the Webfooted Astronomer

The Seattle Astronomical Society

March 2006

Special points of interest:

- Dark Sky Site News
- Jodrell Bank Astronomers Find New Type of Star
- Is the Universe Infinite?
- SAS January Banquet Photos

March Meeting:

March 15, 2006

Barred Spiral Galaxies

Victor Debattista, University of Washington

The program for the March 15 meeting is Victor Debattista, a post-doc at the University of Washington. Please visit his web page: http://www.astro.washington.edu/debattis/

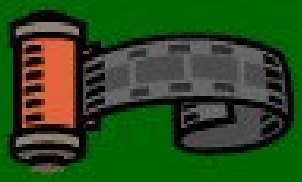
He will speak about Barred Spiral Galaxies.

Meeting Information

Wednesday, March 15
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!



In this issue:

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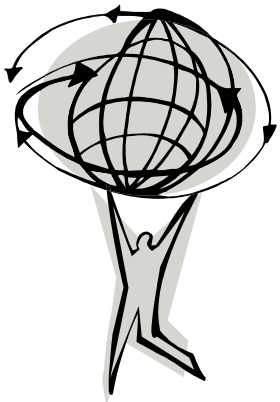


From the President's Desk…

Dark Sky Site News

By Thomas Vaughan

Dark Sky Site

Thanks to all who showed up at the Dark Sky Members meeting on February 9th! We agreed on a couple of initiatives to further the fundraising efforts, and are starting to think beyond fundraising to how to manage improvements to a site once it is purchased. If you haven't already heard: a donor has offered to match up to $15K of donations, which has really accelerated the project.

At the moment we have 24 dark sky members, who have made over $5000 in donations. Their efforts, plus the matching donations, means **we are 62% of the way towards purchasing a site.** If you are interested in being a part of this effort, join now! Details are in this newsletter, and on the SAS website at http://www.seattleastro.org/dark-sky.html.

Upcoming Meetings

Bruce Kelley has been scheduling a number of speakers for future months. But he has also scheduled more time for SAS events and speakers. Is there a topic you would especially like to hear about? Or is there a talk you would enjoy giving? Do you know of someone else in the Society who has a fascinating astronomy story to tell? Let Bruce know! We are always looking for suggestions to try new and different things at the SAS meetings. Contact Bruce (programs@seattleastro.org) or myself (president@seattleastro.org) if you have ideas.

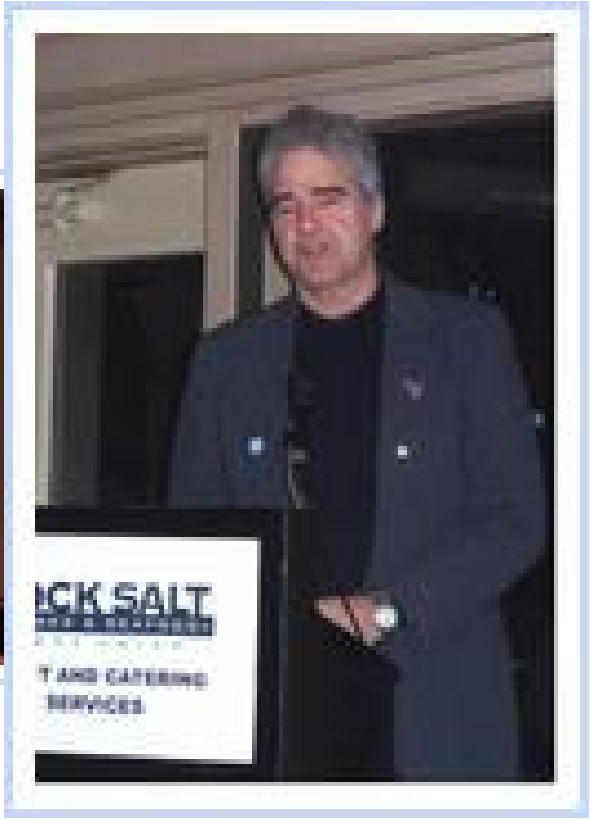
VP Membership

The SAS is looking for a VP of Membership. Duties include mailing membership packets to new members, and in general helping to find and welcome new members! Contact an SAS Board member if you are interested.

Happy Observing-

-Thomas

SAS January Banquet Photos

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SAS February 2006 Club Meeting Minutes

Announcements:

Des Moines Elementary School will be having a star party on either 3/10 or 3/24 from about 6-9PM. SAS members are invited and encouraged to participate.

Public observing nights are held at the UW Theodore Jacobson Observatory on the first and third Wednesday of each month. SAS partners in this outreach program and volunteers are always welcome to assist. Contact Karl Schroeder for more information.

The Dark Sky Site initiative is approximately 50% of the way towards the goal needed to start shopping for a site. A generous offer of $15,000 in matching funds has been made for donations over and above the initial membership fee.

A recap was given of the members who received awards during the 2006 SAS banquet.

Meeting Topic:
SAS member Bob Suryan gave a lively and entertaining account of "My Summer Vacation or How I Shed a Thousand Pounds", with many pictures of his visit to Edinborough and London, including a rare close-up visit to Stonehenge.

High Energy Particle Award winner Maxine Nagel provided a great presentation about her visit to Meteor Crater in Northern Arizona complete with lots of good photos.

Meeting was adjourned around 9:00PM.

Space Bits

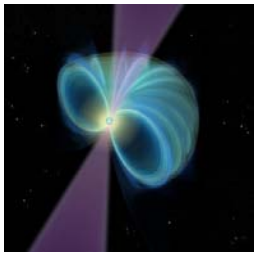


Image Credit: Russell Kightly Media

Jodrell Bank astronomers find new type of star

Astronomers of the University of Manchester's Jodrell Bank Observatory (UK) have led an international team which used the Parkes radio telescope in Australia to find a new kind of cosmic object which sends out radio flashes. These flashes are very short and very rare: one hundredth of a second long, the total time the objects are visible amounts to only about one tenth of a second per day.
Link: http://www.jb.man.ac.uk/news/rrats/

Modeling Giant Cores

University of Minnesota researchers Renata Wentzcovitch and Koichiro Umemoto and Philip B. Allen of Stony Brook University have modeled the properties of rocks at the temperatures and pressures likely to exist at the cores of Jupiter, Saturn and two exoplanets far from the solar system. They show that rocks in these environments are different from those on Earth and have metallic-like electric and thermal conductivity. These properties can produce different terrestrial-type planets, with longer-lasting magnetic fields, enhanced heat flow to the planetary surfaces and, consequently, more intense "planetquake" and volcanic activity.

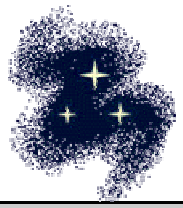
Link: http://www.astrobio.net/news/modules.php?op=modload&name=News&file=article&sid=1877&mode=thread&order=0&thold=0

Image credit: NASA

The High Cost of Boots on the Moon

When President Bush announced his new Vision for Space Exploration in January 2004, he set NASA on a new course to return to the Moon, and maybe even set boots on the surface of Mars in the next few decades. Instead of a quick course change, NASA would work within a modestly increased budget to develop the new Crew Exploration Vehicle, while completing the International Space Station and retiring the Space Shuttle. Science, such as the Hubble Space Telescope, Mars rovers, and climate research wouldn't be affected.

Link: http://www.universetoday.com/am/publish/high_cost_boots_moon.html?2322006



March 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 UW Campus Observatory public viewing night	2 UW Astronomy Colloquium	3	4 Green Lake Star Party Paramount Park Star Party
5	6	7	8	9 UW Astronomy Colloquium	10	11 Amateur Telescope Makers SIG Meeting
12 Astrophot-ography/ Imaging SIG Meeting	13	14	15 SAS Meeting UW Campus Observatory public viewing night	16	17	18
19	20 SAS Board Meeting	21	22	23 UW Astronomy Colloquium	24	25 Tiger Moun-tain/Poo Poo Point Star Party
26	27	28	29	30	31	

April 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 Green Lake Star Party Paramount Park Star Party
2	**3**	**4**	**5** UW Campus Observatory public viewing night	**6**	**7**	**8**
9	**10**	**11**	**12**	**13**	**14**	**15** Amateur Telescope Makers SIG Meeting
16	**17**	**18**	**19** SAS Meeting UW Campus Observatory public viewing night	**20**	**21**	**22**
23 Texas Star Party **30** Texas Star Party	**24** Texas Star Party SAS Board Meeting	**25** Texas Star Party	**26** Texas Star Party	**27** Texas Star Party	**28** Texas Star Party	**29** Texas Star Party Tiger Mountain/Poo Poo Point Star Party

Micro-sats with Macro-potential

[By Patrick L. Barry]

Future space telescopes might not consist of a single satellite such as Hubble, but a constellation of dozens or even hundreds of small satellites, or "micro-sats," operating in unison.

Such a swarm of little satellites could act as one enormous telescope with a mirror as large as the entire constellation, just as arrays of Earth-bound radio telescopes do. It could also last for a long time, because damage to one micro-sat wouldn't ruin the whole space telescope; the rest of the swarm could continue as if nothing had happened.

And that's just one example of the cool things that micro-sats could do. Plus, micro-sats are simply smaller and lighter than normal satellites, so they're much cheaper to launch into space.

In February, NASA plans to launch its first experimental micro-sat mission, called Space Technology 5. As part of the New Millennium Program, ST5 will test out the crucial technologies needed for micro-sats—such as miniature thrust and guidance systems—so that future missions can use those technologies dependably.

Measuring only 53 centimeters (20 inches) across and weighing a mere 25 kilograms (55 pounds), each of the three micro-sats for ST5 resembles a small television in size and weight. Normal satellites can be as large and heavy as a school bus.

"ST5 will also gather scientific data, helping scientists explore Earth's magnetic field and space weather," says James Slavin, Project Scientist for ST5.

Slavin suggests some other potential uses for micro-sats:

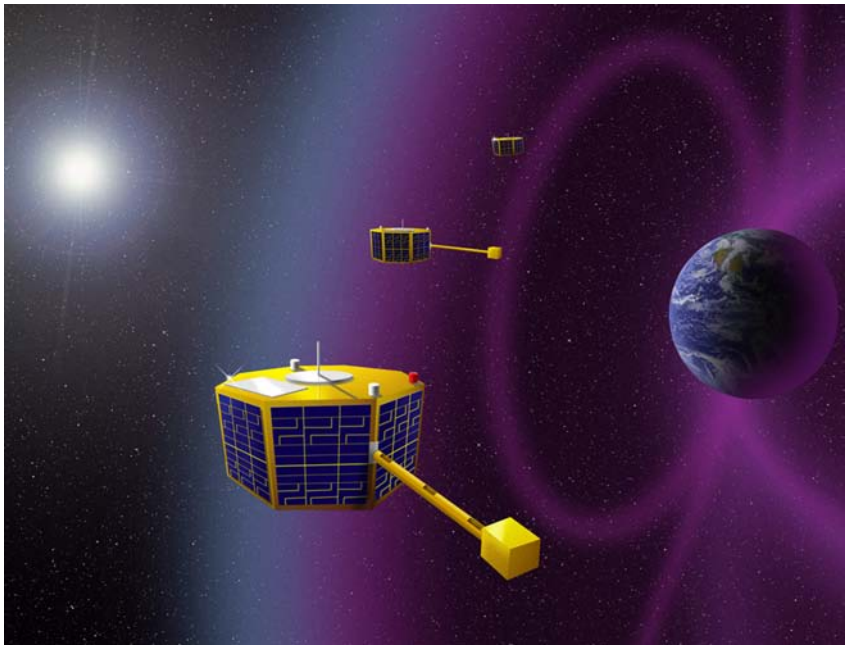
A cluster of micro-sats between the Earth and the Sun—spread out in space like little sensor buoys floating in the ocean—could sample incoming waves of high-speed particles from an erupting solar flare, thus giving scientists hours of warning of the threat posed to city power grids and communications satellites.

Or perhaps a string of micro-sats, flying single file in low-Earth orbit, could take a series of snapshots of violent thunderstorms as each micro-sat in the "train" passes over the storm. This technology would combine the continuous large-scale storm monitoring of geosynchronous weather satellites—which orbit far from the Earth at about 36,000 kilometers' altitude—with the up-close, highly detailed view of satellites only 400 kilometers overhead.

If ST5 is successful, these little satellites could end up playing a big role in future exploration.

The ST5 Web site at nmp.jpl.nasa.gov/st5 has the details. Kids can have fun with ST5 at spaceplace.nasa.gov, by just typing ST5 in the site's Find It field.

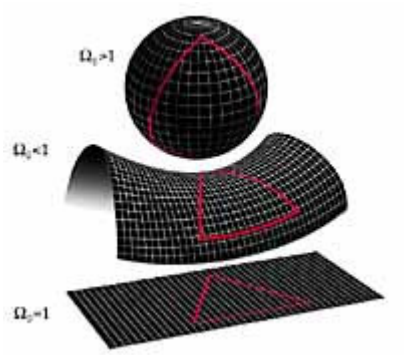
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



The Space Technology 5 mission will test crucial micro-satellite technologies.

Is the Universe Infinite?

The shape of the universe is determined by a struggle between the momentum of expansion and the pull of gravity. The rate of expansion is expressed by the Hubble Constant, H_o, while the strength of gravity depends on the density and pressure of the matter in the universe. If the pressure of the matter is low, as is the case with most forms of matter we know of, then the fate of the universe is governed by the density. If the density of the universe is less than the "critical density" which is proportional to the square of the Hubble constant, then the universe will expand forever. If the density of the universe is greater than the "critical density", then gravity will eventually win and the universe will collapse back on itself, the so called "Big Crunch". However, the results of the WMAP mission and observations of distant supernova have suggested that the expansion of the universe is actually accelerating which implies the existence of a form of matter with a strong negative pressure, such as the cosmological constant. This strange form of matter is also sometimes referred to as the "dark energy". If dark energy in fact plays a significant role in the evolution of the universe, then in all likelihood the universe will continue to expand forever.



Geometry of the Universe

The density of the universe also determines its geometry. If the density of the universe exceeds the critical density, then the geometry of space is closed and positively curved like the surface of a sphere. This implies that initially parallel photon paths converge

slowly, eventually cross, and return back to their starting point (if the universe lasts long enough). If the density of the universe is less than the critical density, then the geometry of space is open, negatively curved like the surface of a saddle. If the density of the universe exactly equals the critical density, then the geometry of the universe is flat like a sheet of paper. Thus, there is a direct link between the geometry of the universe and its fate.

The simplest version of the inflationary theory, an extension of the Big Bang theory, predicts that the density of the universe is very close to the critical density, and that the geometry of the universe is flat, like a sheet of paper. That is the result confirmed by the WMAP science.

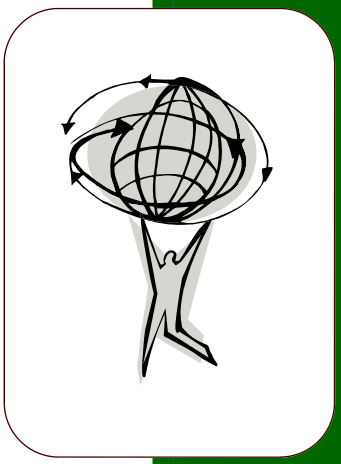
Measurements from WMAP

The WMAP spacecraft can measure the basic parameters of the Big Bang theory including the geometry of the universe. If the universe were open, the brightest microwave background fluctuations (or "spots") would be about half a degree across. If the universe were flat, the spots would be about 1 degree across. While if the universe were closed, the brightest spots would be about 1.5 degrees across.

Recent measurements (c. 2001) by a number of ground-based and balloon-based experiments, including MAT/TOCO, Boomerang, Maxima, and DASI, have shown that the brightest spots are about 1 degree across. Thus the universe was known to be flat to within about 15% accuracy prior to the WMAP results. WMAP has confirmed this result with very high accuracy and precision. We now know that the universe is flat with only a 2% margin of error.

Source: http://wmap.gsfc.nasa.gov/m_uni/uni_101shape.html

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.

The Seattle Astronomical Society

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Total amount enclosed:	$_____

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