



December 2005

Special points of interest:

- Banquet
- Titan's Atmosphere Surprised Scientists
- Comets in Ancient Cultures

December Meeting:

The Christmas Star

The legend of a star, a very special star believed by many to have heralded the birth of the Christ, is a cherished part of our Christmas traditions, both religious and secular. Whether we believe there was just such a star or that the star is simply a lovely creation of time and tradition, the power of the Christmas Star to fascinate and draw upon our imagination and sense of wonder is undeniable. What is the origin of this beautiful and mystical image? Is it symbolic myth? Or was there, in fact, an actual star—observed, interpreted and followed?

The Seattle Astronomical Society is pleased to welcome long-time member, associate and friend Tom Colwell and his presentation on the Christmas Star. Tom traces the story of the Star, pursuing an intriguing search for the facts behind the legend^{3/4}through history, science, and religious traditions—to uncover a thought-provoking explanation.

Tom Colwell is a past-Chairman of the Northwest Region of the Astronomical League, and past-Trustee and long-time member of the Seattle Astronomical Society. He has been lecturer and program producer for the Willard Geer Planetarium at Bellevue Community College as part of their community education program. He also has worked with the Pacific Science Center in the planetarium, training their staff in astronomy education and teaching their local-school astronomy programs. He is the founding-father of the well-known – now 25-years old – Table Mountain Star Party held each summer on Table Mountain in eastern Washington. He has served as the Chairman of Washington State Astronomy Week. For many years Tom was the principal of TRC Consultants, working as a management, health-care, and legal systems consultant specializing in organization development and information technology. He is now working with a variety of organizations and individuals as an executive / corporate coach.

Meeting Information

Wednesday, December 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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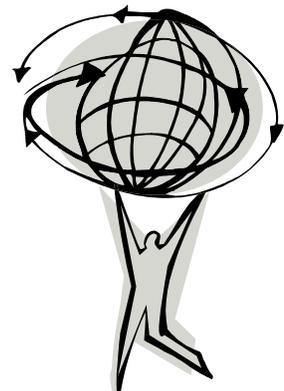
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From the President's Desk...

Banquet

By Thomas Vaughan

Banquet

Don't forget: the Annual SAS Awards Banquet is being held January 21st. There will be no regular SAS meeting at the UW in January (of course, we will be meeting on December 21).

As always, the banquet will feature fine food, witty conversation, and some fabulous door prizes. This year we are also organizing displays of astrophotography from SAS members. If you have some photos you've taken that you'd like to display, get in touch with the banquet chair (banquet@seattleastro.org).

I am most excited about this year's speaker, Dr. Peter Ward. Dr. Ward is a paleontologist and geologist (I've also seen him described as a paleobiologist) who has worked closely with astronomer Don Brownlee. Dr. Ward has written several popular science books on paleontology such as *Gorgon* and *Rivers in Time*, and with Dr. Brownlee has written *Rare Earth* and *The Life and Death of Planet Earth*, both interesting studies of Astrobiology applied to both Earth and the cosmos.

Send in your reservations now! This is as simple as sending a check in to our Treasurer, with a note on the check specifying your menu choices. See the Banquet page in this newsletter for details, or visit the online banquet information at <http://www.seattleastro.org/banquet.html>. I look forward to seeing you there.

One last note: we are still looking for a Banquet chair! The SAS Board (particularly our indefatigable treasurer, Scott) is managing the reservations, but we would love a member to step forward and help out with Banquet arrangements for the day. If you are interested please contact me (Thomas Vaughan, president@seattleastro.org).

Elections

Elections were held at the November meeting, and the results are as follows:

- President: Thomas Vaughan
- VP Programs: Bruce Kelley
- VP Education: Burley Packwood

- VP Publicity: Greg Scheiderer
- VP Membership: *open*
- Treasurer: Scott Cameron

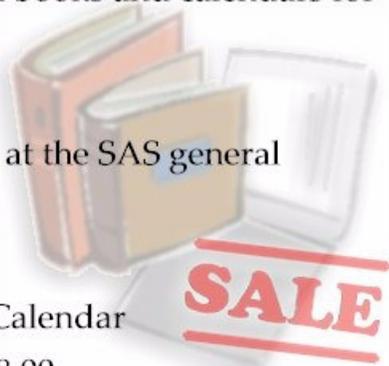
Congratulations to all of the officers. We are still looking for a VP of Membership!
Please contact me if you are interested.

Happy Observing-
-Thomas

Books & Calendars at Discounts!

The Seattle Astronomical Society has ordered books and calendars for sale to SAS members at a discounted price.

The following items will be available for sale at the SAS general meetings on Dec. 21.



Astronomy "Deep Space Mysteries" 2006 Calendar
List price: \$12.99 SAS Member price: \$8.00

The Year in Space 2006 Desk Calendar
List price: \$14.95 SAS Member price: \$10.00

Royal Astronomical Society of Canada Beginner's Observing Guide
List price: \$19.95 SAS Member price: \$17.00

Royal Astronomical Society of Canada Observer's Calendar 2006
List price: \$13.95 SAS Member price: \$10.00

Royal Astronomical Society of Canada Observer's Handbook 2006
List price: \$24.95 SAS Member price: \$18.00

The Latest Announcement on Our SAS BANQUET for 2006

Location	ROCK SALT ON LATITUDE 47° RESTAURANT & CATERING 1232 WESTLAKE AVENUE NORTH SEATTLE WA 98109
Date/Time	21 January, 2006 6:00-6:30pm: No Host Bar 6:30pm: Dinner served promptly
Menu	Roasted King Salmon or Prime Rib or Vegetarian Penne Pasta Entree will be served with: Caesar salad, garlic mashed potatoes, bread and butter, coffee or tea, dessert.
Cost	\$31.00 per person
Speaker	Dr. Peter Ward <i>Author of "Life as We Do Not Know It: The NASA Search for (and Synthesis of) Alien Life"; "Gorgon: Paleontology, Obsession, and the Greatest Catastrophe in Earth's History"; and with Don Brownlee, "Rare Earth" and "The Life and Death of Planet Earth".</i>
Payment	Send your entree choice and check (made out to SAS) for \$31.00 per person to the following address: Seattle Astronomical Society Attn: BANQUET P.O. Box 31746 Seattle, WA 98103 Questions? Contact Thomas Vaughan (banquet@seattleastro.org or (206) 772-1282)

SAS November 2005 Club Meeting Minutes



Announcements:

Dave Ingram from the Boeing Employees' Astronomical Society announced and distributed reservation forms for the 2005 Astronomers' Holiday Banquet on 12/5 at 6:00PM at the Museum of Flight. Guest speaker is NASA astronaut Dr. Bonnie Dunbar.

Dark Sky Site memberships and contributions are still being sought. About nineteen total memberships have come in so far.

The SAS banquet will be held at the Rock Salt on Lake Union restaurant on 1/21. Reservations should be sent to the SAS PO Box at least two weeks prior to the event.

Greg Sheiderer was introduced as the new VP of Publicity. A nominee for VP of Membership is still needed.

Thomas Vaughan introduced the slate for officer elections and made a motion to approve the slate, which was seconded and approved by acclamation.

Meeting Topic:

Douglas Downing, Ph.D., Seattle Pacific University provided an excellent and informative presentation on finding the distance to very distant galaxies, and the acceleration of the expansion of the universe.

Meeting was adjourned around 9:00PM.

Space Bits

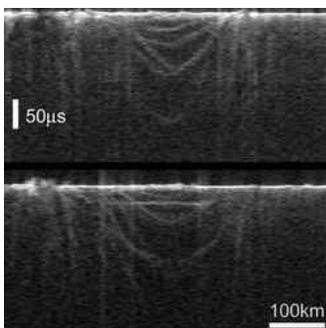


*Huygens probe descending through Titan's atmosphere.
Image credit: ESA*

Titan's Atmosphere Surprised Scientists

When ESA's Huygens probe passed through Titan's atmosphere on its way to a successful landing, it was buffeted by turbulence unexpected by scientists. Very little was known about Titan's atmosphere before Huygen's landing because the moon is shrouded by a thick hydrocarbon haze. Huygens found that the upper atmosphere was much thicker than expected, and broken up into several distinct layers. The probe also discovered possible evidence of lightning strikes around it.

Link: http://www.universetoday.com/am/publish/titan_turbulence_surprises.html?1122005

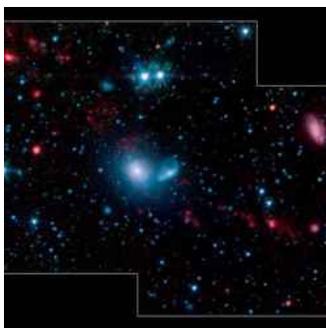


*MARSIS 'radargrams' of buried basin on Mars.
Image credit: ESA*

Mars Express Finds a Buried Impact Crater

Now that its MARSIS radar instrument is working perfectly, ESA's Mars Express has turned up evidence of buried impact craters, layered deposits at the Martian north pole, and deep underground water-ice. One unusual discovery is a 250-km diameter (155-mile) circular structure buried under the ground; probably an impact crater which seems to be a rich source of water ice.

Link: http://www.universetoday.com/am/publish/me_uncovers_mars_depth.html?1122005



*Spitzer captured galaxy interaction in this image of NGC 5291.
Image credit: NASA/JPL*

Dwarf Galaxies are Ablaze in Star Formation

When galaxies collide, it's a messy affair. Gas, dust and stars are often spun out into space and can form into satellite dwarf galaxies that continue to orbit their parent galaxies. NASA's Spitzer Space Telescope has spotted a few dwarf galaxies in the process of formation around a recent merger in NGC 5291. Spitzer found that the dwarf galaxies are ablaze with star formation.

Link: http://www.universetoday.com/am/publish/spitzer_ngc5291_star_formation.html?1122005



December 2005

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



January 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	 6	7
8	9	10	11	12	13	 14
15	16	17	18	19	20	21 SAS Banquet
 22	23	24	25	26	27	28
 29	30	31				

Voices from the Cacophony



[By Trudy E. Bell and Dr. Tony Phillips]

Around 2015, NASA and the European Space Agency plan to launch one of the biggest and most exacting space experiments ever flown: LISA, the Laser Interferometer Space Antenna.

LISA will consist of three spacecraft flying in a triangular formation behind Earth. Each spacecraft will beam a laser at the other two, continuously measuring their mutual separation. The spacecraft will be a mind-boggling 5 million kilometers apart (12 times the Earth-Moon distance) yet they will monitor their mutual separation to one *billionth* of a centimeter, smaller than an atom's diameter.

LISA's mission is to detect gravitational waves—ripples in space-time caused by the Universe's most violent events: galaxies colliding with other galaxies, supermassive black holes gobbling each other, and even echoes still ricocheting from the Big Bang that created the Universe. By studying the shape, frequency, and timing of gravitational waves, astronomers believe they can learn what's happening deep inside these acts of celestial violence.

The problem is, no one has ever directly detected gravitational waves: they're still a theoretical prediction. So no one truly knows what they "sound" like.

Furthermore, theorists expect the Universe to be booming with thousands of sources of gravitational waves. Unlike a regular telescope that can point to one part of the sky at a time, LISA receives gravitational waves from many directions at once. It's a cacophony. Astronomers must figure how to distinguish one signal from another. An outburst is detected! Was it caused by two neutron stars colliding *over here* or a pair of supermassive black holes tearing each other apart in colliding galaxies *over there*?

"It's a profound data-analysis problem that ground-based astronomers don't encounter," says E. Sterl Phinney, professor of theoretical physics at the California Institute of Technology in Pasadena.

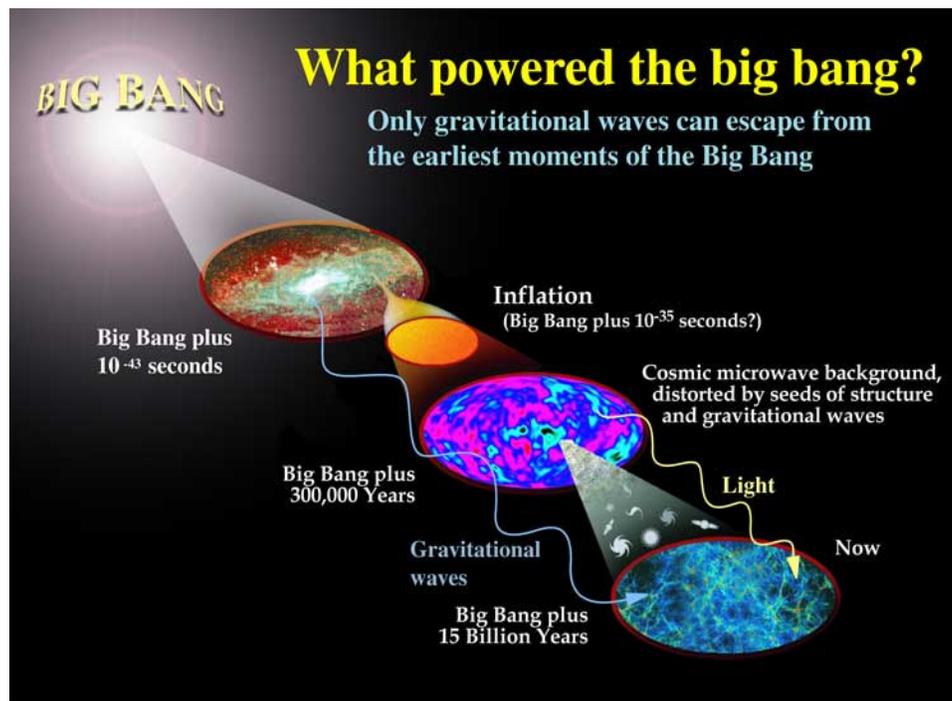
Profound, but not hopeless: "We have lots of good ideas and plans that work—in theory," he says. "The goal now is to prove that they actually work under real conditions, and to make sure we haven't forgotten something."

To that end, theorists and instrument-designers have been spending time together brainstorming, testing ideas, scrutinizing plans, figuring out how they'll pluck individual voices from the cacophony. And they're making progress on computer codes to do the job.

Says Bonny Schumaker, a member of the LISA team at the Jet Propulsion Laboratory: "It's a challenge more than a problem, and in fact, when overcome, a gift of information from the universe."

For more info about LISA, see lisa.nasa.gov. Kids can learn about black holes and play the new "Black Hole Rescue!" game on The Space Place Web site at <http://spaceplace.nasa.gov/en/kids/blackhole/>.

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



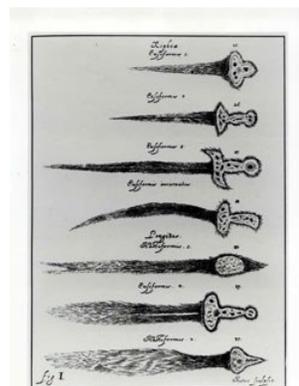
LISA will be able to detect gravitational waves from as far back as 10^{-36} second after the Big Bang, far earlier than any telescope can detect.

Comets in Ancient Cultures

[By Noah Goldman, U. Maryland, College Park Scholars]

Comets have inspired dread, fear, and awe in many different cultures and societies around the world and throughout time. They have been branded with such titles as "the Harbinger of Doom" and "the Menace of the Universe." They have been regarded both as omens of disaster and messengers of the gods. Why is it that comets are some of the most feared and venerated objects in the night sky? Why did so many cultures cringe at the sight of a comet?

When people living in ancient cultures looked up, comets were the most remarkable objects in the night sky. Comets were unlike any other object in the night sky. Whereas most celestial bodies travel across the skies at regular, predictable intervals, so regular that constellations could be mapped and predicted, comets' movements have always seemed very erratic and unpredictable. This led people in many cultures to believe that the gods dictated their motions and were sending them as a message. What were the gods trying to say? Some cultures read the message by the images that they saw upon looking at the comet. For example, to some cultures the tail of the comet gave it the appearance of the head of a woman, with long flowing hair behind her. This sorrowful symbol of mourning was understood to mean the gods that had sent the comet to earth were displeased. Others thought that the elongated comet looked like a fiery sword blazing across the night sky, a traditional sign of war and death. Such a message from the gods could only mean that their wrath would soon be unleashed onto the people of the land. Such ideas struck fear into those who saw comets dart across the sky. The likeness of the comet, though, was not the only thing that inspired fear.



Types of cometary forms, illustrations from Johannes Hevelius' Comographia (Danzig, 1668)

(Scan of original and caption from Don Yeomans' Comets: A Chronological History of Observation, Science, Myth and Folklore)

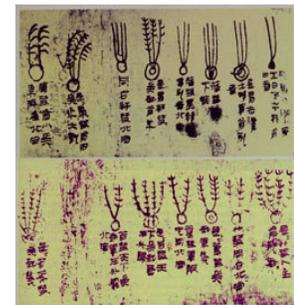
Ancient cultural legends also played a hand in inspiring a terrible dread of these celestial nomads. The Roman prophecies, the "Sibylline Oracles," spoke of a "great conflagration from the sky, falling to earth," while the most ancient known mythology, the Babylonian "Epic of Gilgamesh," described fire, brimstone, and flood with the arrival of a comet. Rabbi Moses Ben Nachman, a Jew living in Spain, wrote of God taking two stars from Khima and throwing them at the earth in order to begin the great flood. Yakut legend in ancient Mongolia called comets "the daughter of the devil," and warned

of destruction, storm and frost, whenever she approaches the earth. Stories associating comets with such terrible imagery are at the base of so many cultures on Earth, and fuel a dread that followed comet sightings throughout history.

Comets' influence on cultures is not limited simply to tales of myth and legend, though. Comets throughout history have been blamed for some of history's darkest times. In Switzerland, Halley's Comet was blamed for earthquakes, illnesses, red rain, and even the births of two-headed animals. The Romans recorded that a fiery comet marked the assassination of Julius Caesar, and another was blamed for the extreme bloodshed during the battle between Pompey and Caesar. In England, Halley's Comet was blamed for bringing the Black Death. The Incas, in South America, even record a comet having foreshadowed Francisco Pizarro's arrival just days before he brutally conquered them. Comets and disaster became so intertwined that Pope Calixtus III even excommunicated Halley's Comet as an instrument of the devil, and a meteorite, from a comet, became enshrined as one of the most venerated objects in all of Islam. Were it not for a Chinese affinity for meticulous record keeping, a true understanding of comets may never have been reached.

Unlike their Western counterparts, Chinese astronomers kept extensive records on the appearances, paths, and disappearances of hundreds of comets. Extensive comet atlases have been found dating back to the Han Dynasty, which describe comets as "long-tailed pheasant stars" or "broom stars" and associate the different cometary forms with different disasters. Although the Chinese also regarded comets as "vile stars," their extensive records allowed later astronomers to determine the true nature of comets.

Although most human beings no longer cringe at the sight of a comet, they still inspire fear everywhere around the globe, from Hollywood to doomsday cults. The United States even set up the Near Earth Asteroid Tracking (NEAT) program specifically to guard us from these "divine" dangers. However, although they were once regarded as omens of disaster, and messengers of the god(s), today a scientific approach has helped allay such concerns. It is science and reason that has led the fight against this fear since the days of the ancients. It is science and reason that has emboldened the human spirit enough to venture out and journey to a comet. It is science and reason that will unlock the secrets that they hold.



The Mawangdui silk, a 'textbook' of cometary forms and the various disasters associated with them, was compiled sometime around 300 B.C., but the knowledge it encompasses is believed to date as far back as 1500 B.C.

Source: <http://deepimpact.jpl.nasa.gov/science/comets-cultures.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.



We're on the Web!
www.seattleastro.org



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The Seattle Astronomical Society

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- 1 year of Astronomy Magazine (optional) \$34.00
- Donation (optional) \$_____

Total amount enclosed: \$_____

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