



the Webfooted Astronomer

News from the Seattle Astronomical Society

March 2008

Big crowd takes in lunar eclipse at SAS party

by Greg Scheiderer

Ma Nature was smiling on Northwest astronomers Feb. 20 when the winter evening clouds parted to allow spectacular viewing of a total eclipse of the Moon.

The Seattle Astronomical Society had an official viewing party at the Green Lake Small Craft Center, where hundreds of people gathered and passed by for a glimpse of the eclipse, the last total lunar eclipse that will be visible from Seattle until December of 2010.

There was some delayed gratification for the Green Lake throng, as there was one cloud bank in the sky that evening – right on the eastern horizon, where the eclipse began shortly after Moonrise. Thus, the event was already well under way by the time the Moon popped out above the clouds some time after 6 p.m. Observers enjoyed the up-close views afforded by SAS members' telescopes and binoculars.

The event generated excellent visibility for SAS, as there was ample pre-eclipse coverage, including an article in the *Seattle PI* and a story on KOMO radio, that helped pump up the turnout, and several TV stations turned up at Green Lake for the fun. Loren Busch reported he and Karl and Judy Schroeder were set up at Paramount Park and probably had 50-plus eclipse viewers there as well. It turned out to be good outreach; at least three people who found us at Green Lake attended the general meeting that Friday, and several others are planning to drop in on the next star party March 15.

NEXT MEETING

March 19, 2008 — 7:30 p.m.
University of Washington
Physics/Astronomy Building,
Room A-102

Galaxy formation

Chris Brook, a postdoctoral fellow with the UW Department of Astronomy, will discuss his cosmological simulations of galaxy formation.

www.astro.washington.edu/cbrook/



SAS VP/Programs Jingchun Chen waits at Green Lake with his homemade Dob Feb. 20, while in the background SAS member David Dorais explains the eclipse people will see when that pesky cloud bank in the east goes away. Photo by Denis Janky.

SAS Calendar

March 7 — New Moon

March 14 — First quarter Moon

March 15 — 1 p.m.

New member orientation meeting. Contact Karl Schroeder, 206-362-7605 or orientation@seattleastro.org

March 15 — 7 p.m.

Seattle Astronomical Society Star Parties

- ◆ Green Lake, Seattle
- ◆ Paramount Park, Shoreline

March 18-19

Moon and Saturn form close pair around dusk

March 19 — 7 p.m.

UW Observatory — Public viewing night

March 19 — 7:30 p.m.

Seattle Astronomical Society Meeting
Guest speaker: Chris Brook, simulations of galaxy formation. Details on page 1.

March 16 — 2 p.m.

Astrophotography/imaging SIG
Contact: astrophoto@seattleastro.org

March 21 — Full Moon

March 22 — 6:30 p.m.

Amateur telescope makers SIG meeting
Contact: atm@seattleastro.org

April 2 — 9 p.m.

UW Observatory — Public viewing night

April 5 — New Moon

April 5 — 7 p.m.

Tiger Mountain Star Party (members only)

New member orientations return

The popular SAS orientation meetings for new members and beginners are returning. Hosted by Karl and Judy Schroeder at their home, the orientations are a great way to meet new people and learn the basics of astronomy.

The first orientation meeting of 2008 will be on March 15 at 1 p.m., and will run until about 5 p.m. The sessions cover telescopes, charts, viewing, planning, star parties, and even what to wear. Then there is dinner, provided by Karl and Judy, followed by an evening of observing, if the weather cooperates.

Interested? Contact the Schroeders in advance so they know how much food to prepare. Call (206) 362-7605 or e-mail orientation@seattleastro.org.

What to bring: a chair, something to drink with dinner, and lots of questions.

Two other new member orientation meetings are planned for this year: June 7 and Sept. 6

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Editor: Greg Scheiderer

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An overlooked astronomical resource?



From the president's desk
By Jon Bearscove

The other day I was at a local bookstore browsing through my favorite astronomy publications, and came across a most unlikely, or rather overlooked publication that surprised me in terms of information on our hobby. I hadn't considered purchasing this before, and was amazed at the wealth of information it contained. See if you can guess what I'm referring to.

First up is a nice glossary of astronomy terms ranging from aphelion all the way to zodiac. Terms such as conjunction and descending node, retrograde and synodic month are included among the list. I'm assuming this is right up front because you might encounter these words throughout the publication, so the authors may have thought you'd like to get cozy with these terms right from the start.

Then it's on to the monthly calendars which contain so much astronomical information that one wouldn't really need any other resource. Everything from conjunctions, to when stars are at meridian, to which constellation the Moon appears in throughout the month, to sunrise and sunset data.

Lunar phases are included; you could plan an entire year of star parties just by using this section alone. Then it's on to the "sky watching" section which includes a month-by-month breakdown of upcoming meteor showers, planetary positions – a summary of practically everything we might like to see in terms of a snapshot of what's up throughout the year.

Next up are celestial events, planet-specific information such as which planet will be the brightest in the night sky throughout the year. Eclipse data follows including when the seasons begin. It literally covers everything. A three year calendar on the back, metric conversions, table of weights and measures...the list goes on.

Then it's on to a few astronomy articles such as the stellar life cycle written by John Tillman, including a table of the 21 brightest stars. The article itself contains an excellent description of many of our favorite stars, and identifies these in terms of their classification. Perfect for the beginner wanting to learn more about the stars without getting overloaded in details or confusing diagrams and charts.

This is all followed by a well-written article on Clyde Tombaugh and Pluto, by Rob Simbeck, and how Clyde was a "dedicated amateur capable of something spectacular given hard work, opportunity, and a little luck."

By now you may have figured out that I'm referring to a simple *Farmer's Almanac* (Harris's #30) found in any grocery store or bookstore. For \$5.00, I didn't realize that there was this much no-nonsense information on my favorite past-time.

Of course I like color star charts, and checking out the latest astro-gadgets in my favorite magazines each month, but who would have thought that this little almanac first published in 1692 would be so packed with astronomy information?

It's got to be one of the most overlooked publications in our hobby... after all, I've yet to see an astronomer pull one out to check what time sunset is, or where Mars might be hiding. Oh, and by the way, there are a few killer ice cream sundae recipes on page 68.

Plan and log observing sessions with ease

by Greg Scheiderer

Astronomical observing without a plan is like going grocery shopping without your list, according to Paul Rodman. In the night sky, as in the supermarket, there's an enormous selection.

"There are hundreds of thousands of things in stock at the supermarket, and there are hundreds of thousands of things in the sky," Rodman said in a presentation at the February meeting of the Seattle Astronomical Society. "There's huge variety and too much choice."



Paul Rodman demonstrated his AstroPlanner software at the SAS meeting on Feb. 22. Photo by Greg Scheiderer.

Without your shopping list, you might remember your staples like bread and milk, but forget you needed cinnamon. Similarly, without an observing plan you might take a look at old favorites and obvious choices such as Mars, Saturn, and the Orion Nebula, but miss other wonders that are also up in the sky that night.

Rodman, SAS member and Webmaster, is the creator of AstroPlanner, software that is an excellent tool for planning and logging your observing sessions. AstroPlanner can help improve the quantity and quality of your observations by creating a custom list of what you want to view and which items on your list are observable on a particular night.

The trick to this, according to Rodman, is that there are so many variables to consider. To make a plan, one must figure out which objects are visible on any given night, where and how bright they are, what they are, and what you should expect them to look like. You also need to know where you are, the sky conditions, date and time, and the limitations of the instruments you'll be using for viewing, including your own eyes.

Figuring all of this out the old-fashioned way would take a big stack of catalogs, star atlases, calendars, and planispheres, not to mention the math.

"A lot of astronomy is really just three-dimensional trigonometry, and that's enough to give anyone a headache," Rodman said. "If you have a computer that will do all that math you won't have to worry about dredging up those old textbooks."

Astroplanner does the hard work, churning through all the data and math and allowing you to easily create charts, lists, and observing orders. It will even point your scope for you!

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When you're finished you can use it to log what you saw. Rodman did a demo of AstroPlanner at the meeting and SAS members were impressed with the software's versatility and ease of use. Several lucky members won free packages as door prizes, but many others made the purchase on the spot. AstroPlanner doesn't have whiz-bang features such as animation that are the



Screen shot from AstroPlanner, courtesy Paul Rodman.

hallmark of planetarium software like Starry Night Pro, but it can't be beat for simple and versatile organization, and it's extremely value priced.

The author picked up a copy and can attest to AstroPlanner's superb organizing capabilities. I've been working on the Astronomical League's Urban Observing Club award. Over the last year and a half I'd spread my observing notes over three different notebooks and dozens of scraps of paper, or the backs of star charts I'd printed using Starry Night. Using AstroPlanner, in just one afternoon I had all of those notes logged into my computer. Now with a couple of mouse clicks I can get a progress report on my Urban Club goal. (As of this writing I've bagged 62 of the 100 – nearly two-thirds the way there!) With all 100 items now part of an observing plan, on any clear night I'll be able to create an observing list almost instantly and put many more objects into the "observed" column.

AstroPlanner runs on a MAC or a Windows PC. To learn more about AstroPlanner or to purchase a copy, visit www.astroplanner.net.



Spring has sprung - sorta - and public observing nights are back at "the Jake"

With the turn of the calendar to March the public is once again invited to viewing nights at the Theodor Jacobsen Observatory on the University of Washington campus.

The Jacobsen Observatory is open on the first and third Wednesday of every month, March through November. The first open house of the season was held March 5, and the next will be on the 19th starting at 7 p.m.



Theodor Jacobsen Observatory. UW photo.

The program for each open house includes a talk by a UW undergraduate student, and other exhibits and activities. If the weather holds, volunteers from SAS operate the observatory's 110-year-old refracting telescope for a look at what's in the sky.

If you'd like to join the team of Jacobsen volunteers, contact Mike Langley.

There's more about the observatory, including a schedule of lectures for the next few months, on its Web site:

<http://www.astro.washington.edu/observatory/>

Invisible spiral arms

by Patrick Barry

At one time or another, we've all stared at beautiful images of spiral galaxies, daydreaming about the billions of stars and countless worlds they contain. What mysteries—and even life forms—must lurk within those vast disks?

Now consider this: many of the galaxies you've seen are actually much larger than they appear. NASA's Galaxy Evolution Explorer, a space telescope that "sees" invisible, ultraviolet light, has revealed that roughly 20 percent of nearby galaxies have spiral arms that extend far beyond the galaxies' apparent edges. Some of these galaxies are more than three times larger than they appear in images taken by ordinary visible-light telescopes.

"Astronomers have been observing some of these galaxies for many, many years, and all that time, there was a whole side to these galaxies that they simply couldn't see," says Patrick Morrissey, an astronomer at Caltech in Pasadena, California, who collaborates at JPL.

The extended arms of these galaxies are too dim in visible light for most telescopes to detect, but they emit a greater amount of UV light. Also, the cosmic background is much darker at UV wavelengths than it is for visible light. "Because the sky is essentially black in the UV, far-UV enables you to see these very faint arms around the outsides of galaxies," Morrissey explains.

These "invisible arms" are made of mostly young stars shining brightly at UV wavelengths. Why UV? Because the stars are so hot. Young stars burn their nuclear fuel with impetuous speed, making them hotter and bluer than older, cooler stars such as the sun. (Think of a candle: blue flames are hotter than red ones.) Ultraviolet is a sort of "ultra-blue" that reveals the youngest, hottest stars of all.



In this image of galaxy NGC 1512, red represents its visible light appearance, the glow coming from older stars, while the bluish-white ring and the long, blue spiral arms show the galaxy as the Galaxy Evolution Explorer sees it in ultraviolet, tracing primarily younger stars. Photo: NASA/JPL-Caltech/DSS/GALEX.

"That's the basic idea behind the Galaxy Evolution Explorer in the first place. By observing the UV glow of young stars, we can see where star formation is active," Morrissey says.

The discovery of these extended arms provides fresh clues for scientists about how some galaxies form and evolve, a hot question right now in astronomy. For example, a burst of star formation so far from the galaxies' denser centers may have started because of the gravity of neighboring galaxies that passed too close. But in many cases, the neighboring galaxies have not themselves sprouted extended arms, an observation that remains to be explained. The Galaxy

Evolution Explorer reveals one mystery after another!

"How much else is out there that we don't know about?" Morrissey asks. "It makes you wonder."

Spread the wonder by seeing for yourself some of these UV images at www.galex.caltech.edu.

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

Exploring the frontier of the Solar System

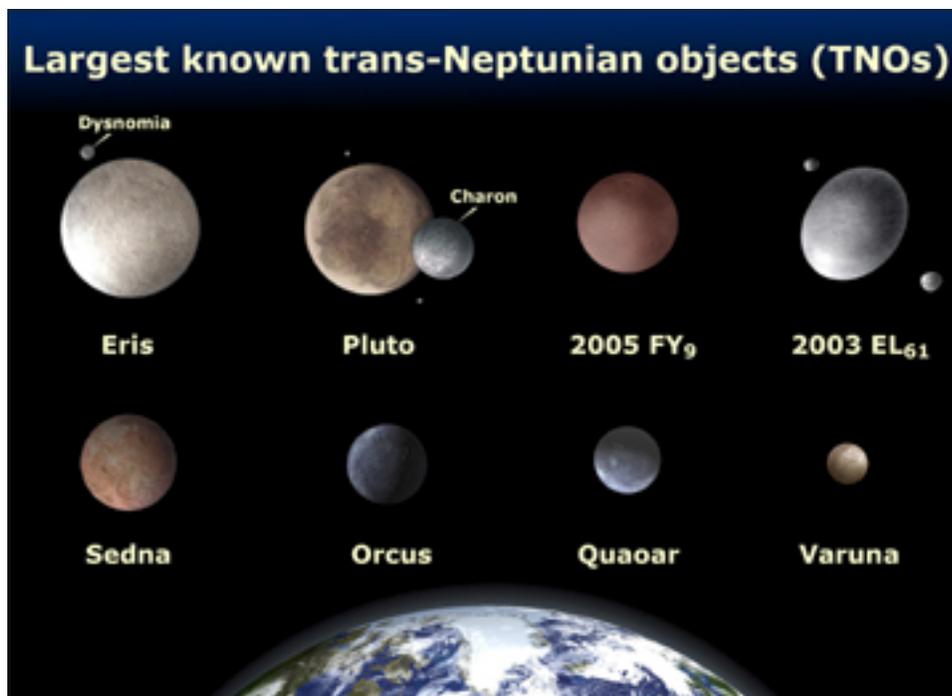
by Ron Hobbs

Nearly 400 years ago, Galileo Galilei made the revolution of Copernicus real by turning his newly invented telescope to the skies. During the 20th Century the astronomical frontier shifted to the universe beyond the Milky Way Galaxy. Since 1992, however, attention has shifted back to the frontier of the Solar System, with almost 1,300 objects having been found near or beyond the orbit of Neptune.

Nearly three years ago, on July 29, 2005, the prolific discovery team led by Mike Brown announced the discovery of three Pluto-sized bodies, including one larger than Pluto. These discoveries brought to the fore a revolutionary image of the outer Solar System. After a year and half of sometimes heated debate, the International Astronomical Union concluded that Pluto should be reclassified with the largest new trans-Neptunian object as “dwarf planets” and named the ninth largest object orbiting the Sun (136199) Eris, after the Greek goddess of strife and discord.

I am tiring of the debate over whether or not Pluto is a planet. Oh, I don't mind debate, even though this debate is more about language and history than about the scientific understanding of the trans-Neptunian worlds. My problem is that this debate is obscuring a full appreciation of what Alan Stern has called the “third zone” of the Solar System. The other two TNOs announced three summers ago have yet to receive names and we have no idea when they might be classified, though they are very likely to be named the next dwarf planets. Admittedly, the delay is due in part to the fact that one of them is the subject of the largest international controversy over an astronomical discovery since Neptune was discovered in 1846. Nevertheless, two very intriguing worlds seem to be stuck in a bureaucratic limbo. Ironically, the astrologists have not been distracted by all of this; the Web is full of discussions of the astrological implications of Eris and the other new, distant worlds.

The two potential dwarf planets will be at opposition over the next month and will be well positioned for observation, even by amateurs with high-end telescopes and good photographic technique. (136472) 2005 FY9 (nicknamed “Easterbunny” by its discoverers) is the second brightest TNO, with a visual magnitude of 16.75. It is likely the third largest TNO (absolute magnitude = -0.48) and will be closest to Earth around March 15 at a distance of 50.634 AU. It is currently in Coma Berenices, just north of the star gamma



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Comae and not far from the “Mice” galaxies (NGC 4676). “Easterbunny” is the largest member of the classical Kuiper Belt (previously known as *cubewanos*, after the first modern TNO discovered, (15760) 1992 QB₁), with a semi-major axis of 45.8 AU, an eccentricity of 0.159 and a period of almost 310 years. Spectroscopically, it is a slightly smaller twin of Pluto; it is the third TNO, after Pluto and Eris, on which the spectrum of frozen methane was found. It is likely that (136472) has a thin atmosphere, a transitional case between Pluto’s and the atmosphere of Eris, which has completely frozen. It may be surprising that Clyde Tombaugh did not find this world back in the 1930s until you realize that back then (136472) was near the border of Taurus and Auriga, among the stars of the galactic equator. Clyde was good, but not that good.

By coincidence, the third brightest KBO is also in Coma; at this apparition it is near the Coma – Boötes border, just 15’ south of the star HD118389. It will be closest to Earth around April 5 at 50.229 AU with an apparent magnitude of 17.33. Provisionally designated 2003 EL₆₁ and given the number (136108), this TNO is perhaps the strangest world yet discovered in the outer Solar System. Formal credit has been given to a team of Spanish astronomers led by Jose-Luiz Ortiz, though this has been contested by Mike Brown and his team, who gave this body the nickname, “*Santa*.” This sizable world rotates in just less than four hours, forcing it into an ellipsoid about 2,000 km along its long axis. It has two satellites, nicknamed “*Rudolph*” and “*Blitzen*” which revolve around “*Santa*” in orbits that are inclined to each other. It appears to be a rocky world with a thin crust made primarily of crystalline water ice. Furthermore, at least seven other TNOs are believed to be fragments of a momentous collision, which likely explains the rapid rotation rate and the

water ice shell. This world, of all the ones discovered in the last 15 years, has much to tell us about the evolution of the outer Solar System. To those of you who might attempt to observe them, NASA has released an “Ephemeris of 2003 EL₆₁ and 2005 FY₉.” It can be downloaded for free from: <http://www.lulu.com/content/215736> or you generate your own at <http://ssd.jpl.nasa.gov/horizons.cgi>.

Perhaps after this season of observing, we will find out more about these intriguing worlds, and maybe they will finally get proper names. To be fair, the naming of so many new objects has to be a rather overwhelming task. Mike Brown used the nickname “*Xena*” for 2003 UB₃₁₃ (later named Eris) and he reported that he had saved that particular name for the first object he found that was larger than Pluto because it began with “X.” He repeatedly assured people in his lectures that the nickname was a convenience and that he and his team had submitted a name from properly classical mythology to the IAU. So it seems to have caught a few people by surprise last September when the Minor Planet Center posted the name (66652) Borasisi for the primary of a binary TNO designated 1999 RZ₂₅₃. While this appears to be a name from an archaic mythological, it turns out that it is from the creation myth in a modern fictional religion in the science fiction story *Cat’s Cradle* by Kurt Vonnegut. Borasisi is estimated to be just over 150 kilometers in diameter and its satellite, Pabu, is very slightly smaller, so they are too small to be considered dwarf planets. This choice of names, while intriguing, probably tells us nothing about what to expect when the IAU finally gets around to naming the worlds beyond Neptune. ★

The Solar System Ambassadors Program is a public outreach program designed to work with motivated volunteers across the nation. These volunteers communicate the excitement of JPL’s space exploration missions and information about recent discoveries to people in their local communities. Ron Hobbs has been an Ambassador since 2001.



SAS Gallery

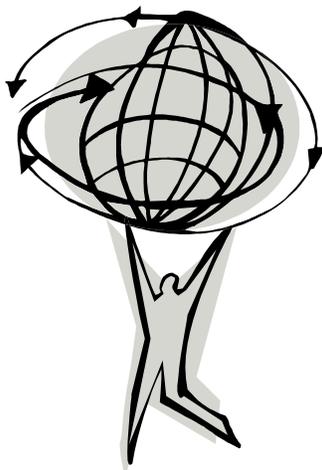
Weird Science!

Jim Peterson and Burley Packwood made liberal use of Photoshop to create their picture-postcard images of the Feb. 20 lunar eclipse. Jim's (right) was shot at the SAS event at Green Lake, and Burley's (below) was made in Arizona. Both are composites that make the Moon a LOT BIGGER than it actually appears in the sky. And no, Mars at opposition is NOT as large as the full Moon, either!



The SAS outreach event (below) for the eclipse was a big success. Hundreds of people – and dogs, too! – lined up at Green Lake for a view of the eclipsed Moon, Saturn, and other objects up that night.

Photo by Greg Scheiderer.



NEXT MEETING
March 19
 Chris Brook,
 Galaxy formation
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The Webfooted Astronomer
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