



## Frequently Asked Questions

### WHAT IS IDA MISSOURI?

The International Dark-Sky Association (IDA) is a 501(c)(3) founded in 1988 ([darksky.org](https://darksky.org)) to preserve and protect the nighttime environment and the heritage of dark skies through environmentally responsible outdoor lighting. IDA Missouri ([darksourcemissouri.org](https://darksourcemissouri.org)) was launched in October 2018 as an official state chapter of the International Dark-Sky Association.

IDA Missouri has representatives throughout the state of Missouri and oversees educational and research programs that support the IDA mission. IDA Missouri partners with local amateur astronomy clubs to promote the library telescope program ([librarytelescope.org](https://librarytelescope.org)).

### WHAT IS THE IDA MISSOURI CITIZEN SCIENCE PROGRAM?

The IDA Missouri Citizen Science Program is a collection of citizen science projects allowing patrons of public libraries to contribute data that will help scientists better understand the impact of artificial light on our night sky and life on Earth. The citizen science program is made available to libraries through called SciStarter ([SciStarter.org](https://scistarter.org)) which was founded in 2014 to improve the citizen science experience. Partners of SciStarter include Arizona State University's School of Future Innovation in Society, the National Science Foundation, NASA Space Science Education Consortium and Globe at Night.

### WHO IS THE TARGET AUDIENCE?

The IDA Missouri Citizen Science Program is designed for patrons of public libraries. The project skill level set for ages eight or older with no prior experience needed.

### WHAT CITIZEN SCIENCE PROJECTS ARE AVAILABLE?

The IDA Missouri Citizen Science Program is launching in early 2020 with six citizen science projects. Three projects collect data on how light pollution impacts our view of the night sky. Three projects collect data on how light pollution impacts the diversity of life on Earth.



## Frequently Asked Questions (Continued)

### **WHAT PROJECTS MEASURE OUR VIEW OF THE NIGHT SKY?**

According to the 2016 groundbreaking “World Atlas of Artificial Night Sky Brightness,” 80 percent of the world’s population lives under skyglow. In the United States and Europe, 99 percent of the public can’t experience a natural night! The following projects will help scientists better understand how light impacts our view of the night sky: (1) Measuring Light in the Night Sky – Help gather light pollution data, (2) Astrophotos Measuring Light Pollution - Help astronomers study light pollution by taking photos of the sky with your smartphone, and (3) Astrophotos – Experiment using smartphones and telescopes for astrophotography.

### **WHAT PROJECTS MEASURE THE DIVERSITY OF LIFE ON EARTH?**

Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures including amphibians, birds, mammals, insects and plants. Projects in this group will help scientists understand the diversity of our natural world: (1) Birds of North America – Collect pictures of birds, (2) Exploring Biodiversity – Document and identify plants and animals around you, and (3) The Great Sunflower Project – Identify where pollinators need help.

### **WHAT ARE THE COSTS TO THE LIBRARY?**

The IDA Missouri Citizen Science Program is designed to be low cost for libraries. Libraries are not charged for use of the SciStarter platform or for the third-party applications used to collect the citizen science data. Libraries are responsible for printing costs of the library patron checkout materials, marketing materials and internal instructions used by library staff. Optional costs to libraries include an additional \$200.00/kit for various measuring devices and adapters. More information regarding requirements and costs are outlined in the attached exhibit.



## Frequently Asked Questions (Continued)

### **HOW DOES A LIBRARY PATRON PARTICIPATE IN THE PROGRAM?**

A library patron interested in participating will visit the library to request the project materials for the selected project. The project materials provide instructions on how to participate in the project. Optionally, the library will provide kit materials they have purchased for the project (see attached exhibit). To begin a project, the library patron will visit [darksky.scistarter.org](https://darksky.scistarter.org) to create an account (a one-time event). Once logged into their account, the patron will view the selected project and follow the step-by-step instructions. Once the library patron completes the data collection step, the patron will be directed to third-party applications outside of SciStarter.org where they will enter the collected data. The third-party applications are hosted by trusted partners who specialize in collecting data for scientific research.

### **WHAT OTHER LIBRARIES ARE PARTICIPATING IN THIS PROGRAM?**

SciStarter has more than 3,000 projects and has recently hosted a pilot project for Arizona libraries ([scistarter.org/library-kits](https://scistarter.org/library-kits)). IDA Missouri repurposed several popular citizen science projects from the Arizona library project and worked with the NASA Space Science Education Consortium and other organizations to create additional projects to complement the already popular library telescope program. Different from the Arizona pilot project, the common thread through the IDA Missouri Program is scientific research related to light pollution.

### **IF MY LIBRARY IS INTERESTED IN JOINING THE PROGRAM, WHAT SHOULD I DO?**

To learn more about joining the program and obtaining the necessary support materials, please contact Don Ficken at [IDAMissouri@darksky.org](mailto:IDAMissouri@darksky.org) or by calling (636) 851-9630.





## Welcome!

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Thanks to support from SciStarter (an online citizen science hub), NASA Space Science Education Consortium, Globe at Night and the International Dark-Sky Chapter of Missouri, we have created “Citizen Science at Your Library,” program that provides libraries with tools and kits for loan.

The central goal of this project is to get specialized tools into the hands of the citizen scientists who need them. While citizen science projects are open for anyone to participate in, not everyone has the necessary instructions or tools for proper data collection. Libraries are a natural partner in this endeavor as trusted resources in their communities, with experience lending books, media, and even telescopes.

To get started, visit [darksky.scistarter.org](https://darksky.scistarter.org) where you will be guided through the steps to test our citizen science projects! After you’ve selected project, please complete a short evaluation form on SciStarter. Your feedback will help shape the next version of the Citizen Science Kits. We could not do this without you—thank you!

**PLEASE NOTE: When returning the kit to the library, be sure to return it to the service/front desk and NOT the drop box.**

### QUESTIONS?

Please contact your local library.

### INTERNATIONAL DARK-SKY ASSOCIATION - MISSOURI

Learn how light pollution impacts our everyday lives by wasting energy, impacting animal and plant behavior and destroying our night sky. We hope you will join our efforts to fight light pollution.

Learn more at [darkskymissouri.org](https://darkskymissouri.org).



# MEASURING LIGHT IN THE NIGHT

Help gather light pollution data.

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Seven out of 10 people in the US have never seen our Milky Way Galaxy arch across their night sky from where they live. Have you? If so, you're lucky! If not, it's probably because of light pollution (too much outdoor lighting).

Light pollution not only affects our view of the stars, but it also 1) wastes energy and money (about \$2 to \$10 billion a year!); 2) causes sleep disorders in people; and 3) disrupts the sleeping and breeding habits of animals like newly hatched sea turtles that try to find their way back into the moonlit ocean but get confused by streetlights and end up on streets instead. Light pollution may be a global problem, but the solutions are local and it starts with you.

To participate in this project, you will go outside more than an hour after sunset (8-10 pm local time). The Moon should not be up. Let your eyes become used to the dark for 10 minutes before your first observation. And then, compare how many stars you can see in a constellation to how many stars you should be able to see. You can collect required data by 1) using the Sky Quality Meter (SQM), which might be available at your local library or school; OR 2) without using the SQM.

After submitting your data, you can compare your light pollution levels to other reports around the world.

## MATERIALS NEEDED

Computer or smartphone with internet access, GlobeAtNight.org on web. Optional: Sky Quality Meter, RED LED Flashlight, Planisphere

## STEP 1

Go to [darksky.scistarter.org](https://darksky.scistarter.org) and sign up for an account, or log in to your existing account. A SciStarter account helps you track your contributions and find relevant projects to participate in.

## STEP 2

Click the "Measuring Light in the Night" icon at [darksky.scistarter.org](https://darksky.scistarter.org) and follow the instructions to go to the Globe at Night website and watch a brief video about the project.

## STEP 3

There are 6 questions in total on the Globe at Night submission form. You will need to answer 5 of them. You can choose to answer either Question 3 (if you don't use the SQM kit) or Question 5 (if you use the kit). Please remember you can always click on the "?" icon at each question for further guidance.

## STEP 4

Get started with Question 1 "When did you make your observations?" by entering the date and the time. Then, to answer Question 2 "Where did you make your observations?", just click on the map to mark the location with a red balloon. Leaving location comments is optional.

(Continued on reverse)



## **STEP 5**

If you don't use the SQM kit, answer Question 3. Otherwise, you can skip Q3 and answer Q5. Once your location is marked, in Question 3 "How dark was the sky that night?", you will see a large magnitude chart. Select one of the thumbnail images below the large chart for the right magnitude.

## **STEP 6**

In Question 4 "What were sky conditions like that night?", select an image that best resembles your view of the night sky. Leaving sky condition comments is optional.

## **STEP 7**

If you use the SQM kit, answer Question 5, You will need to enter the SQM reading and, optionally, the serial number of the kit.

## **STEP 8**

For Question 6 "Ready to send us your data?", please remember to enter the email address you used to create your SciStarter account so that you will earn credit for your contribution to this project.

## **QUESTIONS?**

Head over to [darkskymissouri.org/citizenscience](https://darkskymissouri.org/citizenscience).

## **LOOKING FOR MORE?**

Head over to [darksky.scistarter.org](https://darksky.scistarter.org).



**PROJECT MATERIALS: COMPUTER OR SMARTPHONE WITH INTERNET ACCESS, GLOBEATNIGHT.ORG ON WEB. OPTIONAL: SKY QUALITY METER, RED LED FLASHLIGHT, PLANISPHERE**





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# **ASTROPHOTOS – MEASURING LIGHT POLLUTION**

**Help astronomers study light pollution  
by taking photos of the sky with your  
smartphone.**

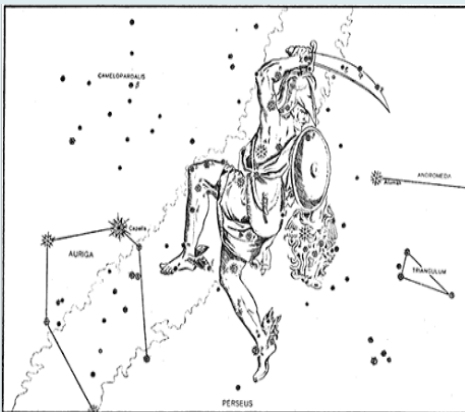


# ASTROPHOTOS – MEASURING LIGHT POLLUTION

Help astronomers study light pollution by taking photos of the sky with your smartphone.

Thousands of people around the world are studying how city light pollution is robbing us of a view of the starry sky. The Globe at Night program and the International Dark Sky Association coordinate these world-wide observing sessions either by having you use star maps and figuring out the faintest star visible, or using a specially-designed light meter to measure the sky's brightness. A third way is to photograph the sky and use the image data to calculate a sky brightness. Here's how to participate in this research and take some spectacular photos of the starry night sky...while it lasts!

Observations should be taken on a clear night when the Moon is not up and when the Sun has set for at least an hour. Use an app such as Planets (by Dana Peters) to find Orion (winter), Scorpius (summer) or The Big Dipper (anytime) in the sky. If you can see another constellation more easily make a note of its name.



## MATERIALS NEEDED

Camera or smartphone with camera, Computer or smartphone with internet access, Anecdota app.

Optional: Clip-on lens kit

## STEP 1

Go to [darksky.scistarter.org](https://darksky.scistarter.org) and sign up for an account, or log in to your existing account. A SciStarter account helps you track your contributions and find relevant projects to participate in.

## STEP 2

Click the "Astrophotos - Measuring Light Pollution" icon at [darksky.scistarter.org](https://darksky.scistarter.org) and follow the instructions to download the Anecdota app and watch a brief video about the project. Tip: To earn credit on SciStarter for your participation in this project, create your account on Anecdota using the same email address you used to create your SciStarter account.

## STEP 3

Point your smartphone in the direction of the constellation you selected and use your 'camera' app to take a photo. NOTE: It is recommended to put your camera in manual mode and select an ISO of 800 and an exposure speed of 1 seconds to get a near-naked eye picture but you can also use the 10-second exposure on a tripod to get some really nice pictures of even fainter stars if your camera is good enough!

(Continued on reverse)

#### **STEP 4**

Get your camera's 'Exposure time' and 'ISO speed' in the photo. NOTE: If you know your camera's 'Exposure time' and 'ISO speed', you can skip this step. Then, download the photo to your laptop or desktop, and with your mouse, right-click the image file and select 'Properties' and in the window open the 'Details' tab. Write down the information for 'Exposure time' and 'ISO speed.'

#### **STEP 5**

Open the Night Sky Light Pollution project under the Anecdotal icon on your phone. Tap the camera symbol and select 'Upload from camera roll.' Then, find your image and tap it to upload. Fill in the information about the Exposure time and ISO speed, and click on the appropriate check boxes. Tap 'save' on the upper-right corner of the data page to upload your observation.

#### **QUESTIONS?**

Head over to [darkskymissouri.org/citizenscience](https://darkskymissouri.org/citizenscience).

#### **LOOKING FOR MORE?**

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**PROJECT MATERIALS: CAMERA OR SMARTPHONE WITH CAMERA, COMPUTER OR SMARTPHONE WITH INTERNET ACCESS, ANECDATA APP. OPTIONAL: CLIP-ON LENS KIT**





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# **ASTROPHOTOS - LUNAR PHOTOGRAPHY**

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# ASTROPHOTOS - LUNAR PHOTOGRAPHY

Experiment using smartphones and telescopes for astrophotography.

Can smartphones, with and without additional instruments, be used for actual scientific investigations? Let's find out!

You'll need a telescope for this protocol. If you don't have one, the Library Telescope Program, run by the Astronomical League, lets you borrow a 4.5-inch Orion Starblaster telescope for up to two weeks to pursue your interests. For more information, visit the Astrophotos page on [darksky.scistarter.org](https://darksky.scistarter.org).



## MATERIALS NEEDED

Smartphone with camera, Computer or smartphone with internet access, Telescope, Aneccdata app. Optional: Camera adapter

## STEP 1

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## STEP 3

Take a photograph of some astronomical object and click "+ Add Observation" in the App or on the project website. Then fill out the data entry form and upload your image. Your image together with the information you have entered will then be uploaded and geotagged on a world map. You can access this map and image archive of all pictures taken to see what other members are doing, and use this information to improve your efforts! To incorporate the telescope portion into this project, please contact Don Ficken, below, for more instructions.

## QUESTIONS?

Head over to [darkskymissouri.org/citizenscience](https://darkskymissouri.org/citizenscience).

## LOOKING FOR MORE?

Head over to [darksky.scistarter.org](https://darksky.scistarter.org).

**PROJECT MATERIALS: SMARTPHONE WITH CAMERA, COMPUTER OR  
SMARTPHONE WITH INTERNET ACCESS, TELESCOPE, ANECDATA APP.  
OPTIONAL: CAMERA ADAPTER**





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# **BIRDS OF NORTH AMERICA**

**Collect pictures of wild birds of  
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Collect pictures of wild birds of North America.

Scientists have learned that the number of birds in the United States and Canada has declined by 3 billion, or 29 percent, over the past half-century. Agriculture and habitat loss are thought to be primary drivers. However, light pollution is also thought to be a contributor to the decline because the artificial light can disorient birds, especially during spring and fall migration.

To participate in this project, you will go outside and take photos of wild birds. You can start in your backyard or where you live. But consider taking photos of wild birds in your community or places where you visit. Take note of the date, time and location of your photo. Do your best to identify the wild bird and determining whether or not the bird migrates.

The photos that you submit will help scientist understand the diversity of wild birds during the different seasons of the year.



## MATERIALS NEEDED

Camera or smartphone with camera, Computer or smartphone with internet access, iNaturalist app

## STEP 1

Go to [darksky.scistarter.org](https://darksky.scistarter.org) and sign up for an account, or log in to your existing account. A SciStarter account helps you track your contributions and find relevant projects to participate in.

## STEP 2

Click the “Birds of North America” icon at [darksky.scistarter.org](https://darksky.scistarter.org) and follow the instructions to download the iNaturalist app and watch a brief video about the project.

## STEP 3

After you sign up on iNaturalist, return to your SciStarter Dashboard to add your iNaturalist user name to your SciStarter account profile. It’s easier than it sounds. In your SciStarter account settings, you’ll see an option to integrate with iNaturalist. That’s where you’ll add your iNaturalist user name. This will sync your project contributions from iNaturalist to SciStarter for years to come! Sometimes, it may take up to 24 hours for an observation to be credited in your SciStarter dashboard.

(Continued on reverse)

#### **STEP 4**

Capture photos of wild birds around you. Rather than focusing on a wild bird in your backyard, try to photograph a wild bird in your community or places where you visit. Take note of the different types of wild birds that you see during the spring, summer, winter and fall seasons.

#### **STEP 6**

After selecting your best photos, open the iNaturalist app or website and follow instructions to share your nature photos. Make sure you indicate the location of where you took the observation. Do your best to identify your observation including whether or not the bird migrates. If all you know is that it's a wild bird, just say that. That's great, too!

#### **STEP 7**

The iNaturalist community of citizen scientists and experts will help identify your observation, and after enough people have verified it, it becomes "research grade" – meaning that it's shared with scientists around the world.

#### **STEP 8**

You can make as many observations as you would like!

#### **QUESTIONS?**

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**PROJECT MATERIALS: CAMERA OR SMARTPHONE WITH CAMERA, COMPUTER OR SMARTPHONE WITH INTERNET ACCESS, INATURALIST APP**





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# EXPLORING BIODIVERSITY

**Document and identify plants  
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Document and identify plants and animals around you.

The iNaturalist app helps you record images of biodiversity and learn about the natural world. Join a community of naturalists who share observations of nature, collaboratively identify species, and share data with scientists.

If enough people record their observations, it will be like a living record of life on Earth that scientists and land managers could use to monitor changes in biodiversity, and that anyone could use to learn more about nature.



## MATERIALS NEEDED

Camera or smartphone with camera, Computer or smartphone with internet access, iNaturalist app. Optional: Clip-on lens kit

## STEP 1

Go to [darksky.scistarter.org](https://darksky.scistarter.org) and sign up for an account, or log in to your existing account. A SciStarter account helps you track your contributions and find relevant projects to participate in.

## STEP 2

Click the “Exploring Biodiversity” icon at [darksky.scistarter.org](https://darksky.scistarter.org) and follow the instructions to download the iNaturalist app and watch a brief video about the project. After you sign up on iNaturalist, return to your SciStarter Dashboard to add your iNaturalist user name to your SciStarter account profile. It’s easier than it sounds. In your SciStarter account settings, you’ll see an option to integrate with iNaturalist. That’s where you’ll add your iNaturalist user name. This will sync your project contributions from iNaturalist to SciStarter for years to come! Sometimes, it may take up to 24 hours for an observation to be credited in your SciStarter dashboard.

## STEP 3

Capture photos of living things, like plants or animals. Try to focus on “uncultivated” nature. Rather than a flower you grew in your garden, try to photograph a wildflower, a weed, or a caterpillar. Nature can be all around you: on the sidewalk in the big city, a tree in a forest. If you’re using the optional lens kit, capture photos of small things using the macro lens. To use this lens you need to be about an inch from your subject. Capture photos of things that are far away using the zoom lens.

(Continued on reverse)

#### **STEP 4**

After selecting your best photos, open the iNaturalist app or website and follow instructions to share your nature photos. Make sure you indicate the location of where you took the observation. Do your best to identify your observation: if all you know is that it's a plant, just say that. That's great, too!

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# THE GREAT SUNFLOWER PROJECT

Identify where pollinators need  
help.

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Identify where pollinators need help.

Join a community of gardeners, beekeepers, birders and naturalists who are providing thousands of records of pollinators each year. Your records are invaluable data on the state of our pollinators and are helping to build the best data set on plants and pollinators.

The best and most useful way to contribute to the Great Sunflower is to focus on a particular site or set of sites. Each time you visit your yard, favorite park or wild area, you can do a pollinator count on any of the plants in that space. Over time, this will be a list of the most important plants for each pollinator and give you an indication of which plants are important at what times of year.



## MATERIALS NEEDED

Camera or smartphone with camera, Computer or smartphone with Internet access, GreatSunflower.org on web. Optional: Clip-on lens kit

## STEP 1

Go to [darksky.scistarter.org](https://darksky.scistarter.org) and sign up for an account, or log in to your existing account. A SciStarter account helps you track your contributions and find relevant projects to participate in.

## STEP 2

Click the "Great Sunflower Project" icon at [darksky.scistarter.org](https://darksky.scistarter.org) and follow the instructions to go to The Great Sunflower Project's website and watch a brief video about the project.

## STEP 3

When you're ready to participate in the project, record the date and time that you begin.

## STEP 4

Select a plant to monitor and record its scientific name, as well as how many flowers on the plant you're observing. If it is a plant with lots of flowers in a spike or bunch, you will need to count how many flowers are in that bunch.

## STEP 5

Once you are settled, start your timer and record the number of visits by pollinators and try to identify the pollinators.

(Continued on reverse)

## STEP 6

When you are done observing (try to participate for at least 5 minutes), enter the data on the Great Sunflower Project's website. Remember, you can find the "participate" button to be directed to this project's website at [darksky.scistarter.org](https://darksky.scistarter.org).

## QUESTIONS?

Please visit [darkskymissouri.org/citizenscience](https://darkskymissouri.org/citizenscience).

## LOOKING FOR MORE?

Head over to [darksky.scistarter.org](https://darksky.scistarter.org).

**MATERIALS NEEDED: CAMERA OR SMARTPHONE WITH CAMERA, COMPUTER OR SMARTPHONE WITH INTERNET ACCESS. OPTIONAL: CLIP-ON LENS KIT.**

