

## **GLOBE at Night 2.0: On the Road Toward IYA 2009**

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**Abstract.** The outcome of the 2008 GLOBE at Night campaign will provide the basis for a quantitative global effort in 2009 as one of the major U.S.-led programs in the planned International Year of Astronomy (IYA). A worldwide dark-skies awareness campaign is a cornerstone activity of IYA 2009.

### **1. Introduction**

In March 2006, the National Optical Astronomy Observatory (NOAO) and the GLOBE project conducted the GLOBE at Night program to enable “citizen-scientists” around the world to contribute simple unaided-eye observations on sky-brightness to a growing global database. Citizen-scientists recorded the brightness of the night sky by matching its appearance toward the constellation Orion with 1 of 7 stellar maps of different limiting magnitude. Observations and their exact locations were submitted on-line. More than 18,000 people contributed 4,600 observations from 96 countries.

With further funding from the National Science Foundation, the GLOBE at Night 2007 program built upon the success of the inaugural campaign in 2006. The international star-hunting event returned March 8-21 in two flavors: the classic GLOBE at Night activity incorporating unaided-eye observations toward Orion, and a new effort to obtain precise measurements of urban dark skies toward zenith using digital sky-brightness meters. Participation increased to 8,500 observations from 60 countries in the last event.

### **2. The Digital GLOBE at Night Program 2007**

To make possible the digital GLOBE at Night program, the NSF funded the purchase and distribution of 135 low-cost, handheld, well-calibrated sky-quality meters (manufactured by Unihedron), or “SQMs”. Along with related educational materials developed by NOAO (including a hands-on demonstration of lighting using a flashlight and mask), the meters were distributed to citizen-scientists in 21 U.S. states plus Washington DC, and in 5 countries, including Chile, where NOAO has a major observatory. About 1000 measurements were reported by a variety of citizen-scientists including teachers, their students, astronomers at observatories, International Dark-Sky Association (IDA) members, and staff from 19 science centers.

At many of the sites where the SQMs were delivered, a local coordinator promoted dark-sky education using the educational kits, and trained a number of teachers and amateur astronomers on using the meter. For each meter, citizen-scientists were asked to make measurements from different locations in their

region and record on-line their measurements with their latitude and longitude at each location, using either a GPS unit or GIS-related website.

As an illustration of the results, the SQM data for Tucson is plotted against population density in Figure 1. Other preliminary results can be found at <http://www.noao.edu/outreach/press/pr07/pr0707.htm>.

### 3. Plans for 2008

Building upon the existing infrastructure of local coordinators and participants in GLOBE at Night, a similar but expanded U.S.-based SQM program will be implemented in 2008 with additional collaboration from the International Dark-Sky Association (<http://www.darksky.org>) and a SQM citizen-science program called Night Vision (<http://www.nightwise.org/nightvision.htm>).

With funding for the 2008 campaign, this effort will support ongoing student-teacher teams, as well as new participants, and build a more formal network of GLOBE at Night sites and coordinators. People who commit to the program will have access to sky-brightness meters as well as an updated teaching kit. Participants will learn how to use the meters, how to organize a meaningful campaign in their community, and how to teach with the kit. Interested participants will be offered the opportunity to continue measurements year-round.

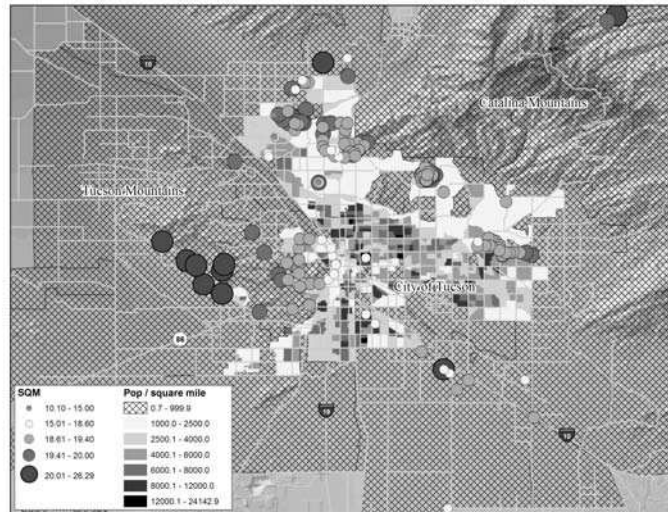


Figure 1. SQM measurements of Tucson

### 4. Summary

The 2008 campaign will provide the basis for a quantitative global effort in 2009 as a major U.S. program in the planned International Year of Astronomy.

GLOBE at Night has been a collaboration between NOAO, the GLOBE program, the IDA, CADIAS and Windows to the Universe. NOAO is operated by the Association of Universities for Research in Astronomy (AURA), Inc. under cooperative agreement with the National Science Foundation. This work was supported by a grant to NOAO by the NSF AST Division.