

July 2004

Special points of interest:

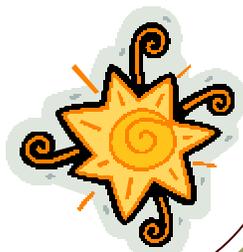
- SAS to participate in Trailfest, July 10, 2004
- Various SAS volunteer opportunities
- Cassini to flyby Saturn Rings while approaching Saturn's moon Titan

July Meeting:

"Flares on the Sun and Lower Mass Stars"

Dr. Suzanne Hawley is a faculty member at the University of Washington Astronomy Department. Dr. Hawley studies magnetic activity in M dwarfs through large surveys of field objects and investigations of low mass stars in open clusters. She has also spent considerable time observing and modeling flares on low mass stars.

Strong magnetic fields on the surface of the Sun give rise to the easily observed phenomena of sunspots and solar flares. Many stars that are smaller than the Sun have even stronger magnetic fields and more explosive flares. Dr. Hawley will show some of the new observations of the Sun that are now possible from satellites such as SOHO, TRACE and RHESSI, which give wonderful views of the solar surface. She will also talk about what can be learned from the lower mass flare stars, which are harder to observe since they are farther away, but which often show much stronger magnetic heating and flares.



Meeting Information

Speaker: Professor Suzanne Hawley

Flares on Low Mass Stars

Wednesday, July 21
7:30 p.m.

Physics-Astronomy Building
Room A102
University of Washington
Seattle

*Come early at 7 p.m. for coffee
and snacks and to visit with
your fellow members!*



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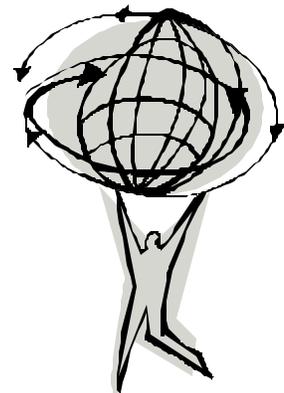
Co-editor: Rose Millican

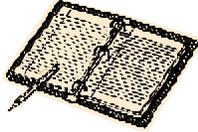
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From the President's Desk...

By Stephen Van Rompaey

Well, our newsletter is back in circulation and I would like to thank Saurabh Saxena and Rose Millican for volunteering as the new co-editors for the Webfooted Astronomer. I am looking forward to working with them in the coming months and I know they will do an excellent job.

I have a variety of news items to pass on that require volunteers to help out. First, I have not heard from anyone interested in serving as our VP-Programs. As you may recall, Rick Libsack had to resign from this position due to work commitments and we have been without a VP-Programs for several months now. The VP-Programs is responsible for arranging speakers for our monthly meetings and for the annual awards banquet. The SAS Board discusses and chooses the speaker for the awards banquet and the VP-Programs contacts and provides assistance to the speaker. The SAS is very successful getting speakers for our monthly meeting and we are fortunate to be well supported by the UW Astronomy Department. Faculty and students are generally happy to come make a presentation before the club and in my opinion, the VP-Programs does not require much time each month to line up speakers. The VP-Programs is a member of the SAS Board and is directly involved in the governance of the club. Anyone who is interested in volunteering for this position should email me at president@seattleastro.org.

**Interested in serving as our
VP-Programs?**

**Responsibilities include
arranging speakers for our
monthly meetings and the
annual awards banquet.**

Please contact

["president@seattleastro.org"](mailto:president@seattleastro.org)

Once again, the SAS is going to participate in Trailfest, held at Rattlesnake Lake on Saturday, July 10th (<http://www.wta.org/~wta/cgi-bin/wtaweb.pl?0+tf-main>). We will have a table/canopy set up with information about the SAS and a telescope with a filter for solar viewing. We have permission from the Cedar River Watershed Authority to

hold a star party at Rattlesnake Lake that evening in one of the parking lots behind the locked gate. Moonrise will be around 1AM and that should provide at least 2 hours of nice dark sky observing. If you would like to volunteer to work at our booth during the day or bring your telescope to star party, please let me know soon.

You may not believe it, but it's time to start thinking and planning for our awards banquet next January and we need someone to volunteer as our Banquet Chair. The Banquet Chair is responsible for identifying a restaurant for the banquet and making formal arrangements between the club and the restaurant concerning food and cost. The Banquet Chair collects the checks/cash from members, keeps track of all reservations,

**Mark de Regt (VP-Publicity) and
Thomas Vaughn (Secretary)
have begun exploring the
feasibility of purchasing 5 to 10
acres of land as a club
dark sky site.**

and coordinates these activities with the Treasurer. The Annual Awards banquet is a very important event for the SAS and anyone who is interested in helping out should contact me as soon as possible.

So, what else has your SAS Board been up to? Well, Mark de Regt (VP-Publicity) and Thomas Vaughn (Secretary) have begun exploring the feasibility of purchas-

ing 5 to 10 acres of land as a club dark sky site. The initial parameters are: 1) the site needs to be sufficiently remote to not suffer from significant light pollution, 2) reasonably accessible (meaning, most likely, near I-90 and not too far from Ellensburg or Cle Elum - within a two hour drive of Seattle), 3) more altitude is better than less altitude, 4) far enough away from population so that we would not be encroached on for a long time, and 5) 'safe'. At a minimum we are thinking about laying some cement slabs (maybe with piers) for observing/imaging and porta-potty facilities. Mark contacted a real estate agent and was told that it is unlikely that a 5 to 10 acre parcel meeting our specs could be purchased for less than \$50,000. He was also told that for a raw land purchase like this, especially by a cash-strapped organization like ours, we would typically have to put 50% down (\$25,000), unless we could get more favorable seller financing.

I plan to use the August or September meeting to discuss this idea further, because there are a lot of issues involved. For example, do we want to pool our resources with another local club and try to obtain a larger/better site? Would we require an annual access fee for members who wanted to use the site? Should we consider a more grandiose scheme that includes building an observatory? How do we come up with the down payment? So, for those of you who are interested in this idea, you are welcome to send your comments to Mark (publicity@seattleastro.org) and Thomas (secretary@seattleastro.org).

This past June was one of the best months I've had observing in the Seattle area since I caught the astronomy bug. Even with the limited darkness of summer, I had four great nights out at Rattlesnake Lake and

logged 51 new Herschel 400 objects and other goodies. Lee Ambler, who is the Chief Water Inspector for the Cedar River Watershed Authority, has granted us some additional access to the Rattlesnake Lake area for observing. In the past, SAS members with permits were limited to parking only one vehicle behind the lake. Thanks to the

efforts of Skip Murray, she has given us permission to now park up to three vehicles back there. Be sure to operate your vehicles responsibly in this area and stay on the road. We also will be able to hold SAS member-only star parties in the parking lot area at Rattlesnake Lake behind the first locked gate. Those of you who observe out there know that the car lights are a problem at the first parking lot and in the turnaround area. The advantage of the new parking lot is that we are screened from car lights and will have more privacy. The opportunity to hold these star parties at Rattlesnake Lake will be limited to the non-summer months, but the sky is darker than at Tiger Mountain and it will be nice to have an alternative site.

SAS has been granted some additional access to the Rattlesnake Lake area for observing. We can now park up to three vehicles behind the lake and also hold SAS member-only star parties in the parking lot area.

Well, I've rambled on enough for this month. I hope that I've given you plenty to think about and have motivated you to volunteer and help out as either our VP-Programs, Banquet Chair, or at Trailfest. ☒

Space Weather



By Patrick Barry and Tony Phillips

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

Radiation storms, 250 mile-per-second winds, charged particles raining down from magnetic tempests overhead... it sounds like the extreme weather of some alien world. But this bizarre weather happens right here at Earth.

Scientists call it "space weather." It occurs mostly within the gradual boundary between our atmosphere and interplanetary space, where the blast of particles and radiation streaming from the Sun plows into the protective bubble of Earth's magnetic field. But space weather can also descend to Earth's surface. Because the Earth's magnetic field envelops all of us, vibrations in this springy field caused by space weather reverberate in the room around you and within your body as much as at the edge of space far overhead.

In fact, one way to see these "geomagnetic storms" is to suspend a magnetized needle from a thin thread inside of a bottle. When solar storms buffet Earth's magnetic field, you'll see the needle move and swing. If you live at higher latitudes, you can see a more spectacular effect: the aurora borealis and the aurora australis. These colorful light shows happen when charged particles trapped in the outer bands of Earth's magnetic field get "shaken loose" and rain down on Earth's atmosphere.

And because a vibrating magnetic field will induce an electric current in a conductor, geomagnetic storms can have a less enjoyable effect: widespread power blackouts. Such a blackout happened in 1989 in Quebec, Canada, during a particularly strong geomagnetic storm. These storms can also induce currents in the metallic bodies of orbiting satellites, knocking the satellite out temporarily, and sometimes permanently.

Partly because of these adverse effects, scientists keep close tabs on the space weather forecast. The best way to do this is to watch the Sun. The NASA/ESA SOHO satellite and NOAA's fleet of GOES satellites keep a constant watch on the Sun's activity. If a

"coronal hole"--where high-speed solar wind streams out from the Sun's surface--comes into view, it could mean that a strong gust of solar wind is on its way, along with the geomagnetic storms it will trigger. And an explosive ejection of hot plasma toward the Earth--called a "coronal mass ejection"--could mean danger for astronauts in orbit. The advancing front of ejected matter, moving much faster than the solar wind, will accelerate particles in its path to near the speed of light, spawning a radiation storm that can threaten astronauts' health.

Look for coming articles for more about space weather and about NOAA's efforts to forecast these celestial storms. Meanwhile, read today's space weather forecast at <http://www.sec.noaa.gov/>. Learn about the geostationary and orbits of the GOES satellites at http://spaceplace.nasa.gov/en/kids/goes/goes_poes_orbits.shtml.

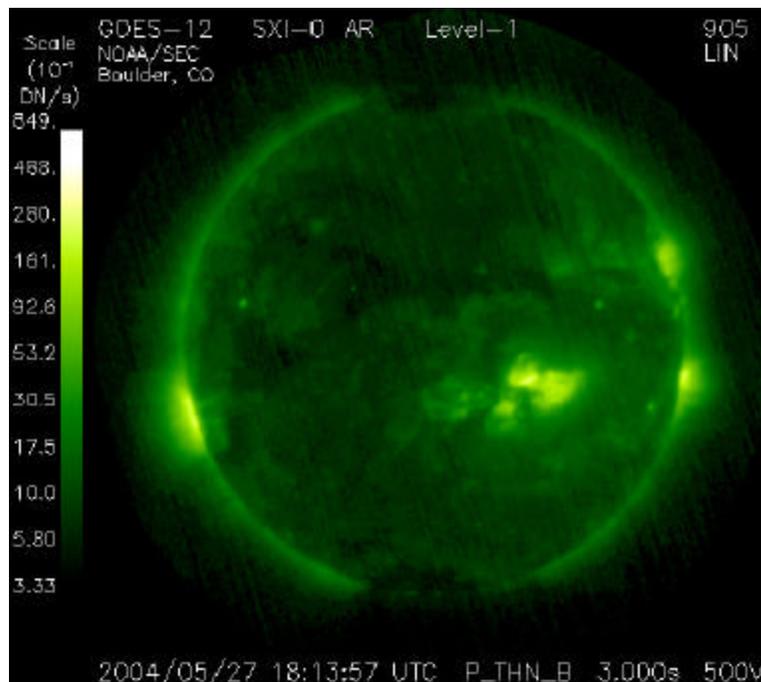
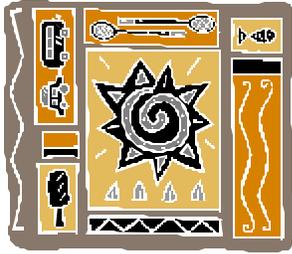


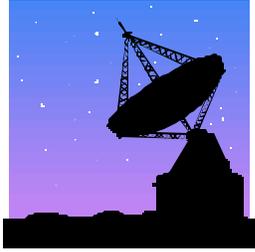
Image courtesy of the Space Environment Center/NOAA.

This image shows the outer solar atmosphere, or corona, as viewed by the GOES 12 Solar X-ray Imager (SXI). It shows the plasma at 4.0 MK (million degrees Kelvin). Bright areas are associated with sunspots seen in white light images and may produce explosive events known as flares. Dark regions are coronal holes where the fastest solar wind originates. ☐



July 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	1	 2	3
4	5	6	7 UW Public Viewing Night 9:00 pm	8	 9	10 TrailFest Rattle Snake Lake and Star Party
11	12	13	14	15 Table Mountain Star Party	16 Table Mountain Star Party	17  Table Mountain Star Party Tiger Mountain/ Poo Poo Point Star Party (members only!)
18	19	20	21 Monthly SAS Meeting UW Room A102 7:30 pm UW Public Viewing Night 9:00 pm	22	23	24 Green Lake Star Party Paramount Park Star Party
 25 Astro - photography/ Imaging SIG Meeting 2:00 pm	26 SAS Board Meeting 7:00 pm	27	28	29	30	31 



August 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4 UW Public Viewing Night 9:00 pm	5	6	7 
8	9	10	11	12 Oregon Star Party	13 Oregon Star Party Stellafane 9:00 am	14 Oregon Star Party Stellafane 9:00 am New Member Orient. 1:00 pm Tiger Mountain Star Party (Members Only!)
15 Oregon Star Party	16 	17	18 Monthly SAS Meeting UW Room A102 7:30 pm UW Public Viewing Night 9:00 pm	19	20	21 Green Lake Star Party Paramount Park Star Party
22	23  SAS Board Meeting 7:00 pm	24	25	26	27	28 Amateur Telescope Makers SIG Meeting 6:30 pm
29	30 	31	1 UW Public Viewing Night 9:00 pm	2	3	4

Cassini is now part of the Saturnian system

News Source: Space.com, NASA and The Planetary Society

June 30, 2004 at 9:12 pm PDT, exactly one second ahead of schedule, Cassini completed its 96 minute engine burn and entered orbit around Saturn. As expected, the firing of the engine slowed down the spacecraft and enabled it to be captured by Saturn's gravity and enter orbit around the planet.

Despite the burn, Cassini's speed actually increased during the 96 minutes from 54,500 Miles per hour to 67,000 miles per hour because of Saturn's strong gravitational pull. Were it not for the engine burn, the spacecraft would have accelerated far more and continued on to the outer reaches of the Solar System.

Cassini successfully completed its ascending passage through the rings of Saturn. With its high-gain antenna pointing the way and shielding the spacecraft from rock and dust particles, the spacecraft flew successfully between the sparse F and G rings. The first signal from the spacecraft confirming the successful passage was received at 7:30 pm, when the low gain antenna was pointed towards the Earth.

Despite some concerns, the 70 meter dish at Canberra, Australia, is fully operational and was available to receive the transmission from the spacecraft. It is the only antenna in NASA's deep space network sensitive enough to receive signals from Cassini's low-gain antenna. NASA had only one shot at a Saturn orbit insertion. If the burn wouldn't have worked, we would have observed a Saturn flyby and that's not what this mission was about.

After a nearly seven-year journey covering 3.5 billion kilometers, the Cassini probe is poised to spend the next four years exploring Saturn and its many moons.

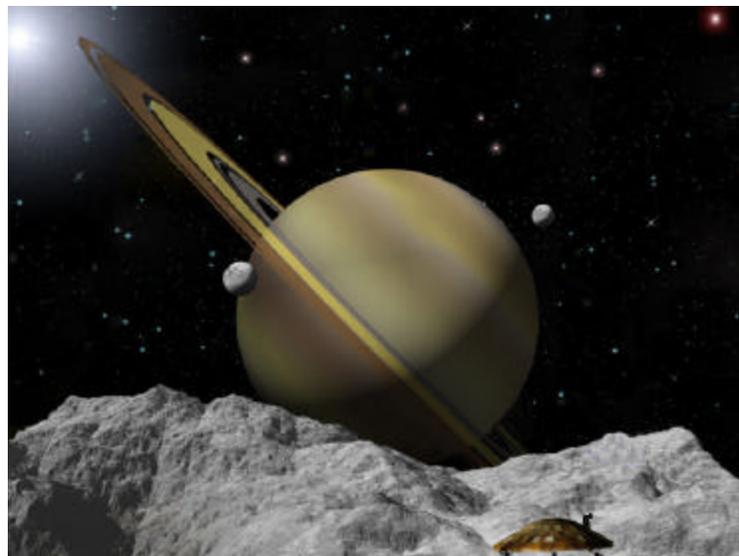
Dr. Charles Elachi, JPL director and team leader on the radar instrument onboard Cassini, said, "It feels awfully good to be in orbit around the lord of the rings. This is the result of 22 years of effort, of commitment, of ingenuity, and that's what exploration is all about."

NASA, the European Space Agency and the Italian Space Agency already have spent about \$3 billion building, launching and operating the Cassini-Huygens Saturn mission. The three partners are hoping for at least four years of operations yielding 76 orbits around the Saturn system, including 52 close encounters with seven of the planet's 31 known moons. Cassini has enough propellant on board, however, to last 10 years or longer, depending on what kind of objectives are set for an extended mission.

Charles Elachi, director of NASA's Jet Propulsion Laboratory, Pasadena, Calif. and a 15-year veteran of the Cassini science team, said the objectives of the primary mission are threefold: to study Saturn itself, to study the planet's brilliant rings, and to study its many moons. To accomplish these science goals, Cassini is equipped with 12 sophisticated instruments and a 320-kilogram stowaway, the European-built Huygens Probe.

Cassini is expected to release the Huygens probe Dec. 24 during a flyby of Titan, Saturn's largest moon. About three weeks later it will plunge into Titan's atmosphere for a leisurely two-hour parachute drop down to the moon's surface, its six instruments sending back pictures and other data all along the way. ☐

(Read more: http://www.space.com/scienceastronomy/cassini_rings_040701.html)



Artist's conception of the Cassini Probe on Saturn's moon Titan

Space Bits

SpaceShipOne—First Manned Private Spaceflight

On June 21, 2004, SpaceShipOne became the first privately owned aircraft to enter space. Test pilot Michael Melvill (age 62) took SpaceShipOne to the altitude of 62.5 miles (100 km) above the Earth's surface. Flying to this altitude officially makes Melvill an astronaut.

SpaceShipOne and White Knight took off at 9:45 EDT, and SpaceShipOne was released from White Knight at around 50,000 feet. After a few seconds of freefall, Melvill fired SpaceShipOne's hybrid rocket motor for 80 seconds, propelling him into space for three and half minutes. SpaceShipOne landed safely just over an hour after it took off. Despite of a few glitches in the trajectory and pitch trim, this flight is considered a success and marks a critical turning point in the history of aerospace.



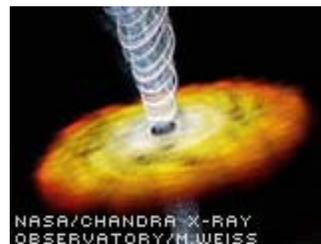
Photo courtesy Scaled Composites, LLC

Link: http://www.space.com/missionlaunches/sso_rutan_archive.html ☒

A Massive black hole 10 billion times larger than sun stumps researchers

Sitting at the heart of a distant galaxy, the black hole appears to be about 12.7 billion years old, which means it formed just one billion years after the universe began and is one of the oldest supermassive black holes ever known.

The black hole, researchers said, is big enough to hold 1,000 of our own Solar Systems and weighs about as much as all the stars in the Milky Way.



Link: http://www.space.com/scienceastronomy/heavy_blazar_040628.html

Perseids Should be Good This Year

Thursday, August 12 enjoy the annual Perseid meteor shower. Observers in North America should be able to see up to 200 meteors an hour when the Earth passes through this filament, in addition to the regular 40-60 meteors/hour we see every year.

Link: http://www.universetoday.com/am/publish/perseids_should_be_good.html ☒

Mars Rovers continue to surprise, now put on to 'brand new missions'

NASA said both rovers are healthy. Two interplanetary Energizer bunnies NASA's Spirit and Opportunity rovers, keep going and going. Mission controllers had to troubleshoot two software glitches in the past few weeks that caused Spirit to unexpectedly shut itself down. The rover is back to normal now. And Opportunity is now regularly powering down to "deep sleep" mode at night, a move designed to keep a heater stuck in the "on" mode from draining the onboard power supply during the bitterly cold overnight hours.

Link: <http://www.cnn.com/2004/TECH/space/06/03/mars.rover.trucking/index.html> ☒

Comet Wild 2—UW astronomy professor leads NASA's Stardust mission

A detailed analysis of the comet Wild 2 (pronounced "Vilt 2") has left astronomers astounded at an object that has no known peers in the solar system. NASA's Stardust probe, on a mission led by University of Washington astronomy professor Donald Brownlee, is bringing some of the primal dirt and its secrets to Earth. The comet, examined in a close flyby in January by Stardust spacecraft, has towering protrusions and steep-walled craters that seem to defy gravity. More than a dozen jets of material shoot out from its insides. Dust swirls around the comet in unexpectedly dense pockets. Among the bizarre features are two depressions with flat floors and nearly vertical walls that resemble giant footprints. They aren't structured like typical impact craters.



Photo courtesy Space.com

Link: http://www.space.com/scienceastronomy/stardust_results_040617.html ☒

Some Stellar Facts

Pulsars are dead stars that have collapsed. Some spin around in as little as 1/500 second, pretty fast for a body that contains as much mass as the Sun.

Astronomers think that all of the normal matter in the universe makes up only about 5 percent of the contents of the universe. Dark matter is thought to make up about 25 percent, and a strange form of energy known as the cosmological constant is thought to make up the remaining 70 percent.

Friday, July 2nd and Saturday, July 31st brings us the two full Moons this month. Some almanacs and calendars assert that when two full Moons occur within a calendar month, the second full Moon is called the "Blue Moon."

We promise you the sun, moon and 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 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.



We're on the Web!
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