WPI

Worcester Polytechnic Institute

Dark Skies

Final Presentation

October 13th, 2020

Evan Buckley
Casey Gosselin
Sullivan Mulhern
Larson Ost
Bridget Wirtz

Goal

The goal of this project was to assist Glacier National Park in achieving full International Dark Sky Park status by evaluating the park's night sky quality, lighting compliance, and educational programs to identify ways to ensure achievement of full IDSP status in the timeframe given by the International Dark Sky Association.

International Dark Sky Association (IDA)

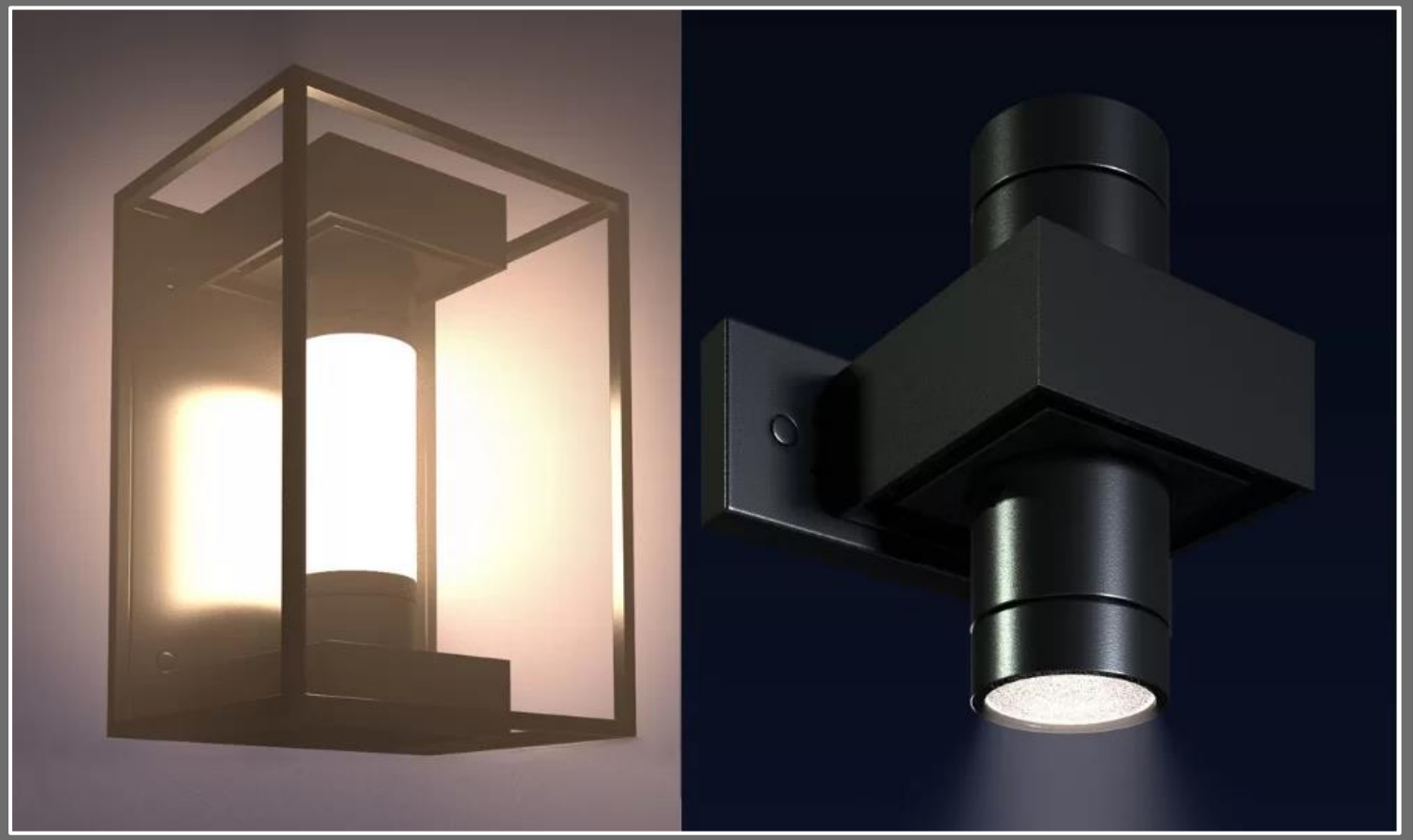
"The International Dark Sky Association (IDA) is the recognized authority on light pollution and is the leading organization combating light pollution worldwide."

International Dark Sky Parks

darksky.org

Lighting Compliance

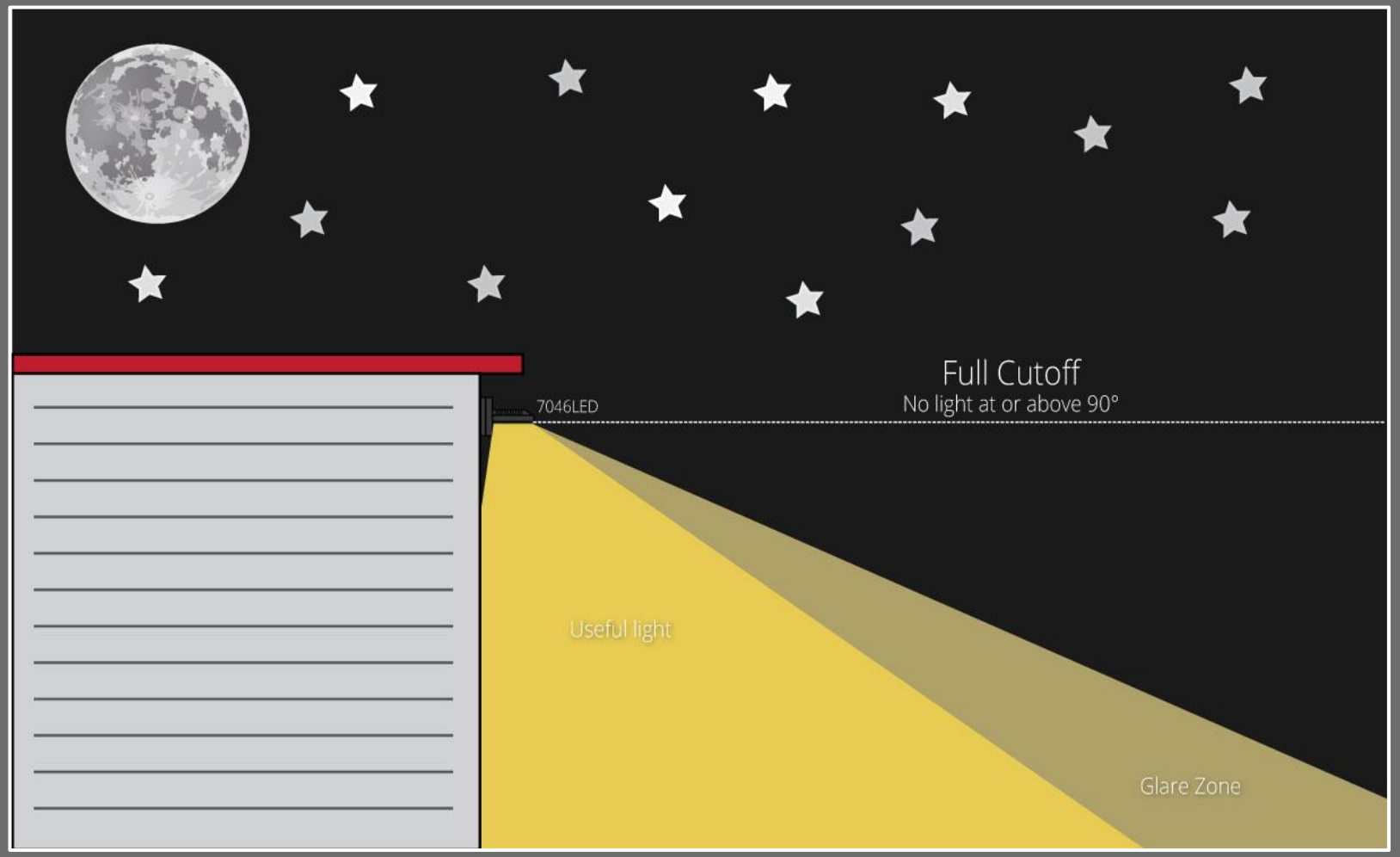
Not Compliant



Wayfair.com

Compliant

Lighting Compliance (cont.)



brownlee.com

Results

IDA Annual Report

Flickr.com/glaciernps

Lighting Compliance Timeline

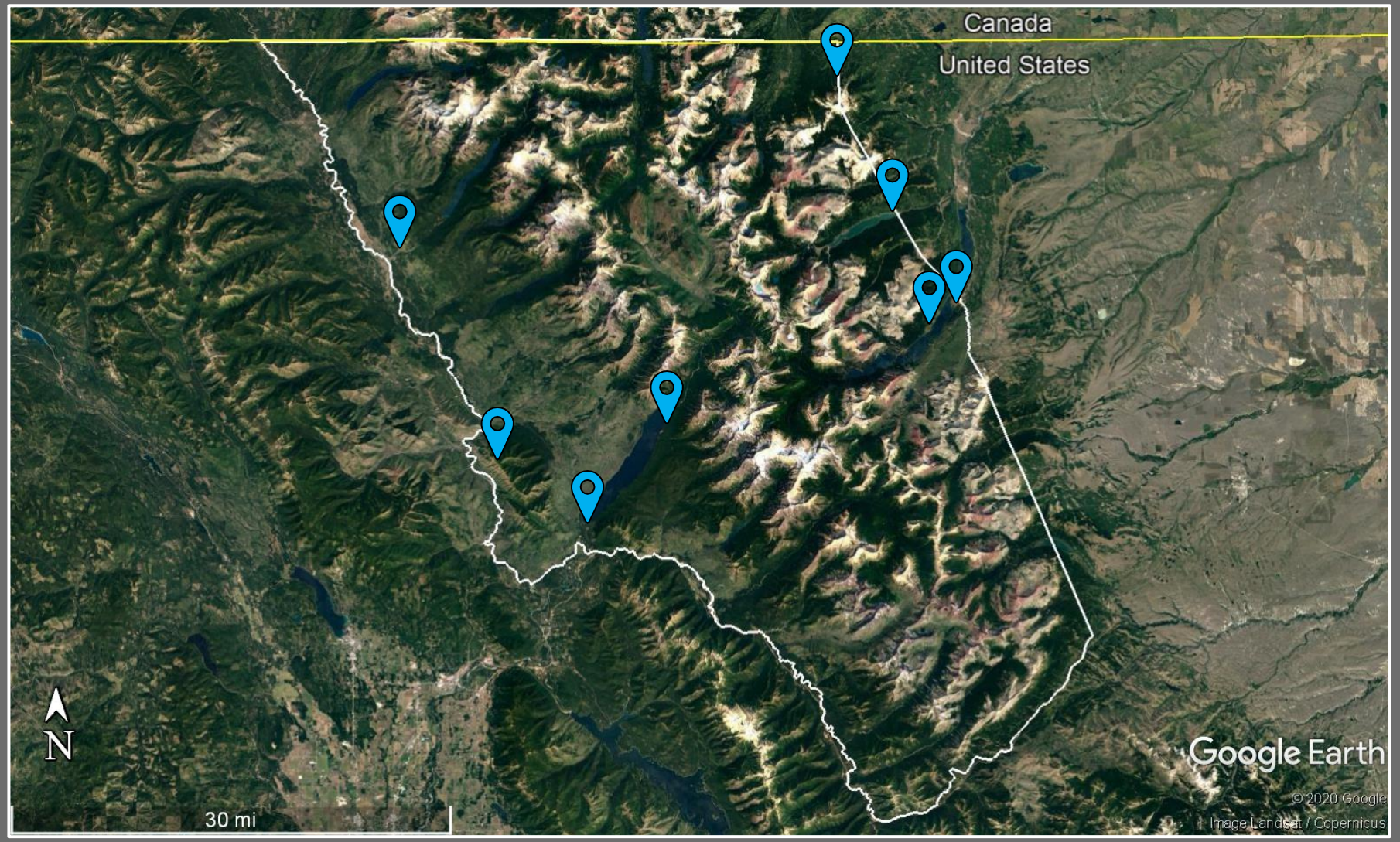
2017	2020	2021	2022	2027
29% Compliance **Initial Application**	61% Compliance **Current**	67% Compliance **On Track For 74%**	90% Compliance	100% Compliance

Sky Quality Measurements

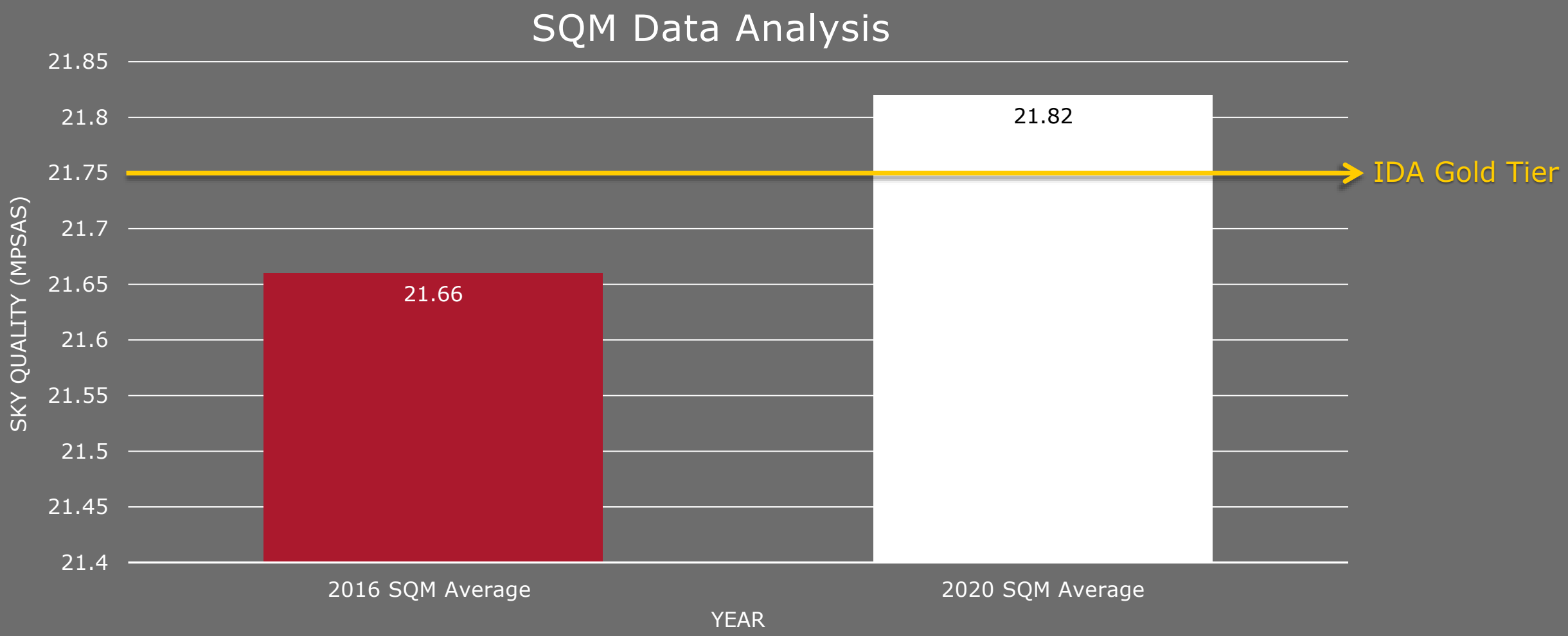
youtube.com/glaciernps

optcorp.com

Sky Quality Measurements (cont.)



Sky Quality Data Analysis

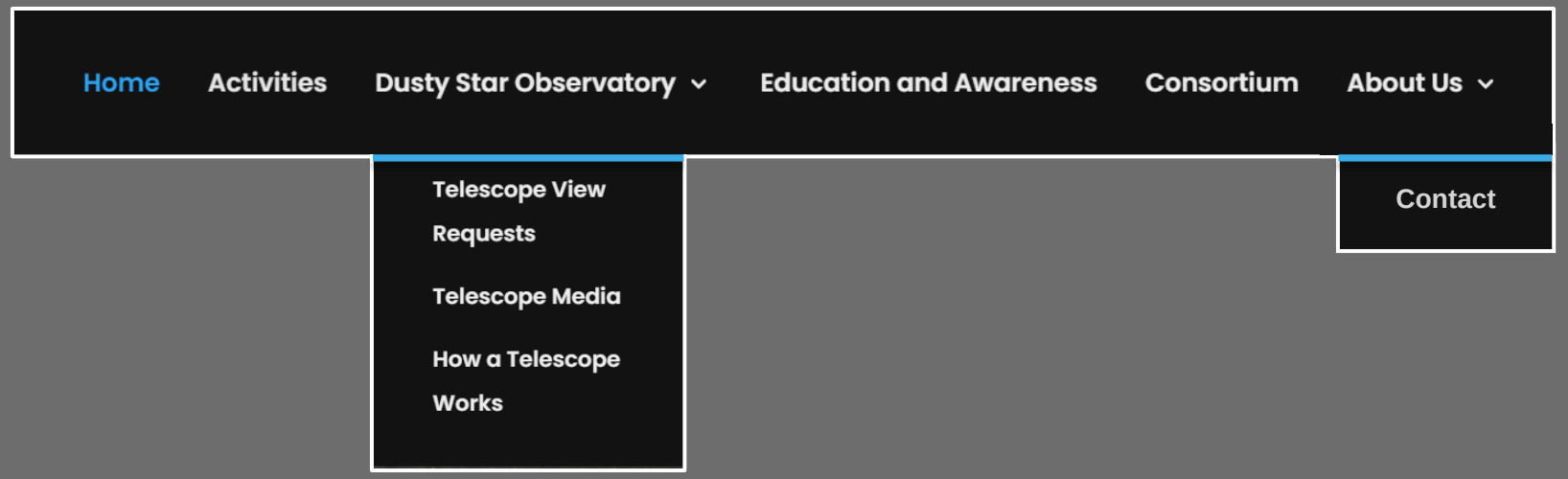


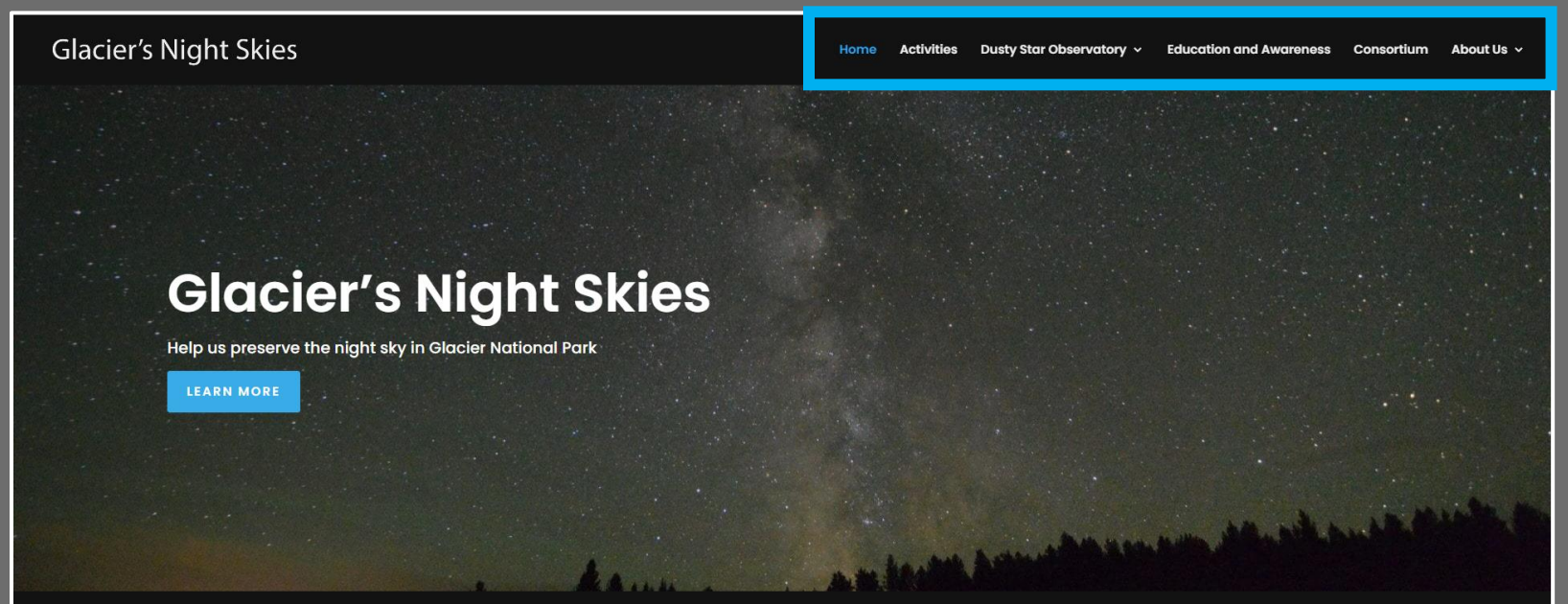
Glacier's Night Skies Website

- Hard to locate
- Little about IDA designation
- No activity descriptions
- No observatory

nps.gov

Glacier's Night Skies Website





wp.wpi.edu/darksky2020/

Link To Website

Activities Webpage

Glacier's Night Skies

Home | Activities | Dusty Star Observatory | Education and Awareness | Consortium | About Us

Dark Sky Activities

Come experience the skies of Glacier in person.

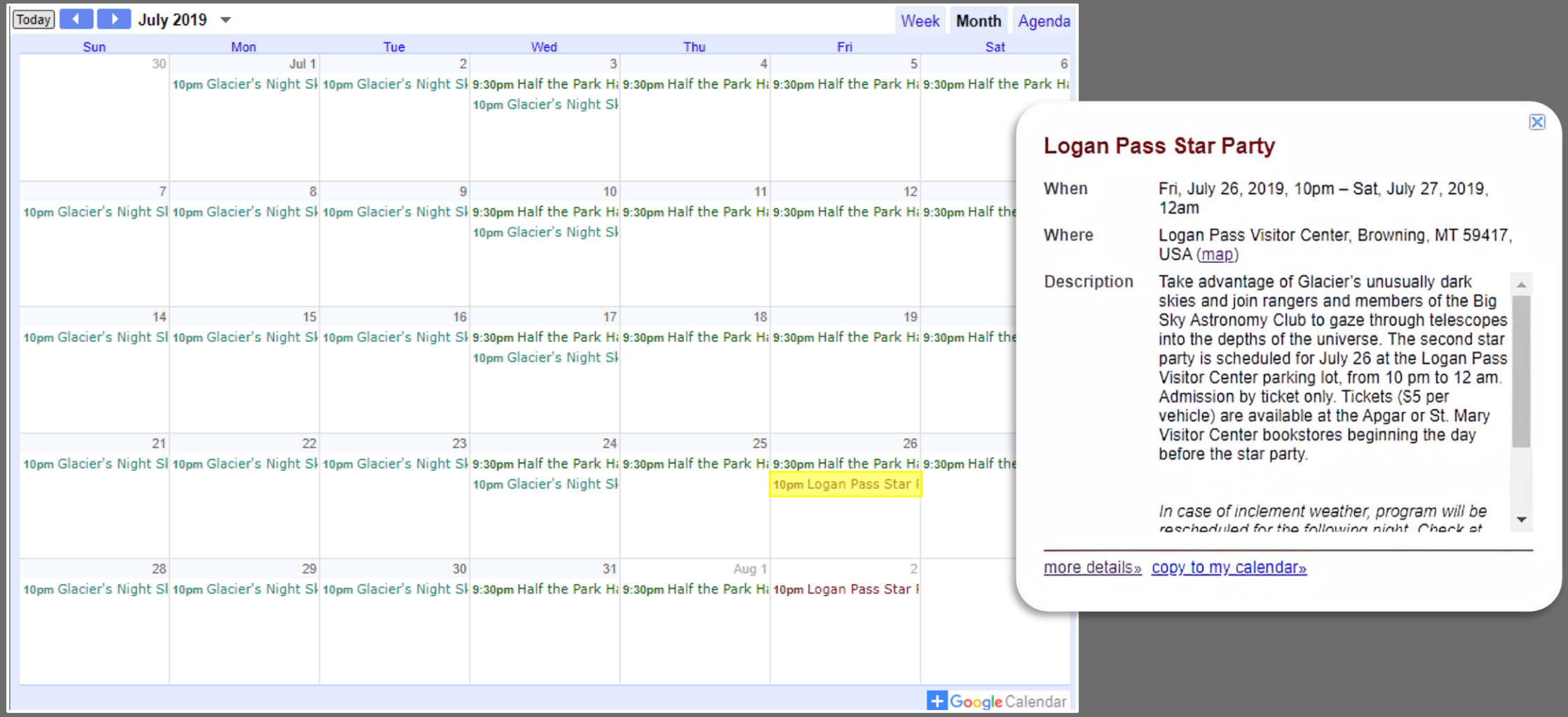
Logan Pass Star Parties

Come experience Glacier's unusually dark skies by joining rangers, astronomers, and members of the Big Sky Astronomy Club to look through telescopes into the depths of the universe. This event is held at the Logan Pass Visitor Center, which provides views of Glacier's darkest skies. Only offered several times per year, Logan Pass Star Parties are among the most popular events Glacier has to offer. Viewing times go from 10 PM to after midnight.

Admission ticket only. Tickets ($5 per vehicle) can be purchased at the Apgar or St. Mary visitor centers starting the day before the star party. In case of inclement weather, the star party will be held the following night. Check at the visitor centers or on Glacier National Park's social media accounts for more information.

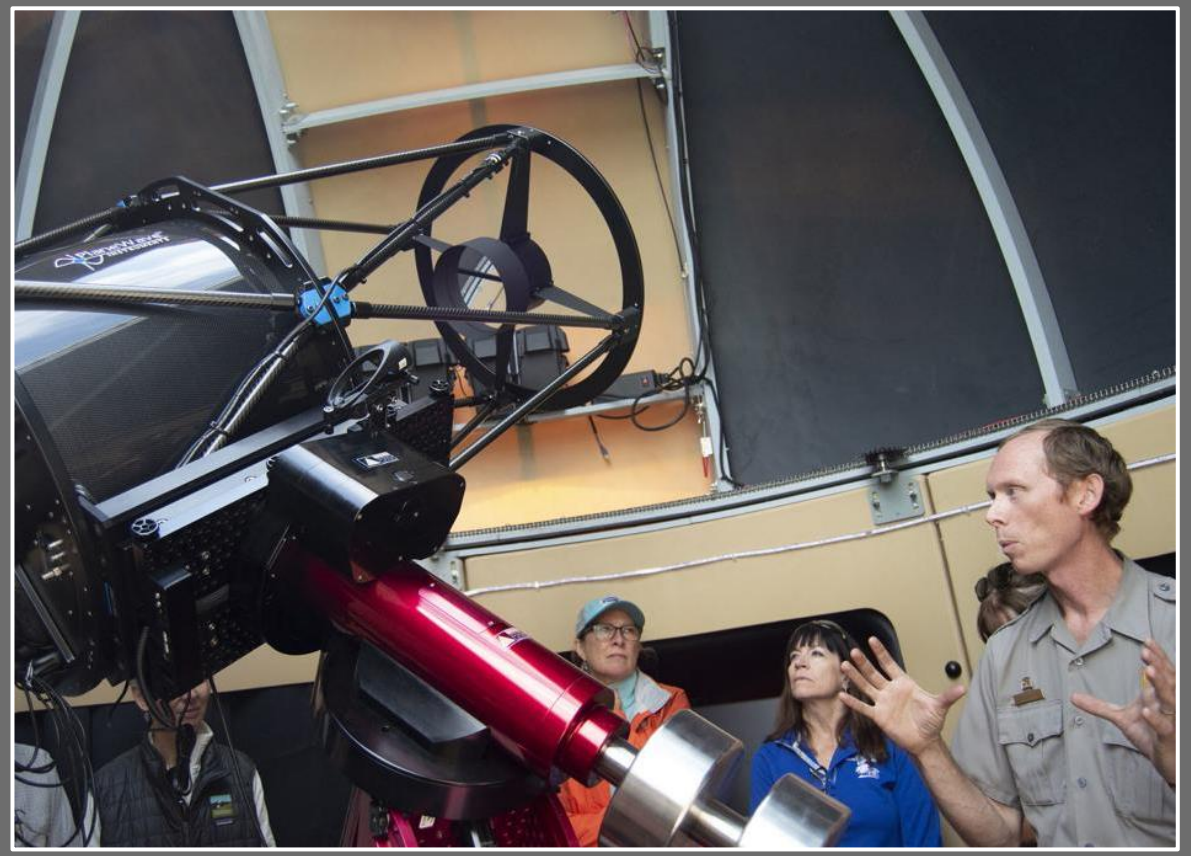
Image source: GlacierNPS, NPS.gov

Activities Webpage



Dusty Star Observatory

Ben Allan Smith (2019)



GNP Conservancy

Telescope Requests Webpage

Glacier's Night Skies

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Telescope Viewing Requests

Is there something you want to see in the night sky?

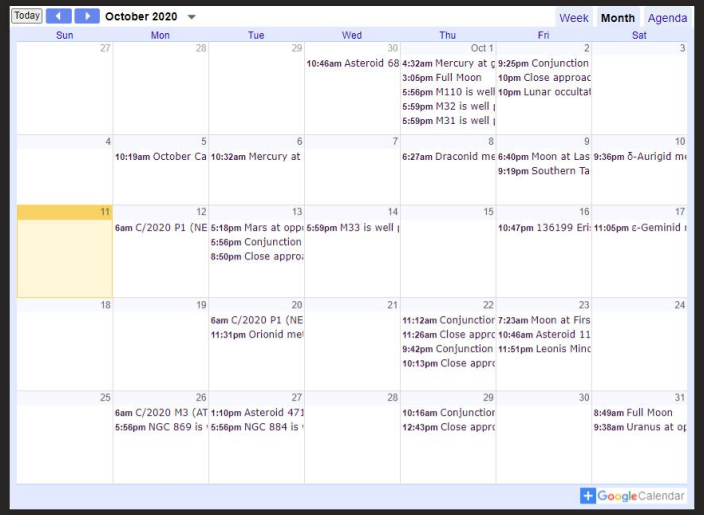
Do you have a favorite planet, galaxy, or nebulae? Submit a request for celestial objects to be captured by the Dusty Star Observatory telescope. If it is visible, we may be able to capture an image of the object and upload it to the "Telescope Media" page!

Below are some interactive star charts and a calendar of celestial events.

Interactive Sky Chart

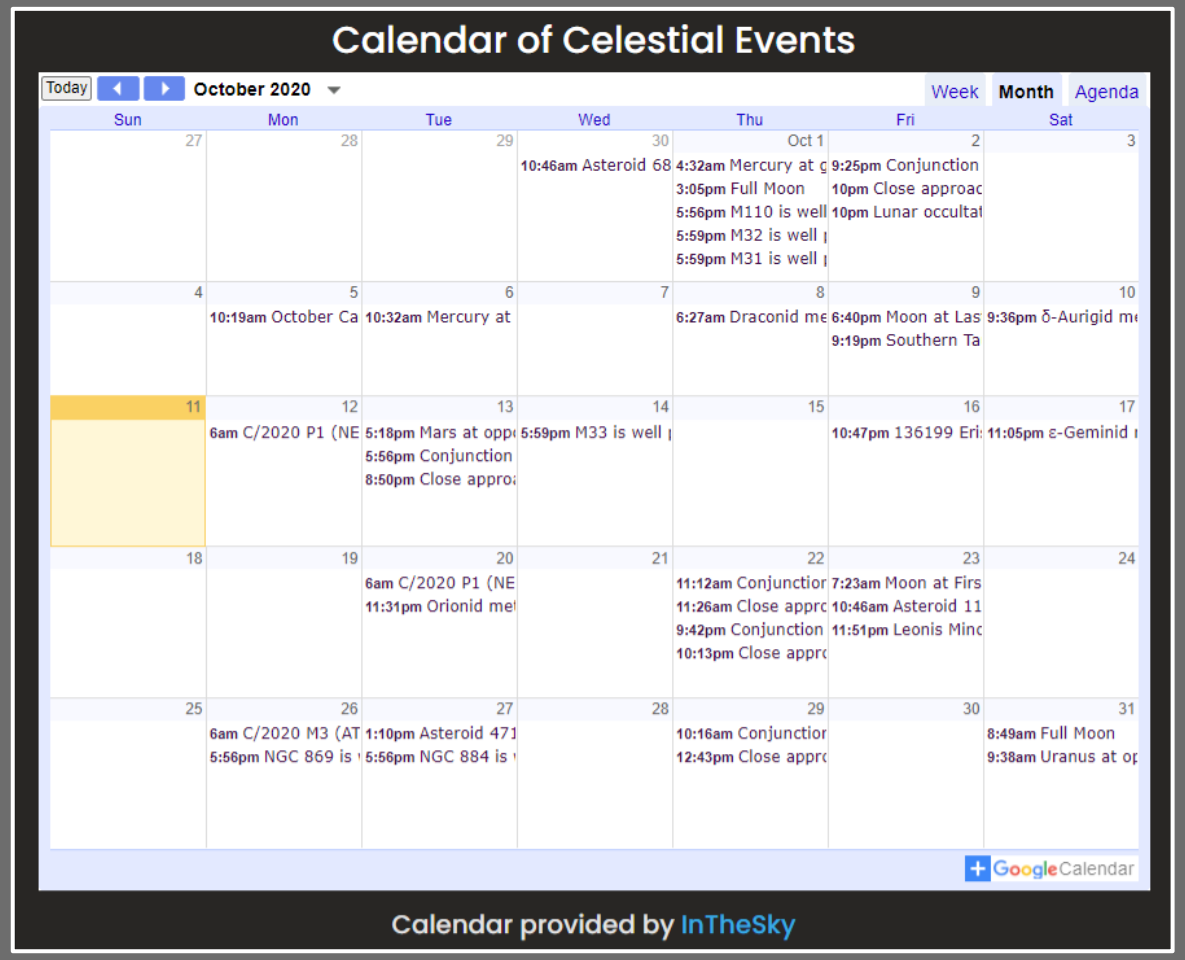
Chart provided by VirtualSky, Las Cumbres Observatory

Calendar of Celestial Events



Calendar provided by InTheSky

Telescope Requests Webpage

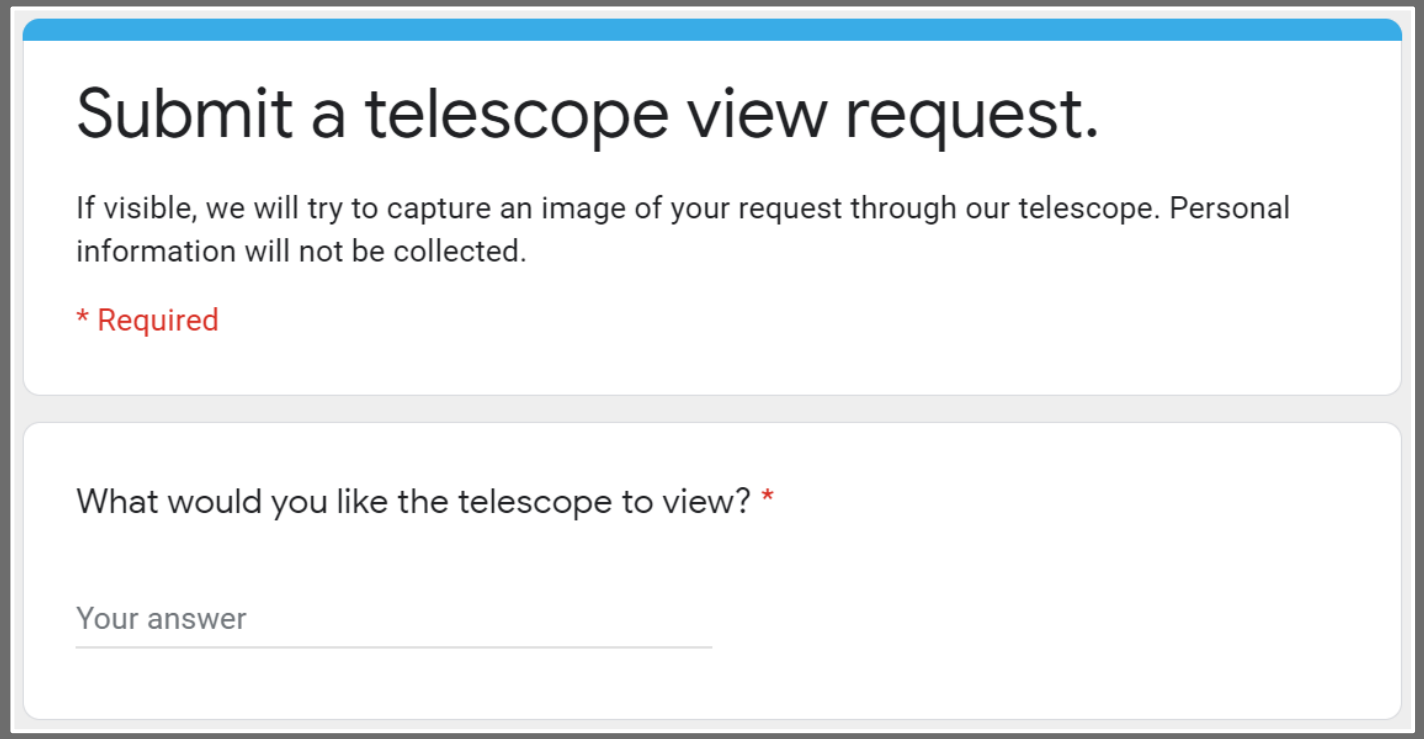


- Celestial Events Calendar

Telescope Requests Webpage

- Celestial Events Calendar
- 2 Astronomy Simulators

Telescope Requests Webpage



- Celestial Events Calendar
- 2 Astronomy Simulators
- Request Form

Telescope Media Gallery

Glacier's Night Skies

Home Activities Dusty Star Observatory Education and Awareness Consortium About Us

Telescope Media Gallery

Peer into the universe with images taken by the observatory. Even though the gallery is small and currently growing, it provides the foundation for an extensive media gallery in the future, consisting of images of planets, stars, galaxies, and nebulae.

Highlighted Images and Media

Dumbbell Nebula

Date Taken: 9/10/2020

Distance: 1,200 light years

More Info

Whirlpool Galaxy and Satellite

Messier Catalog Number: M51

Distance: 31 Million Light Years

More Info

Whirlpool Galaxy

Date Taken: 8/22/2019

Distance: 37 million light years

More Info

Date Taken: 7/30/2020

Distance: 239,000 miles

More Info

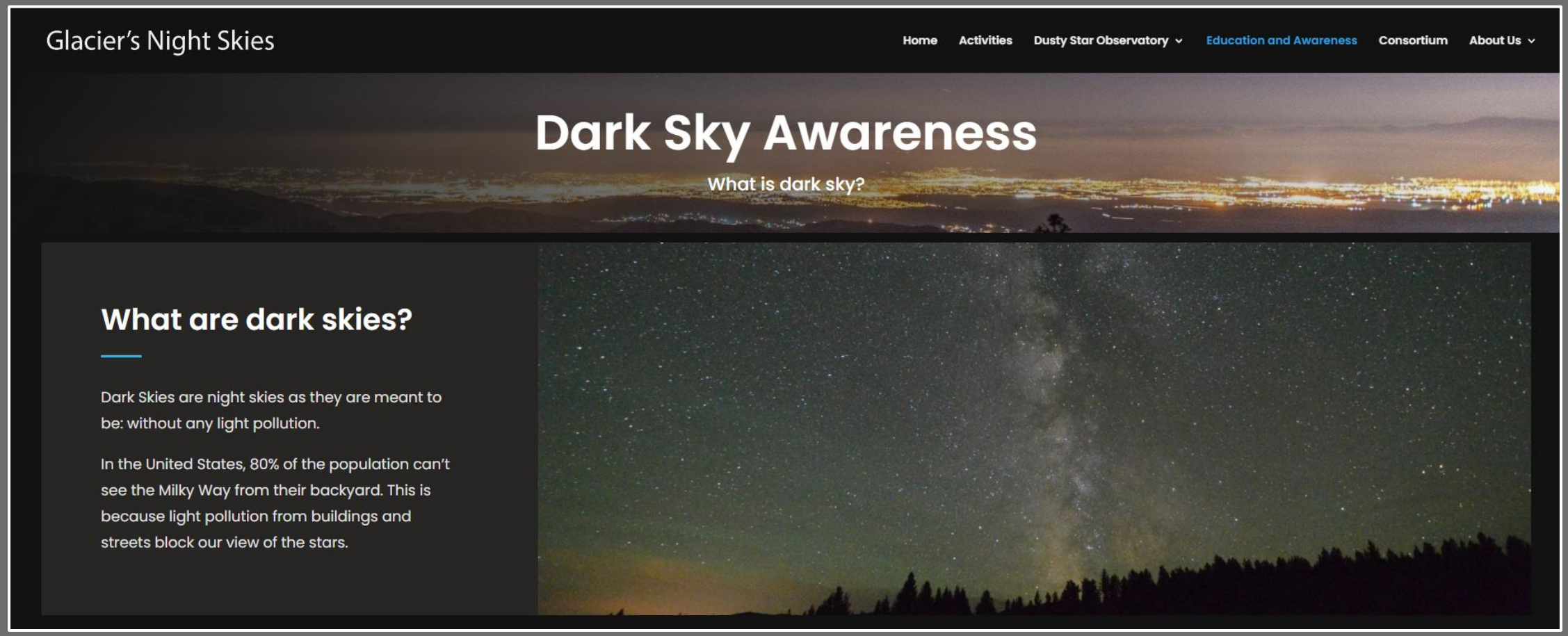
Telescope Media Gallery

How Telescopes Work

Finderscope

The finderscope is a smaller telescope or sight that is mounted to the side of a telescope. They often have lower magnification but provide a wider field of view of the night sky. Finderscopes align with the telescope's line of sight. They are used for quickly aiming the telescope at objects in the sky then fine-tuning the aim with the full-size telescope. The Observatory's telescope uses a red laser sight to help with aiming.

Education and Awareness Webpage



Education and Awareness Webpage

UnderLuckyStars.com (2020)

- What are dark skies?
- Light Pollution
  - Interactive Slider
- Types of Light Pollution
- Why is it harmful?
- What you can do
- At-home activities

"How to Become an IDSP" Infographic

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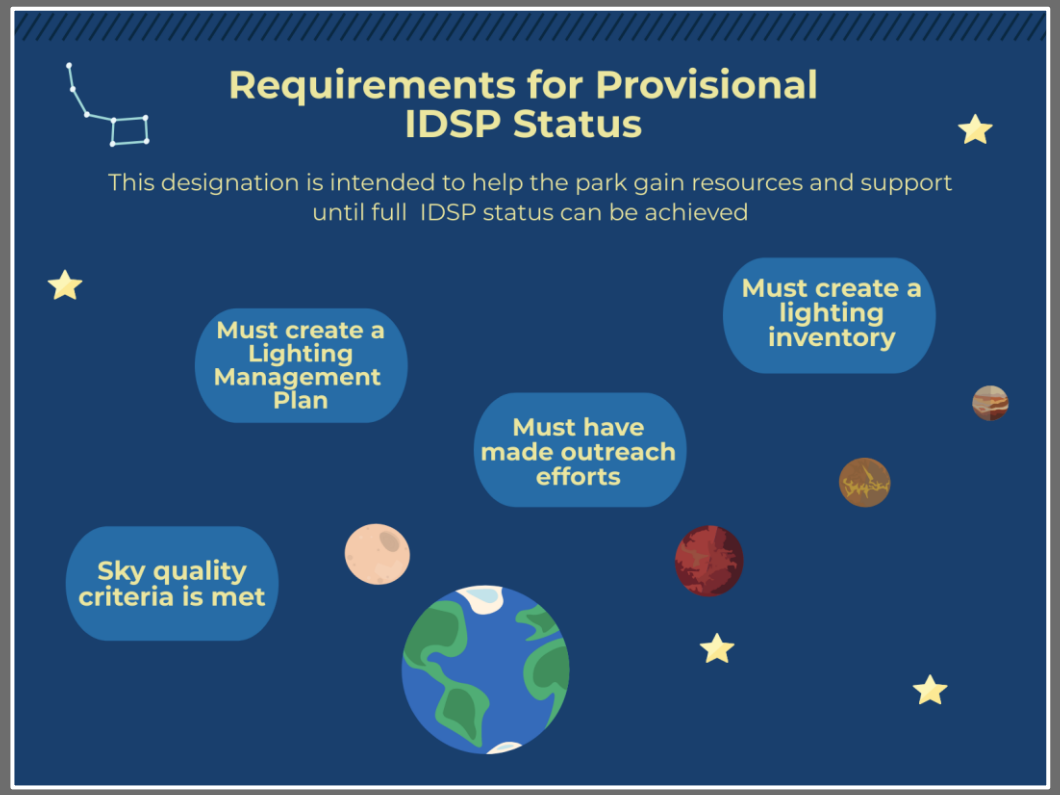
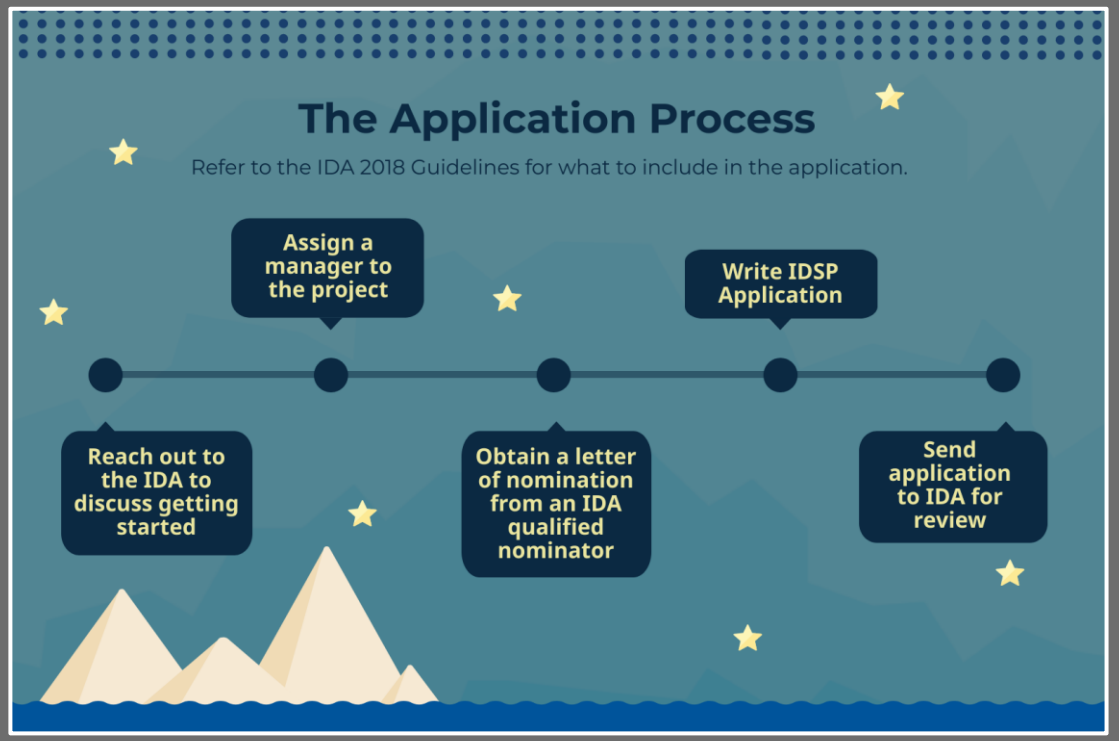
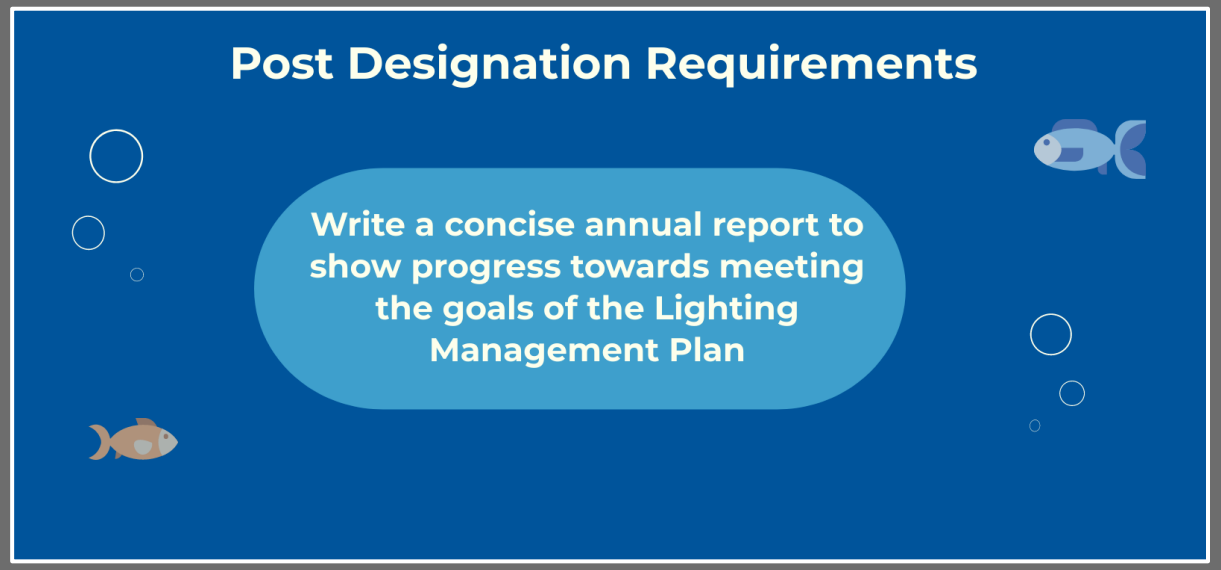




"How to Become an IDSP" Infographic



Recommendations

Create a Dark Sky Consortium

darksky.org

- Subgroup of IDA Annual Conference
- Facilitated by our webpage, infographic

Increase SQM measurement frequency

optcorp.com

lettherebenight.com

Increase SQM measurement frequency

unihedron.com

ikarusimaging.com

Livestream Dark Sky Activities

Grand Canyon
National Park

600,000 Followers

nps.gov

Livestream Dark Sky Activities

Glacier
National Park

800,000 Followers

nps.gov

Acknowledgements

Tara Carolin

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Adam Dalton

Bark Ranger Gracie

Thank You

Questions or Comments?

wp.wpi.edu/darksky2020/

Link To Website

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SQM Data Analysis (cont.)