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National Parks for Astronomy and Solar System Outreach

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Abstract

With the rise of urban lighting, national, state, and regional parks have become some of the last remaining dark-sky sites the typical family can easily visit. As a consequence, visitors to national parks in the United States consider a star-filled sky an integral part of their "park experience." U.S. national parks have therefore become an increasingly important tool for informal science education and outreach in the areas of astronomy and planetary science, potentially reaching tens of millions of people annually. Fostering stronger astronomer/park collaborations benefits educational and public outreach goals.

1. Introduction

In *The First World Atlas of the Artificial Night Sky Brightness*, Cinzano, Falchi, & Elvidge [1] estimate that two-thirds of the population of Europe and North America are unable to see the Milky Way from where they live. From the Bortle classification of night sky brightness we know that with the loss of the Milky Way we also lose sight of the zodiacal light, faint meteors, comets, and eventually everything in our solar system but the moon and major planets. Moore et al. [3] argue that while "more of the population [today] understands simple astrophysics (that stars are fusion reactors feeding on hydrogen, that comets are dirty snowballs, and that our galaxy is one of many other cities of stars) it is our observation that the type of knowledge that makes the larger universe directly relevant is declining." This knowledge, Moore continues, is a basic understanding of the phases and motion of the Moon and the resulting tides, the tilt of Earth's axis that causes seasons and changes the length of daylight, or what our galaxy looks like in the sky, and "is the type of understanding necessary to provide a bridge from their daily lives to the current wealth of astronomical discovery."

National, state, and regional parks far from sources of light pollution are therefore one of astronomer's greatest tools for direct "eyes-on" exposure to (and understanding of) our solar system and galaxy, and thus a natural venue from which build interest in its exploration among the general public.

2. Astronomer-Parks Collaboration

Over the last decade, a number of organizations including the International Dark-Sky Association (IDA), Astronomical Society of the Pacific (ASP), the U.S. National Park Service (NPS), have begun to take advantage of the relatively dark skies located above U.S. national parks to educate the public about astronomy, planetary science, and the need to preserve dark skies. These activities fall in three main categories:

1) Training park rangers to give accurate and effective night sky talks. Approximately 60 out of 392 NPS units provide some kind of regular stargazing programs. One such unit, Bryce Canyon National Park, conducts over 100 outdoor programs each year on astronomy and in 2009 recorded nearly 27,000 astronomy-related visitor contacts. [3] This audience is more than that at many planetariums.

Figure 1: Example of posters used by the U.S. NPS promoting dark-sky and planetary astronomy outreach based on 1930s-era U.S. travel posters.

2) Educating astronomers, park rangers, and park administrators, on the ways that the parks serve as both hands-on, and eyes-on, laboratories for current astronomical and planetary research, and how this

current research serves to give visitors a better understanding of the park. Examples include the relationship between geysers in Yellowstone National Park with recently discovered geysers on Saturn's moon Enceladus, and erosional flow-features on Mars and Titan with the role of water in carving the rivers and canyons of the American southwest. [4]

3) Saturn, Titan, and Mars are all objects visible in a dark sky where volunteers are on hand to point these objects out to the public and provide accurate information on what is being seen. The NPS Night Sky Team (a small group of U.S. park rangers and professional astronomers) has been measuring and monitoring sources of light pollution over U.S. parks [2] and has recently begun coordinating the pairing of trained amateur astronomers with parks looking to provide night sky programs.

Figure 2: Example using French travel posters to promote dark-sky and planetary astronomy outreach.

3. Summary

National parks are a natural venue for educating the public about the broader universe. In the U.S., park rangers have nearly one hundred years' experience educating the public about the strange and unusual natural world of grizzly bears, geysers, and granite peaks with which modern urban life has rendered the public unfamiliar. The extension to the beauty of the world overhead is a natural one. Visitors to these parks are therefore already primed to expect and look forward to informal education in an outdoor surrounding, especially when a dark sky at night is one of the sights with which the public is now unfamiliar. Astronomers and planetary scientists can take advantage of this reservoir of public enthusiasm for learning by promoting and disseminating our latest astronomical discoveries in a place that provides its immediate appreciation.

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References

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