# SciStarter & CITIZEN SCIENCE MONTH

## Level Up Your Dark Sky Week Activities With Citizen Science

**Emma Giles**

Director of Programs, SciStarter

SciStarter
Science we can do together.

NASA
Grantee

# Level Up With Citizen Science



Your night sky observations can help advance **real research**!

When we collaborate with researchers and scientists to accelerate science, this is called "**Citizen Science**"

SciStarter
Science we can do together.

# Citizen Science can involve...

| | |
|---|---|
| **Observing** | Biodiversity, Night Sky |
| **Monitoring** | Air Quality, Pollinator Activity, Bird Migration |
| **Measuring** | Water Quality, Light Pollution, Marine Debris |
| **Analyzing** | Videos and Images online |
| **Collecting** | Photos and Samples |



***in your backyard, while exploring your interests, through your hobbies, with your family, and more!***

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# Science For All Ages – What we've learned



**Sky brightness** doubles every 8 years, which is nearly 10% **every** year
*(Globe at Night, 2011-2022)*



We lose **One Billion Birds** to building collisions each year, in part, because of **light pollution** and window **reflections** imitating habitat (American Bird Conservancy, eBird and local citizen science , 2024)

SciStarter
Science we can do together.

# SciStarter

Science we can do together.

A go-to resource for volunteers, scientists, facilitators (librarians/staff), and researchers.




**Create your free account: SciStarter.org/login**

# SciStarter

Science we can do together.




**Use SciStarter to:**

- Find and save projects
- Find an event or promote an event
- Take free trainings & earn badges
- Create lists of projects
- Track your participation
- Participate in live events, such as *Do NASA Science LIVE!*

**Create your free account: SciStarter.org/login**

# Special Event Partners

Night Sky Network

Astronomy clubs bringing the wonders of the universe to the public

Hosting gatherings and ways to engage their communities in Citizen Science Month 2026

Being part of the *Do NASA Science LIVE!* effort in bringing NASA-supported citizen science projects to the public during April and all year long.

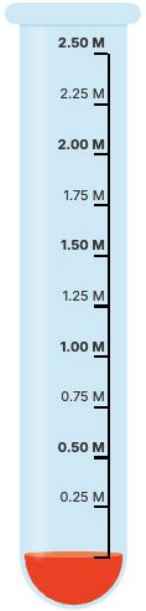
SOLAR SYSTEM AMBASSADORS

Get Involved

## Help Us Achieve

# 2.50 MILLION ACTS OF SCIENCE

OFFICIAL PARTNER OF AMERICA 250

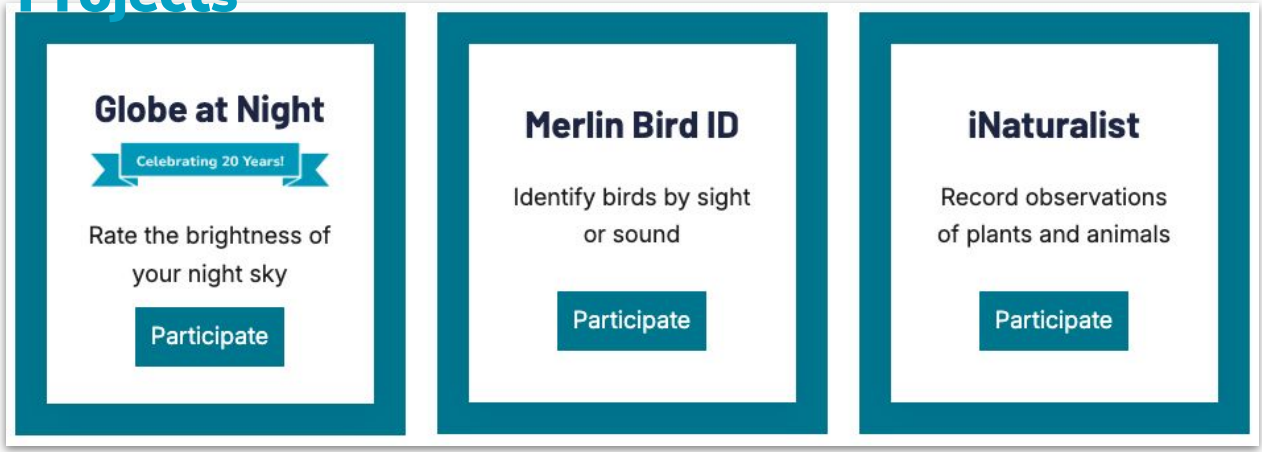



**Get Ready to Participate!**

| 12 | 10 | 16 | 39 |
|---|---|---|---|
| Days | Hours | Minutes | Seconds |

# Dark Sky, Safer Fly

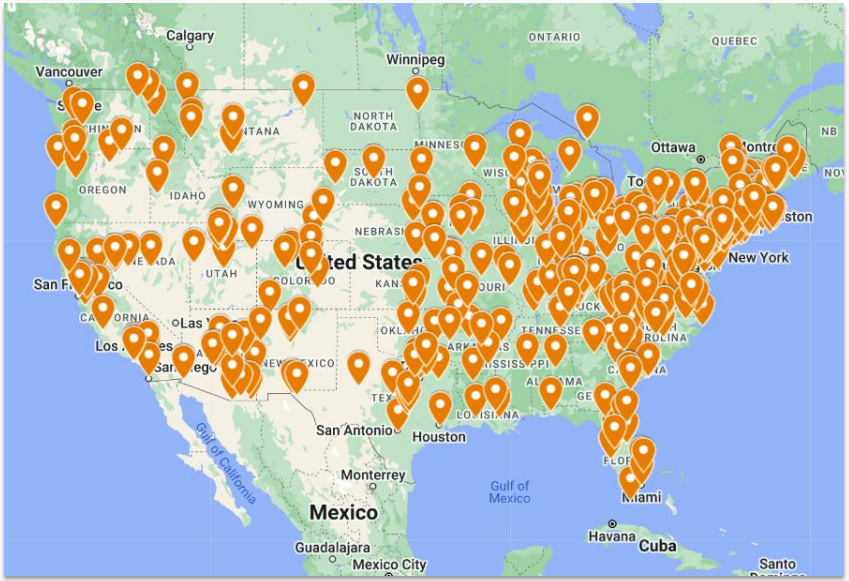
## Three Beginner-Friendly, Relevant Projects




https://pages.scistarter.org/dark-sky-safer-fly/



# Citizen & Community Science Library




Many libraries have citizen science kits
Like the **"*Measuring Light in the Night*"** kit
in which you participate in **Globe at Night.**







## Find a participating library near you:

SciStarter.org/library-locations

SciStarter
Science we can do together.

# Engagement Opportunity

## Pop-Up Citizen Science Star Party at Independence Hall

***Hosted by SciStarter and The City of Pl***

**When**: April 13 *(Rain date April 14)* at 8PM
**Where**: Independence National Historical Park, Philadelphia, PA

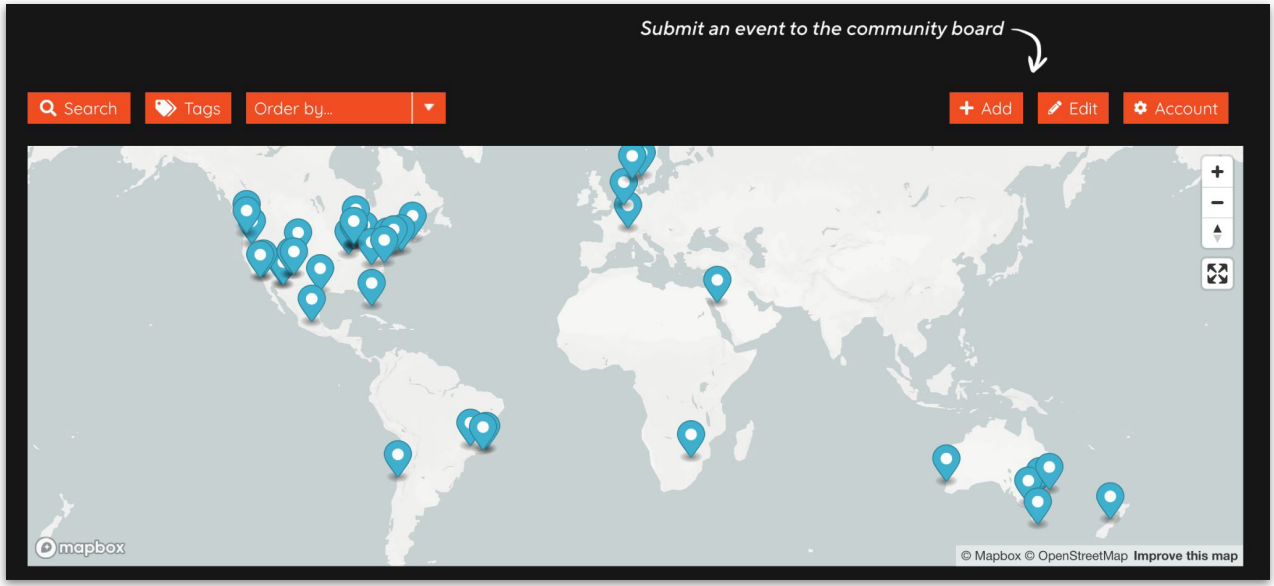



Bring your telescope and knowledge of the stars, we'll help connect people to citizen science projects to protect the night sky and migrating birds!

Interested in joining us? Email *info@scistarter.org*.

# International Dark Sky Week

## Add your Star Parties to the Map!




https://idsw.darksky.org/activities

# Report Your *Acts of Science* : Events & Observations




Reporting your participation in citizen science month helps inform the IDSW team's data too!




**CitizenScienceMonth.org/Report**

# Here's how to make sure your Acts count!

Overview | Participate | Plan an Event | Report Your Acts

## Report Your Acts

Report *Acts of Science* that you did or that you are reporting on behalf of a group. Attendance at events count too! Note: If you participate in SciStarter Affiliate projects, their *Acts of Science* will count automatically.



**Report Science Acts**

**You Did**

Report Now »

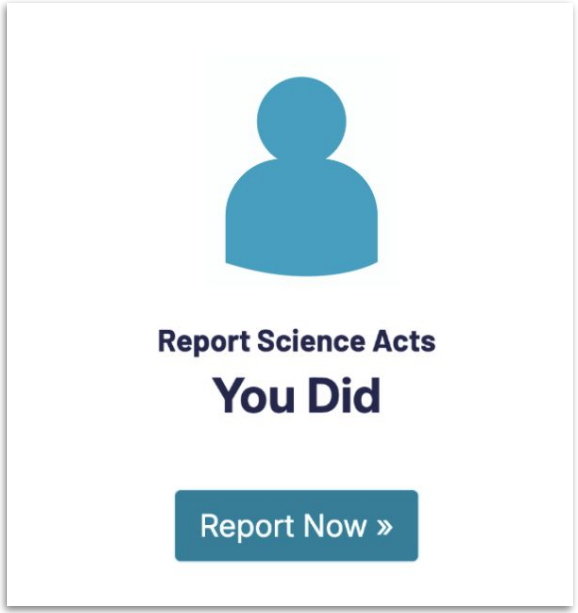


**Report Science Acts**

**You Facilitated**

**for many people**

Report Now »




You are logged into your SciStarter account using **emmagiles32@gmail.com**.
You'll receive a one-time digital badge upon submitting your first report!

---

All Acts are displayed on the Wall of Fame on CitizenScienceMonth.org.

**How would you like your name displayed?** (required)

We recommend using your full first name and first initial of your last name.

**Your Country**

Select your country

**Your Email** (required)

emmagiles32@gmail.com

We won't share this. We do require this to validate reports.

***Tell us about the Acts YOU did***

## Your Act(s)

**In less than 10 words, describe your Act(s) (required)**

*Identified birds and did a site review*

Example: Attended NASA event. Logged data about pollinators. Completed Trainings.

**Estimated # of Acts (required)**

*6*

How many times did you participate: attend events, log data, analyze data, etc?

**If you participated in a project or event, give it a shout out here! (optional)**

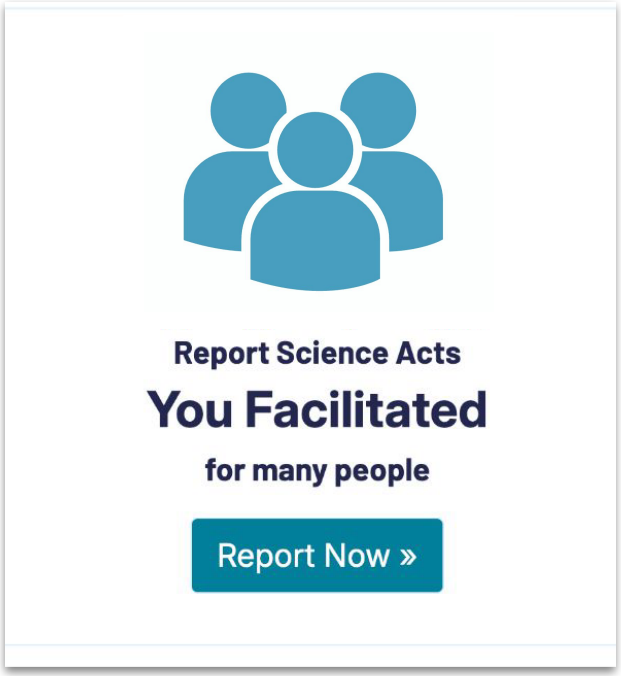
*eBird & Birdability Map*

You can select from our drop down menu or type a different project or event name

☑ **Please send me the SciStarter Newsletter every other week so I can learn about new projects and events near me!**

Thank you and well done! Thank you for being part of 2.50 Million *Acts of Science*!

***Tell us about the Acts YOU did***




**In less than 10 words, describe the Act(s)** (required)

Example: Joined *Acts of Science Connected*; Attended NASA event. Logged data about pollinators. Completed Trainings.

**Estimated # of Participants** (required)

**Estimated # of Acts** (required)

How many times did participants attend events, log data, analyze data, etc?

**Display Names of Participants** (optional)

Type one name per line as you'd like them to appear on CitizenScienceMonth.org's Wall of Fame. We recommend using the full first name and the last name's initial.

**Did your team participate in a project or event? Give it a shout out here!** (optional)

You can select from our drop down menu or type a different project or event name.

***Tell us about the Acts your group or event did***

# Engagement Opportunity

## Pop-Up Citizen Science Star Party at Independence Hall

***Hosted by SciStarter and The City of Pl***

**When**: April 13 *(Rain date April 14)* at 8PM
**Where**: Independence National Historical Park, Philadelphia, PA

Bring your telescope and knowledge of the stars, we'll help connect people to citizen science projects to protect the night sky and migrating birds!




Interested in joining us? Email *info@scistarter.org*.

***Thank you!***

***Next, we'll dive into Globe at Night.***

# Globe At Night - Bringing Dark Skies and Citizen Science together

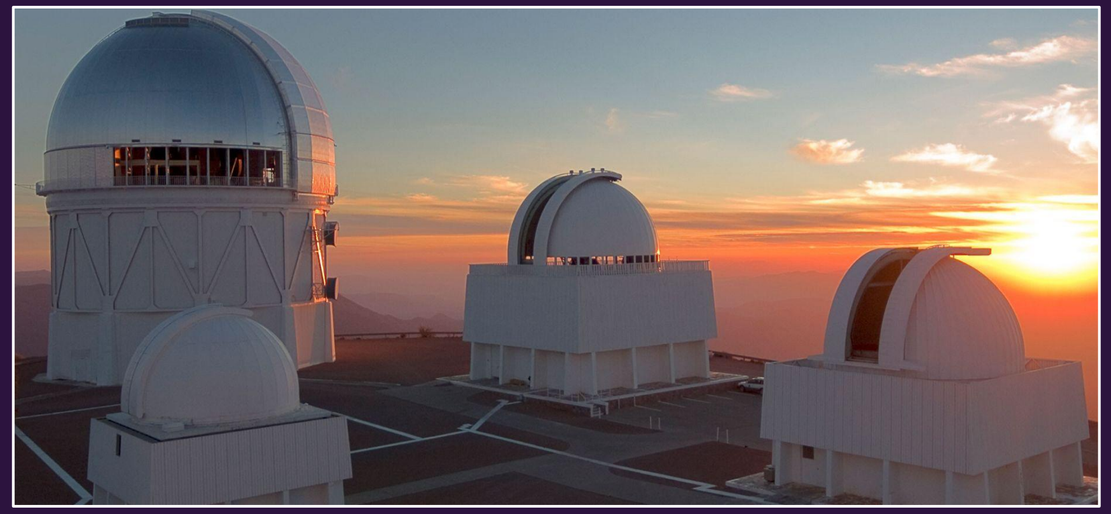
Connie Walker
Head, Globe at Night Program
Member, DarkSky International Board of Directors
Head, Office of Observatory Site Protection, NOIRLab, USA
Associate Director, Center for the Protection of D&QS

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# NOIRLab Observatories



Gemini Observatory South & North (Chile + Hawaii, USA)



Cerro Tololo Inter-American Observatory (Chile)



Kitt Peak National Observatory (Arizona, USA)

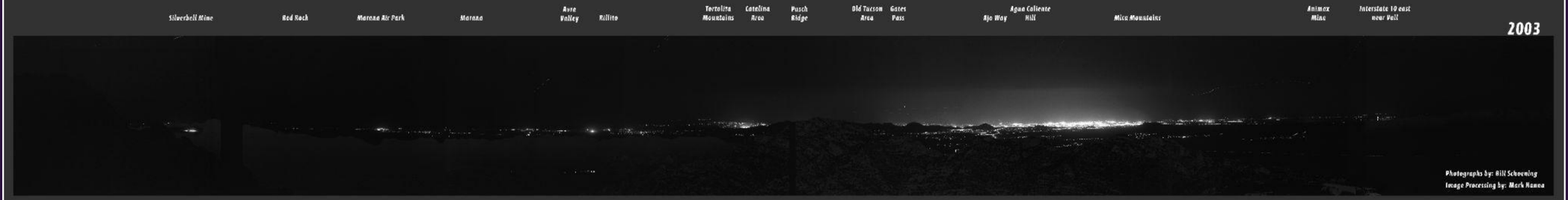
# The Evolution of Tucson City Lights As Seen From Kitt Peak



1959



1980




2003



2023

# Light Pollution affects…

## Energy, Safety & Cost



## Astronomical Observations



## Human Health



## Wildlife



## Cultural Heritage



# What can we do?

## Protecting the night sky starts with YOU!

**1** Light only what you need



**2** Use energy efficient bulbs and only as bright as you need




**3** Shield lights and direct them down



**4** Only use light when you need it




**5** Choose warm white light bulbs



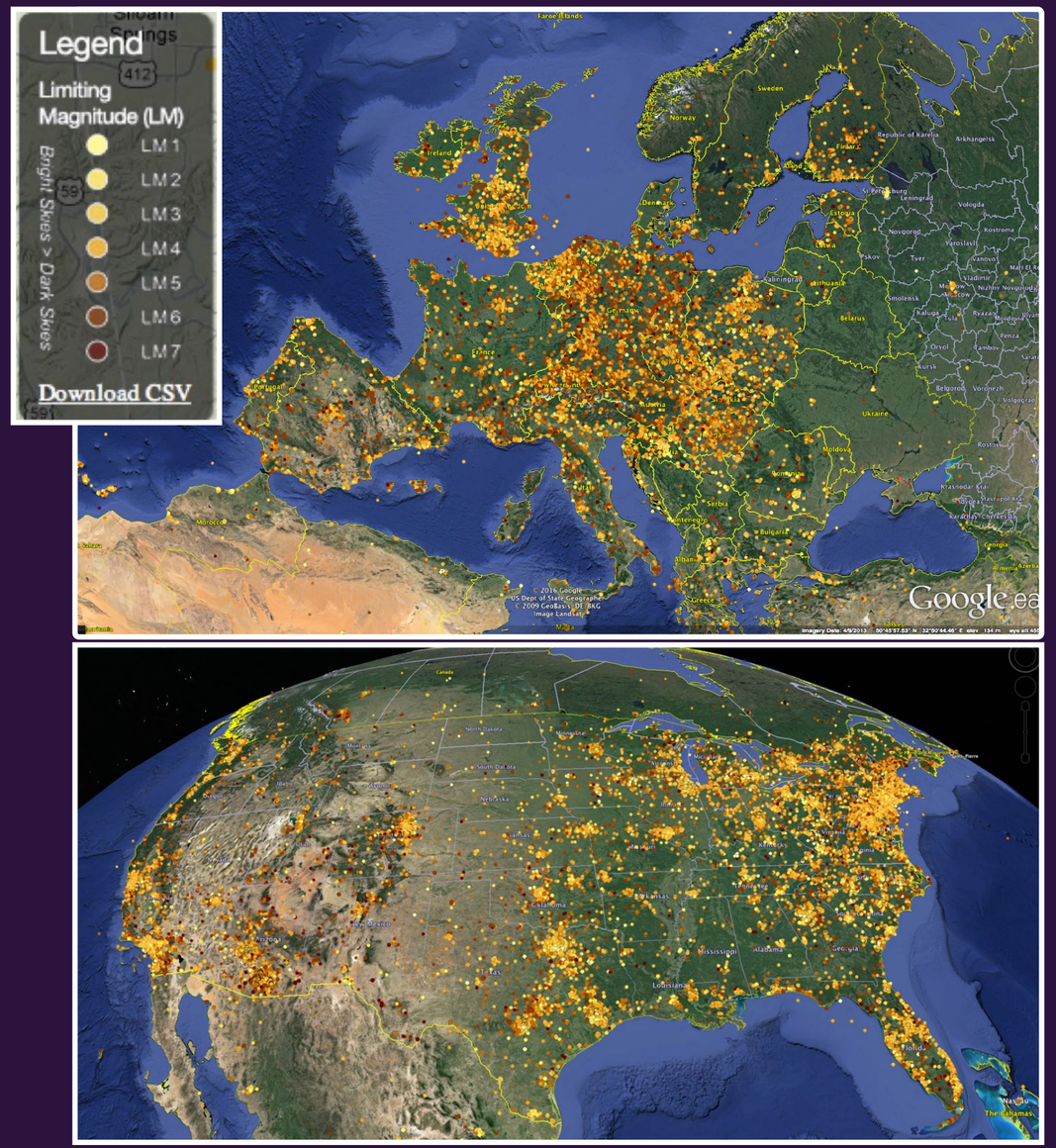
**6** Join DarkSky

We need your help to continue the fight against light pollution.

DarkSky

darksky.org

# Globe at Night




**What:** Invites citizen-scientists to measure their night sky brightness and submit their observations to a website from a computer or smartphone: www.globeatnight.org

**Who:** People aged 8 and up

**When:** 10-day campaigns each month (no Moon in 1st half of night)

**Where:** Anywhere; everywhere!

**How many:** Over 320,000 measurements from 180 countries in the last 20 years.

# Fun & easy to participate in Globe at Night!

Here is how to start:

- Go outside more than an hour after sunset.
- Make sure there's no moon.
- Then....




Sky Quality Meter



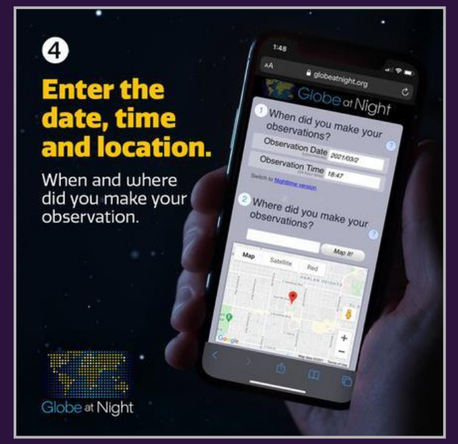












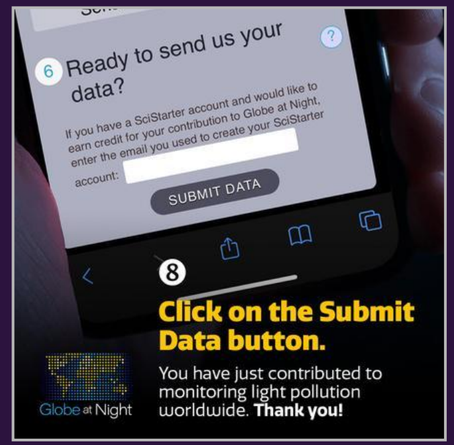














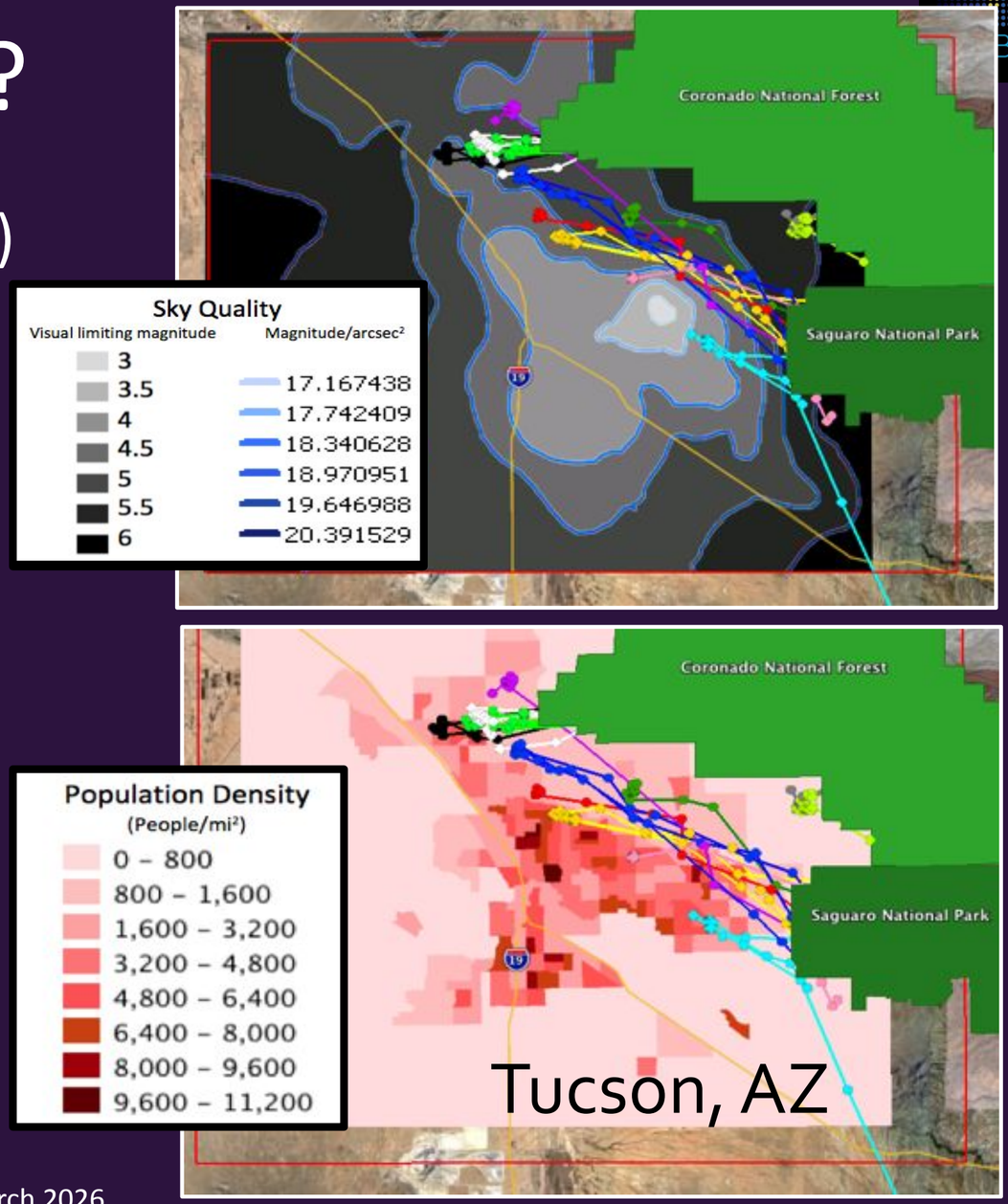

# Happy Birthday, Globe at Night!



- Globe at Night has turned 20 !
- Celebrating with the “Love Your Stars video campaign”
- Now until beginning of April.
- 5 second videos saying in your own language either
  - I love a starry sky, I love dark skies or I love Globe at Night
- Can also hold up a sign that says one of those 3 phrases in your own language.
- Submit video here: https://bit.ly/4skHtPm
- Will debut the montage of videos during International Dark Sky Week.

# How can the data be used?

- Compare data over time (changes, trends)
- Compare data on population density
- Use in a lighting survey
- Search for dark sky oases
- Monitor ordinance compliance
- Study effects of light pollution on
  - animals or plants
  - human health
  - safety, security,
  - energy consumption, cost



# Students and Globe at Night

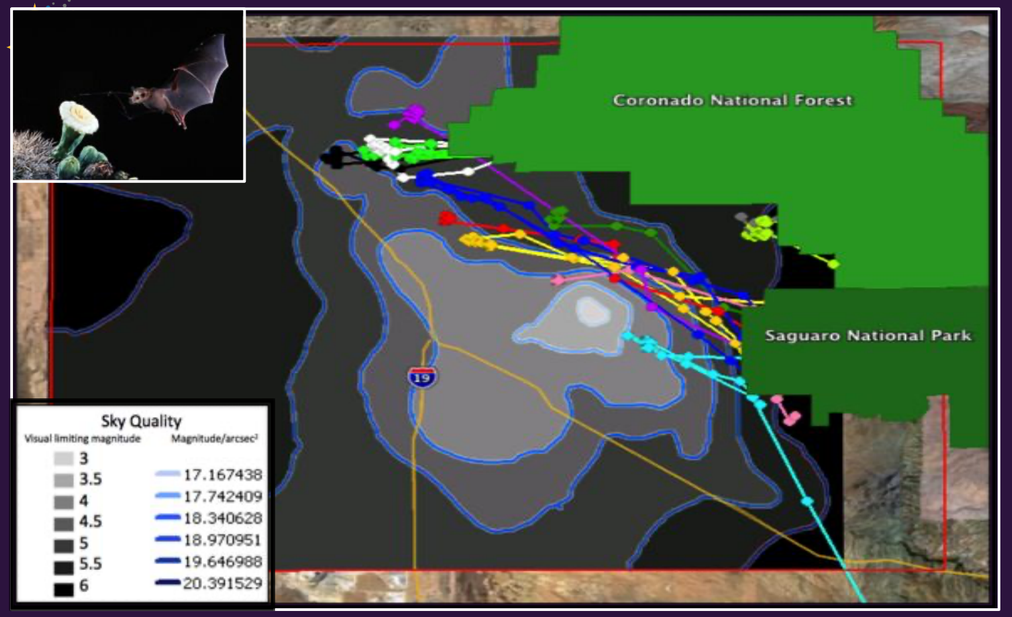
**TOP:** 3700 elementary-middle schoolers asked how much of the night sky have they already lost. They used their Globe at Night observations to create a lego map using 35000 pieces.

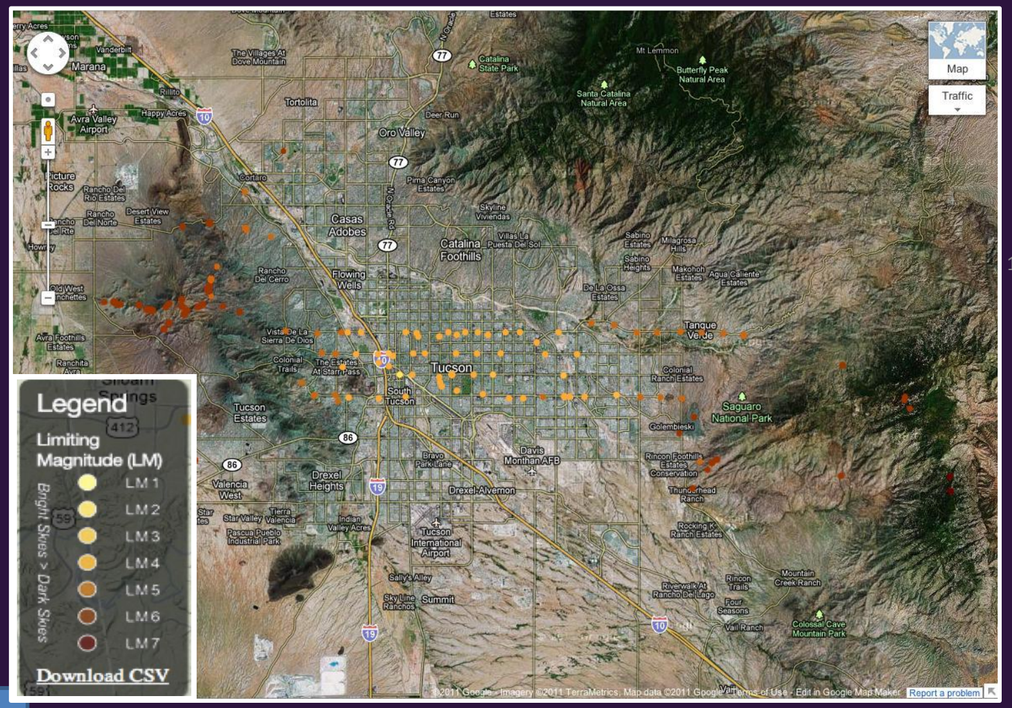
**BOTTOM:** Lighting inventories by high school students and amateur astronomers (using Globe at Night observations) convince city council to strengthen lighting laws.






# Globe at Night, the General Public & Tomorrow's Leaders



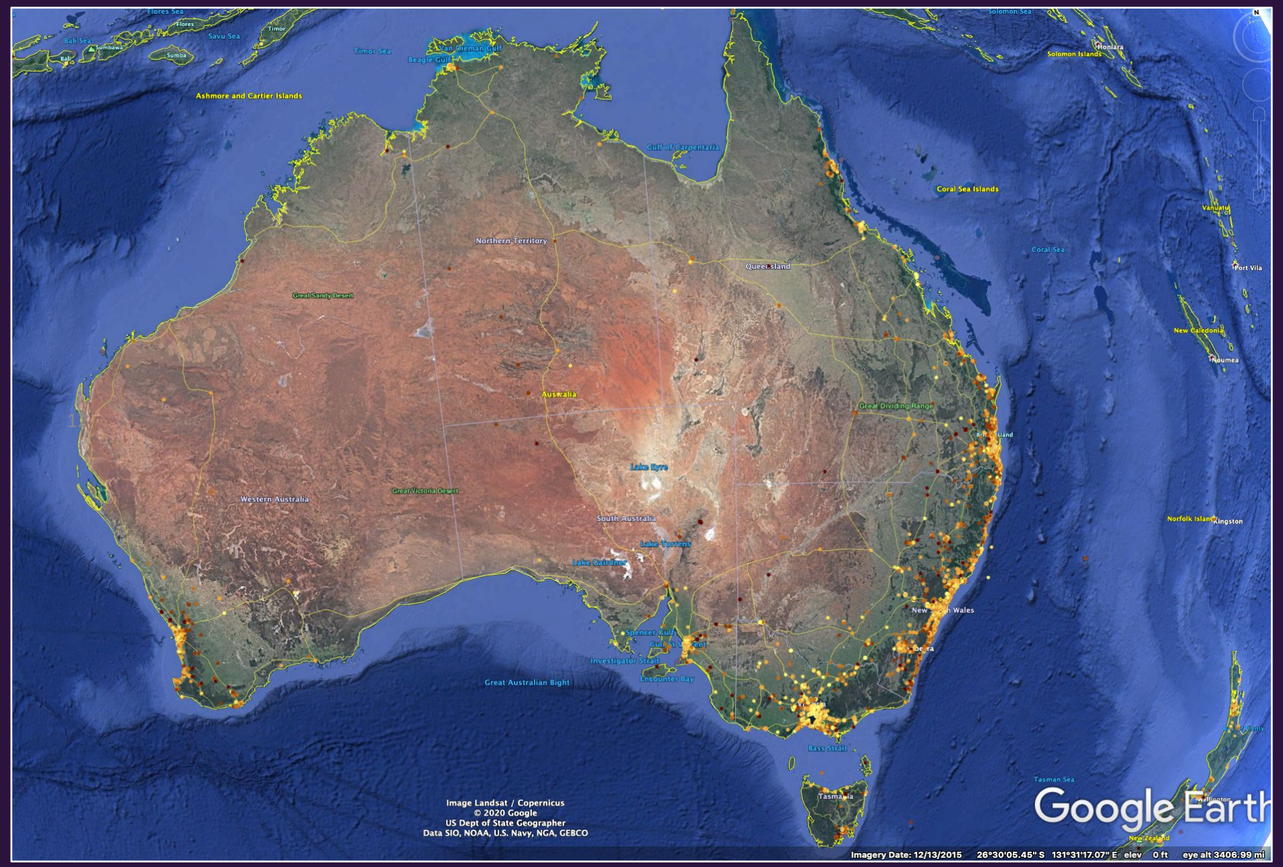

**TOP:** Undergraduates study the impact of city lights on lesser long-nosed bats using 3500 Globe at Night observations - why do they avoid city center?

**BOTTOM:** Boy scouts, park rangers, the general public and amateur astronomers participate in taking Globe at Night observations across Tucson. How much brighter is city center than the national parks?

# ASDA & Globe at Night break a world record!

- Using Globe at Night, **Australians** broke the **Guiness Book of World Record** for the most users to take an online environmental sustainability lesson in 24 hours.
- As part of the lesson, on June 21, the longest night of the year in the Southern Hemisphere, they submitted **6700 Globe at Night measurements**.

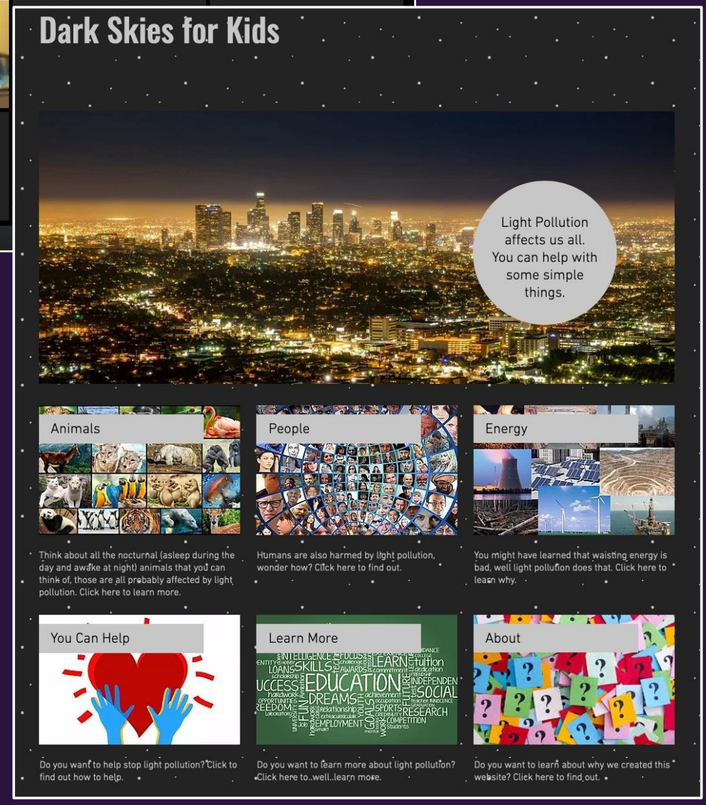


# Mentoring Girl Scouts

- An interactive Zoom Meeting with Girl Scouts from the Heart of New Jersey inspired them to hold a statewide virtual campout. The Great NJ Camp-In had 1000 families participate.




- Two Girl Scouts (twins) in Arizona inspired by Globe at Night, worked on a dark skies webpage for kids for their Silver Award (with us as advisor), earned it and subsequently won an IDA Rising Star Award and a Presidential Service Award.





We will continue efforts to inspire the next generation

# Dark Skies Rangers Activities




Light Shielding Demo

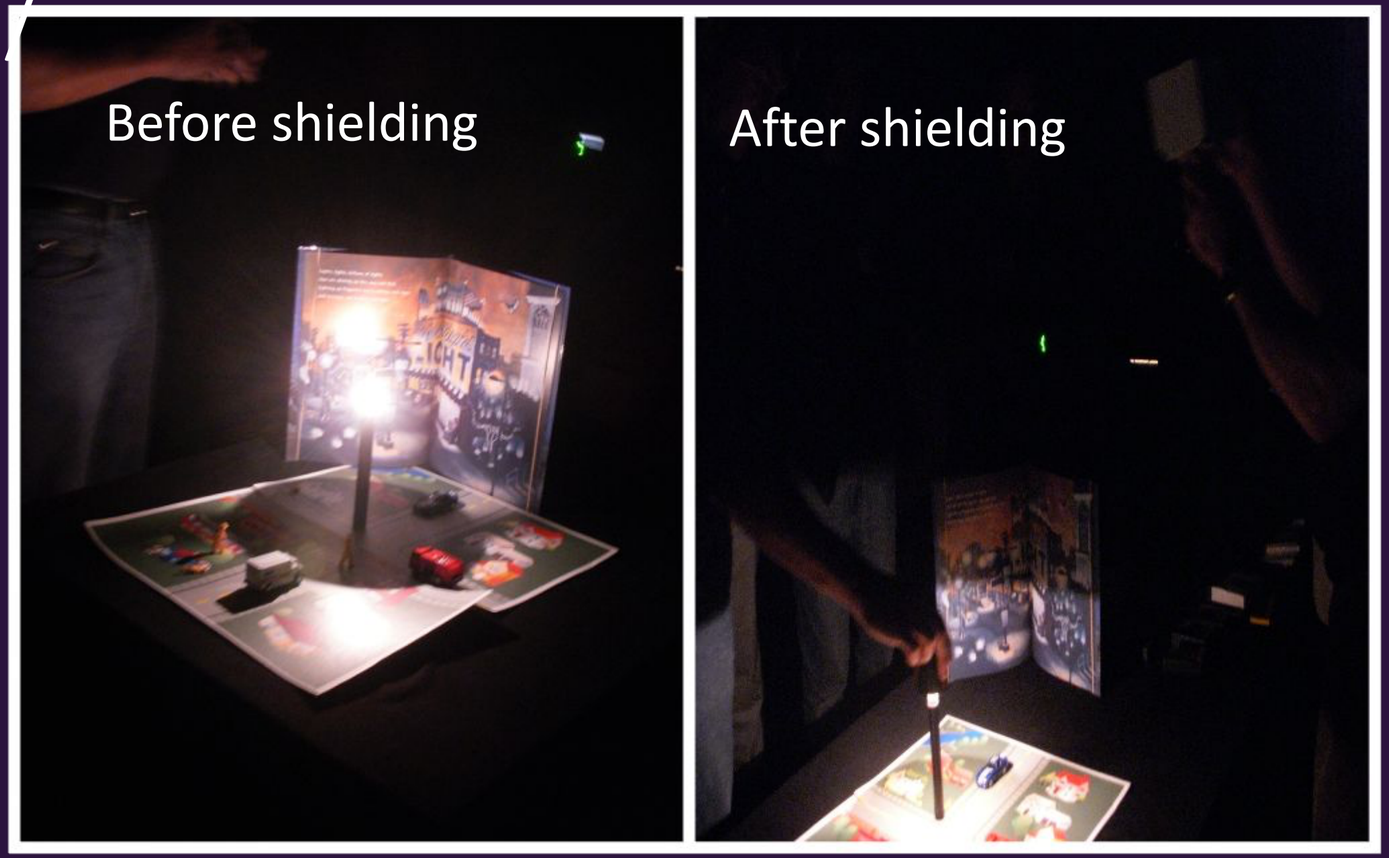


The NIght You Hatched



Constellations at Your Fingertips

Elementary through 6th grade
https://globeatnight.org/dark-skies-rangers/



# Quality Lighting Teaching Kit Activities

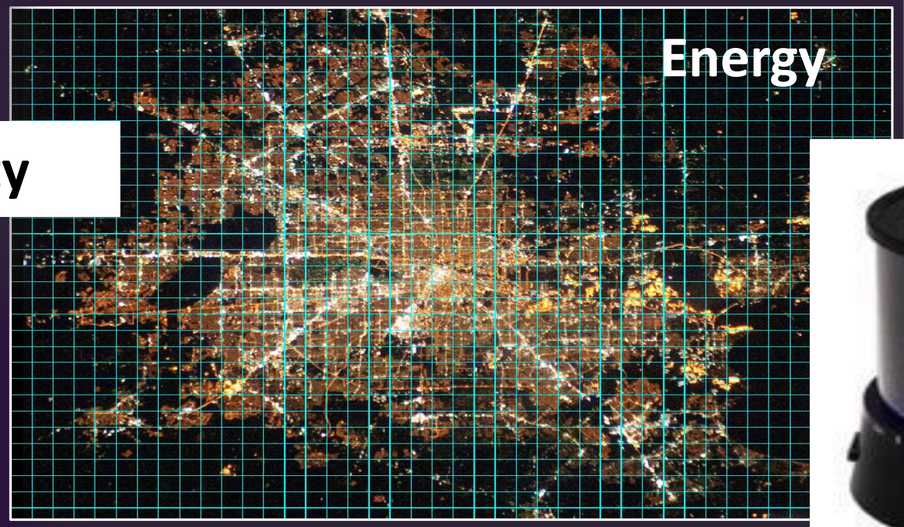
https://noirlab.edu/public/products/education/edu001/











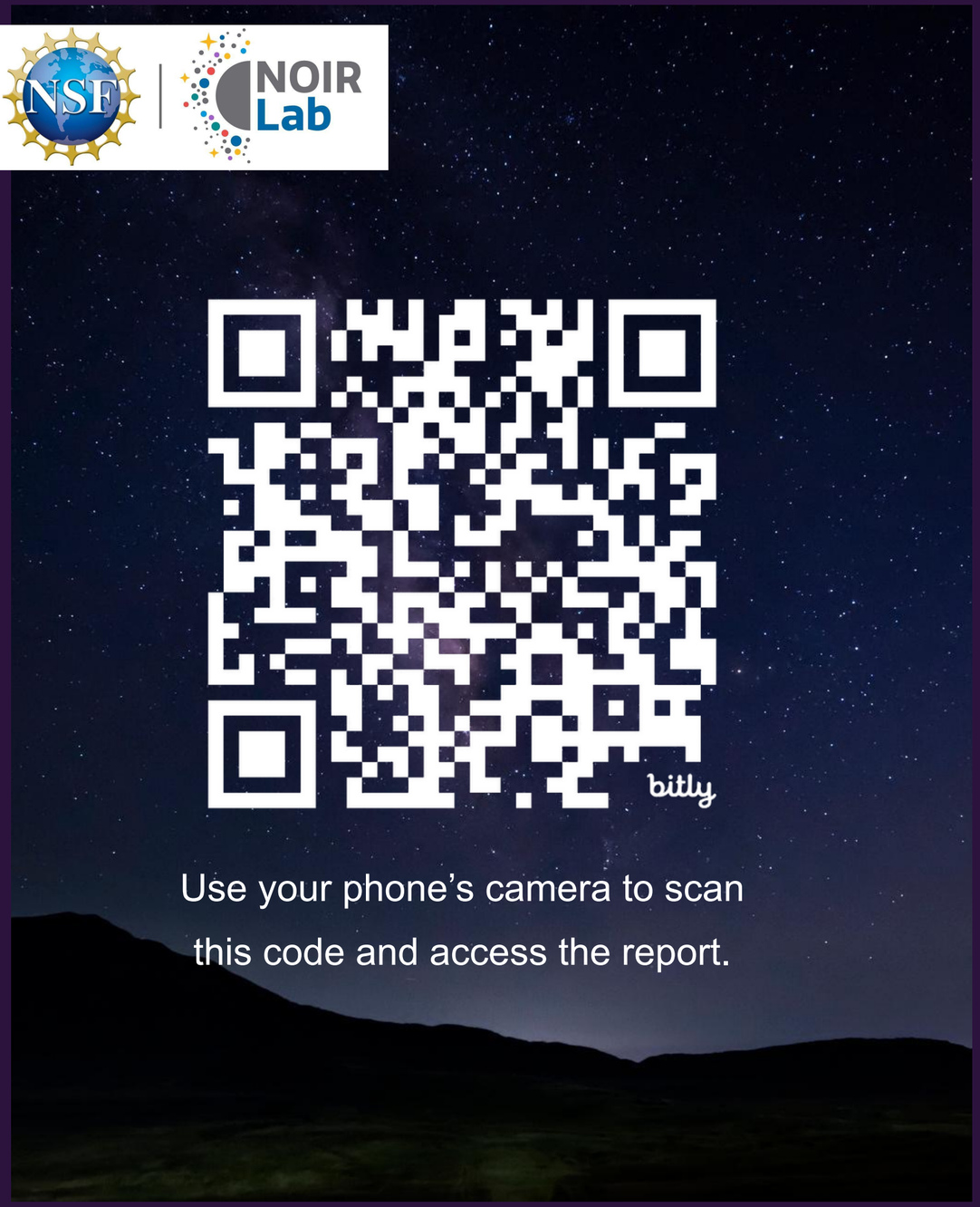

# Students of Ejiofor International College during the QLT program activities



# OSA & SPIE Student Chapters from Tucumán, Argentina as facilitators of the QLT activities





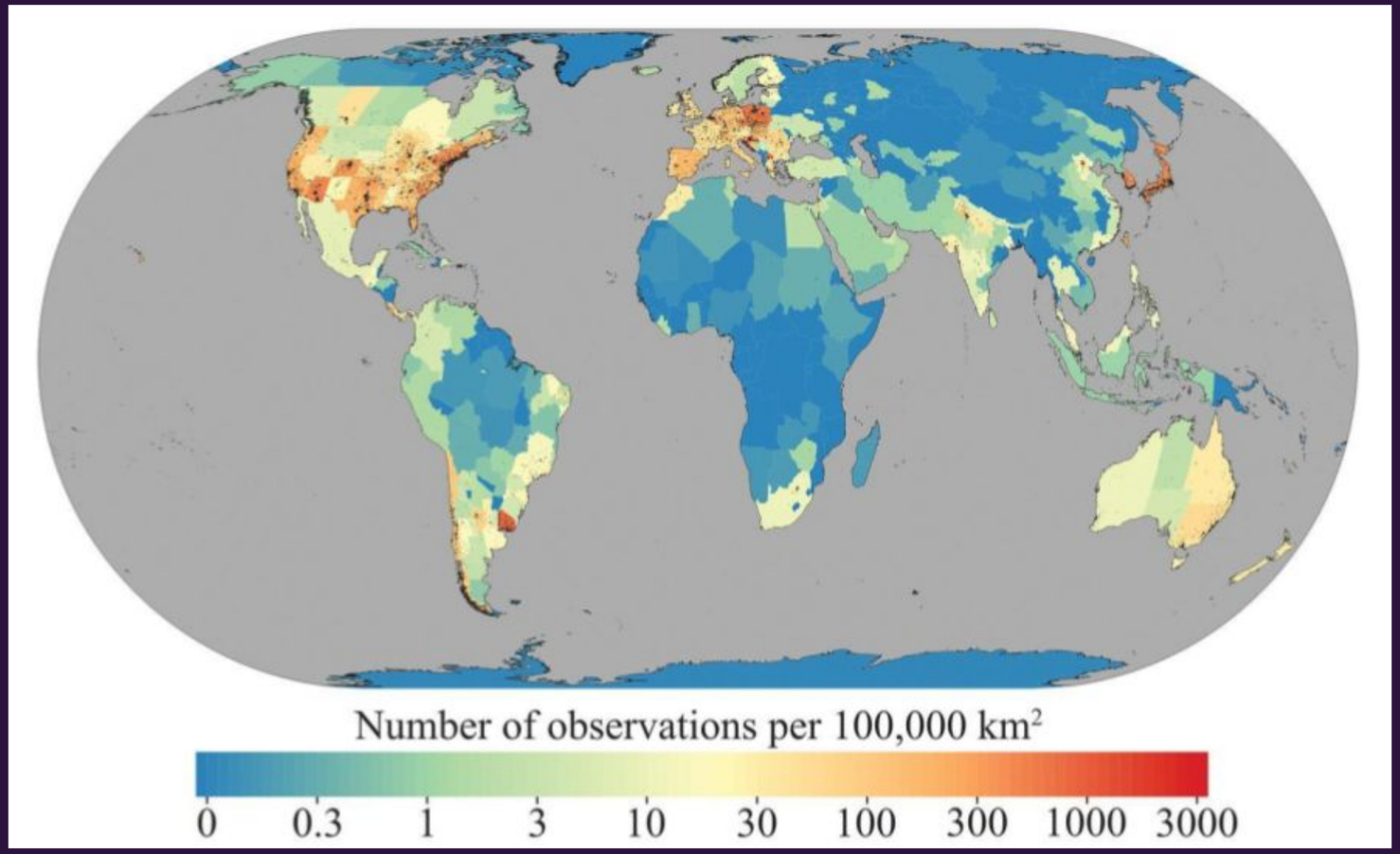

# Globe at Night data discovers a large increase in light pollution worldwide

- We investigated the change in sky brightness over 12 years using 51,000 Globe at Night observations of the visibility of stars from citizen scientists worldwide.
- The number of stars decreased by an amount explained by a 10% rise in light pollution each year worldwide.
- C.C.M. Kyba, Y. Ö. Altintaş, C.E. Walker & M. Newhouse, Science 379, 265 (2023)

# Citizen Scientists are vital in providing data from across the world and from every year

Spatial distribution of all years combined. Colors indicate participation normalized by land area.

RESULTS ARE ONLY AS RELIABLE AS THE THOROUGHNESS OF THE DATA.



# JOIN US at app.globeatnight.org




## Globe at Night Campaign Dates for 2026

| | |
|---|---|
| March 10-19 | August 4-13 |
| April 9-18 | September 2-11 |
| May 8-17 | October 2-11 |
| June 6-15 | November 1-10 |
| July 6-15 | Nov 30 - Dec 9 |

DarkSky is a sponsor of Globe at Night.

# Together, We Can Protect Our Starry Night Sky!

**Next Steps:**

- Try out Globe at Night - https://www.globeatnight.org
- Send us your “I love dark skies” video
  Fill out form at https://bit.ly/4skHtPm
- Join us in April - Have your star party collect observations and report them to CitizenScienceMonth.org

2.50 MILLION ACTS OF SCIENCE
Citizen Science Month APRIL

**Bonus! Listen to the NPR Podcast featuring Globe at Night:**
https://www.kcur.org/2026-02-02/stargazers-unite-for-science

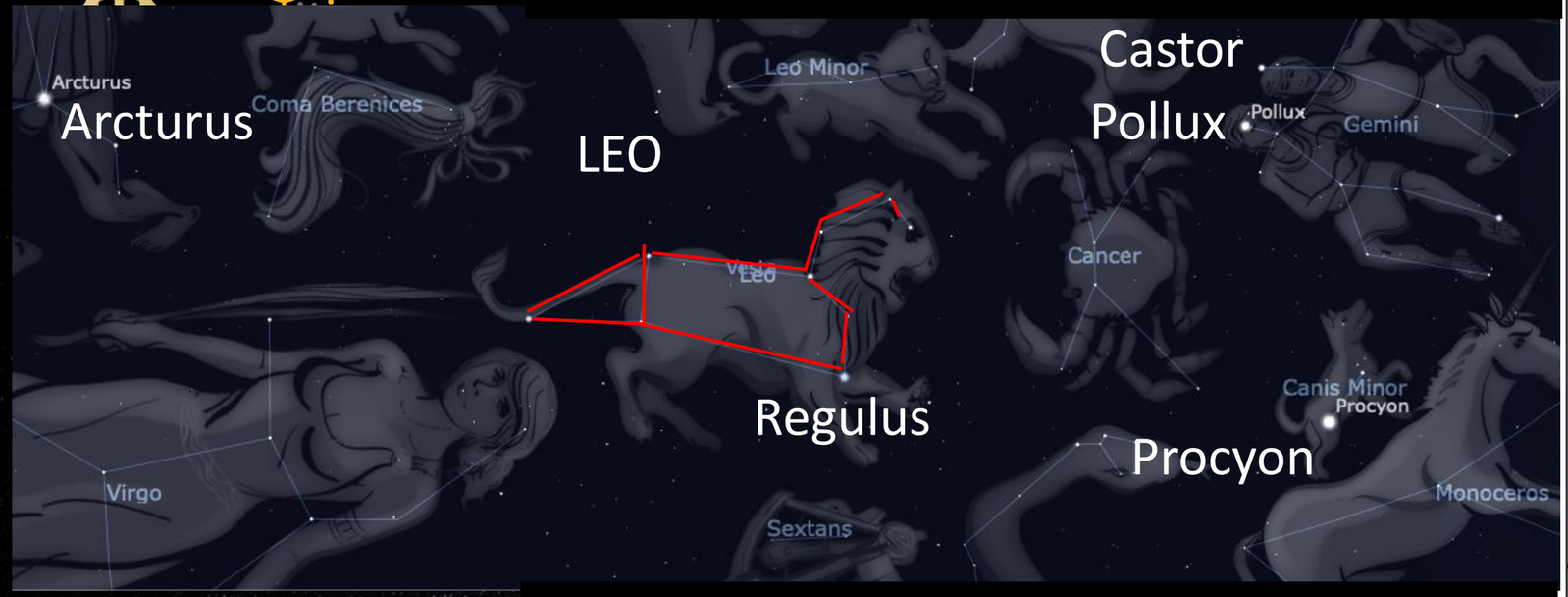
Info@SciStarter.org

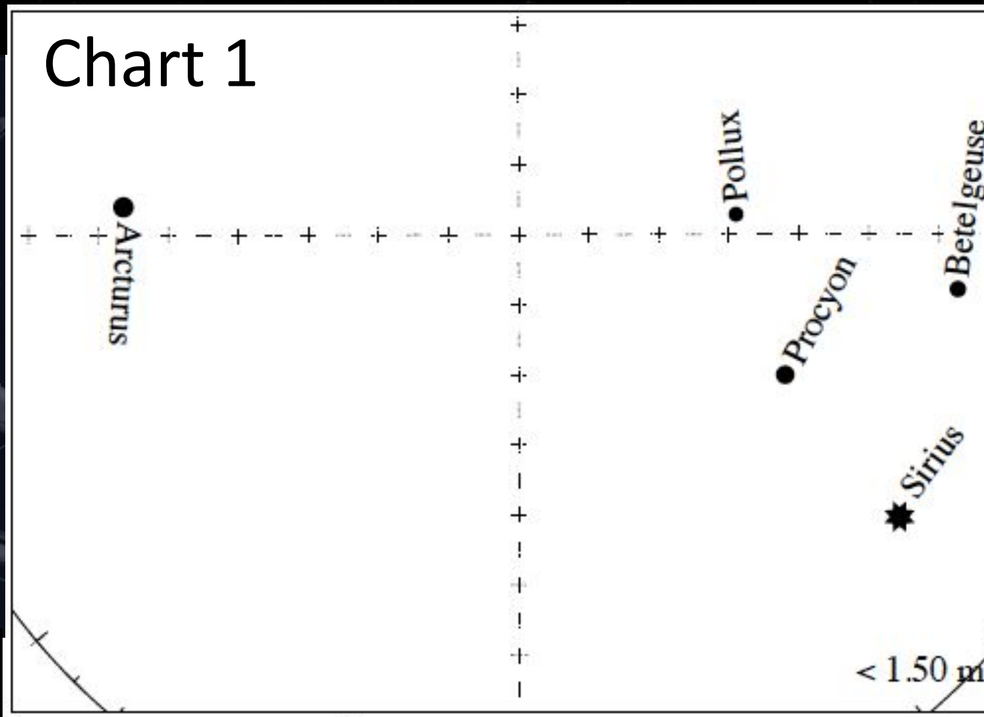
If any part of this presentation is reproduced/used, please credit "NOIRLab's Globe at Night program."

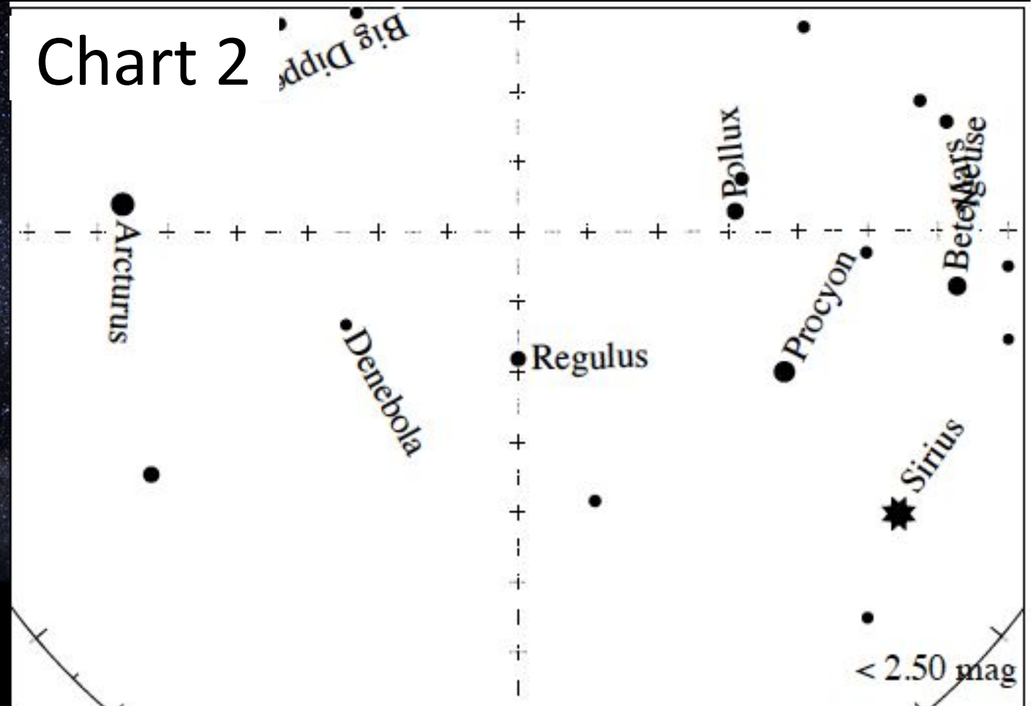
# ADDITIONAL SLIDES

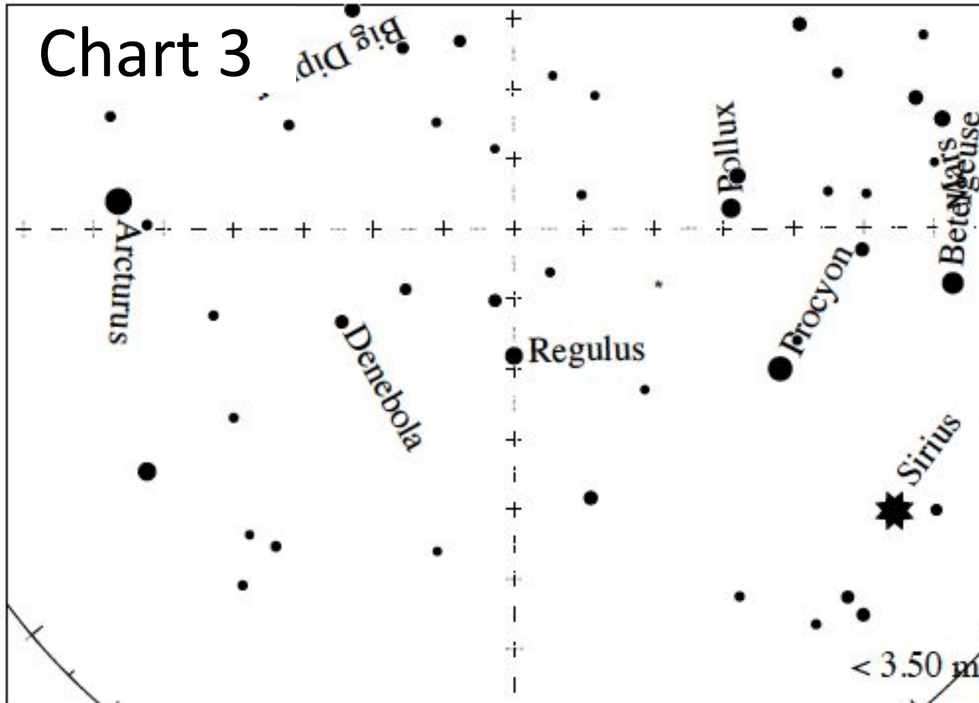
# Leo, the Lion

April 2026 campaign



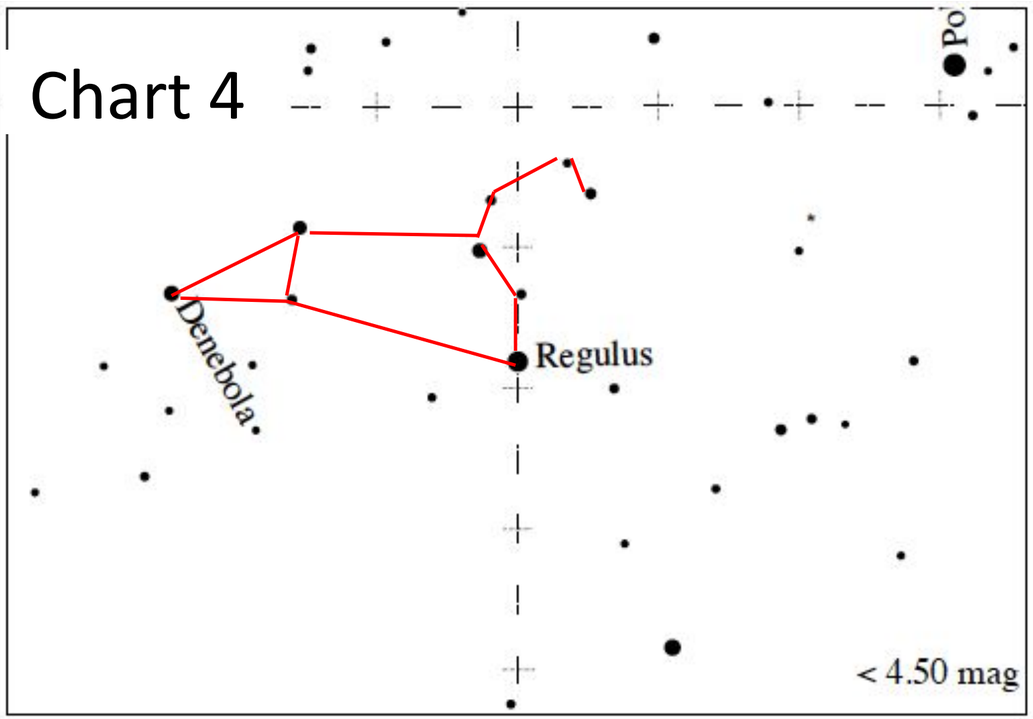



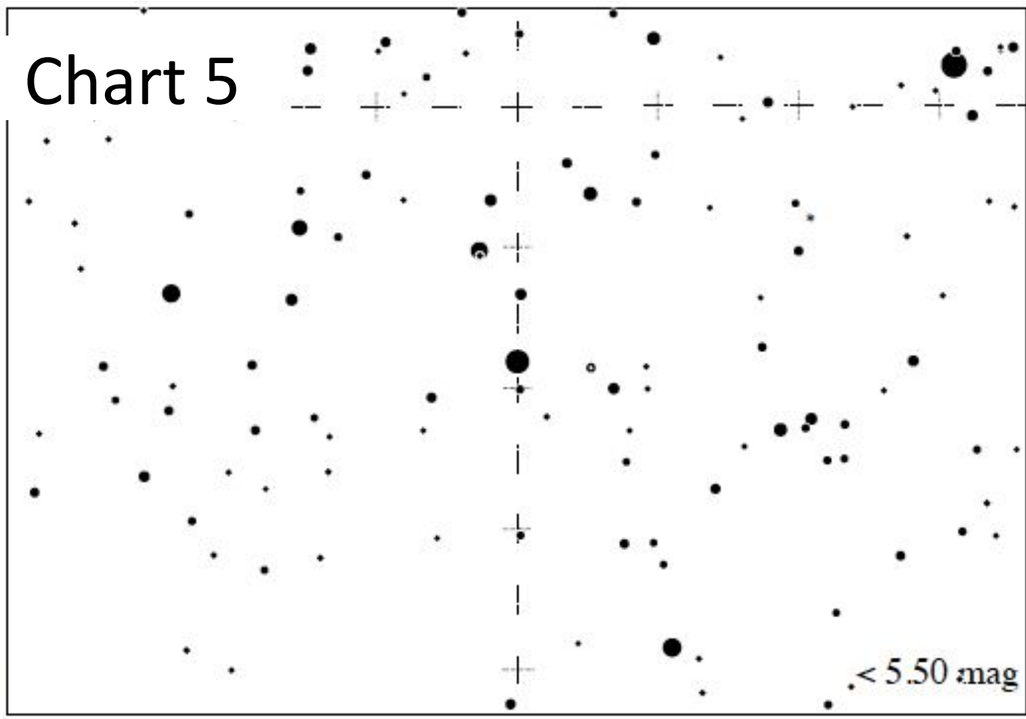



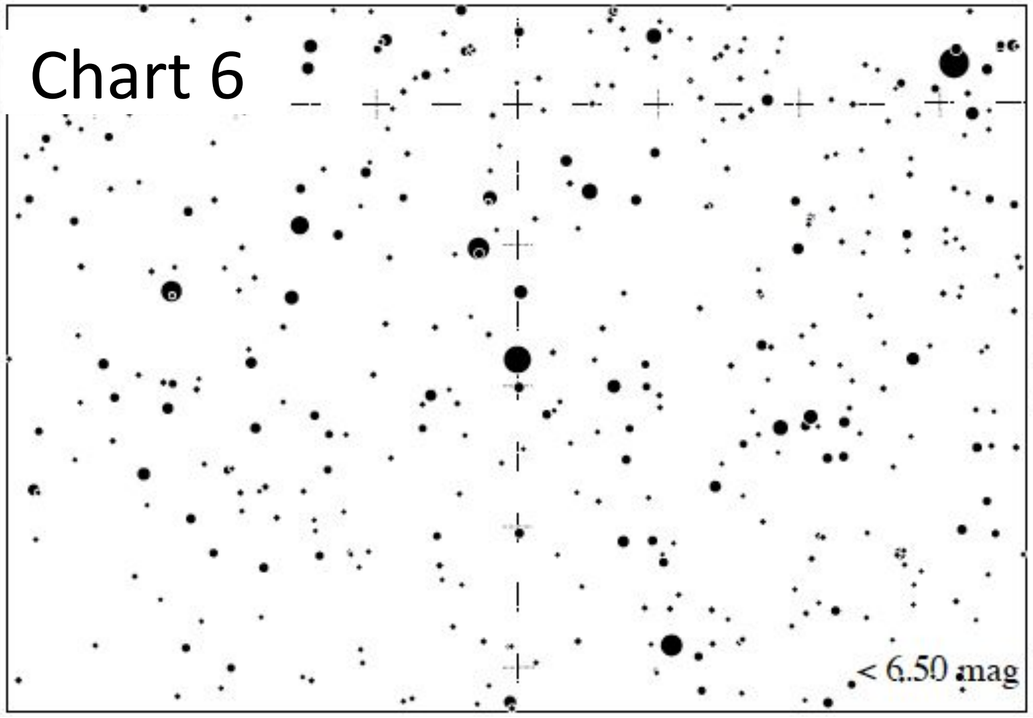



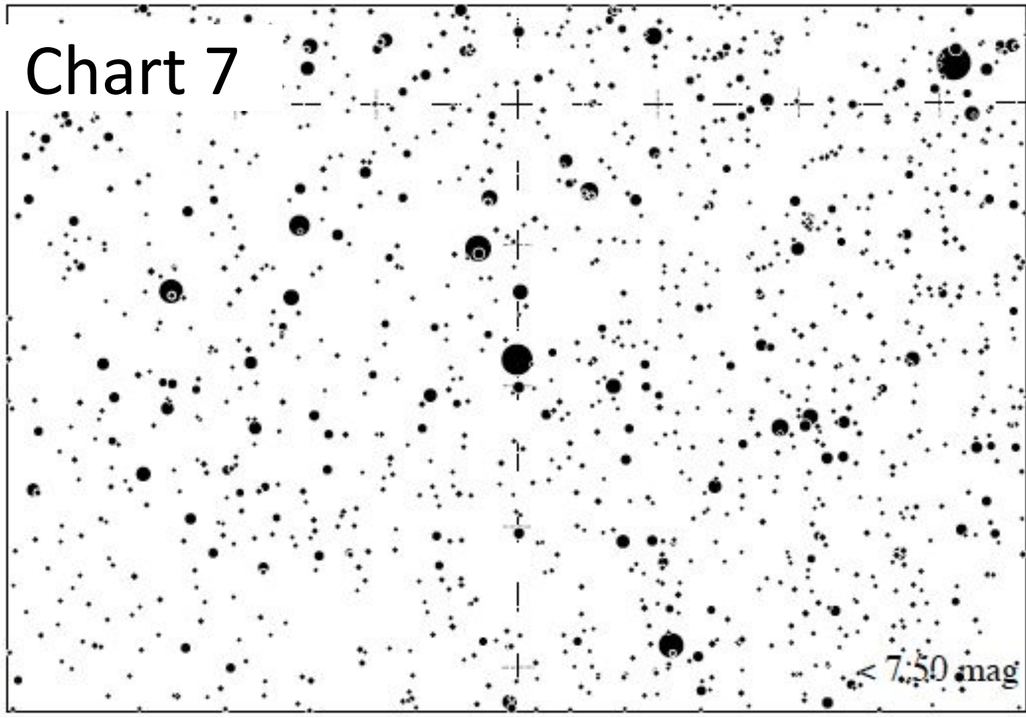
# Leo, the Lion

April campaign, 2022



# Quality Lighting Teaching Kit: Features

- Problem-Based Learning
- 6th grade on up
- Adaptable to age group, venue and time allotment.
- Can be used in classrooms, afterschool programs, museums and national parks
- Can be done one activity to a group and report out, or as rotating through 6 stations.
- Translated into Spanish



# All-sky camera photos of the night sky brightness over Kitt Peak Observatory



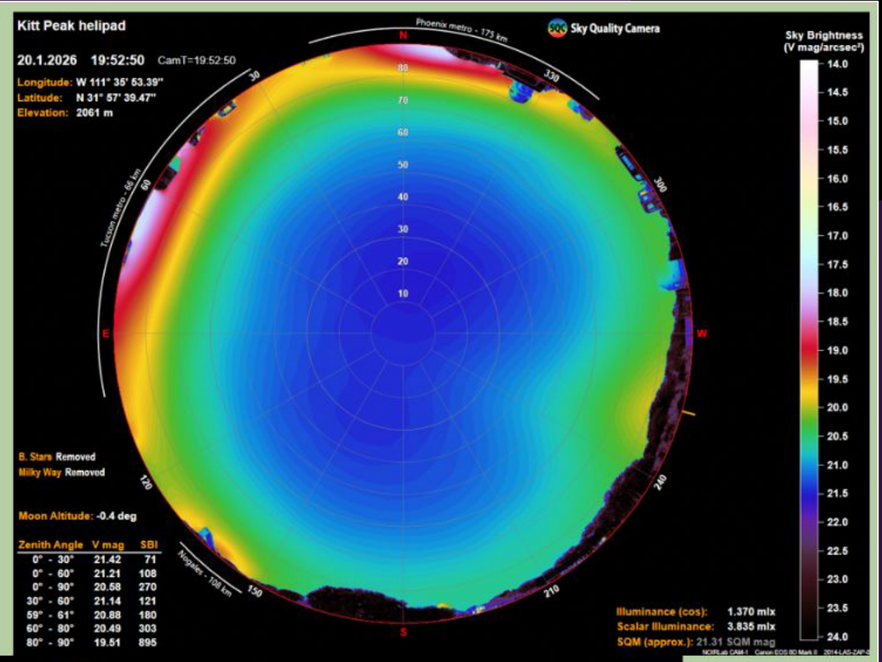
SQC Example, taken January 20, 2026 (W. Liu and J. Winsky)

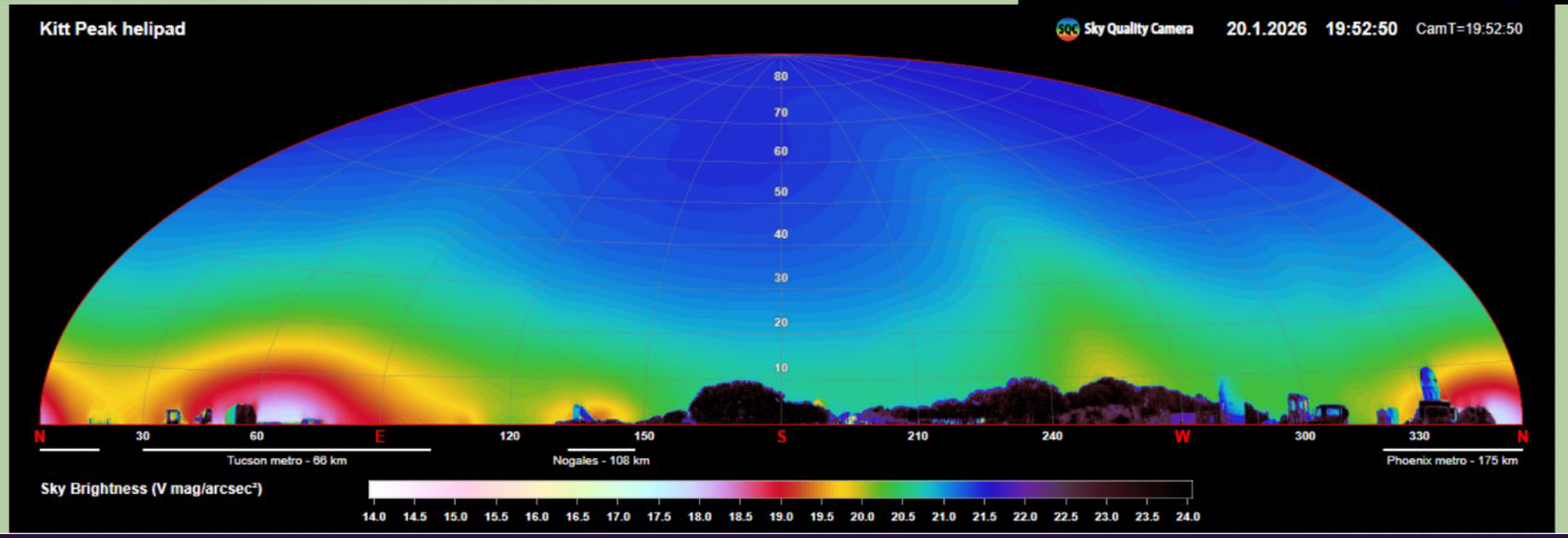
*Left*: All-sky image

*Right*: Sky brightness image derived from the image to the left. The Phoenix, Tucson, and Nogales **light domes** are indicated. Milky Way and bright stars removed

The bright feature to the west is the **zodiacal light**

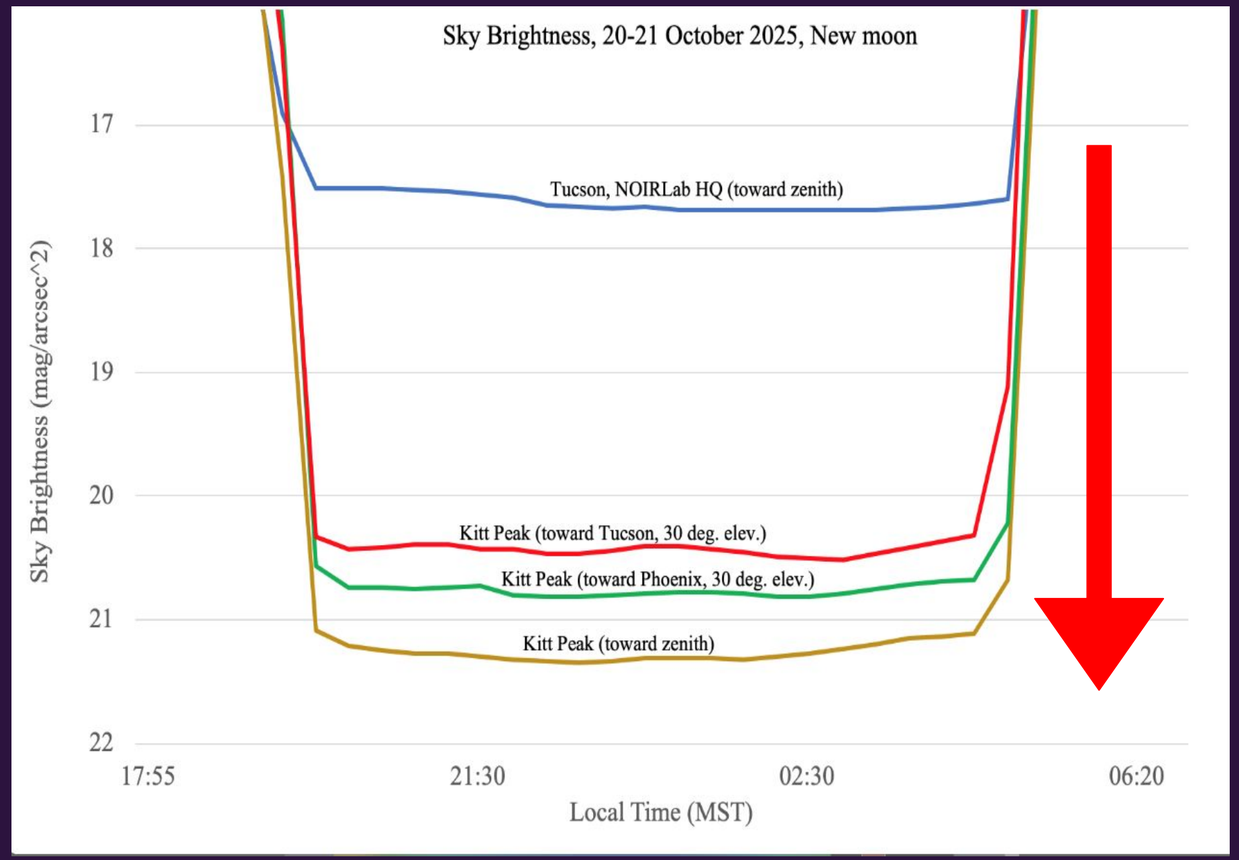
*Below*: Same sky-brightness image as right, Hammer-Aitoff projection

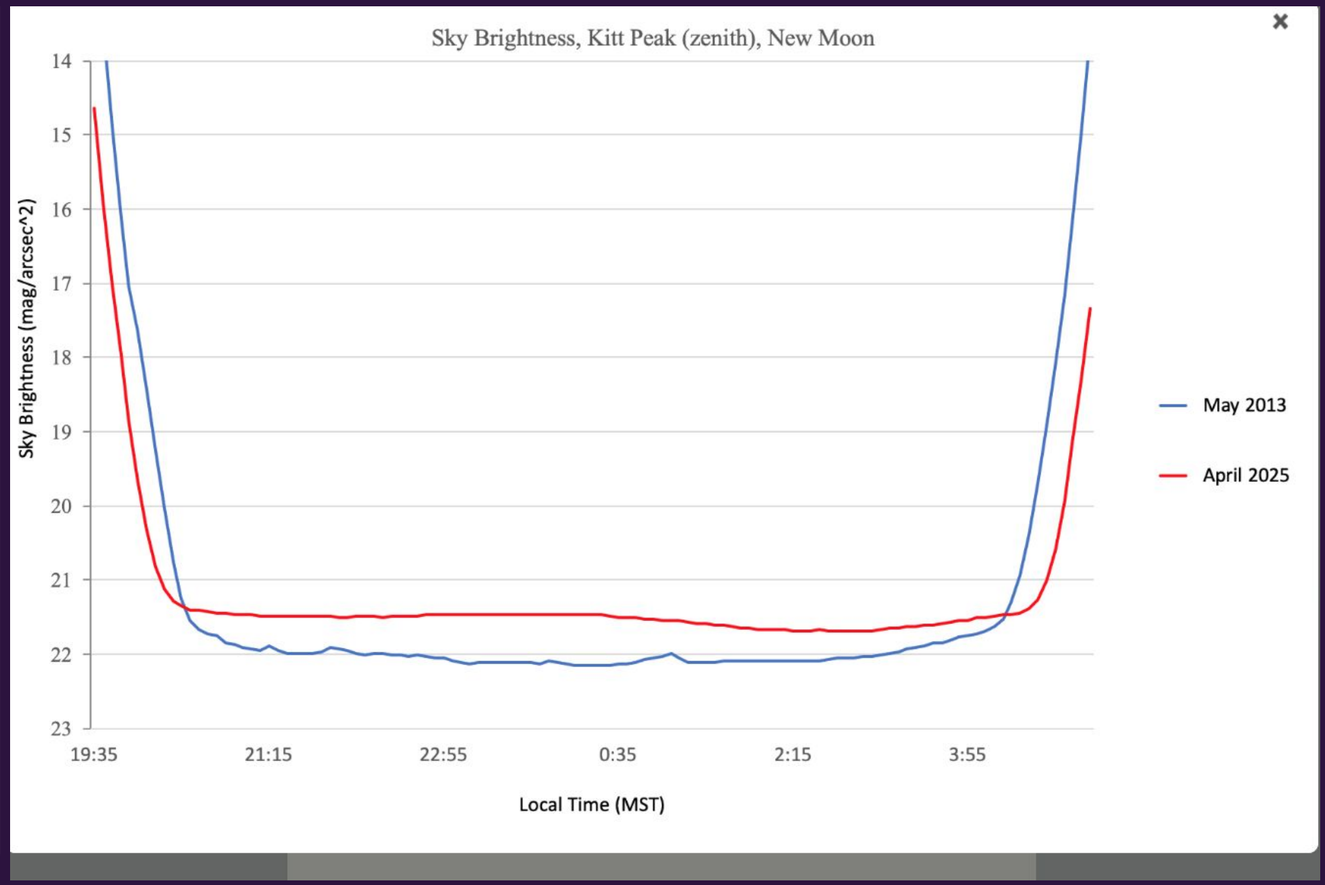


# “Spot” measurements of the night sky brightness above Kitt Peak Observatory

# Brightness Measurements Toward Kitt Peak & Nearby Cities in 2025 vs 2013

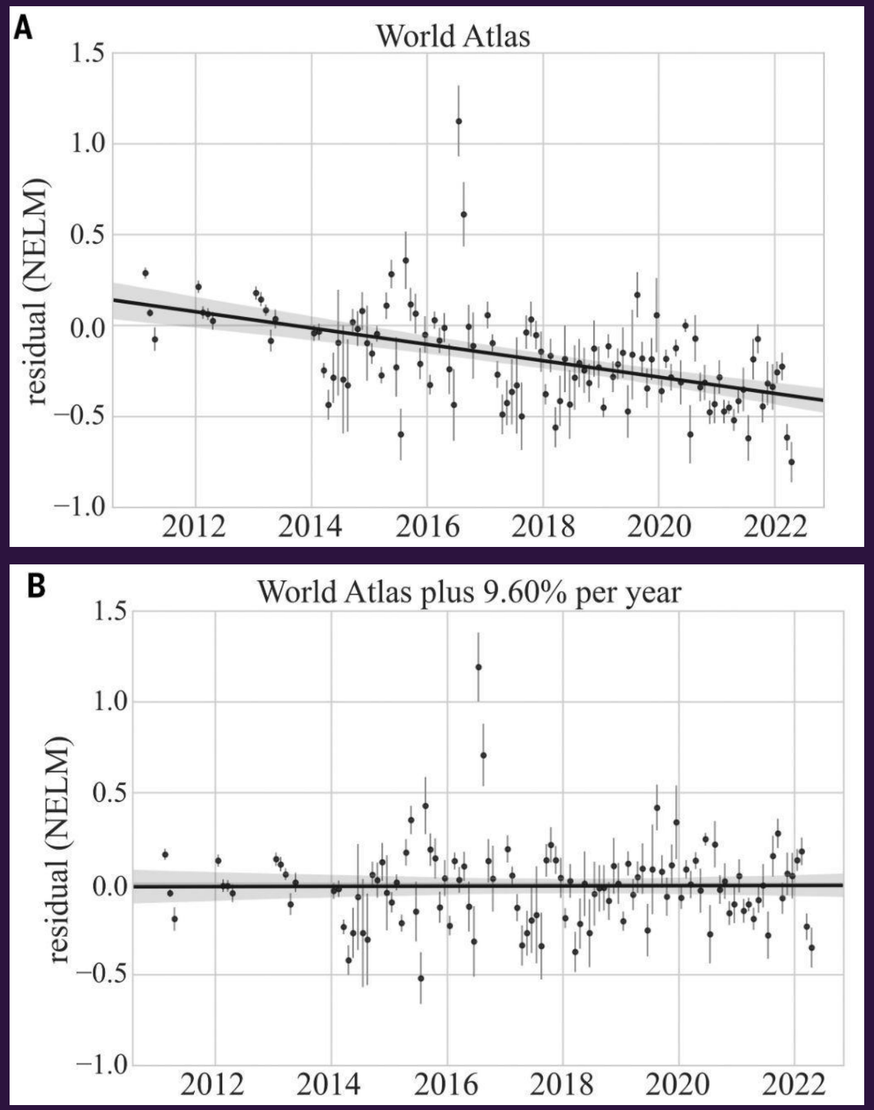


Data showing an increase in sky brightness of 9.6% per year on avg worldwide (Kyba et al 2023 paper)

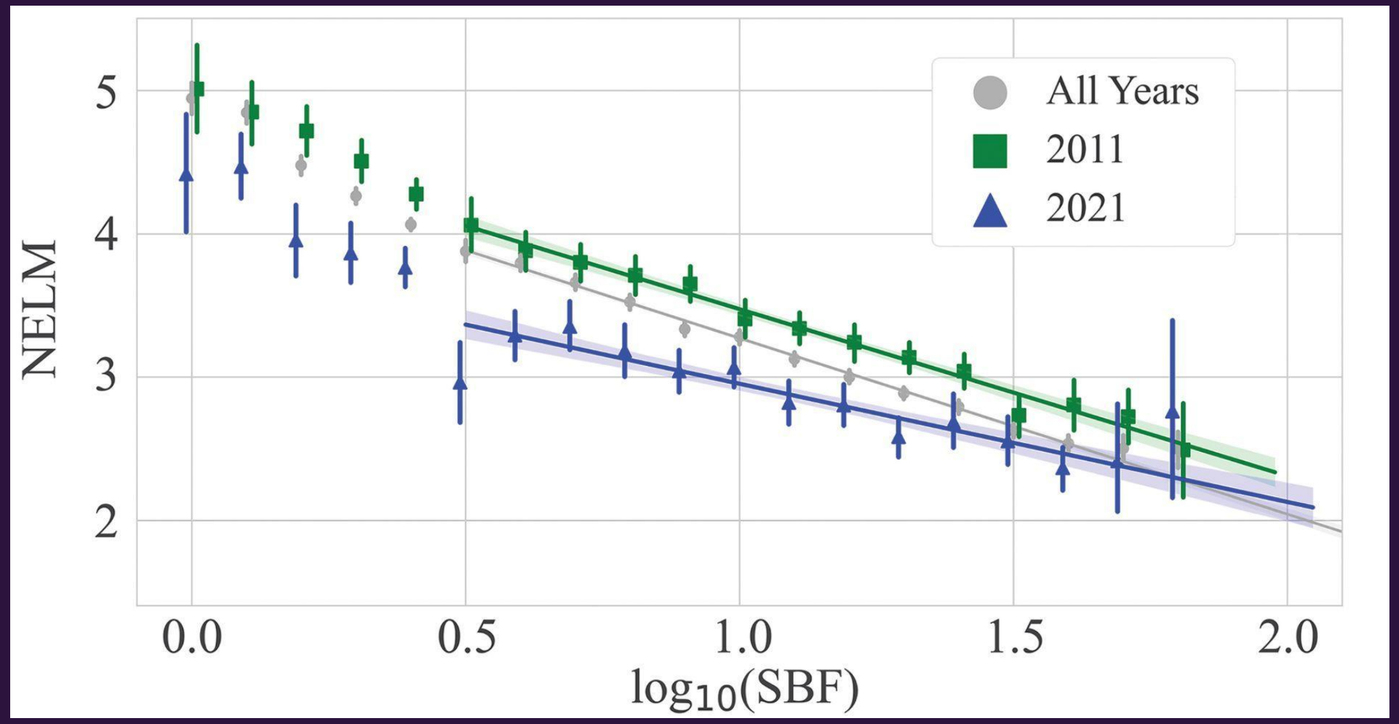
# Globe at Night data discovers a large increase in light pollution worldwide

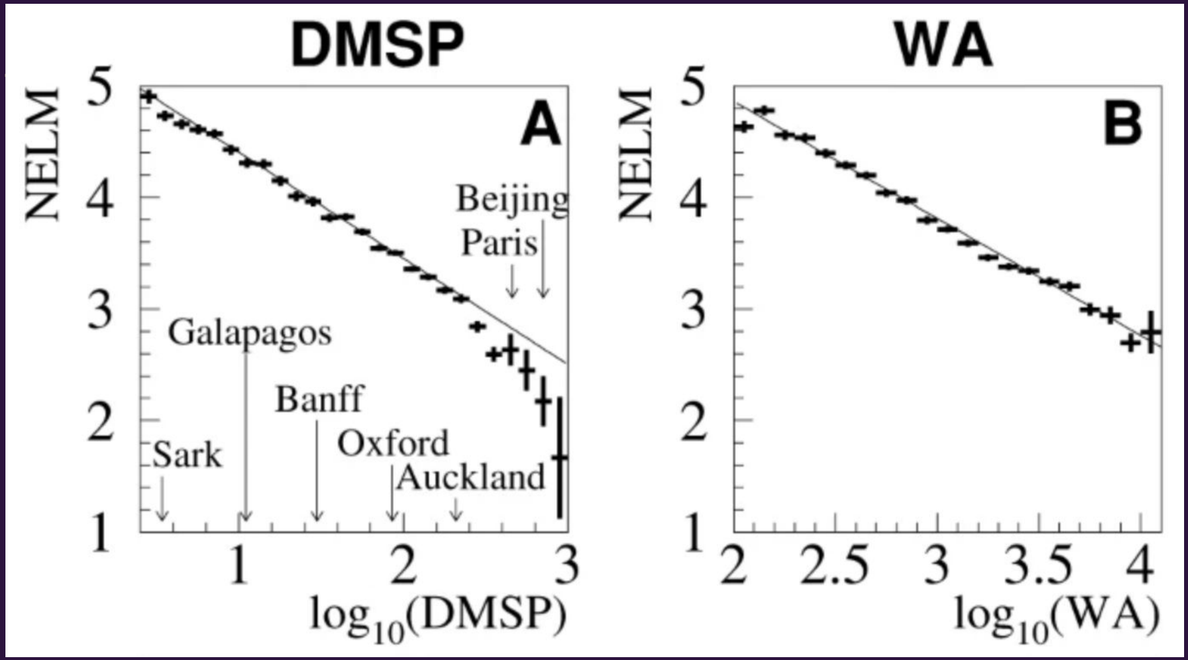
The number of visible stars decreased by an amount that can be explained by an increase in sky brightness of 9.6% per year in the human visible band, which is equivalent to doubling the sky brightness every 8 years.

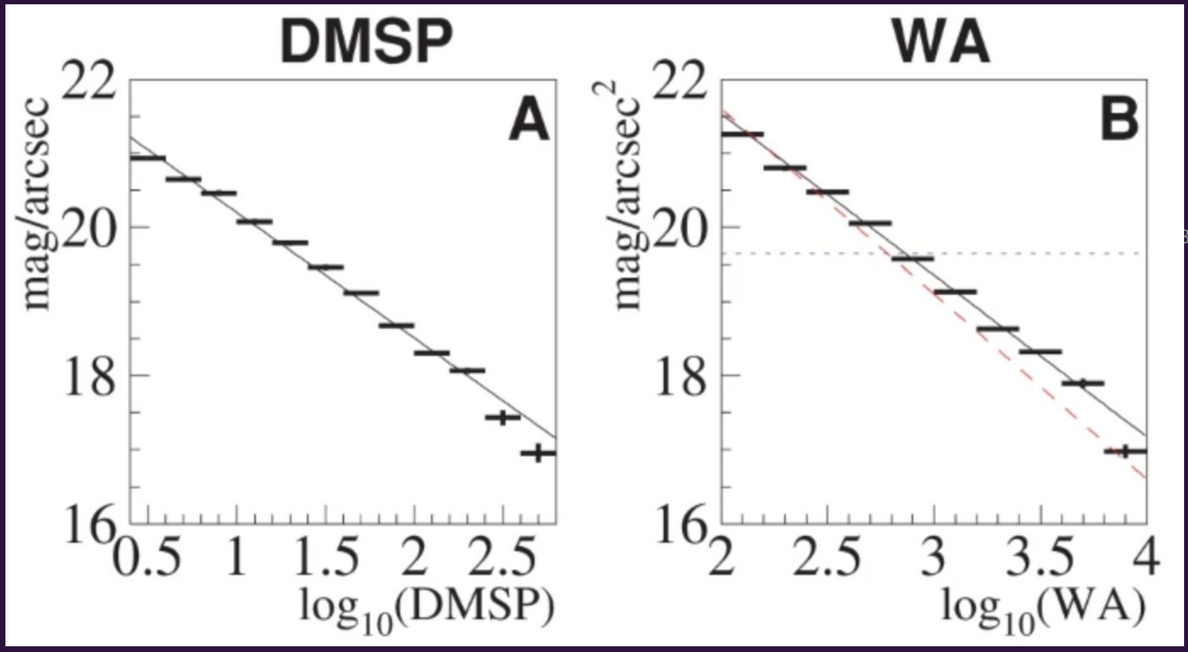


# Globe at Night data discovers a large increase in light pollution worldwide

This increase is faster than emissions changes indicated by satellite observations (2%), primarily because the satellites are not sensitive to the wavelengths at which white LEDs peak, or to light emitted horizontally.






# Globe at Night Provides Valuable Data for Monitoring Global Night Sky Brightness

- **DMSP** = Defense Meteorological Satellite Program
- **WA** = World Atlas of Artificial Night Sky Brightness (Uses light pollution propagation software with data from the VIIRS satellite)
- Kyba, C., Wagner, J., Kuechly, H., Walker, C. E. et al. Citizen Science Provides Valuable Data for Monitoring Global Night Sky Luminance. Sci Rep 3, 1835 (2013). https://doi.org/10.1038/srep01835