

Global Astronomy Month 2015

Post-Event Report

Global Astronomy Month, coordinated by Astronomers Without Borders, is the world's largest annual celebration of astronomy. Now in its sixth year, this month-long celebration of the sky brings people together from around the globe, embodying the AWB motto: *One People, One Sky*.

Summary

With 28 AWB-supported programs, myriad events registered on the AWB website, and hundreds of thousands of people around the world involved, Global Astronomy Month 2015 was a fantastic success.

Groups around the globe took part in AWB-supported programs and organized events, sharing their results with the AWB worldwide community.

The diverse array of programs included public outreach and online observing events, AstroArts, public lectures, presentations, AstroCrafts, and more.







Sponsors

Astronomers Without Borders extends its heartfelt gratitude to our sponsors, without whom Global Astronomy Month would not be possible.

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Moon Sponsors





AstroPoetry Prize Donors

Sky and Telescope Magazine, Bob Crelin, Wally Pacholka, Bob Eklund, and Babak Tafreshi.



GAM2015 Programs

Of the 28 programs held throughout the month, many were collaborations with other organisations. There were three types of official programs organized for GAM2015 - AWB Programs, Partner Programs and Associate Programs.

AWB Programs are run solely by AWB.

Partner Programs are organized and conducted jointly by AWB and a partner organization.

Associate programs are organized and conducted solely by partner organizations, resulting in increased international recognition and a wider, more diverse audience for the program.

Below are some program highlights, followed by a complete list of GAM 2015 programs.



Figure 1 AstroCrafts at Astro Cafe, Lake Tekapo, New Zealand.

GAM 2015 Blog (April 1 - 30)

The GAM 2015 Blog featured 18 posts by bloggers from around the world during the month-long celebration. Professional and amateur astronomers, science journalists, and outreach specialists contributed their personal perspectives on astronomy and the global movement to connect people through astronomy. The blog was very popular, with almost 4000 hits on the website, and high engagement on social media, particularly through shares.



Index of GAM 2015 blog posts

| Title | Author | Affiliation |
|---------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Our View of Spaceship Earth | Mike Simmons | Founder and President of Astronomers Without Borders |
| Look Up! | Marieke Baan | Head of Communication Netherlands Research School for Astronomy (NOVA) |
| Constellations | Evangelia Ntormousi | Post-doctoral researcher in Astrophysics at CEA-Saclay near Paris, France |
| Inspiring Youngsters With Astronomy and Space Science | Tibisay Sankatsing Nava & Audrey Korczynska | Tibisay Sankatsing Nava is Project Manager of Universe Awareness coordinated by Leiden University and works with the IAU office of Astronomy for Development Audrey Korczynska is Project Manager at the Education and Public Outreach Office of Leiden Observatory. |
| Is it a bird? Is it a plane? No, it's a fireball! | Megan Argo | Radio astronomer and press officer for the International Meteor Organisation |
| Living the idea: One People, One Sky | Johannes Stübler | Amateur astronomy, Linz, Austria |
| Astronomy for Development: Roadmap towards "impact" | Kevin Govender | Director, IAU Office of Astronomy for Development |
| Light: Beyond the Bulb | Kimberly Arcand | Visualization Lead for NASA's Chandra X-ray Observatory |
| Drawing of traditional asterisms | Pisit Nitiyanant | Astronomical public outreach officer of National |
| in Thailand Konnichiwa from Office for Astronomy Outreach | Lina Canas | Astronomical Research Institute of Thailand (NARIT) IAU Office for Astronomy Outreach |
| An Australian Space Policy | Tom Gordon | Tom Gordon is a science communicator at the School of Physics, University of Sydney, Australia. |
| Starting the era of the ground- based Mega Projects | Samir Dhurde | In-charge of the outreach programme - SciPop, at the Inter-University Centre for Astronomy & Astrophysics (IUCAA) in Pune, India |
| The When and How of Astronomy Outreach | Dr. Monica Young | Web Editor, Sky and Telescope |
| Astronomy Outreach: Bringing Us All Under The Same Umbrella | Shaila Akhter | PhD candidate at the School of Physics, UNSW Australia |
| Occultations by Pluto – Exploring Climate Change on a Distant World | Thijs Kouwenhoven | Research professor at the Kavli Institute for Astronomy and Astrophysics (KIAA) at Peking University in China |
| Exploring the Intersections of Astronomy and Culture | Nancy Alima Ali | Coordinator of Public Programs at Multiverse at the Space Sciences Lab at the University of California, Berkeley |
| The ACES up ASKAP's sleeve | Robert Hollow | CSIRO Astronomy and Space Science Education and Outreach Specialist |
| Highlights from GAM 2015 | Christie McMonigal | GAM 2015 coordinator |



IASC Asteroid Search Campaign (March 21 – April 25)

The International Astronomical Search Collaboration (IASC="Isaac") gives students the chance to make original astronomical discoveries in this online educational outreach program for high schools and colleges. Each day, students receive new telescopic images of a region where asteroids are commonly found. Using the software Astrometrica they make precise measurements of the positions and times of possible asteroids and send a report on their observations to the Minor Planet Center (Harvard).

With 14 schools from 10 countries participating, this year's GAM IASC campaign was a great success. Original discoveries and follow-up observations included:

- 8 Main Belt asteroid discoveries (1st observation of a possible, previously unknown asteroid)
- 6 Near Earth Object (NEO) confirmations (2nd observation of a recently discovered NEO)
- 80 Near Earth Object observations (the 3rd, 4th, or 5th observation of a recently discovered NEO)

Dark Skies Awareness Programs

A growing majority of the world's population no longer sees more than a few stars. In addition to seriously impacting astronomical research, light pollution affects human health, ecology, safety, security, economics, and energy conservation. Several GAM Dark Skies Awareness programs, coordinated by Connie Walker, raised awareness of the importance of preserving our night skies.

International Dark Sky Week (April 13 - 18)



International Dark Sky Week (IDSW) is organized by the International Dark-Sky Association (IDA) each year during GAM when the Moon is absent from the early evening sky. The goals of IDSW are to 1) inspire people to celebrate the beauty of the night sky, 2) raise awareness of the negative effects of light pollution, and 3) embolden people to take action. Each day of IDSW features a theme and goals with activities that everyone can do to mitigate the effects of light pollution.

International Earth and Sky Photo Contest (March 10 – April 22)

The sixth edition of the International Earth and Sky Photo Contest on Dark Skies Importance was again a huge success. More than a thousand photos were submitted from 54 countries, each highlighting the beauty of the night sky and its battle with light pollution. The contest is organized by The World at Night and co-sponsored by the US National Optical Astronomy Observatory. Winning photographs were published by the BBC, National Geographic online, and many other media. Winning photos can be seen at http://twanight.org/newTWAN/news.asp?newsID=6101



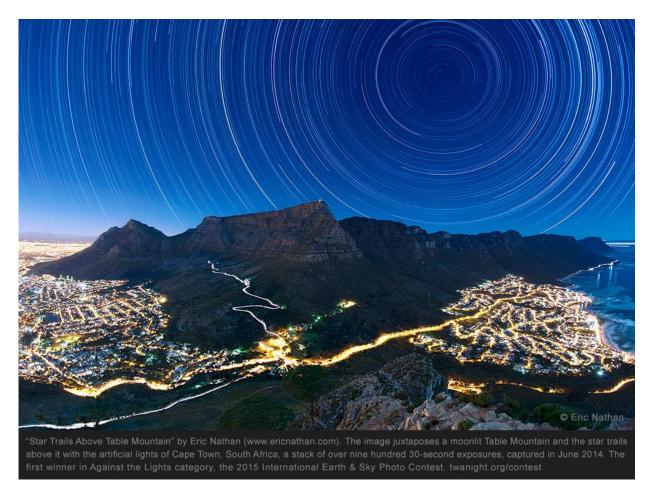


Figure 2 First place winner in the Against the Lights Category, in the 2015 International Earth and Sky Photo Contest

Globe at Night (April 9 - 18)

Globe at Night (www.globeatnight.org) is an international citizen-science campaign that raises public awareness of the impact of light pollution by inviting citizen-scientists to measure the brightness of their night sky and submit their measurements to a central website. The Sky Quality Meter, a device created for these measurements, and two phone apps are available for measuring the night sky's brightness. People in at least 52 countries submitted a total of 2852 measurements (some submissions have not yet been processed for location). Uruguay led the field with 496 measurements, followed by the USA with 463, Chile with 187, and Poland with 185.

Dark Skies Awareness Blog

The Dark Skies Awareness Blog, created each year for GAM by the International Dark Sky Association, featured 13 posts throughout GAM, with one posted each day during International Dark Sky Week (April 13 - 8).

Online Observing

The Virtual Telescope has been involved in GAM since the first edition in 2010. For GAM 2015 the Virtual Telescope offered several online observing programs GAM. The programs were selected based on feedback on previous programs.

The GAM2015 schedule included:

1 Apr. 2015: "Online Messier Marathon – 7th edition!"



- 2 Apr. 2015: "Shadows around Jupiter: Callisto eclipses Ganymede"
- 4 Apr. 2015: "4 April 2015: Total Lunar Eclipse online event"
- 16 Apr. 2015: "Stars for All!: online cosmic journey"
- 27 Apr. 2015: "Walking on the Moon"

Two more sessions were added during the month to take advantage of unexpected events:

- 20 Apr. 2015: "Near-Earth Asteroid 2015 HD1 extremely close encounter: live event"
- 29 Apr. 2015: "Near-Earth Asteroid 2015 HD10 very close encounter: live event"



Figure 3 Images captured by the Virtual Telescope during the Stars For All program. The Needle Galaxy -NGC 4565 (Top), Globular Cluster - M3 (Bottom right) This year, in what we believe to be a world first, Astronomers Without Borders in conjunction with the Virtual Telescope, Galileo Teachers Training Program, and Astronomical Observatory, University of Valencia, made it possible for both sighted people and people with visual impairments to take part in a live online observing event. During The Virtual Telescope observing session, "Stars For All!", special versions of the real-time images were created for conversion into a tactile surface so people with visual impairments around the world could experience the wonder of observing with the Virtual Telescope in real-time.

This event generated a lot of interest and was very widely picked up by the media, including print, online and radio.

Unfortunately, the Messier Marathon and the Walking on the Moon events suffered poor weather both on their original and rescheduled dates and were not able to take place during GAM this year.

Despite the inevitable weather-cancelled events, GAM2015 at the Virtual Telescope was extremely successful. Nearly 70,000 individuals from 174 countries joined the live events that took place. The Lunar Eclipse drew the largest audience, with more than 35,000 viewers. More than 2000 viewers joined the "Stars for All!" party and more than 14,000 observers joined the asteroid events.

The cancellation of both the online Messier Marathon (one of the most popular events invented at Virtual Telescope) and Walking on the Moon certainly affected the total number of viewers. Despite the loss of these programs, the participation numbers were still very high and GAM2015 was a unqualified success at the Virtual Telescope.

Planning for GAM 2016 at the Virtual Telescope is already well underway.

Observing Programs

Interesting astronomical events in April provided the basis for several observing programs. Members and others were encouraged to participate in local events, or to organize their own events and register them on the AWB website.



Global Star Party (April 25)



Figure 4 Students and parents from CSE Bal Bharati Public School, Pitampura, India observing the Moon and planets during the Global Star Party.

The Global Star Party is always the highlight of the observing programs in GAM and the 2015 edition, held on Saturday evening, April 25, was no exception. Skywatchers around the globe turned out to discover, share, and celebrate the night sky. Astronomy clubs, observatories, schools and individuals hosted star parties, inviting friends, family, students and the general public along to share in the beauty of our night sky. Some groups organised public lectures and other activities to supplement the observing programs. Groups shared their experiences with us through hundreds of photos and posts on social media and via dozens of member reports on the AWB website.

CosmoQuest Hangoutathon

AWB partnered with CosmoQuest to support their primary fundraising effort of the year, the Hangoutathon, which took place in April this year. During this 36-hour live Google Hangout Online, guests from various organizations are invited to share their knowledge, experience, and events with the world and encourage contributions to CosmoQuest. AWB participated by arranging for groups hosting Global Star Party events to appear live in the Hangoutathon and share their activities. AWB also arranged for guests from the astronomy and science world to contribute by describing their work and programs. AWB President Mike Simmons hosted a portion of the marathon live event as well. The Hangoutathon was very successful, with CosmoQuest reaching their funding goal, and several groups contacting AWB with thanks for being included and expressing interest in being involved again.



Figure 5 Hangoutathon particpants at the Starizona Star Party. Gilbert Esquerdo (Mount Hopkins Observatory), Dean Koenig (Starizona), Scott Tucker (Starizona), Dr. Larry Behers (Project ASTRO), Lonnie Wege (Celestron), and Chuck Harrell (Starizona).



A Week of Sundays (April 12 - 15)

SunDay is a worldwide observing program with observing events and other educational programs celebrating our closest star, the Sun. Held this year on April 12, SunDay was very popular and produced many member reports and photographs showing people of all ages, all over the world, taking part in celebrating our Sun.



Figure 6 SunDay event with the Astronomical League of the Philippines in cooperation with Exploreum

New this year was a series of live online programs featuring solar astronomers from solar observatories across the US during the week following SunDay. Dr. Matt Penn of the US National Solar Observatory discussed the CATE experiment, a citizen science project to study the Sun during the 2017 solar eclipse. The next episode featured Dr. John Varsik and Claude Plymate discussing the New Solar Telescope at the Big Bear Solar Observatory, one of the

world's largest solar telescopes, from both the control room and telescope dome. Finally, Dr. Dale Gary of the Center

for Solar Research at the New Jersey Institute of Technology described the Expanded Owens Valley Solar Array, the only solar radio array in the US.

AstroArts Programs

A broad range of AstroArts programs covered a variety of media and styles.

OPTICKS

OPTICKS has been a regular – and very popular – part of GAM since 2011. Created by visual artist Daniela De Paulis, OPTICKS is a live performance in which images submitted by the public are beamed to the Moon by a radio transmitter, with the return echo received at the Dwingeloo radio telescope in The Netherlands. During GAM 2015, artists from Museo di dell'Altro e dell'Altrove Metropoliz (Museum of the Other and Elsewhere; MAAM) in Rome submitted their virtual postcards for this Moonbounce event. Two Apollo Moon walkers, Alan Bean and Charles Duke, were also invited to submit images for the performance. Alan Bean contributed an image of one of his paintings, while Charles Duke sent an original scan of the photo of his family that he left behind on the Moon in 1972. The images were sent to the Moon and returned on 30 April at 22:00 CET.



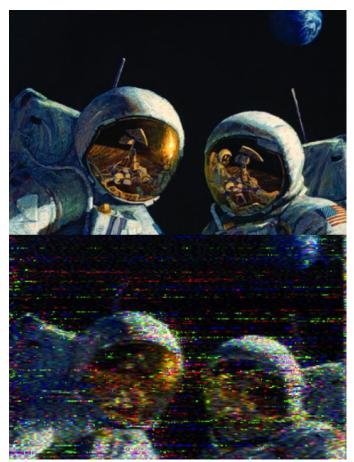


Figure 7: Image of original artwork by Alan Bean before and after being Moonbounced

The live program featured Daniela De Paulis, two radio telescope operators – Nando Pellegrini in Italy transmitting the images and Jan van Muijlwijk at the receiving station at Dwingeloo, The Netherlands – with AWB President Mike Simmons moderating. After the performance, Daniela De Paulis printed the Moonbounced images and mailed them back to the artists. A galley of all Moonbounced images, before and after can be viewed <u>here.</u>

AstroPoetry Contest

People of all ages entered their poems about astronomy to win astronomy-themed prizes in the AstroPoetry Contest. The two-month long contest garnered the greatest participation thus far with 339 poems from 10 countries submitted across the three age categories.

The results can be read on the <u>AWB website</u>.

Astronomers Without Borders is grateful to the sponsors who donated prizes for the AstroPoetry Contest: <u>Sky and Telescope</u>, <u>Wally Pacholka</u>, <u>Babak Tafreshi</u>, <u>Bob Eklund</u> and <u>Bob Crelin</u>. This very popular competition would not be possible without their support.



Complete GAM 2015 Program

| Date | Program |
|------------------------|-----------------------------------------------------------------------------|
| March 1 - April 30 | AstroPoetry Contest |
| March 21 - April 25 | IASC Asteroid Search Campaign |
| March 22 - April 22 | International Earth and Sky Photo Contest |
| April 1, 4, 10, 17, 24 | The Changing Moon (Observing Challenge) |
| April 1 - April 30 | Discovering the Solar System (Observing Challenge) |
| April 1 - April 30 | Lunar Explorations (Observing Challenge) |
| April 1 - April 30 | The Undiscovered Universe (Observing Challenge) |
| April 1 - April 30 | Astronomy Hacks and Tips (Women In Astronomy) |
| April 2 | Shadows around Jupiter: Callisto eclipses Ganymede (Online Observing Event) |
| April 4 | Lunar Eclipse |
| April 4 | Lunar Eclipse (Online Observing Event) |
| April 9-18 | Globe at Night |
| April 11 | Online Messier Marathon (Online Observing Event) (RESCHEDULED TO APRIL 22) |
| April 12 | SunDay |
| April 12 - 15 | A Week of SunDays |
| April 13-18 | International Dark Skies Week |
| April 16 | Stars for All (Online Observing Event) |
| April 19-20 | Jupiter Watch |
| April 21 | Myths on the Birth of the Universe (Hangout) |
| April 21 | The Moon plows through the Hyades (Observing Challenge) |



| April 22 | Online Messier Marathon (Online Observing Event) (RESCHEDULED) |
|-------------|------------------------------------------------------------------------|
| April 24 | Walking on the Moon (Online Observing Event) (RESCHEDULED to April 27) |
| April 25 | Global Star Party |
| April 25-26 | <u>CosmoQuest Hangoutathon</u> |
| April 26 | AStroconcert 'Icy Rose 67P' |
| April 27 | Walking on the Moon (Online Observing Event) |
| April 28 | Cosmic Concert |
| April 30 | <u>OPTICKS</u> |
| | |

Social Media

AWB utilizes several social media channels, including Google+, Twitter, and Facebook, to reach its many followers. Facebook has been the most successful at creating a following and fostering interaction.

Two Facebook pages were maintained during GAM – one for AWB overall and one specifically for GAM. Both pages saw significant increases in engagement and reach throughout GAM. Total reach during April (the sum of unique views on both pages) was 760,000. Total impressions during April (the number of times all posts were viewed), was 1.5 million. Total engagement during April (the number of times a post was "Liked", shared, or had a comment) was 45,000, or 1500 interactions per day during GAM on both pages combined.

Engagement was greater on the AWB page, while the GAM page was preferred by followers for sharing the many GAM-related photos and experiences received from groups and individuals around the world.

Twitter was also popular among GAM followers, again with both AWB and GAM-specific feeds. The AWB feed had 44,000 impressions during April, while the GAM-specific feed had nearly 20,000.

Traditional Media

Traditional media is also used during GAM, including the AWB website and its GAM website (a dedicated sub-site on the AWB website), weekly electronic newsletters, and bloggers who follow and post GAM programs and stories of interest.



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| or <u>join AWB</u> (free) to get newsletter. | | | | Planet Sponsors: |
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The GAM 2015 website

All information about GAM is available on the GAM website, while social and traditional media give basic information while referring readers to the website for more details.

The GAM website is also crucial for fostering community engagement. AWB encourages participants to register their events on the site and post member reports on event outcomes to share with the rest of the worldwide community. The list and map of registered events also inspires others to organize their own events. Event registrants are eligible to download personalised certificates of GAM participation for all participants in their events. Certificates encourage event organizers to register even after the fact, and to post program reports, to be eligible for participation certificates.



Reports on events provide personal accounts, photographs, and videos. This year, Geographic Information Systems (GIS) software from Esri was used for the first time to feature member reports in a new, interactive, visual format in the <u>Tour of Events</u>. This format will be expanded to all AWB programs in the near future.

The number of visits to the AWB website during April was double that during the immediately preceding months. In the lead up to, during, and immediately following GAM more than 34,000 users (65% from the US) visited the website almost 46,000 times, with 178,000 page views. The average session length was two minutes, indicating that people were reading and/or browsing the site rather than leaving immediately.

GAM announcements and details are also communicated with AWB members through a weekly newsletter, which is increased to bi-weekly during GAM. During the month of GAM the number of newsletter subscribers grew by 2% to 3300.

Media Pick-ups

GAM2015 was extensively covered in the media, from local newspapers to large scale astronomy and news websites. Below are some examples of media coverage of GAM 2015.

Astromart The Rural Blog Timaru Herald (stuff.co.nz) Space REF Sky and Telescope Bad Astronomy Universe Awareness HNGN

GAM 2016

Preparations are already underway for GAM 2016, with major programs being scheduled and new, innovative, and unique programs under discussion.

Organisation

Chair <u>Mike Simmons</u> (USA)

Project Coordinator Christie McMonigal (Australia)



Post Event Report 2015

Communications Andrew Fazekas (Canada)

AstroArts Programs

Daniela De Paulis (Netherlands) Bob Eklund (USA), AstroPoetry Contest

Dark Skies Awareness Programs Connie Walker (USA)

GAM Blog Avivah Yamani (Indonesia) Raven Yu (Philippines)

Online Observing Programs Gianluca Masi (Italy)

People with Disabilities Programs and Resources Amelia Ortiz Gil (Spain) Lina Canas (Japan)

Webmaster Liz Sanders (USA)