

El Impacto de la Contaminación Lumínica en la Astronomía



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Edificio de
Ciencias

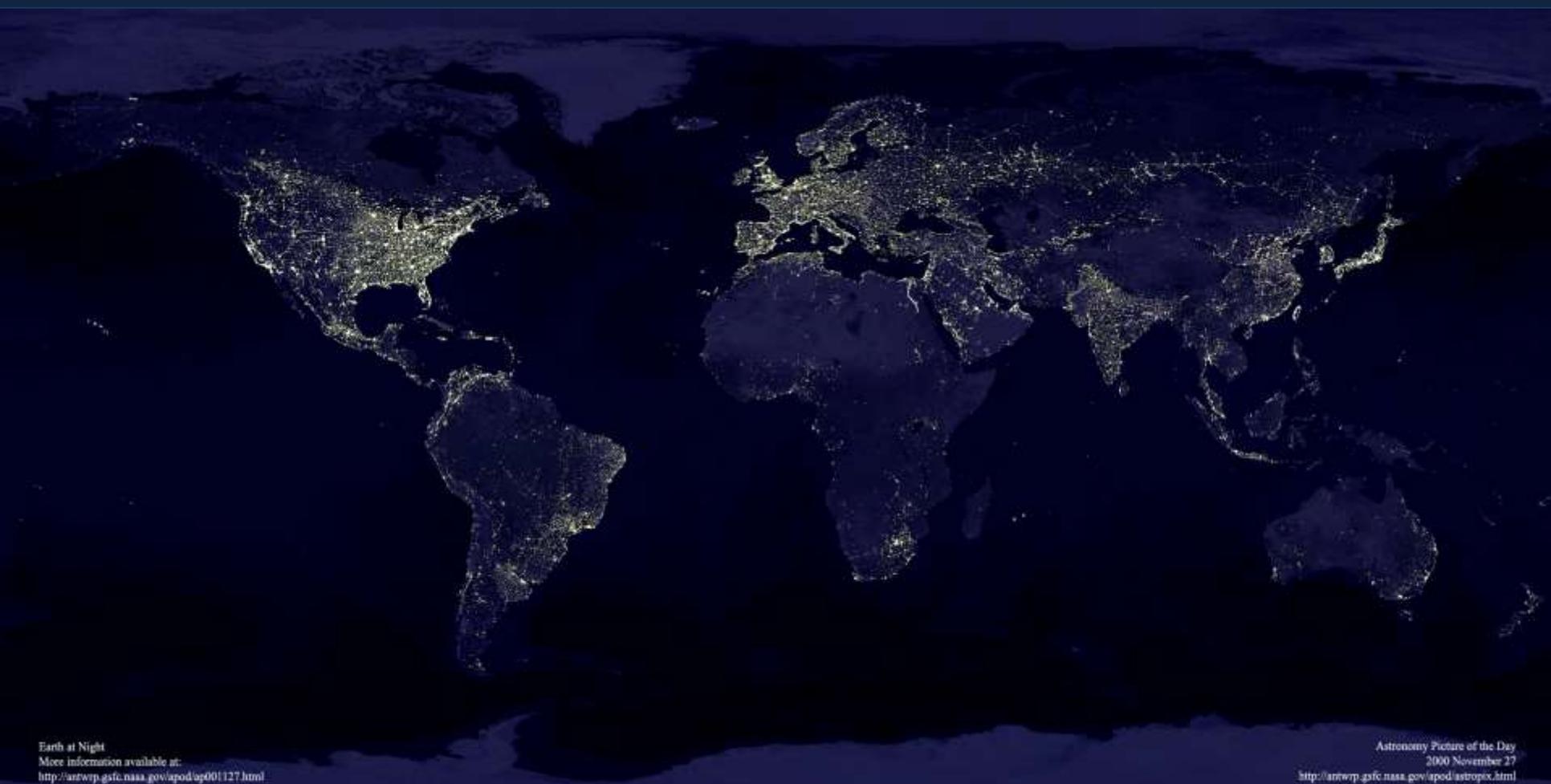


Estudiantes del curso de astronomía (UPR-Cayey)



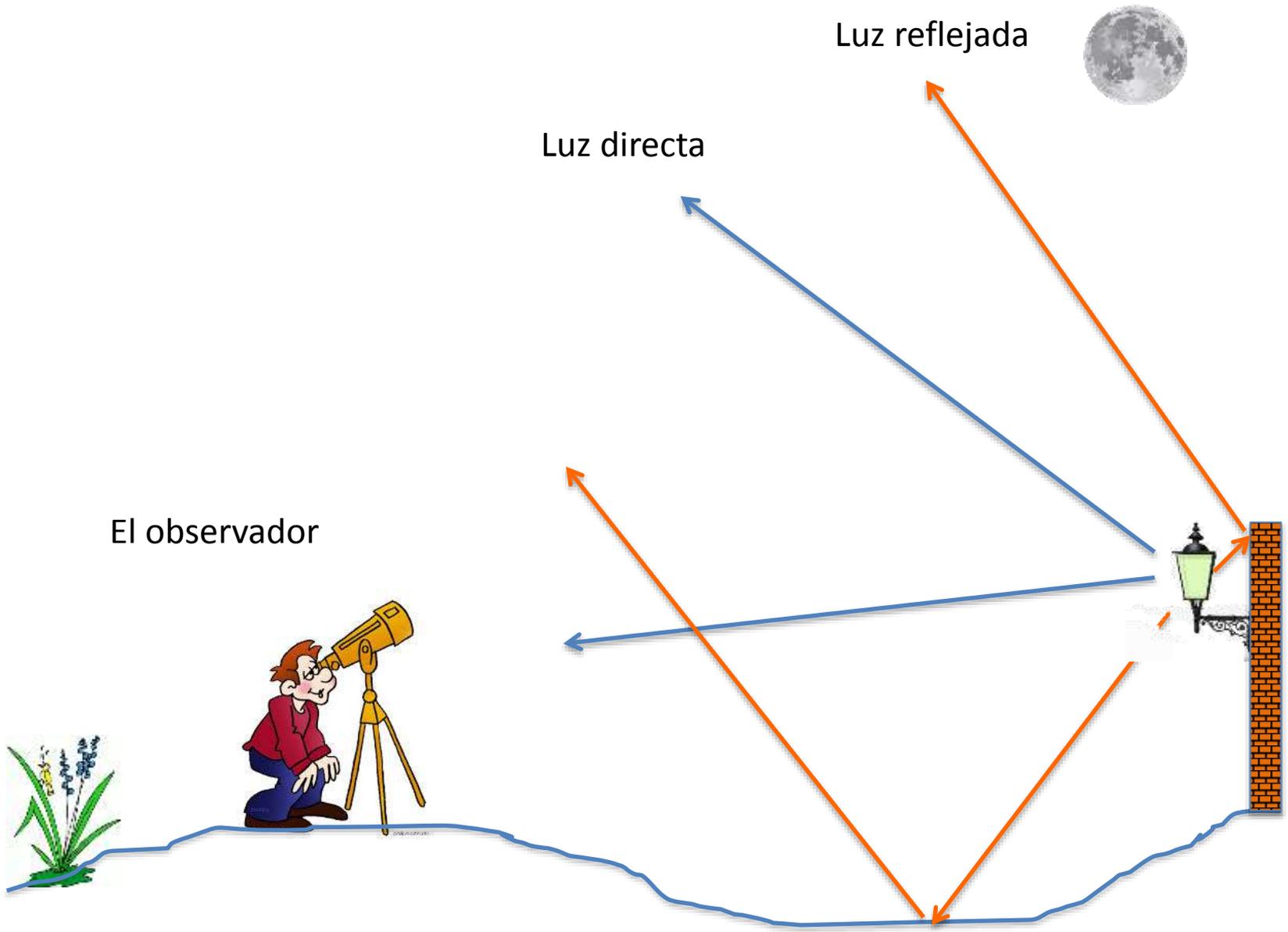
← Tierra

Anocheecer en Marte, 31 de enero de 2014 (NASA-Curiosity)



Earth at Night
More information available at:
<http://anrwp.gsfc.nasa.gov/apod/ap001127.html>

Astronomy Picture of the Day
2000 November 27
<http://anrwp.gsfc.nasa.gov/apod/astropex.html>



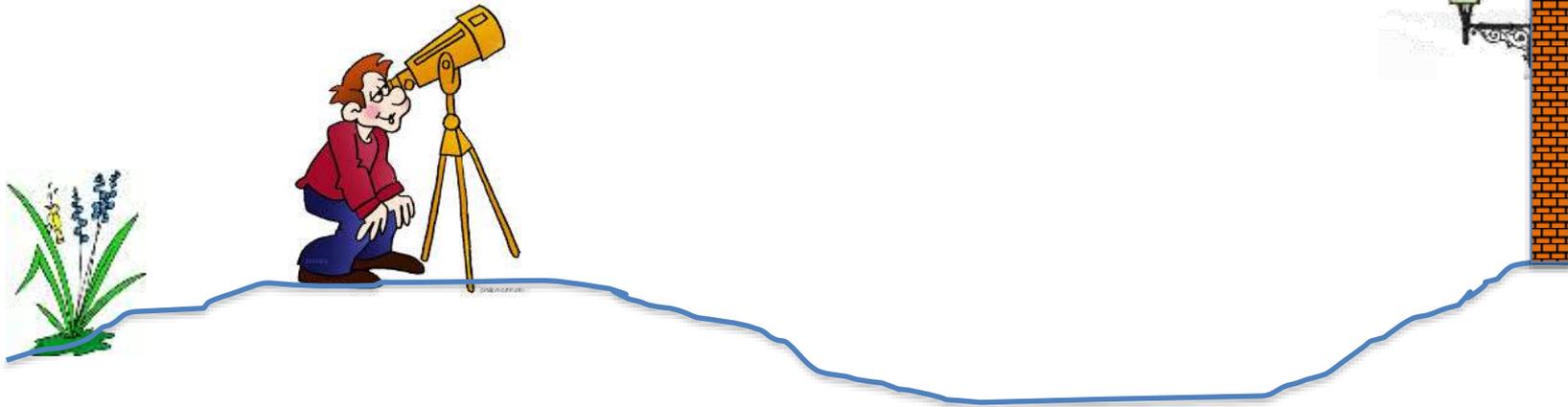
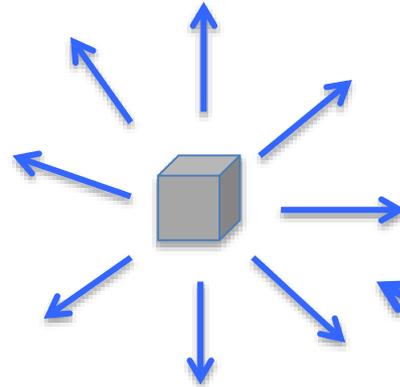
El observador

Luz reflejada

Luz directa



La luz que se propaga hacia la atmósfera experimenta DISPERSION.



La dispersión de la luz en la atmósfera

Moléculas



N_2 , O_2



Dispersión de Rayleigh

Partículas

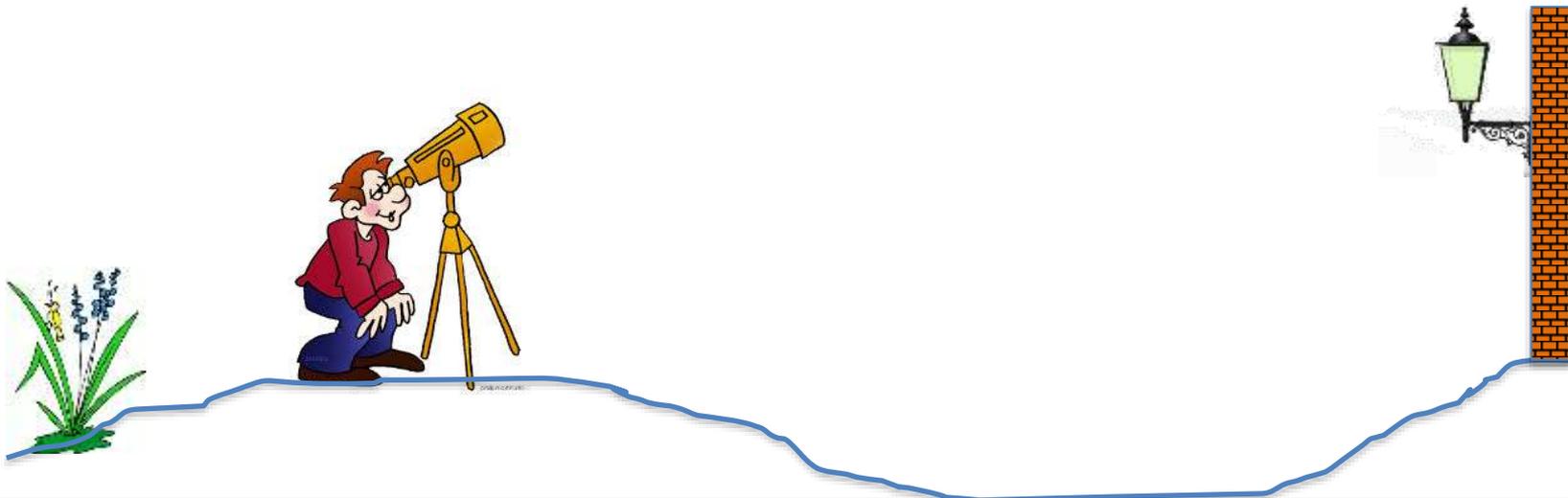
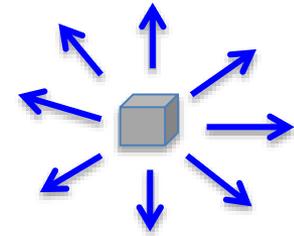
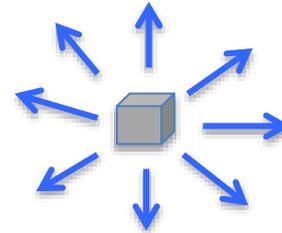
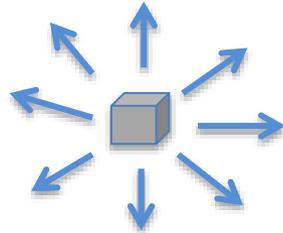
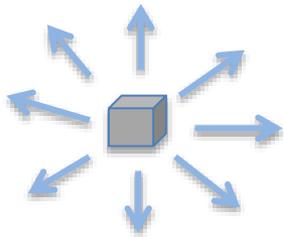


aerosoles, neblina
polvo del Sahara



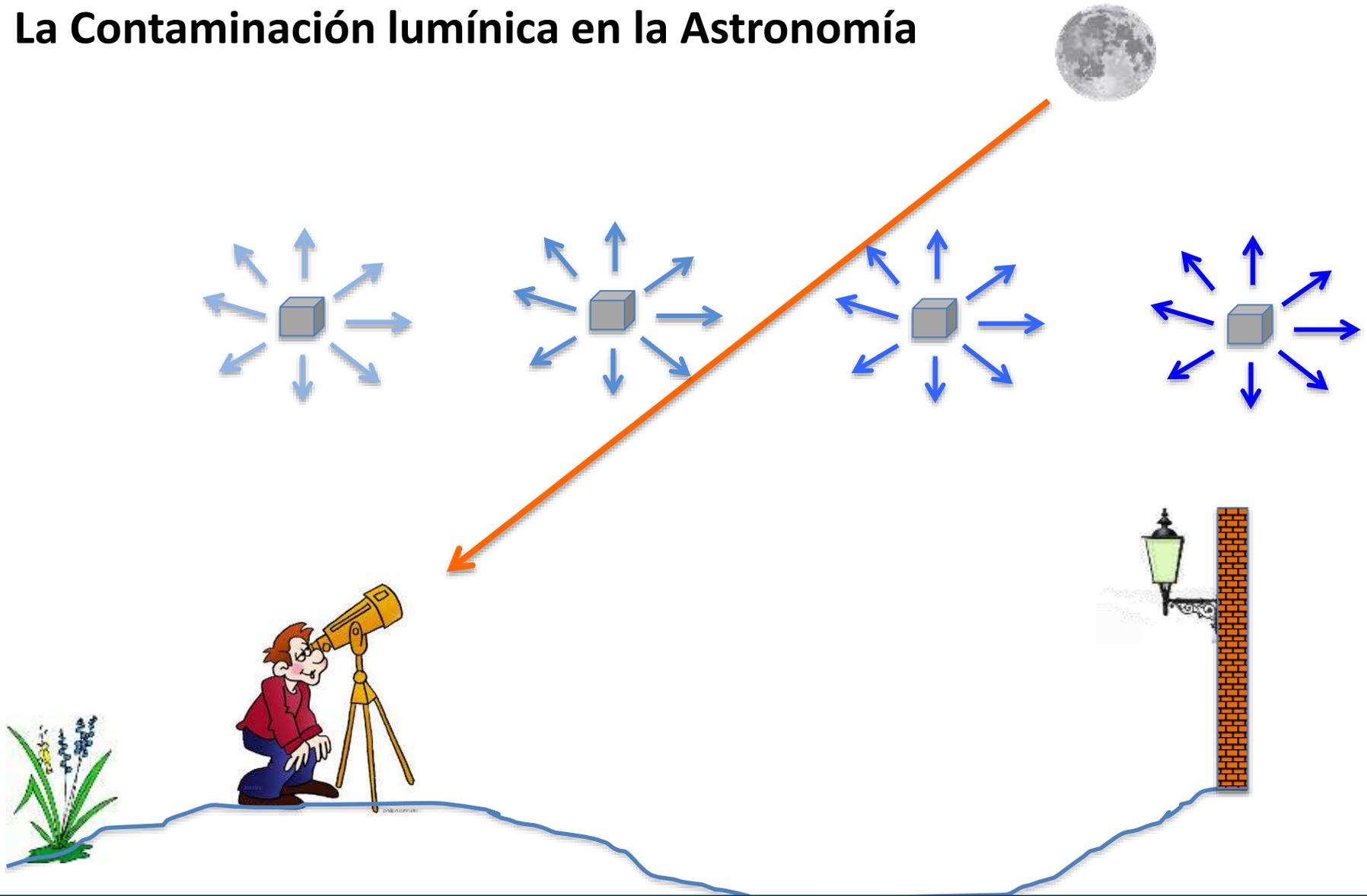
Dispersión de Mie

El Resplandor del cielo Nocturno (Skyglow)



El resultado es una capa de luz difusa que se extiende sobre un área de muchos Km, y que hace que el cielo nocturno sea menos NEGRO.

La Contaminación lumínica en la Astronomía



En la ASTRONOMIA, la contaminación lumínica es la luz no deseada que llega a nuestros instrumentos que proviene de la ATMOSFERA.



Mysore (pop. 700,000)
India

Cielo en lugar bien oscuro

← *π1 Ori (mag = 5)*

Stellarium 12.0
Cielo = 1 (escala Bortle)

Cielo en zona rural/semi-urbana



Stellarium 12.0
Cielo = 4 (escala Bortle)

Cielo en la ciudad



Stellarium 12.0
Cielo = 6 (escala Bortle)

La ciudad de Cayey

Vista nocturna desde Bo. Quebrada Arriba.



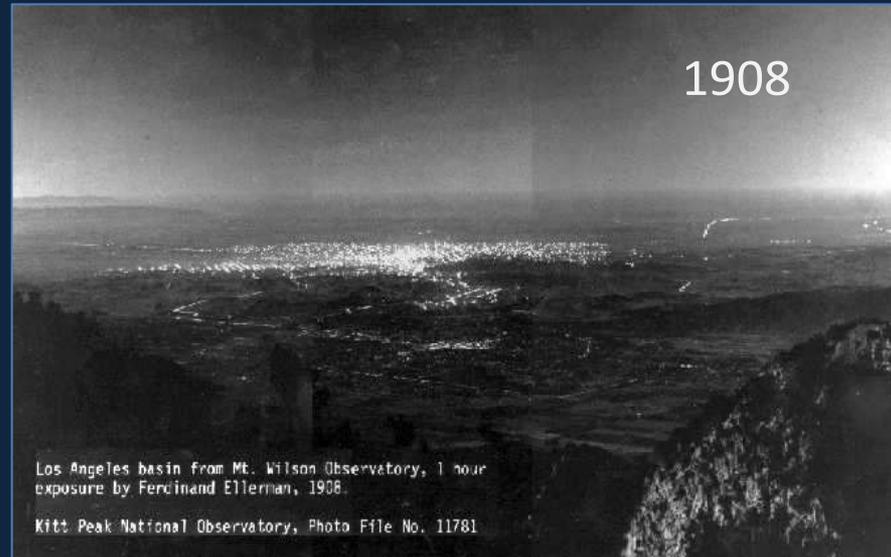
48,000 residentes

Foto:

J. Alonso iphone

24 de septiembre de 2013, 7:00 pm

La ciudad de Los Angeles, desde el Observatorio Mt. Wilson en California



15 millas

El Observatorio de Kitt Peak en Arizona

(al fondo la ciudad de Tucson, 50 millas)



El Impacto en la Astronomía

La atmósfera trae dos complicaciones fundamentales a la astronomía profesional:

- ❑ Contaminación lumínica
- ❑ Turbulencia



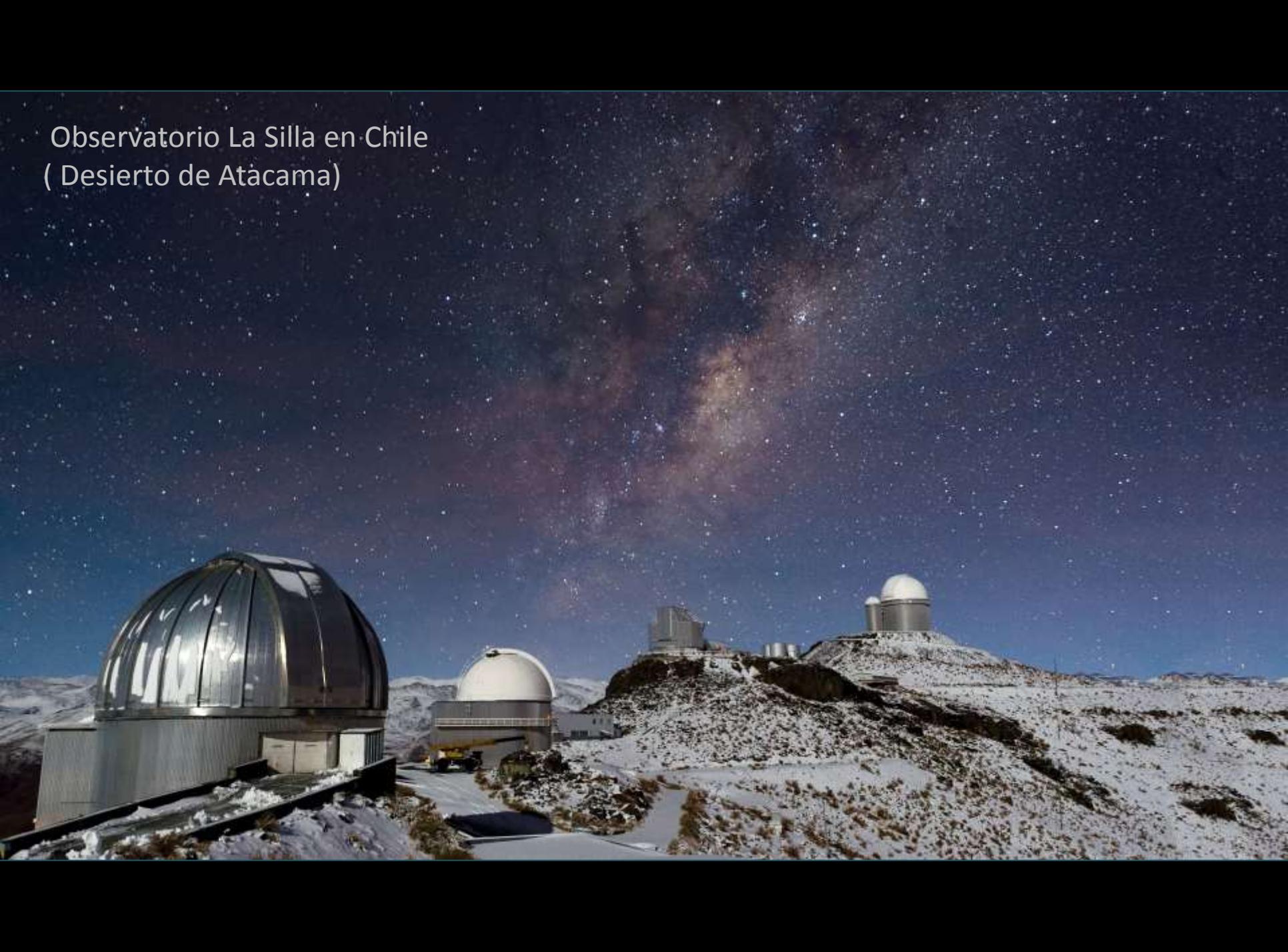
Los Observatorios modernos se colocan en lugares muy altos, secos y lejos de ciudades.

Los grandes observatorios

- ❑ Desierto Atacama en Chile
- ❑ Mauna Loa en Hawai
- ❑ Kitt Peak en Arizona
- ❑ Islas Canarias
- ❑ Sur Africa
- ❑ Australia



Observatorio La Silla en Chile
(Desierto de Atacama)





International Dark-Sky Association

SEARCH



Carnac Menhirs Alignments | Laurent Laveder

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The International Dark-Sky Association is the only non-profit organization fighting to preserve the night. Join us as we work to protect wildlife, cut energy waste and stop light pollution. [Join IDA >>](#)



Skyglow Berlin Project for Kids



Christopher Liko, a member of the IDA Board of Directors

[Save page as PDF](#)

DARK SKY UPDATES

Losing the Dark - a Short Public Service Announcement on Light Pollution [Read More >>](#)

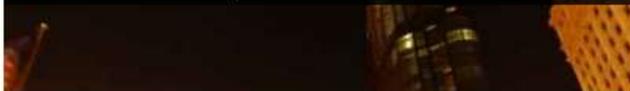
'UFO' street light plan shelved amid eye-damage claim [Read More >>](#)

Purchase Paul Bogard's "The End of Night" [here >>](#)

Purchase Laurent Laveder's collection of astrophotography [here >>](#)

"The City Dark" nominated for Emmy

▶ PLAYLIST Dark Sky Awareness Videos



iphones:



DARK SKY METER
Helps you measure the night sky brightness

The Dark Sky Meter helps you measure the night sky brightness with the press of a button. Get instant information about the night sky quality and contribute to create a global map of sky darkness. Much cheaper than a commercial Sky Quality Meter.
Available for download now!

User comment: *Fantastic! Settling the argument with my observing friends over which of our sites is better is worth the \$5 all by itself. And if I win the wager for a beer, it will be like getting the app for free.*
Jeff Morgan, Prescott AZ

Download the app here

The advertisement features two iPhone screens. The left screen shows a map of the United States with a location marker and a reading of 'SQM 19.98 / Aug 8'. The right screen shows the app's main interface with 'INSTRUCTIONS', 'DARK', 'SKY', and 'SUMMIT' buttons, and a large red reading of 'SQM: 20.15 (6.13m)'. Below the screens is a blue 'GET IT ON THE APP STORE' button with the 'iPhone' logo.

Androids:



LOSS of the NIGHT

Be a part of a worldwide science project that measures light pollution.

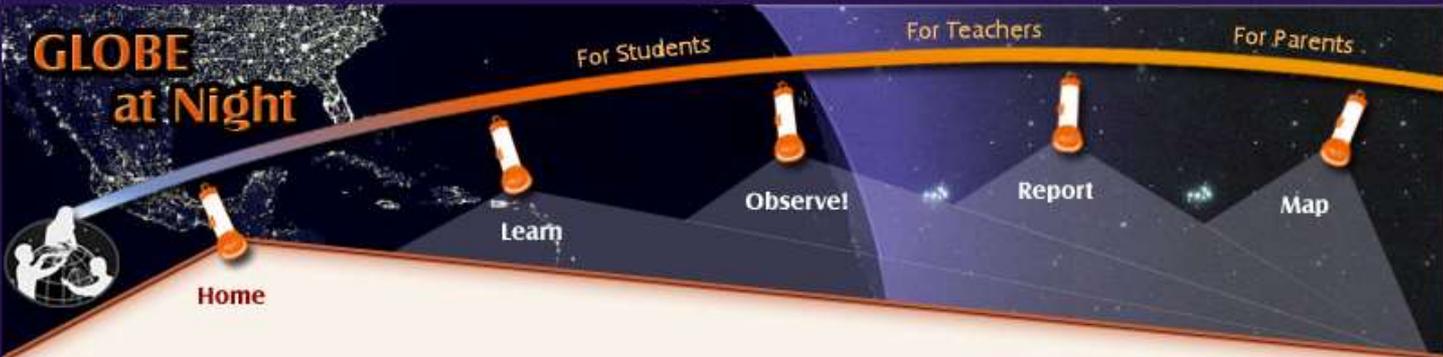
Measure light pollution in 3 easy steps.

SOUTH
Ankaa
Phoenix
Achernar
Taosana
Hy
Grus
Alnair
Pavo
Rigel
Hadar
Aclux

Start observing stars

The advertisement features a dark background with a constellation map. The text 'LOSS of the NIGHT' is in the top left. The main text 'Be a part of a worldwide science project that measures light pollution.' is in the center. On the right, there is a vertical panel with the text 'Measure light pollution in 3 easy steps.' and a list of star names: SOUTH, Ankaa, Phoenix, Achernar, Taosana, Hy, Grus, Alnair, Pavo, Rigel, Hadar, and Aclux. A button labeled 'Start observing stars' is positioned in the middle of this panel.

GLOBE at Night



About GLOBE at Night

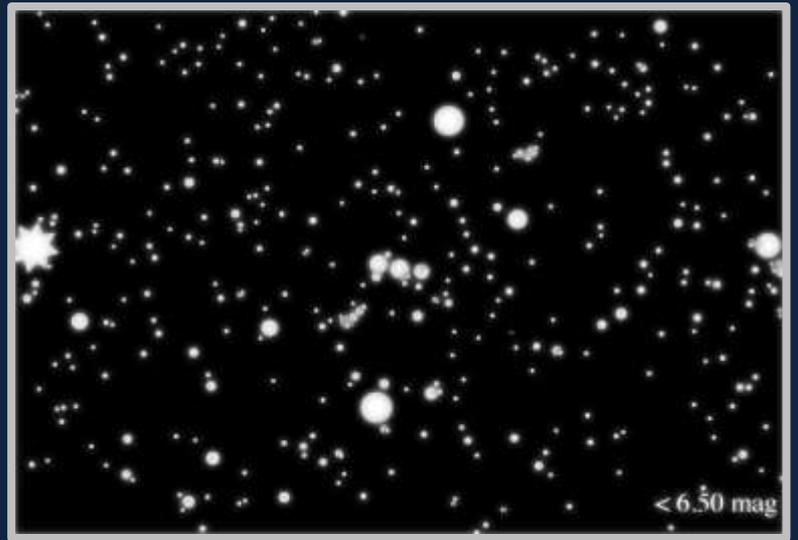
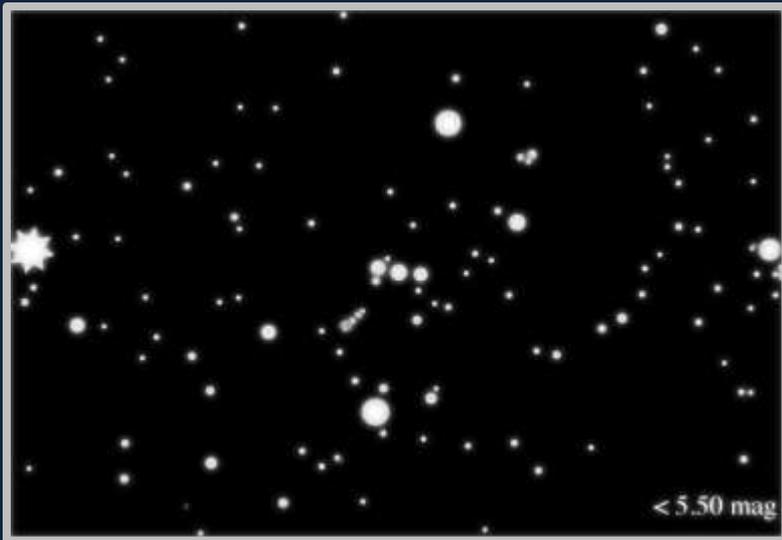
The GLOBE at Night program is an international citizen-science campaign to raise public awareness of the impact of light pollution by inviting citizen-scientists to measure their night sky brightness and **submit their observations** from a computer or smart phone. Light pollution threatens not only our "right to starlight", but can affect energy consumption, wildlife and health. Nearly 100,000 measurements have been contributed from people in 115 countries during the campaigns each winter/spring over the last 8 years, making GLOBE at Night the most successful light pollution awareness campaign to date!

Explore the last 8 years of data in our **interactive map**, or see how your city did with our **map app**. The GLOBE at Night website is easy to use, comprehensive and holds an abundance of background information. The database is usable for comparisons with a variety of other databases, like how light pollution affects the foraging habits of bats.



GLOBE at Night 2014

Globe at Night



Globe at Night – 2013 results



Referencias

- a. International Dark Sky Association (IDA)**
- b. International Astronomical Union (IAU)**
- c. Astronomical Society of the Pacific (ASP)**
- d. American Astronomical Society (AAS)**
- e. Globe at Night**
- f. Sociedad de Astronomía de P.R.**
- g. Sociedad de Astronomía del Caribe**