the Webfooted Astronomer
News from the Seattle Astronomical Society
March 2009

Prospects dim for light pollution legislation

Work could go on without mandate from legislature

by Greg Scheiderer

Prospects appear dim that a bill aimed at reducing light pollution will be enacted this year by the Washington State Legislature. As this issue of *The Webfooted Astronomer* went to press, a deadline for approval by a key committee has passed without a vote on the bill by that committee.

As reported in the February 2009 issue, SHB 1069, prime sponsored by State Rep. Sam Hunt (D-Olympia), declares an intent to reduce energy consumption and protect the nighttime environment, and requires that the Washington State Building Code Council work with interested parties to develop recommendations for a draft code addressing light pollution.

The hangup has to do with the $72,000 estimated cost for the council to do the work, according to a note posted on the Washington Light Pollution Working Group's Web site by Dave Ingram, an SAS member and member of the Northwest section of the International Dark-sky Association. Ingram's note says that John Neff, chair of the council, believes the work could be done within its current budget, and that Neff needs only the mandate from the legislature to do it.

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NEXT MEETING

March 18 — 7:30 p.m.
University of Washington Physics/Astronomy Building, Room A-102

The Great Martian Road Trip

For the last five years, the Mars Exploration Rovers have been conducting the first overland expedition on another world. This expedition has been a part of the global exploration of our neighbor in space which has found Mars to be a unique world with methane exhalations, abundant water ice even at the mid-latitudes, and rich history of interaction with liquid water.

Solar System Ambassador Ron Hobbs will review the incredible missions of the rovers in the context of the past and future exploration of Mars.

SAS Calendar

March 4 — First quarter Moon

March 8
Saturn at opposition

March 15 — 2 p.m.
Astrophotography/imaging SIG meeting
Contact: astrophoto@seattleastro.org

March 18 — 7:30 p.m.
Seattle Astronomical Society Meeting
Guest speaker: Ron Hobbs, Road Trip to Mars. Details on page 1.

March 18 — 7 p.m.
UW Observatory — Public viewing night

March 21 — 7 p.m.
Tiger Mountain Star Party (members only)

March 22
Jupiter 1.5 degrees south of Moon

March 26 — New Moon

March 28 — 1 p.m.
New member orientation. Contact orientation@seattleastro.org

March 28 — 7 p.m.
Seattle Astronomical Society Star Parties
- ♦ Green Lake, Seattle
- ♦ Paramount Park, Shoreline

April 1 — 9 p.m.
UW Observatory — Public viewing night

April 2 — First quarter Moon

Light pollution legislation stalled

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The passing of the March 2 deadline without action on the bill by the House General Government Appropriations Committee means the measure is officially "dead" for the year. Ideas have a way of springing back to life, however. The language of the bill could be amended onto another measure on a similar topic, or a proviso directing the council to do the work could be inserted into its budget.

In the meantime, Ingram is working with others to figure out how to keep the ball rolling in the event the legislative effort fizzles again -- similar legislation was considered but never acted upon last year. It could be helpful that the International Dark-sky Association and the Illuminating Engineering Society of North America have finally, after more than three years of work, come up with a Model Lighting Ordinance draft which is presently up for public review and comment. If the MLO is approved, it could form the basis for discussion by the Light Pollution working group and other interested parties and local advocates as they work to build a strong propopsal to take to the legislature and local jurisdictions around the state. ★

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Editor: Greg Scheiderer
Circulation: Joanne Green

Kepler to look for livable places in the universe

by Ron Hobbs

I have spent the better part of my life exploring the planet of my birth and dreaming about exploring other more distant worlds. I am certainly not the first to wonder about strange new worlds that are yet familiar enough to have copious liquid water and an oxygen-rich atmosphere. 2,300 years ago, the philosopher Epicurus taught that there are "infinite worlds both like and unlike this world of ours …we must believe that in all worlds there are living creatures and plants and other things we see in this world." We are now just four years away from finally having firm data on just how many worlds like the Earth there might be in our galaxy.

On March 6 NASA launched the latest of the low-cost Discovery missions, one designed to discover Earth-sized planets orbiting in the habitable zone of their parent star. Named for the man who discovered the laws of planetary motion, the Kepler spacecraft is essentially a Schmidt telescope with a 0.95-meter aperture and a 1.4-meter mirror, with solar arrays covering three sides. It will function as a photometer solely and has in the focal plane a 95-megapixel CCD, the largest ever flown by NASA. It has a field of view of over 100 degrees. After launch into an Earth-trailing orbit, similar to that pioneered by the Spitzer Space Telescope, Kepler will continuously stare at a patch of sky between Cygnus and Lyra for the next 3.5 years, waiting patiently for planets to transit the over 100,000 stars in its field of view. This field is just above the galactic plane, where there are relatively fewer giant stars, and a rich supply of dwarfs, stellar types F through M. Kepler will need to observe at least two consecutive transits to characterize the orbit of the transiting body, with three transits being ideal.

Almost immediately Kepler will begin to discover 'hot-Jupiters' and other planets that orbit very close to their parent stars. Those results should be announced this December. As time accumulates, it will discover planets in orbits comparable to Mercury and Venus. Finally, enough time will have passed that planets orbiting F through K stars will be characterized. Those results should be released in December of 2012, and humanity will finally have some sense of whether or not it is alone in the galaxy. If planets like ours are common, Kepler could discover as many as 100 or more. It would be a significant finding if Kepler doesn't discover any Earth-like planets in habitable orbits. It would mean that planets like the Earth are very rare indeed. For more information on the Kepler mission, check out http://kepler.nasa.gov/. ★

Ron Hobbs is the Public Programs Assistant for The Museum of Flight and a Solar System Ambassador for NASA's Jet Propulsion Laboratory. For more information on the SSA program see www2.jpl.nasa.gov/ambassador

Kepler field of view over Milky Way. Photo by Carter Roberts.

The future has arrived

Ion propulsion. Artificial intelligence. Hyperspectral imagers. It sounds like science fiction, but all these technologies are now flying around the solar system on real-life NASA missions.

How did they get there? Answer: the New Millennium Program (NMP). NMP is a special NASA program that flight tests wild and far-out technologies. And if they pass the test, they can be used on real space missions.

The list of probes that have benefited from technologies incubated by NMP reads like the Who's Who of cutting-edge space exploration: Spirit and Opportunity (the phenomenally successful rovers exploring Mars), the Spitzer Space Telescope, the New Horizons mission to Pluto, the Dawn asteroid-exploration mission, the comet-smashing probe Deep Impact, and others. Some missions were merely enhanced by NMP technologies; others would have been impossible without them.

"In order to assess the impact of NMP technologies, NASA has developed a scorecard to keep track of all the places our technologies are being used," says New Millennium Program manager Christopher Stevens of the Jet Propulsion Laboratory.

For example, ion propulsion technology flight-tested on the NMP mission Deep Space

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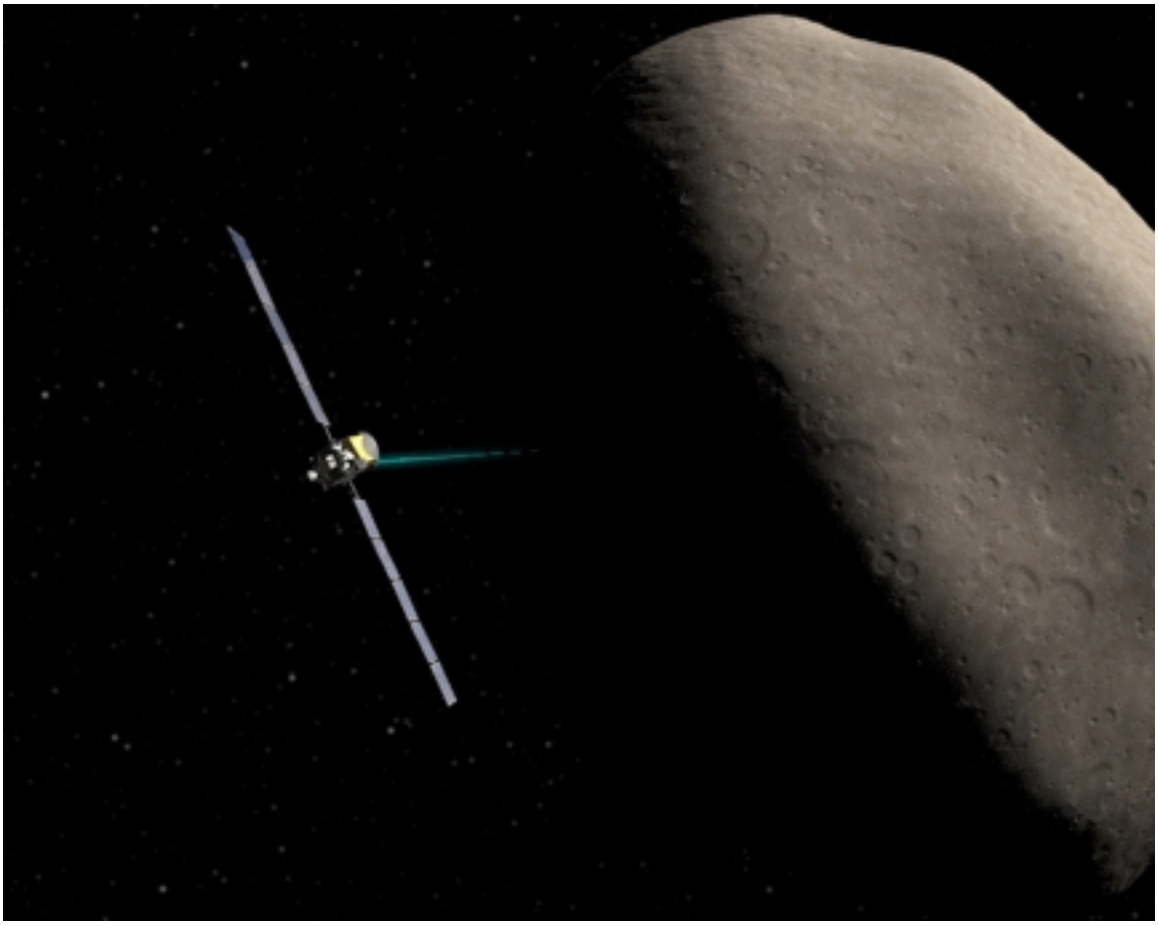

Dawn will be the first spacecraft to establish orbits around two separate target bodies during its mission, thanks to ion propulsion validated by Deep Space 1.

The future has arrived

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1, launched in October 1998, is now flying aboard the Dawn mission. Dawn will be the first probe to orbit an asteroid (Vesta) and then travel to and orbit a dwarf planet (Ceres). The highly efficient ion engine is vital to the success of the three-billion-mile, eight-year journey. The mission could not have been flown using conventional chemical propulsion; launching the enormous amount of fuel required would have broken the project's budget. "Ion propulsion was the only practical way," says Stevens.

In total, 10 technologies tested by Deep Space 1 have been adopted by more than 20 robotic probes. One, the Small Deep Space Transponder, has become the standard system for Earth communications for all deep-space missions.

And Deep Space 1 is just one of NMP's missions. About a half-dozen others have flown or will fly, and their advanced technologies are only beginning to be adopted. That's because it takes years to design probes that use these technologies, but Stevens says experience shows that "if you validate experimental technologies in space, and reduce the risk of using them, missions will pick them up."

Stevens knew many of these technologies when they were just a glimmer in an engineer's eye. Now they're "all grown up" and flying around the solar system. It's enough to make a program manager proud!

The results of all NMP's technology validations are online and the list is impressive: nmp.nasa.gov/TECHNOLOGY/scorecard/scorecard_results.cfm. ★

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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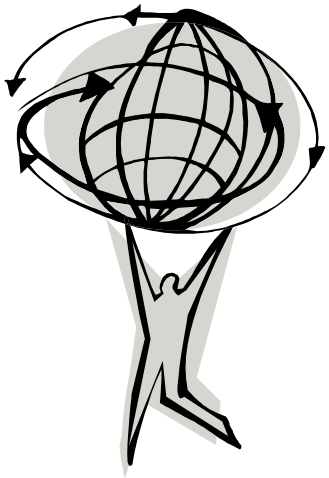


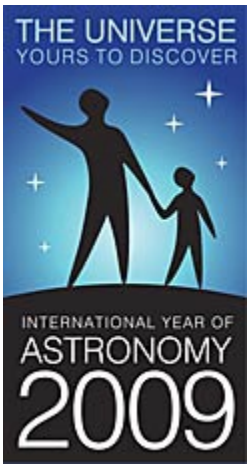
SAS Gallery

Lulus of Lulin

SAS member Burley Packwood captured these two photos of Comet Lulin last month from his backyard in Green Valley, Arizona. The smaller photo at right is a combination of eight 20-second LRGB exposures made on the evening of Feb. 20. The wide-angle shot below is a total 2.5 minutes exposure taken on the 25th. Both were taken through a Meade LX200 with an ST2000XM CCD.

Lulin is leaving Leo and will zip through Cancer and Gemini in March.

IYA events slated



Seattle Astronomical Society members are invited to participate in a cooperative venture in support of the International Year of Astronomy and several Cornerstone projects.

Alice Few of the Tacoma Astronomical Society is working with the Museum of Flight, KCTS (Seattle PBS), and KBTC (Tacoma PBS) on projects centered around the 100 Hours of Astronomy, The Galileoscope Project, and the airing of "400 Years of the Telescope." These could provide ample opportunities for visibility of astronomy.

Projects in the works so far include:

April 2nd Museum of Flight free Thursday
Clubs could do a variety of projects at the Museum of Flight's First Thursday event, including Galileoscops, Night Sky Network Kits, Club booths, Stomp Rockets (outside), a scale of the Solar System demo, and the like. Alternate sites in Tacoma and Olympia are in the works for this evening as well.

Airings of "400 Years of the Telescope" on May 8 on KBTC and May 14 (tentatively) on KCTS
In each case events could be held before and/or after the airing of the program.

If you are interested in participating in any of these events, or creating one of your own, contact Few at few_2001@yahoo.com.

We promise you the Sun, the Moon, and the stars... and we deliver!

The Seattle Astronomical Society is an organization created and sustained by people who share a common interest in the observational, educational, and social aspects of amateur astronomy.

Established in 1948, the SAS is a diverse collection of over 200 individuals. A variety of programs and activities is presented by the SAS throughout the year. Monthly meetings feature speakers on a wide range of topics, from the Hubble Space Telescope to electronic imaging to personal observing experiences. The club holds public observing "star parties" at Green Lake and Paramount Park every month, dark sky observing parties outside Seattle, plus such activities as meteor watches, public telescope and astronomy displays, National Astronomy Day, and an annual Awards Banquet.

The Webfooted Astronomer
Seattle Astronomical Society
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RETURN SERVICE REQUESTED

NEXT MEETING
March 18

Ron Hobbs, *The Great Martian Road Trip*

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Seattle Astronomical Society Membership

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☐ New member ☐ Renewal ☐ SAS may publish info in membership directory

☐ Individual membership – $25	**$** _____
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☐ Full-time student membership – $10	**$** _____
☐ Receive paper copy of newsletter (free on-line) – $15	**$** _____
☐ Sky & Telescope magazine – $33	**$** _____
☐ Astronomy magazine – $34	**$** _____
☐ Donation (optional)	**$** _____
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