



INTERNATIONAL YEAR OF ASTRONOMY 2009



<http://www.globe.gov/globeatnight/>

GLOBE AT NIGHT: A DARK SKIES AWARENESS CAMPAIGN DURING THE INTERNATIONAL YEAR OF ASTRONOMY

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GLOBE at Night is a fun, international citizen-science event that encourages everyone— students, educators, dark sky advocates and the general public— to measure the darkness of their local skies and contribute their observations online to a world map. The program is a centerpiece of the Dark Skies Awareness Global Cornerstone Project for the International Year of Astronomy (IYA) in 2009. Its goal is to raise public awareness of the impact of artificial lighting on local environments by getting people involved. Data collection and online reporting is simple and user-friendly.

Led by the educational outreach staff at the National Optical Astronomy Observatory and the University Corporation for Atmospheric Research GLOBE Program, the GLOBE at Night campaign will take place for a 4th year from March 16-28, 2009. Over the past 3 years, tens of thousands of citizen-scientists around the world have contributed measurements of their local sky brightness to a growing global database in two ways: simple unaided-eye observations toward the constellation Orion and quantitative digital measurements through a handheld, well-calibrated sky-brightness meter. For the first method, citizen-scientists take data on light pollution levels by comparing what they see toward Orion, with star maps showing different stellar brightness limits. The basic idea is to look for the faintest stars and match them to one of seven star maps of progressively fainter limiting magnitudes. For the second method, digital sky-brightness meters are used for more precise measurements. The low-cost digital Sky Quality Meters (SQMs), manufactured by Unihedron, can make a highly repeatable, direct measurement of integrated sky brightness. The newly available second-generation of SQM-Ls being used this year by several GLOBE at Night sites has a cone-shaped "field of view" that is three times more narrow than the older model. This specifically aids its use in city environments, where surrounding lights or buildings may affect the readings. Reporting is also on-line.

To learn the five easy steps to participate in either type of GLOBE at Night program and to obtain important information on light pollution, stellar magnitudes, the mythology of Orion, how to find Orion, how to obtain your latitude and longitude, and how to use an SQM, see <http://www.globe.gov/globeatnight/>. No prior experience is necessary. All information needed to participate is on the GLOBE at Night Web site, along with downloadable activity guides available in six languages. All observations will be available online via Google Earth and as downloadable datasets.

Utilizing the international networks of its partners, GLOBE at Night is able to engage people from around the world. From 2006-2008, GLOBE at Night successfully conducted two-week campaigns each spring, during which a total of 20,000 observations were been submitted online from 100 countries. Within a few weeks after submission, a world map showing the results is available. These measurements can be compared with data from previous years of GLOBE at Night, as well as with satellite data and population density data. Data from multiple locations in one city or region are especially interesting, and can be used as the basis of a class project or science fair experiment, or even to inform the development of public policy.



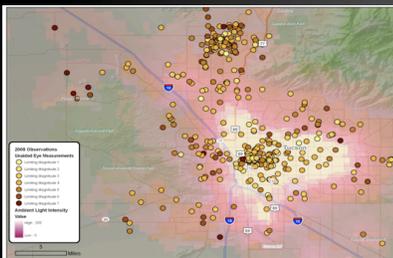
GLOBE at Night results for the campaign in 2008

More measurements made each year and over the next few years will allow for in more depth analysis. More measurements within a city will provide maps of higher resolution. Comparisons between years would allow people to monitor changes. Monitoring our environment will allow us as citizen-scientists to identify and preserve dark sky oases in cities or catch an area developing too quickly and influence people to make smart choices in lighting. Monitoring our environment might allow us to track the habitats of animals endangered by over-lighting. ... If more and more people took a few minutes during the March 2009 campaign to measure sky brightness either toward Orion with the unaided-eye or toward zenith with a Sky Quality Meter (or both!), their measurements will make a world of difference.

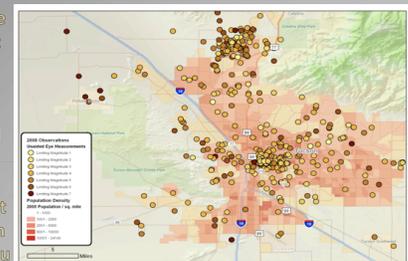
For more information, visit the GLOBE at Night website at <http://www.globe.gov/globeatnight/>. Happy star-hunting!



As an example of the data, the figures on the left and right show results for Tucson from GLOBE at Night 2008. Tucson is a city in which there are about a half a million residents proper and more than three-quarters of a million people in the greater area. Light pollution is a major concern in a city of this size. Limiting magnitudes as observed toward Orion are plotted in the figure on the right against the population density for Tucson from the latest census (in 2005). The same limiting magnitudes are also plotted in the figure on the left with respect to the "Lights at Nights" as seen from the DMSP satellite data from NOAA. The legend shows a series of monochromatically colored dots that represent the limiting magnitudes as observed toward Orion. The lighter in color the dot appears, the brighter the sky. If the faintest star you can see is a Magnitude 1 star, you are either standing below a streetlight, or your city has serious light pollution issues.



Limiting stellar magnitude data toward Orion for Tucson, AZ versus lights at night data from the DMSP satellite



Limiting stellar magnitude data toward Orion for Tucson, AZ versus the population density of Tucson



ACKNOWLEDGEMENTS

The International Year of Astronomy 2009 is supported by a grant from the National Science Foundation to the American Astronomical Society. The GLOBE at Night program has been supported by the National Science Foundation under a grant to the National Optical Astronomy Observatory (NOAO). NOAO is operated by the Association of Universities for Research in Astronomy (AURA) under cooperative agreement with the National Science Foundation. NOAO and UCAR's GLOBE staff work on GLOBE at Night in collaboration with Environmental Systems Research Institute, Inc., the International Dark-Sky Association, and the Centro de Apoyo a la Didáctica de la Astronomía in Chile. We thank the following organizations for use of their networks to promote GLOBE at Night: the GLOBE program at UCAR, the National Optical Astronomy Observatory, the International Dark-Sky Association, the Astronomical Society of the Pacific, the Association of Science and Technology Centers, the Astronomical League, and Astronomers Without Borders.