



August 2004

Special points of interest:

- Third Annual Goldendale star party in Sept.
- SAS volunteer opportunities
- New entrant in the space race—Project da Vinci's spacecraft Wild Fire

August Meeting:

"Proposal to Purchase Land for SAS Dark Sky Observing Site"

Mark de Regt (VP Publicity) and Thomas Vaughn (Secretary) have been exploring the feasibility of purchasing land in eastern Washington for the SAS to use as a dark sky site. They will present what they have learned to date and there will be an open discussion on the issues involved in acquiring and managing a club-observing site.



If time permits, members will also be able to raise other issues for discussion.

Meeting Information

Speaker: Mark de Regt and Thomas Vaughn

Purchase Land for Dark Sky Observing Site

Wednesday, August 18
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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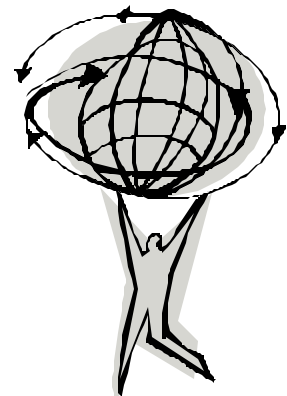
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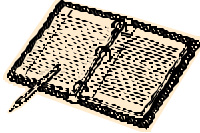
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From the President's Desk...

By Stephen Van Rompaey

The weather has been reasonably good this summer with a lot of opportunities for observing. Many clear dark nights have actually fallen on weekends, which is especially fortuitous. Looking ahead to future observing opportunities I want to remind everyone that the Third Annual Goldendale star party will be held during the weekend of September 11th. Karl Schroeder is the organizer and you should contact him if you would like more information at KSchroe225@aol.com.

Although I thought I made a compelling case, no one has contacted me to volunteer as either our VP Programs or Banquet Chair.

Historically, finding volunteers for these two positions has been difficult and the club gets by with a couple of individuals doing these jobs for several years. For most of the time since becoming President we have been without a VP Programs and I have located speakers for our meetings.

Speaking from this experience I can say that finding speakers for club meetings is relatively easy. Most of our speakers are individuals who give talks for a living as faculty at UW. They are constantly giving talks in their professional capacity and can easily revise a presentation for the SAS. Equally important, these speakers like amateur astronomers, mostly because every professional astronomer starts out in some way as an amateur and they continue to feel an affinity toward astronomy as a hobby.

While it seems a little early, the lack of volunteers for these two positions has me worried about finding new officers for the election in November. All but one of the Board members are currently serving in their position for a second year and according to the SAS by-laws must relinquish their office at the end of the year. It is unreasonable to expect that these Board members will simply shift to another position after serving the club for two years. I would like those of you who have never held a position in the

**Interested in serving as our
VP-Programs
or Banquet Chair?**

**Please contact
"president@seattleastro.org"**

club to give serious thought to becoming a club officer. Ask yourself if there is anything that could be done to make serving as club officer sufficiently attractive that you would volunteer. So, please feel free to send me an email (president@seattleastro.org) or give me a call (425.564.8619) if you have questions or some ideas. ☐

Observing Award Programs

The Astronomical League sponsors several (23 so far) observing programs for its members and others are being developed. The equipment required for these various programs ranges from the unaided eye to telescopes with solar filters. The objects of study range from very near solar system to very deep sky. Likewise, there are observing programs to challenge both beginning and experienced observers.



The Messier Club

The Messier Club is the oldest of the Astronomical League observing award programs. Observers wishing to earn a Messier certificate must independently locate, observe and log at least 70 Messier objects for a regular certificate. Observers who log all the Messier objects earn an honorary certificate and a distinctive pin. Computer controlled telescopes and digital setting circles are not allowed in this program whose purpose is to teach you to learn your way around the night sky. This program is based on the League manual *Observe: A Guide to the Messier Objects*. The manual includes descriptions of the objects and log sheets for recording your observations.

The Binocular Messier Club

This program is for beginning observers as well as experienced amateurs. Special arrangements have been made to offer this program to teachers for use as a classroom observing project at any grade level. The only equipment needed is a pair of binoculars. Any binoculars may be used, but those with objectives between 20mm and

80mm are recommended. An award is given for observations of at least 50 Messier objects using only binoculars. Any of the recognized 110 Messier objects may be observed. Observations must be recorded on log sheets similar to those found in the League manual *Observe: A Guide to the Messier Objects*.

The Lunar Club

This is the program for deep sky observers who are frustrated by moonlight! This is the program for city dwellers who are frustrated by light pollution! This is the program for young and old, new and seasoned observers alike! Remember: full moons bring clear skies! The Lunar observing club introduces our nearest celestial neighbor in a systematic way. Starting with naked eye observations and continuing with binocular and telescopic observations, you need only examine 100 specific aspects and features of the moon to qualify. All observations have been accomplished with binoculars as small as 7x35 and telescopes as small as 60mm refractors. For a real challenge, see how small an aperture will reveal the requisite detail!

The Double Star Club

This Club will introduce observers to 100 of the finest double and multiple stars in the heavens. A large telescope is not necessary since all stars on the qualifying list have been observed using a 3" refractor. You need not travel to the darkest sky sites since many of the stars will be visible from your backyard. See what you can do with your existing equipment from any location!

The Herschel 400 Club and the Herschel II Club

The Herschel Clubs are for more advanced deep sky enthusiasts. This observing program is more challenging than the Messier Club. An observer must locate and log 400 specified objects from William Herschel's catalog to qualify for the Herschel 400 award, then observe an additional 400 objects to qualify for the Herschel II award. Many of these objects are faint, but all can be seen in a quality six-inch scope under dark skies by an experienced observer. The Herschel Clubs are based on the League Manuals *Observe the Herschel Objects* and *Observe the Herschel II Objects*.

Link: <http://www.astroleague.org/al/astrnote/astnot12.html> ✕

Waiting for Cassini's "Safe Arrival" Call



By Diane K. Fisher

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

The evening of June 30, 2004, was nail-biting time at Cassini Mission Control. After a seven-year journey that included gravity assist flybys of Venus, Earth, and Jupiter, Cassini had finally arrived at Saturn. A 96-minute burn of its main engine would slow it down enough to be captured into orbit by Saturn's powerful gravitational field. Too short a burn and Cassini would keep going toward the outer reaches of the solar system. Too long a burn and the orbit would be too close and fuel reserves exhausted.

According to Dave Doody, a Cassini Mission Controller at the Jet Propulsion Laboratory (JPL) in Pasadena, California, there was a good chance the Earth-bound Cassini crew would have to wait hours to learn whether or not the burn was successful. Of the three spacecraft-tracking Deep Space Network (DSN) complexes around the globe, the complex in Canberra, Australia, was in line to receive Cassini's signal shortly after the beginning of the burn. However, winds of up to 90 kilometers per hour had been forecast. In such winds, the DSN's huge dish antennas must be locked into position pointed straight up and cannot be used to track a tiny spacecraft a billion miles away as Earth turns on its axis. "The winds never came," notes Doody. The DSN complex at Goldstone, California, was tracking the carrier signal from Cassini's low-gain antenna (LGA) when the telltale Doppler shift in the LGA signal was seen, indicating the sudden deceleration of the spacecraft from the successful ignition of the main engine. Soon thereafter, however, Goldstone rotated out of range and Canberra took the watch.

After completion of the burn, Cassini was programmed to make a 20-second "call home" using its high-gain antenna (HGA). Although this HGA signal would contain detailed data on the health of the spacecraft, mission controllers would consider it a bonus if any of that data were actually captured. Mostly, they just wanted to see the

increase in signal strength to show the HGA was pointed toward Earth and be able to determine the spacecraft's speed from the Doppler data. If possible, they also wanted to try to lock onto the signal with DSN's closed-loop receiver, a necessary step for extracting engineering data.

Normally it takes around one minute to establish a lock on the HGA signal once a DSN station rotates into range. Having only 20 second's worth of signal to work with, the DSN not only established a lock within just a few seconds, but extracted a considerable amount of telemetry during the remaining seconds.

"The DSN people bent over backwards to get a lock on that telemetry signal. And they weren't just depending on the technology. They really know how to get flawless performance out of it. They were awesome," remarks Doody.

Find out more about the DSN from JPL's popular training document for mission controllers, Basics of Space Flight (www.jpl.nasa.gov/basics) and the DSN website at deepspace.jpl.nasa.gov/dsn. For details of the Cassini Saturn orbit insertion, see www.jpl.nasa.gov/basics/soi. Kids can check out The Space Place at spaceplace.nasa.gov/en/kids/dsn_fact1.shtml to learn about the amazing ability of the DSN antennas to detect the tiniest spacecraft signals. ☒

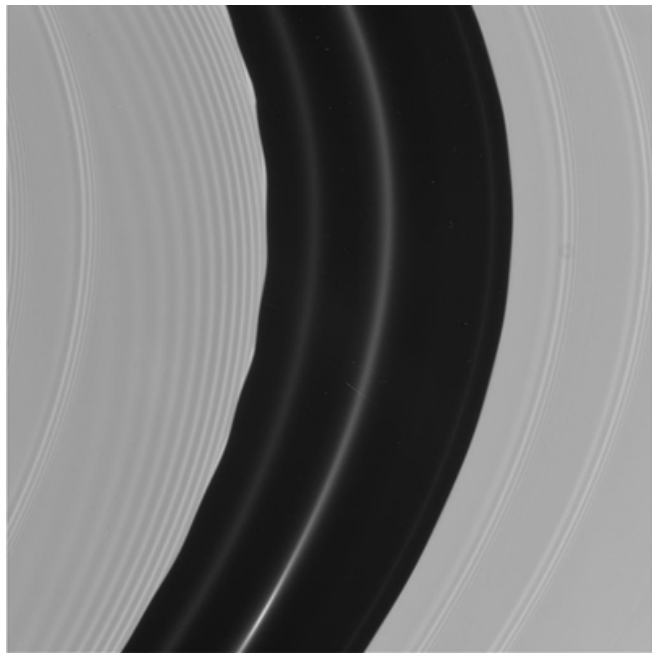






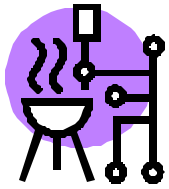
Image credit NASA/JPL/Space Science Institute.

Right after entering Saturn orbit, Cassini sent this image of the part of the Encke Gap in Saturn's rings







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
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



September 2004

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

July Minutes

by Thomas Vaughan

Announcements

- A reminder that the Greenlake Star Party is this weekend.
- An introduction and thank-you to our new newsletter editors!
 - Editor: Saurabh Saxena
 - Co-editor: Rose Millican
- The VP of Programs position is still open. Stephen Van Rompaey is looking for volunteers for this position!
- We are also looking for a banquet chair. The venue has been reserved, but we still need someone to coordinate with them, advertise, help with a speaker, etc. Please see Stephen if you are interested.

Talk: Flare Stars—Speaker: Suzanne Hawley, University of Washington

Suzanne Hawley is a Professor in the Department of Astronomy at the University of Washington. Her talk was about recent flares and studies of our sun, as well as her own studies of more distant stars that flare more often.

Professor Hawley started with recent observations of the sun. Even though we are approaching a minimum of the sunspot cycle, there are still interesting sunspots to be seen on the sun. There is a particularly large sunspot on the sun now (number 652), and it flared just a day or two ago. When the solar wind hits us (another day or so) there will be some spectacular aurora effects.

Many of the mechanisms behind flares are understood, but there are still many factors that we do not understand, nor can we predict flares very accurately. Most sunspots are magnetic hotspots on the sun, and have strong magnetic loops attached. It is believed that the interaction of these loops is what causes flares.

There are spectacular pictures of coronal loops, which is hot plasma (around 1 million degrees) following these magnetic loops. When the field lines suddenly snap into a new configuration, nearby loops can join, and for a brief second two very powerful

particle jets are created: one firing charged particles away from the sun, and one firing particles back into the sun. The outbound particles join the solar wind, and create the aurora here on Earth (and powerful jets can damage electronic equipment). The inbound particles superheat that part of the sun's surface, causing the visible flare on the surface.

The particle jet that hits the sun's surface creates an initial hard X-Ray burst, followed by a more gentle tail of soft X-Rays, ultraviolet, and even visible light, as energetic plasma cools.

Professor Hawley had some amazing photos and videos of solar flares. She then talked about how the flare signatures (hard X-Ray burst, followed by longer emissions of softer X-Rays) could be used to study flares on more distant stars. Most dwarf stars (particularly the M series) is susceptible to flares, so much so that they are called "flare stars". They erupt with flares much more often than our sun.

Professor Hawley studies one flare star in particular: AD Leo, by the bright star Gamma Leo. Recently, she was able to acquire time on the Hubble telescope, along with time on Earth-bound observatories. During a period of a few days, she had several hours of Hubble exposures that managed to capture several flares, one of them quite large.

They have used the observations to help put together computer models of flares, to try and predict them better. One of her graduate students is working on a model of how the incoming particle jet penetrates and heats the star's outer surface.

Professor Hawley had some web links for people who are interested in flares. Astrophotographers, for instance, can use flare information to predict good times to photograph the aurora. ☼

<http://www.spaceweather.com/>
<http://hesperia.gsfc.nasa.gov/sftheory/>
<http://sohowww.nascom.nasa.gov/>

Space Bits

Wild Fire—da Vinci Project Spaceflight

An all-volunteer Canadian team hopes to edge out the lead contender in a \$10-million contest to fly a privately-developed passenger spaceship beyond Earth's atmosphere.

The da Vinci Project of Toronto unveiled its launch vehicle on Thursday and announced plans to fire off its rocket on Oct. 2 for the first round of a two-part space race. The flight is scheduled to occur just three days after frontrunner Scaled Composites of Mojave, Calif., flies a ship it developed in partnership with Microsoft co-founder Paul Allen called SpaceShipOne.

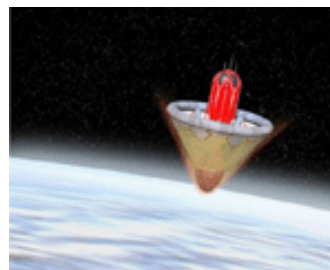


Photo courtesy da Vinci Project

On the other hand Space Transport Corp., another X Prize Contender, suffered a major setback on August 8th when their rocket - Rubicon 1 - exploded shortly after takeoff from a launch pad in Northwest Washington State. The test flight was unmanned, so no one was hurt.

Link: <http://www.davinciproject.com/beta/index.html> ☒

A 30 minute thrill ride is just 6 years away

In about 6 years, reusable rocket ships like the one tested June 21 by Scaled Composites will give stargazers the ride of their lives. Price: \$150,000. That'll drop to \$20,000 after another five years or so. Likely competitors: Armadillo, PanAero, XCOR, Micro-Space and Suborbital.

But private-sector space flight won't be limited to tourism. The industry will give researchers an affordable option for testing ideas and products. Manufacturers of small satellites will have an easier way to launch vehicles into orbit. Look for many other uses to emerge... everything from ads on rockets to scattering cremated remains in space.

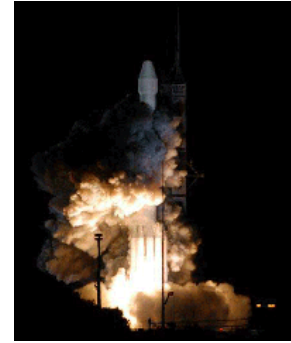
Source: July 2, 2004 edition of *The Kiplinger Letter*, written by *The Kiplinger Washington Editors*. ☒

NASA launches spacecraft named Messenger to Mercury; 8 billion km to go

The spacecraft Messenger recently rocketed away on a long quest to reveal the secrets of mysterious, super hot Mercury, the sun's nearest planet.

"A voyage of mythological proportions," a NASA flight controller announced as soon

as Messenger shed its final rocket stage hours before dawn. The journey will take 6½ years, covering nearly more than eight billion kilometers on a roundabout ramble through the inner solar system. The probe should reach Mercury by March 2011, then spend a year gathering data.



Scientists want to know how the planet turned out the way it did, and whether the perpetually dark craters at the poles hold ice. Anything scientists can learn about how Mercury formed will shed light on the origins of Venus, Earth and Mars, each one very different.

Link: http://messenger.jhuapl.edu/why_mercury/index.html

http://www.nasa.gov/mission_pages/messenger/main/index.html ☒

Cassini Sees Lightning on Saturn

In orbit around Saturn for more than a month now, the Cassini spacecraft has been sending back mountains of scientific data. It's now detected flashes of lightning, a new radiation belt, and a glow around Titan, Saturn's largest moon. The spacecraft's radio and plasma wave science instrument is detecting the lightning, which varies from day to day; a dramatically different situation from what the Voyagers found 20 years ago. The new radiation belt is just above Saturn's cloud tops and extends around the planet, yet the radiation particles are able to "jump over" the planet's rings.

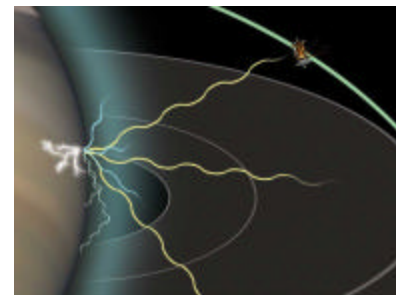


Photo courtesy NASA/JPL/University

Link: http://www.nasa.gov/mission_pages/cassini/media/cassini-080504.html ☒

Some Stellar Facts

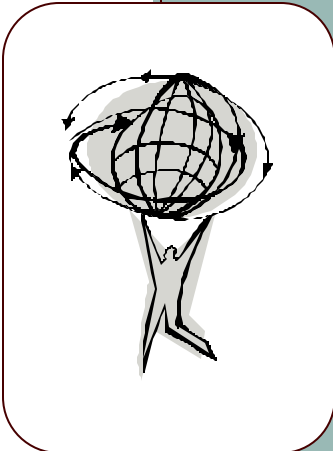
Cosmic rays are not "rays" at all, but high-energy subatomic particles from space that continuously bombard the earth's atmosphere.

A Supernova explosion produces more energy in its first ten seconds than the Sun during the whole of its 10 billion year lifetime and that for a brief period, it creates more energy than the rest of a galaxy put together.

The Milky Way spins through space at a staggering 2.1 million kph (1.3 million mph).

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!
www.seattleastro.org

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