



## Astronomy



An “all-sky” view of light pollution sources from Great Basin National Park

*Great Basin National Park is home to some of the darkest skies in the continental United States. Little to no light pollution, coupled with very clean air, makes the park a great environment to enjoy a night of star gazing. On most nights you have the potential to see over 6000 stars, the Milky Way, planets, and deep sky objects. With a telescope or just the unaided eye and planisphere, many night sky treasures await you at Great Basin National Park.*

### Summer Observing

The summer season brings warm temperatures and low humidity; perfect for star gazing.

#### Seasonal Highlights

**Jupiter** – the fifth planet from our sun and the first of the gas giants – Jupiter can be seen as the brightest “star” in the southern summer sky.

Visible right at sunset, Jupiter and the four Galilean Moons can be observed with almost any telescope or binoculars. Do you see the Great Red Spot? A persistent anticyclonic storm located 22° south of the equator that is larger than Earth. It is known to have been in existence since at least 1831.

**Andromeda Galaxy (M31)** – Andromeda is the nearest spiral galaxy to our own, the Milky Way. As it is visible as a faint smudge on a moonless night, and is one of the farthest objects visible to the naked eye. The Andromeda Galaxy is approaching the Sun at about 62 to 87 miles **per second**, so Andromeda and the Milky Way are expected to collide in perhaps 2.5 billion years.

### Fall Observing

Fall brings cooler but longer nights, perfect to enjoy the changing tree colors during the day and the color of night sky in the evening.

#### Seasonal Highlights

**Alberio** – the fifth brightest star in the constellation Cygnus. Alberio appears to the naked eye to be a single star but can be resolved with a telescope into a double star, consisting of a brighter yellow star and a fainter blue star.

Alberio is cherished by amateur astronomers as a beautiful small telescope object.

**Milky Way Galaxy** – is the galaxy in which our Solar System is located. The Milky Way appears as a hazy band of white light in the night sky arching across the entire celestial sphere. In many Native American stories the Milky Way is described as a great river flowing through the sky.

### Winter Observing

Winter at Great Basin National Park brings long nights and some of the steadiest skies of the year, providing the best time to observe the night sky.

#### Seasonal Highlights

**Orion the Hunter** – It is one of the largest, most conspicuous, and most recognizable constellations in the night sky.

Betelgeuse, the bright, gold star serves as the “right shoulder” of the hunter, is a massive M-type red supergiant star nearing the end of its life. When it explodes it will even be visible during the day.

## Spring Observing

Renewal is the theme of spring at Great Basin National Park and the night skies offer some remarkable features to explore.

### Seasonal Highlights

**Saturn** – is one of the most majestic sights in our night sky. Many future astronomers have been hooked upon their first view of this planet.

Saturn is the sixth planet from the Sun and the second largest planet in the Solar System. Saturn has a prominent system of rings,

consisting mostly of ice particles with a smaller amount of rocky debris and dust. Sixty-one known moons orbit the planet, not counting hundreds of "moonlets" within the rings.

In ancient times, it was the most distant of the five known planets in the solar system and thus a major character in various mythologies. In ancient Roman mythology, the god Saturnus, from which the planet takes its name, was the god of the agricultural and harvest sector.

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## Night Sky Protection and Light Pollution

The night sky can be one of the most awe-inspiring views we will ever experience. But natural darkness is fragile and, in many places, becoming lost in the glow of artificial lights. In fact, it is currently estimated that two-thirds of this country's population live where they cannot see the Milky Way. *Are you among them?*

However, light and dark cycles are essential to our biological well-being and also that of native animals; the emerging field of Scotobiology (scoto=darkness, biology=life) is uncovering many examples of the negative impacts of artificial lights on wildlife, such as altered migration, reproduction, and feeding patterns.

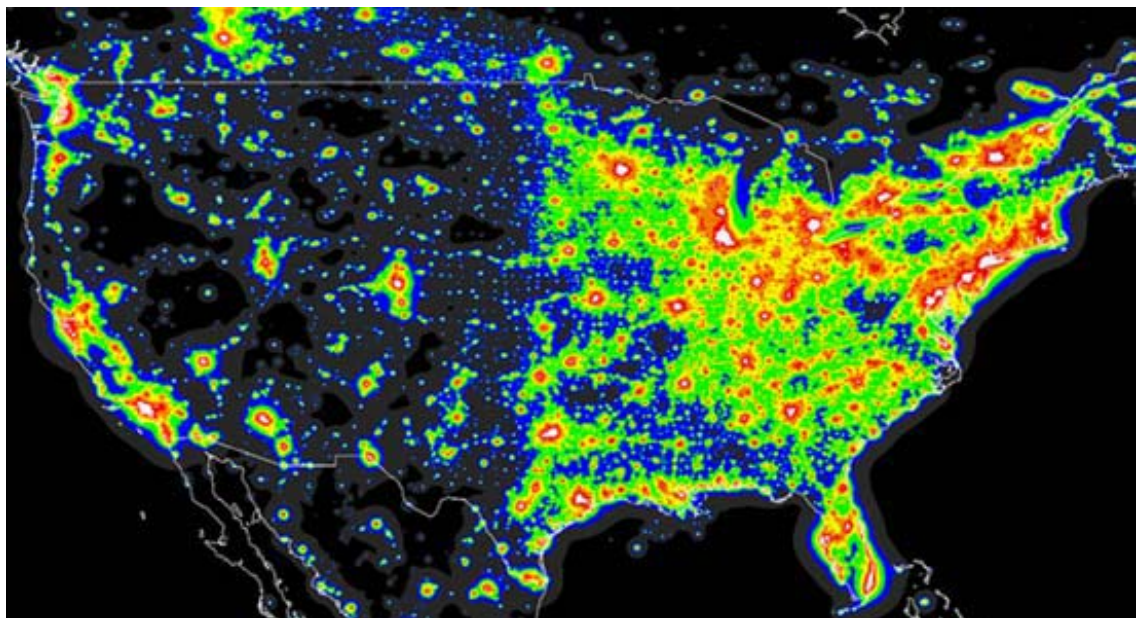
For this reason, many people and animals are seeking protected lands, such as National Parks and wilderness areas, to experience this vanishing resource and the National Park Service has therefore placed the protection of dark night skies as a high priority.

Outdoor lighting is certainly something we need. It provides safety from crime, visibility on roadways, and comfort when walking at night.

But more and more lights are being used improperly and with little thought to address human needs. When you can see a light from far away or from above, it is probably a poorly designed light.

Bad lights do more than just spoil the view of the stars, they can confuse and harm wildlife, create light trespass, waste energy, create glare, and actually reduce nighttime visibility. Bad lights often cost less to purchase and install, but end up costing much more in the lifetime of the fixture.

Good lighting allows us to meet all the basic needs of lighting (safety, security, visibility, comfort) while having very little negative impact. Good fixtures direct all the light where it is needed – **down** and do not scatter it wastefully into the night or through the neighbor's window. Good lighting incorporates modern, high performance optics that aim light in a defined pattern to reduce glare and light pollution.



A model of light pollution across the US shows very few natural dark areas remain.

***Want to help protect this vanishing resource?*** The International Dark Sky Association is a leading global organization whose goal is to preserve and protect our night sky. More information can be found [www.darksky.org](http://www.darksky.org).