

October 2004

Special points of interest:

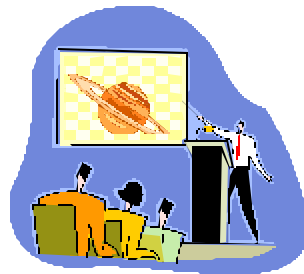
- Nominees for Board positions.
- Zero-G flights.
- Privileged Planet Film Premiere.

October Meeting:

Wednesday, October 20th.

Speaker: "To Be Announced"

The meetings begin at 7:30 P.M., but come as early as you like since many members will be there ahead of time to share their latest activities in astronomy. We generally have a presentation on some topic of interest to amateur astronomers by club members or guest speakers, or occasionally special programs devoted to astronomical computing, members' telescope equipment, and the like. In addition, we have a number of active astrophotographers, and generally reserve time to show slides of their latest efforts.



Meeting Information

Speaker: TBA

Wednesday, October 20
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:

From the President's Desk	3
Book and Calendar Sale	4
NASA Space Place: Gravitational Waves	6
September Minutes	10
Space Bits: Current News	12

Seattle Astronomical Society

Address

PO Box 31746

Seattle, WA 98103-1746

SAS Info Line: 206-523-ASTR

Web Page:

<http://seattleastro.org>

WebfootWeb: webftweb@scn.org

E-mail: information@seattleastro.org

Board & Committees

President: Stephen Van Rompaey,

425-564-8619,

president@seattleastro.org

Board Chairperson: Mary Ingersoll,

206-246-0977,

chair@seattleastro.org

First VP-Programs: Open,

programs@seattleastro.org

Second VP-Education: Mike Langley,

425-241-8094,

education@seattleastro.org

Third VP-Membership: Janice Edwards,

membership@seattleastro.org

Fourth VP-Publicity: Mark deRegt,

publicity@seattleastro.org

Treasurer: Jim Peterson,

206-524-6015,

treasurer@seattleastro.org

Secretary: Thomas Vaughan,

425-445-5371,

secretary@seattleastro.org

Astronomical League: Bob Suryan,

206-789-0599,

alcor@seattleastro.org

Webmaster: Paul Rodman,

425-889-8273,

webmaster@seattleastro.org

Club Telescopes & Equipment: Thomas Vaughan,

425-445-5371,

equipment@seattleastro.org

Special Interest Groups

Dark Sky Northwest: Bruce Weertman,

bruce@weertman.com

Telescope Makers: Peter Hirtle,

206-363-0897,

atm@seattleastro.org

Astrophotography: Keith Allred,

425-821-5820,

astrophoto@seattleastro.org

Vive La Lune (Moon): Pat Lewis,

206-524-2006,

lunar@seattleastro.org

Sidewalk Astronomers: Paul Ham,

206-522-7410,

paulham@webtv.net

Webfooted Astronomer

Editor: Saurabh Saxena

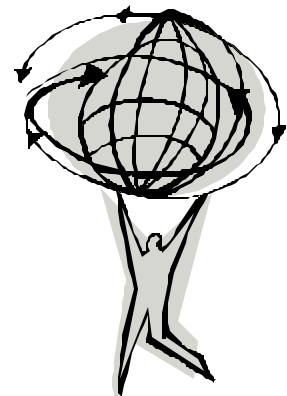
Co-editor: Rose Millican

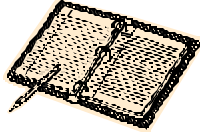
editor@seattleastro.org

Circulation Managers: Pat Lewis & Joanne Green,

206-524-2006,

circulation@seattleastro.org





From the President's Desk...

By Stephen Van Rompaey

So far, we have some members who have come forward to volunteer to run for positions on the SAS board. Remember, our club election will be held at the November meeting. Here is the current set of nominees:

Board Chair	Stephen Van Rompaey
President	Thomas Vaughn
VP Education	Burley Packwood
VP Membership	Janice Edwards
VP Publicity	Rod Ash
Treasurer	Scott Cameron

We are still looking for nominees for the following board positions:

First Vice-President (Activities). The First Vice-President shall preside over all meetings in the absence of the president. The primary responsibility of this office shall be (1) to arrange for a program for each regular monthly meeting and (2) to coordinate and plan other regularly scheduled and special activities of the Organization

Our club election will be held at the November meeting.

Still looking for nominees for several board positions.

Secretary. The Secretary shall preside over all meetings in the absence of the above five officers. Primary duties of this office shall be to (1) keep brief minutes of all Society meetings, (2) maintain other appropriate correspondence external to the Society, (3) coordinate the preparation of materials for distribution to Society members via monthly meeting notices and other such publications as concern Society members and (4) coordinate the assembly, organization, maintenance, and dissemination of materials relating to the history and activities of this Society.

Finally, we are still looking for someone to act as Banquet Chair. I know that I have written during the past months encouraging members to come forward and participate in the governance of their club. I expect that I will have to discuss this further at the October meeting. If you would like to run for one of these positions please contact me as soon as possible. ☐



2005 Book and Calendar Sale

A limited number of the following items will be available for purchase on a first-come, first-served basis at the October monthly meeting. Any items not sold will again be offered for sale at the November meeting. Please bring a check or have exact change.

**Desk calendar may not arrive in time for October sale. The others have all arrived.

Item	Price
Astronomy 2005 Calendar	\$ 7.00
Year-In-Space 2005 Desk Calendar**	\$10.00
RASC Beginner's Handbook (New edition)	\$17.00
RASC 2005 Observer's Handbook	\$17.00
RASC 2005 Calendar	\$10.00

Privileged Planet Seattle Film Premiere

October 15, 2004

Museum of Flight



Discovery Institute is proud to announce the premiere of the new documentary *The Privileged Planet*, based on the book by Guillermo Gonzalez and Jay Richards. Join us for the film's Seattle debut in the William Allen Theater at the Museum of Flight on Friday, Oct. 15 at 7: 30 p.m. General admission is \$5. Online registration opens Oct. 1st or you can register through Janet Markwardt, janetm@discovery.org, 206-292-0401 x.111.

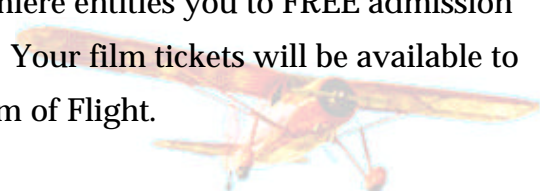
Based on the book, "*The Privileged Planet: How Our Place in the Cosmos is Designed for Discovery*", the film explores the many ways in which Earth is ideally suited, not only for complex life, but also for observing the universe around us.

Utilizing stunning computer animation and the visual archives of NASA, the Hubble Space Telescope Institute, the European Space Agency, and leading observatories throughout the world, this 58-minute film presents a spectacular and uplifting view of our planet, galaxy, and the entire cosmos.

Visit <http://www.privilegedplanet.com> to see the film's trailer, order the DVD or book, read an excerpt from it, read reviews and endorsements, and find out more about the authors.

Dr. Guillermo Gonzalez has been a speaker at many past SAS meetings while he taught at the University of Washington; he is presently an Assistant Professor of Astronomy at Iowa State University.

Special note: The purchase of a ticket to the premiere entitles you to FREE admission to the Museum of Flight on Friday, October 15th. Your film tickets will be available to pick up at the will call window inside the Museum of Flight.



Hunting Gravitational Waves: Space Technology



By Patrick L. Barry and Dr. 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.

Among the mind-blowing implications of Einstein's general theory of relativity, direct verification is still missing for at least one: gravitational waves. When massive objects like black holes move, they ought to create distortions in space-time, and these distortions should spread and propagate as waves – waves in the fabric of spacetime itself.

If these waves do exist, they would offer astronomers a penetrating view of events such as the birth of the Universe and the spiraling collisions of giant black holes. The trick is building a gravitational wave detector, and that's not easy. Ironically, the gravitational waves spawned by these exceedingly violent events are vanishingly feeble.

Gravitational waves exert a varying tug on objects, but this tug is so weak that detecting it requires a device of extraordinary sensitivity and a way to shield that device from all other disturbances.

Enter Space Technology 7 (ST-7). This mission, a partnership between NASA's New Millennium Program and the European Space Agency (ESA), will place a satellite into a special orbit around the Sun where the pull of the Earth's and Sun's gravities balance. But even the minute outside forces that remain – such as pressure from sunlight – could interfere with a search for gravitational waves.

To make the satellite virtually disturbance-free, ST-7 will test an experimental technology that counteracts outside forces. This system, called the Disturbance Reduction System (DRS), is so exquisitely sensitive that it can maintain the satellite's path within about a nanometer (millionth of a millimeter) of an undisturbed elliptical orbit.

DRS works by letting two small (4 cm) cubes float freely in the belly of the satellite. The satellite itself shields the cubes from outside forces, so the cubes will naturally follow an undisturbed orbit. The satellite can then adjust its own flight path to match that of the cubes using high-precision ion thrusters. Making the masses cube-shaped lets DRS sense deviations in all six directions (3 linear, 3 angular).

ST-7 is scheduled to fly in 2008, but it's a test mission; it won't search for gravitational waves. That final goal will be achieved by the NASA/ESA LISA mission (Laser Interferometer Space Antenna), which is expected to launch in 2011. LISA will use the DRS technology tested by ST-7 to create the ultra-stable satellite platforms it needs to successfully detect gravitational waves.

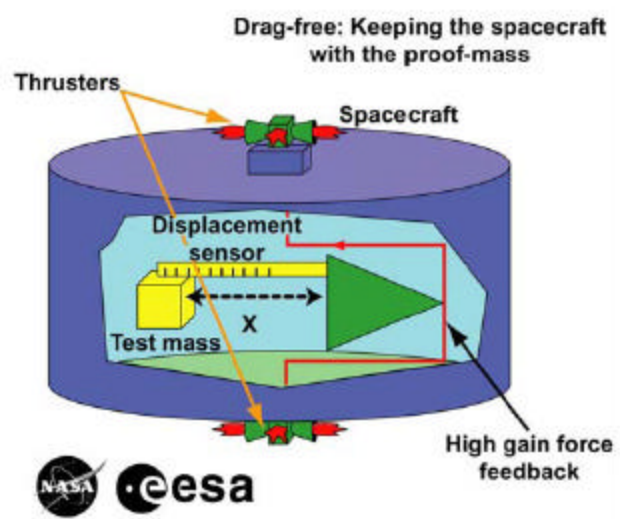


Image credit NASA/JPL/Space Science Institute.

If ST-7 and LISA succeed, they'll confirm Einstein (again) and delight astronomers with a new tool for exploring the Universe. Read more about ST-7 at <http://nmp.jpl.nasa.gov/st7>.

For kids in a classroom setting, check out the "Dampen that Drift!" article at http://spaceplace.nasa.gov/en/educator_s/teachers_page2.shtml



October 2004

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



November 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
31	1	2	3 UW Public Viewing Night 7:00 pm	4	5 ☾	6
7	8	9	10	11	12 ●	13 Tiger Mountain/Poo Poo Point Star Party (members only!)
14 Astrophotography/ Imaging SIG Meeting 2:00 pm	15	16	17 Monthly SAS Meeting UW Room A102 7:30 pm UW Public Viewing Night 7:00 pm	18	19 ☾	20 New Member Orientation 1:00pm Green Lake and Paramount Park Star Parties
21	22 SAS Board Meeting 7:00 pm	23	24	25	26 ○	27 Amateur Telescope Makers SIG Meeting 6:30 pm
28	29	30	1	2	3	4

SAS 2004 Club Meeting -- 15 September 2004

Speaker: Professor Donald Brownlee

Announcements

The meeting began with these announcements:

- Elections are coming! We will be voting for elected positions at the November meeting.
- There is still logging at Poo Poo Point. There will be no dark sky parties in September.
- Just a reminder: the club is still volunteering at the UW Observatory. Feel free to stop by the observatory after SAS meetings, and see Mike Langley if you are interested in being an Observatory volunteer.

Talk: Stardust Project

Professor Donald Brownlee (University of Washington) gave an update on the NASA Stardust Mission, of which he is the principal investigator.

Stardust is a sample return mission, whereby a probe is launched, collects samples, and returns the sample to Earth. Although returning samples is somewhat expensive, Professor Brownlee pointed out the many benefits of being able to analyze the samples back down on the ground. The vehicle doesn't have to carry instruments itself, keeping it lighter and less complex. Also, ground-based researchers can take advantage of the latest advances in state-of-the-art equipment, whereas the vehicle is stuck with the technology used when it was built.

This is an opportune time to talk about Stardust: the vehicle completed its sample gathering in January 2004, and is now on a return path for a January 2006 landing on Earth. Also, Stardust is similar to the recent Genesis mission, which just returned to earth last month.

Genesis had a spectacular failure, whereby the parachutes failed to deploy, so the vehicle slammed into the ground at over 200 mph. Professor Brownlee had some video footage of the "landing." Even with that failure, the project may yet be a success. Many of the samples are retrievable, and contamination seemed to be minimal. Also, the fact that the vehicle returned back to the appropriate spot on Earth indicates how well the mission was going, up until the parachute failure.

The Stardust mission was focused on a recent comet, named Wild2 (pronounced "vilt-2"). The primary mission objective was to capture over 500 particles of size 15 microns

or greater from a comet, and return them to Earth. Secondary missions include imaging of the comet itself, and return of other samples.

The Stardust vehicle had a small "bucket" to capture particles from the comet. The bucket was filled with an aerogel, a solid but almost invisible glass that varies in density from top to bottom. It is designed so that incoming particles smash into the aerogel and slow down in the less-dense part of the gel, coming to a stop in the dense gel.

The vehicle had to be designed to withstand impacts of even larger particles as it approached the comet. The mission designers knew that particles would become bigger and more numerous near the comet, but they weren't sure of the distribution. They assumed a smooth distribution, and planned on having the vehicle survive an impact with a 1cm rock, just to be safe.

In fact, the distribution was "not" smooth. One of the mission's findings was that particle trails leave the comet in dense jets. This meant that the vehicle was bombarded by much more intense particle streams than was expected. Fortunately, the biggest rock to hit the vehicle was only 1/2 cm across--but it hit the craft at 6 kilometers a second!

The spacecraft flew by the asteroid AnneFrank en route to Wild2. This ended up being a great idea--the asteroid encounter was used as a dry run for the comet encounter. They discovered that the CCD camera had a condensation problem. They were able to compensate by heating the camera in the sun before using it later in the mission.

The images of Wild2 were also unusual. Wild2 ended up being quite unlike other comets imaged so far. Here, the comet had much more jagged impact craters, with sharp vertical cliffs. There were also many spires and pinnacles etched in the rock. They captured images of particles streaming away from the comet in highly collimated jets.

Professor Brownlee called Wild2 "per area the most feature-rich body in the solar system." Its unusual characteristics are already leading to new and updated theories on comet development, and the nature of the gas cloud that formed the solar system 4.5 billion years ago.

The sample capture was a success. Stardust survived the comet encounter, and is now on its way back to earth. Actually, it is still swinging out in the solar system, but in a few months it will hit apogee and then start its direct return to earth.

Space Bits

Bizarre Matter Found in a Neutron Star

Scientists have theorized that the inside of a neutron star - the remnant from a star that has collapsed under its own gravity - is a special place where the laws of physics begin to break down; atoms are squeezed so tightly by gravity that all protons and electrons are crushed into neutrons which swirl around like a liquid, but without friction (called a superfluid). This theory has gotten some confirmation according to new research from NASA which observed neutron star EXO 0748-676, located 30,000 light years away. Using various instruments, NASA scientists determined that it's approximately 11.5 km (7 miles) in diameter, and contains 1.75 solar masses. With this much mass packed into a small area, the observations match the theory that neutron stars exist in this super-fluidic state, but without being crushed further.

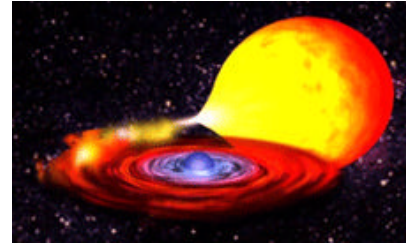


Photo courtesy: Goddard Space Flight Center, NASA

Link: <http://www.gsfc.nasa.gov/topstory/2004/0908nsmatter.html> ☒

Weightless flights: Zero G Flights for the Public

The Zero Gravity Corporation has been given the thumbs up by the Federal Aviation Administration (FAA) to conduct "weightless flights" for the general public, providing the sensation of floating in space. Tickets are on sale for around \$3,000.

Weightless Flight (also known as Parabolic Flight) is achieved aboard ZERO-G's Boeing 727 aircraft named G-FORCE ONE™. Weightlessness is achieved by flying G-FORCE ONE™ through a parabolic flight maneuver. Specially trained pilots fly these maneuvers between approximately 24,000 and 34,000 feet altitude. Each parabola takes 10 miles of airspace to perform and lasts approximately one minute from start to finish.



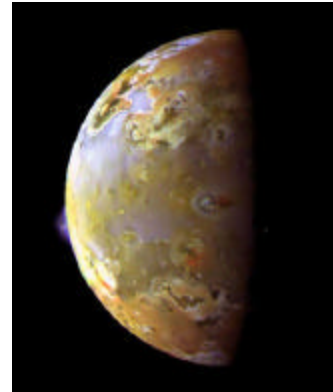
Photo courtesy: Zero Gravity Corporation

Link: <http://www.nogravity.com> ☒

Stream of Particles from Io

Jupiter's moon Io is peppered with volcanoes spewing gas and dust up to 400 km (284 miles) high. You'd think that this material would all settle down again onto the moon,

but something very unusual is happening: it's being accelerated to a velocity second only to the Sun's solar wind. This new space hazard came as a complete surprise when it was first discovered pelting the NASA/ESA Ulysses spacecraft. The dust came in a tight stream, moving at 300 km per second (200 mps), and it was detected again when Galileo visited the Jovian system. It turns out that Jupiter's powerful magnetic field picks up the material from Io and accelerates it. ☒



SpaceShipOne Wins \$10 Million Ansari X Prize in Historic 2nd Trip to Space

Human flight took a significant step forward as the privately built SpaceShipOne flew into suborbital space for the second time in five days, securing the \$10 million Ansari X Prize.



Link: http://www.space.com/missionlaunches/xprize2_success_041004.html ☒

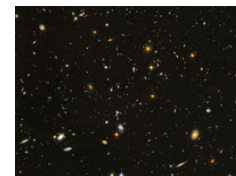
Photo courtesy: Scaled Composites, LLC

Some Stellar Facts

Earth's speed in its orbit around the Sun is 67,000 MPH and spins about 1,000 MPH on its axis measured at the equator. Earth spins faster on its axis in September than in March.

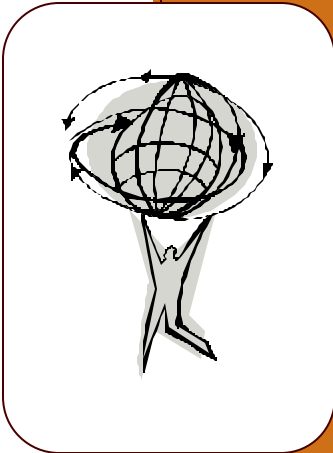
Closest to the Sun, Mercury is as hot as 800 °F on one side and as cold as -279°F on the other side.

Hubble Ultra Deep Field is the deepest visible-light image of the universe ever observed by a telescope. The image shows about 10,000 galaxies, and is like a geologic core sample of the universe, cutting across billions of light-years of space. The patch of sky is just one-tenth the area of the full Moon as seen from Earth



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

The Seattle Astronomical Society

PO Box 31746

Seattle, WA 98103-1746

SAS hotline: (206)-523-ASTR

E-mail: information@seattleastro.org



Membership Information

Choose from the membership and subscription options listed and mail this form and your check to the address below. For family memberships, please include the names of persons you want to appear in the membership directory. For student memberships, please include verification of full-time student status (such as student ID card). For renewals, please attach magazine subscription renewal cards.

The Seattle Astronomical Society

PO Box 31746

Seattle, WA 98103

- | | | |
|--------------------------|---|---------|
| <input type="checkbox"/> | Full-Time Student Membership (copy of student ID required) | \$10.00 |
| <input type="checkbox"/> | Individual/Family Membership(s), no print newsletter via mail | \$25.00 |
| <input type="checkbox"/> | Individual/Family Membership(s), print newsletter via mail | \$30.00 |
| <input type="checkbox"/> | 1 year of Sky and Telescope Magazine (optional) | \$33.00 |
| <input type="checkbox"/> | 1 year of Astronomy Magazine (optional) | \$30.00 |
| <input type="checkbox"/> | Donation (optional) | \$_____ |

Total amount enclosed: \$_____

- New SAS Member SAS Member Renewal Gift Membership

Name _____

Address _____

Phone _____

E-mail address (optional) _____

- Please do not include my information in the SAS membership directory.

Please print above information clearly.

Important: If you move, please send a change of address card to the above address.

The Webfooted Astronomer is the monthly publication of the Seattle Astronomical Society (SAS). All opinions expressed herein are those of the contributors and not necessarily those of SAS. Advertising display rates: full page (5" x 8") \$30; less than full page: \$5 per page inch (1" x 5"). Personal ads are published free to current paid members of the SAS. For all others, 10 cents per word, 50 word minimum charge. Submit article ideas to Editor, The Webfooted Astronomer, PO Box 31746, Seattle, WA 98103, or e-mail to editor@seattleastro.org.

Contents copyright ©2004 for the contributors by the Seattle Astronomical Society.



SEATTLE ASTRONOMICAL SOCIETY

PO BOX 31746

SEATTLE, WA 98103-1746

RETURN SERVICE REQUESTED