college students who graduated from the Kudan secondary school have supported the stargazing parties and have been teaching the student staff. We shall pursue to establish such cycles.	The University of Tokyo
Farmanyanyan	Sona	Promoting Science Communication with 5 Senses	The present study is proposed to introduce the methods and for promoting science communication with all our 5 senses. We will show how to present space related topics to general public with our 5 senses and how to gain new enthusiasts of the Universe. The basic processes of communication that explain how different publics deal with scientific information will be analyzed and we will apply these insights so as to help improve communication practices in the field of science. Special focus will be given on the science-society relationship and the usage of the persuasive and effective means like science museums, science exhibitions, science festivals, science cafes and pubs, public lectures, talks and discussions, scientific journalism and scientific tourism. We will suggest science communicators to use entertainments including humor, storytelling and metaphors. Scientists even can be trained in some of the techniques used by actors to improve their communication for acting in science shows. Science communication may also be realized by websites and social media platforms. The positive outcome of the usage our 5 sense in science communication such as the rejection of superstitious beliefs, astrology and numerology will be pointed out. We conclude with future tendencies of science communication and benefits of the scientists and young researchers who are actively involved in science outreach activities.	Byurakan Astrophysical Observatory

Durst	Steve	Astronomy from the Moon: Galaxy First Light Imaging and Global Astronomy Outreach	Astronomy from the Moon as a new frontier for astrophysics has attracted explorers, scientists, and educators throughout the Space Age, and its realization offers new opportunities for 21st century global / interglobal learning and knowledge, consistent with International Astronomical Union astronomy education development.	Space Age Publishing Company
			The International Lunar Observatory Association (ILOA) series of missions to the Moon aims for Galaxy First Light Imaging.	
			As did Apollo's first image of Earth from the Moon, acquiring and transmitting the first image of the Milky Way / Galaxy Center taken from the Moon could provide inspiration for people worldwide, expand human understanding of the Cosmos, and advance 21st century science education in every class.	
			The ILO-1 mission to the Moon South Pole / Malapert Mt., as well as a possible ILO-X precursor aboard a Moon Express lander, will prioritize Galaxy imaging, along with a full range of astronomy observations, for the use and benefit of the worldwide Galaxy Forum network.	
			The ILOA Galaxy Forum program, to expand galaxy awareness and the understanding of humanity's place in the universe, has hosted thousands of science teachers, students, astronomers and interested citizens in 80+ Galaxy Forums at 25+ locations in Hawai'i, USA, Canada, China, India, Southeast Asia, Japan, Europe, South Africa, Chile and Brazil since the first Galaxy Forum in July 2008.	
Cheung	Sze-leung	The IAU National Outreach Contact network	The ILOA Galaxy Map © designed to inspire and educate, is usually given free to Galaxy Forum participants and demonstrates that Moon-based galaxy / astronomy observation and research is consistent with IAU programs bringing many scientific communities together. The IAU National Outreach Contact (NOCs) networks started back in 2012, it is the structure within the IAU to coordinate worldwide outreach efforts. The network is managed by the IAU Office for Astronomy Outreach (OAO) hosted by the National Astronomical Observatory of Japan (NAOJ). This poster presents the latest summary of the NOCs activities in the 80 countries in the NOC network. It forms the basis of discussion for the panel discussion at the IAU FM14.	IAU Office for Astronomy Outreach / National Astronomical Observatory of Japan

Goncalves	Thiago	Astronews: scientific journalism in developing countries	<p>Astronomy is undoubtedly an attractive field and presents a major opportunity to promote science anywhere in the world. Nevertheless, this is a major challenge in developing countries, where investment in outreach is small, and the inflow of information from press offices in wealthier nations is dominant. The end result is a lack of awareness and/or interest in science, or alternatively an impression of monopoly in scientific discoveries by developed economies. In this talk I will present a Brazilian project started in 2017 and financed by the IAU Office of Astronomy for Development that aims to address the problem. More specifically, we have created a working group dedicated to promoting national science, acting as liaison between the academic community and the press, with a goal to raise public awareness, attract new talents, and hopefully encourage economic development through investment in science. I will discuss the challenges faced thus far, the strategies used in establishing contact with journalists and our recent attempts to expand the project to other Latin American countries.</p>	Valongo Observatory, Federal University of Rio de Janeiro
Heenatigala	Thilina	IAU National Outreach Contact: Sri Lanka – Activities and Challenges	<p>The IAU National Outreach Contacts (NOC) network was established in 2013 with the purpose of centralising global outreach efforts and to empower local representation. The IAU Office for Astronomy Outreach (OAO) acts as the central coordination point of the NOC network to support the projects at a national level. IAU NOC Sri Lanka is actively engaged in activities and spent time at the IAU OAO office at the National Observatory of Japan in Mitaka to strengthen the collaboration and to support projects. Like many nations, Sri Lanka has quite a few amateur and school based astronomical societies in several parts of the country. But currently there's no research level astronomy or degrees at private or governmental institutions. However, there are currently about 10-15 professional astronomers from Sri Lanka working abroad and about 5 students pursuing astronomy for higher studies. In recent years, with the support of NOC, students could participate in IAU's International School for Young Astronomers, International Space University, and other courses. While there's a large interest in astronomy among public and students, there are quite a lot of challenges from traditional superstitious, astrology, and lack of options for higher studies in astronomy. This poster highlights the current astronomy activities of Sri Lanka, some of the major achievements and challenges the country face in further the astronomy education and research.</p>	Sri Lanka Astronomical Association

Madura	Thomas	Astronomy for Students with Visual Impairments: Development of a Hands-on Career Exploration Lab	<p>For students with blindness/visual impairments (B/VI), the possibility of a future in astronomy, or any science, technology, engineering, and mathematics (STEM) field, seems daunting. In order to bolster astronomy and STEM opportunities for high school students with B/VI (ages 15 - 19) we developed a series of student Career Exploration Labs (CELs). Our CEL methodology employs tactile astronomy instruction via three-dimensional (3D) printing technologies and 3D-printed models, STEM teachers of students with B/VI, interactions with professional scientists with B/VI acting as role models, and partnerships with local STEM businesses that provide insights into possible career paths. In cooperation with the South Carolina Commission for the Blind and the Bureau of Services for Blind Persons in Michigan, we held three week-long pilot CELs during June 2017, June 2018, and July 2018. We gathered pre- and post-CEL data via student and teacher surveys, quantitative assessments of students' astronomy knowledge and spatial thinking skills, and audio and video recordings of the CEL activities in order to study to what extent the CEL model could enhance high school students with B/VI's attitudes towards, interests in, and capacities to participate in astronomy education and careers. Once tested and refined, we will make our 3D model files and associated activities freely available to the community for further use and study. This work serves as a testbed for an expanded international CEL program.</p>	San Jose State University
Akihiko	Tomita	The 3D map astro/geo tour with your fingertips	<p>I present the example of the practice of the fingertip virtual tour of prefecture-level living area map and discuss future development of this activity. Once a year, I visit the half-day indoor activity for visually impaired children of mostly primary school ages, organized by a nonprofit organization "Picture Books for Visually Impaired and Weak Eyesight Children," Osaka, Japan. This presentation is the report of the activity in 2017. I made 15 cm x 15 cm 3D map with height emphasized by five, 250 km x 250 km Kansai area in Japan using numerical data by Geospatial Information Authority of Japan. Using this 3D map as the mold, plaster replica was prepared for each of all the participants including about a dozen visually impaired children and their brothers and sisters, parents, and staff. Though the 3D printer has become common, it is still expensive and not easy to handle. The plaster replica making is easy and quite inexpensive. The 3D printer work was made in the university, and the plaster work was made by parents and activity staff on site. The Kansai area shows many rows of the north-south direction mountain ridges parallel to each other. This means that a great compression force is acting in the east-west direction on the plate of this area. We can understand why we have so many earthquakes in this area. The participants understand that planetary geological mechanism contributes to maintaining the Earth environment. Children shouted, "Interesting!" and parents enjoyed understanding the nature of the planet. We already have numerical map data around the world. Children can learn about other countries through their fingertip trip, which can help connect children across the borders of countries and language. We also have numerical map data of other worlds in the solar system. Children regardless of the eyesight can share the "grand tour" of the solar system and can understand each world's nature and history by reading scientifically the surface information.</p>	Wakayama University

Ribeiro	Valerio A. R. M.	Development of PALOP Knowledge in Radioastronomy	DOPPLER (DevelOpment of PaloP knowLEdge in Radioastronomy) is a recently awarded project through the Aga Khan Development Network and the Portuguese Science and Technology Foundation to foster ongoing and forge new collaborations in Mozambique. DOPPLER is born from ENGAGE SKA - a fully funded Portuguese Roadmap of Research Infrastructures of Strategic Relevance and leading the Portuguese efforts to join the SKA Organisation. ENGAGE SKA includes an International Cooperation and Science for Development workpackage which promotes ongoing endeavours, in particular with advanced training in areas of biodiversity, food security, resource management and radio astronomy. Through these advanced trainings DOPPLER will be in recognition of a number UNESCO sustainable development goals (4, 5, 7, 8, 9, 13, and 17). Along with advanced training we have an outreach team that has worked closely with a number of local communities including where the Square Kilometre Array South Africa project identified potential site locations.	CIDMA/Departamento de Fisica
Insiri	Wichan	Expansive Public Outreach in Thailand - Far and Wide	In Thailand, the network of astronomy has been a success as it has seen an expansive impact to the Thai society as a whole since the establishment of the National Astronomical Research Institute of Thailand (NARIT). We simply put the public as our priority. Innovation-driven economy is Thailand's national agenda and astronomy has been one of the forces behind the success en route to the knowledge-based society. We have seen sharp increase in the awareness of science and technology as can be seen through the escalation of activities in relation to astronomy or even other fields of science and technology. This has also been felt through the surge of government's spendings on research and development in science, technology and innovation in the past years. All combined, the climate of astronomy and its related fields together with public outreach and astronomy popularization have utilised all the resources in good use	National Astronomical Research Institute of Thailand
Waller	William	Towards an IAU Position and Public Statement on Terrestrial Climate Change	As the largest organization of astronomers in the world, the International Astronomical Union (IAU) has a responsibility to explain important astronomical findings and to communicate agreements on key definitions, fundamental standards, naming conventions, etc. The IAU typically does not take stands on terrestrial issues, unless there is a strong astronomical connection. In the case of terrestrial climate change, the connection is both strong and revealing. Earth is not alone in having an atmosphere that contains greenhouse gases. Both Venus and Mars have atmospheres that are dominated by carbon dioxide - a potent greenhouse gas. Venus, in particular provides startling evidence for drastic surface warming due to its thick blanket of carbon dioxide. In this poster, I present quantitative interplanetary perspectives on terrestrial climate change, and how these perspectives could inform an IAU position and public statement on this vital topic.	Rockport Public Schools and The Galactic Inquirer

Wadadekar	Yogesh	Learnings from multilingual astronomy outreach in eight Indian states	<p>Over the last decade, the author who is a research astronomer, has carried out more than 50 outreach programs in eight Indian states in 4 languages (3 Indian languages + English) to a variety of audiences ranging from students at the most privileged schools to students at rural, underprivileged poorly funded schools where the students are almost always the only literate people in their family. These interactions have ranged from formal slide presentations to night sky gazing (with and without a telescope) to informal question and answer sessions on science in general and astronomy in particular. All over India, like perhaps everywhere in the world, interest in astronomy is universal and at these outreach programs, it is common to see school children bringing their parents and grandparents along. Field astronomy is the cheapest, most universally accessible and most interesting introduction to science, particularly in societies where science literacy is very low. Many ideas in mathematics, physics, geography and the especially rich mythology of India can be illustrated through astronomy demonstrations. Many misconceptions derived from the deeply entrenched astrological beliefs can also be discussed in a modern astronomical context. I will share my experiences and thoughts on how astronomy concepts can be introduced to students at the high school level in an interesting, inclusive and non-condescending way while still maintaining scientific accuracy.</p>	National Centre for Radio Astrophysics
Hanaoka	Yoichiro	Professional- Amateur Collaboration in the Scientific Observations of Total Solar Eclipses	<p>Professional solar scientists and amateur astronomers in Japan have been energetically collaborated in the observation of the total solar eclipses in the last ten years. The collaboration has been producing scientific results, which have been published in scientific papers. The observation of the total eclipses has some advantages to let amateurs participate in as follows.</p> <ul style="list-style-type: none"> - The observation can be done with small telescopes. - The multipoint observation can be realized. It helps to avoid the risk of the weather, and also enables to track the temporal variation of the corona - Wide range of amateurs, not only experienced ones but also beginners for the eclipse observation can contribute. <p>Therefore, the observation of the total eclipses is one of the most suitable targets to promote the participation of amateurs in scientific observations. Furthermore, because the astronomers from various nations gather to observe eclipses, it is expected that the more extensive collaboration is promoted by an international organization such as IAU. We will present our collaborative activities so far in our poster, and we would like to contribute to extending such activities.</p>	National Astronomical Observatory of Japan

Sánchez	Yuly	ASTRONOMY AS A TOOL FOR INCLUSION OF BLIND AND VISUALLY-IMPAIRED STUDENTS AT UNIVERSITY	In 2017 a pedagogical innovation project named “Feeling astronomy: astronomy for equity and inclusion” was approved to be funded by the Academic Office at the National University of Colombia. The project was selected among several other proposals due to the relevance of developing initiatives for the increasing population of blind and visually impaired students at the Bogota campus. In this work we present the experience of planning, designing and implementing an undergraduate course on astronomy, being the first time a course offered by the Faculty of Sciences represents an option to be taken by blind and visually impaired students. It has also the possibility of registration for student with full vision. Furthermore, this is the first time that such a course is officially registered in the curriculum of a colombian higher education institution. Students learned, among other topics, about the celestial vault, the Sun, the Moon, the Earth, eclipses, constellations, galaxies, cosmology, elementary particles, black holes, and dark matter. In the classroom, the board and conventional presentations are replaced by braille (tactile reading and writing system designed for blind people), embossed material, icopor, balloons, wool, bedbugs, pins, cardboard and even a kit of geometry in Braille, so that students can touch and feel what is being explained to them. Instructors were mainly composed by 8 teachers from the Physics Department and the National Astronomical Observatory of the university; a group of experts that assumed the challenge of preparing the class topics and the evaluations. Although astronomy is synonymous of visualization, we want to show that it can be understood with other senses, and that this initiative will help blind and visually impaired students to expand their perspectives into other fascinating topics that will help them to enlarge their perception of the world, giving to them a big picture of the human knowledge.	National University of Colombia
Randriamanakoto	Zara	Growing Astronomy Public Outreach in Madagascar	Founded in 2016, Malagasy Astronomy & Space Science or MASS is mainly a community of young professional astronomers and graduate students from Madagascar; though membership is also open to enthusiast amateurs. The creation of MASS stems for the need to promote Astronomy and Science education in the Red Island given the participation of the country to the large radio astronomy SKA project and the African VLBI Network (AVN). One of the primary objectives of MASS, with the support from its IAU OAO National Outreach Contact, is to run regular outreach activities in the country. Since its launch, MASS has grown from simply using social media platforms to reach some of its targets into organizing annual primary/high school outreach events and Astro Quiz for graduate students. This paper reports such activities and also highlights the best practices being adopted to make these events successful. We will then discuss the challenges often encountered as a research astronomer devoted to public outreach. Finally, we will present the anticipated plan to bring Astronomy to more Malagasy people, as a pre-campaign of the IAU centenary celebration.	University of Cape Town/Malagasy Astronomy & Space Science

Benkhaldoun

Zouhair

Atlas Dark Sky Reserve:
Towards the creation of the
First Dark Sky Reserve in
North Africa

In 2016, Morocco organized the United Nations Climate Change Conference (COP22) in Marrakech. Following this conference, Morocco, like other countries, has made the commitment to become a major player in the fight against pollution. In this context, the Atlas Dark Sky project was born and today it becomes a reality and a project in progress. In fact, the broad spectrum of impacts of light pollution is directly related to pollution and thus global warming. To cite only one example, taking measures against light pollution will reduce the energy bill of the countries and consequently reduce their contribution to the carbon emission. In this poster, we will present the Atlas Dark Reserve project, a project that aims to create the first Dark Sky reserve in North Africa and the biggest one in the world. The Observatory of Oukaïmeden located at the Atlas Chain in Morocco will be the central region of this reserve. Dark Sky Communities will be composed of about 120 villages and cities located in a diameter of 80 km from the central region. We will present our Strategic Plan (2018-2021) to create Atlas Dark Sky reserve in Morocco.

Oukaïmeden
Observatory, Cadi
Ayyad University