the Webfooted Astronomer
The Seattle Astronomical Society
January 2005

Special points of interest:

- Opportunity Finds its Heat Shield
- Saturn Madness
- Seattle Science lecture series

January Awards Banquet:

Saturday, January 15th.
Rock Salt on Latitude 47

6:00-6:30 p.m. — No host bar
6:30 p.m. — Dinner served promptly

Speaker: "Professor Toby Smith"
Topic: "Uncovering Titan: Latest Cassini Results"

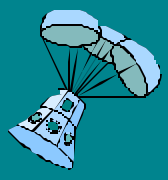
As you may know, the Huygens Probe will land on the surface of Titan on the 14th of January and Professor Smith will discuss the latest results from the Cassini mission to Saturn.

Meeting Information

Speaker: Prof Toby Smith

Saturday, January 15
6:00 p.m.

Rock Salt on Latitude 47°
Restaurant & Catering, Seattle



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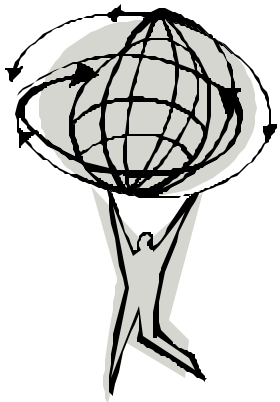
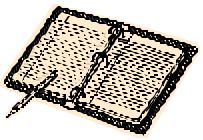




From the President's Desk…

By Thomas Vaughan

Hello! As you've read in the past several newsletters, the 2005 board was elected at the November meeting. Since then, the old board has been transitioning its duties to the new officers.

Who are these new board members?

- Immediate Past President: Stephen Van Rompaey
- President: (myself)
- First Vice President (Activities): Bruce Kelley
- Second Vice President (Education): Burley Packwood
- Third Vice President (Membership): Janice Edwards
- Fourth Vice President (Publicity): Rod Ash
- Secretary: no one! If you are interested in this position, please let me know.
- Treasurer: Scott Cameron.

I'm excited about this board--it is a great combination of long-time and new members, and all of them are passionate about the SAS.

I also want to thank the outgoing 2004 board (most of whom also served in 2003). The society has accomplished a lot in the past 2 years, thanks to the hard work of practically everyone reading this newsletter, and I think the previous board did a great job of managing the society's membership, property, and direction.

By the way, if you are at all curious about the positions or any other aspects of the society's constitution, I recommend reading the bylaws. They are available online at http://www.seattleastro.org/SASbylaws.pdf.

What do I want to accomplish in 2005?

Here are the rough goals I have for 2005.

First, and most important, I want to make sure the SAS keeps doing what it is doing. This means supporting our monthly star parties and meetings, as well as our new outreach programs such as volunteering at the UW Observatory and the Youth Astronomers.

Second, I'd like to increase our membership. The society has taken on many new commitments over the past few years. This means there is more work to be done, but I also think we have more to offer prospective members. The 2005 board will be focused on attracting and retaining more members.

Goals for 2005

Make sure the SAS keeps doing what it is doing

Increase our membership

Purchase land for dark sky site

Third, I want to purchase land for a dark sky site. Mark de Regt and I have been investigating this for the past 6 months, with guidance from the society and the board. Given the size of the society and the most likely costs of a site, purchasing land looks possible. What's left is the hard work to set up the accounts and other paperwork to start taking donations.

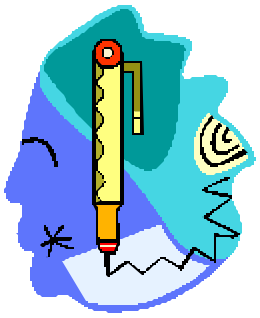
In the next few meetings and newsletters, I'll be following up with progress on all of these. If you have opinions on any of these goals, or anything else for that matter, drop me a line. In fact, if you have any comments or suggestions for any of the officers, feel free to contact us! Our contact information is listed on the website, at http://www.seattleastro.org/officers.html. You can certainly email me at any time at president@seattleastro.org.

Announcements and Reminders

Banquet: Remember, the 2005 SAS Awards Banquet is January 15th at the Rock Salt. See the notice in this newsletter, or on the web site.

Saturn Madness: The UW is hosting a Saturn Madness event on January 26th. Toby Smith will speak at 7pm in Kane Hall, and they have asked the SAS to help out with observing by the Fountain afterwards. If you are interested in volunteering for this outreach event, please contact me.

Secretary: The SAS still needs a Secretary! This position is a fun way to learn more about the society, and astronomy. If you can read and write, and are interested in helping out, you would enjoy being Secretary. If you would like to hear more about the position, let me know.



In the meantime, I wish you all clear skies, and with luck I'll see you out observing. ¤

Antennas, Designed by Darwin [by Patrick L. Barry]

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

Who in their right mind would design this bizarre-looking antenna? Actually, nobody did. It evolved. Taking a cue from nature, NASA engineers used a kind of "artificial evolution" to find this design. The result may look odd, but it works very well.

"The evolutionary process improves the design of antennas, just as evolution in nature leads to fitter plants and animals," says Jason Lohn, leader of the Evolvable Systems Group at NASA's Ames Research Center.

The improvement comes from Darwin's idea of natural selection: only the fittest members of a generation survive to produce offspring. Over many generations, traits that hinder survival are weeded out, while beneficial traits become more common. "In the end," he says, "you have the design equivalent of a shark, honed over countless generations to be well adapted to its environment and tasks."

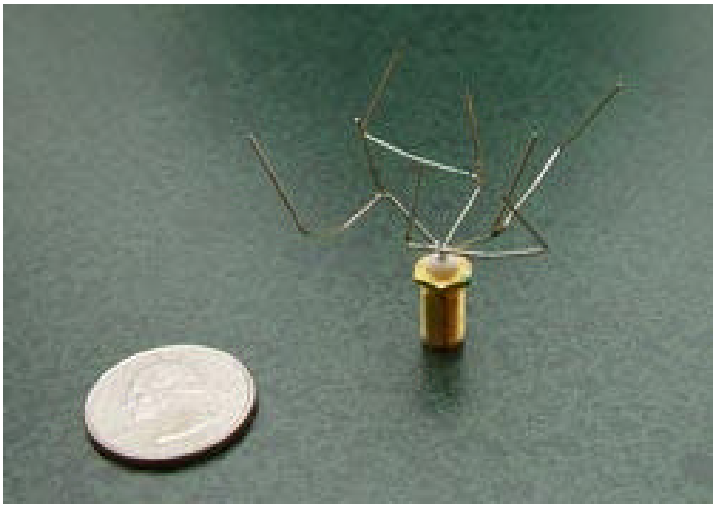
Evolutionary computation, as it's called, applies this principle to hardware design. It's particularly useful for tackling problems that are difficult to solve by hand--like the design of new antennas.

Designing a new antenna for NASA's Space Technology 5 (ST-5) mission was the challenge facing Lohn's group. ST-5 will explore how TV-sized "nano-satellites" can perform the tasks of much larger, conventional satellites at a cheaper cost. Antennas on these satellites must be smaller than usual, yet capable of doing everything that a bigger antenna can do.

The evolution of this bizarre-looking antenna happened inside a computer. Many random designs were tested in a computer simulation. The computer judged their performance against certain goals for the design: efficiency, a narrow or wide broadcast angle, frequency range, and so on.

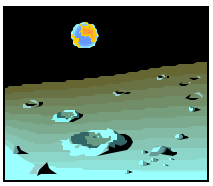
As in nature, only the best performers were kept, and these served as parents of a new generation. To make the new generation, the traits of the best designs were randomly mixed by the computer to produce fresh, new designs—just as a father and mother's genes are mixed to make unique children. This new generation was again tested in the computer simulation, and the best designs became the parents of yet another generation. This process was repeated thousands, millions of times, until it settled onto an optimal, shark-like design that wouldn't improve any further. With today's fast computers, millions of generations can be simulated in only a day or so. The result: an excellent antenna with an odd shape no human would, or could, design.

For more about artificial evolution, see http://ic.arc.nasa.gov/story.php?sid=86&sec. For more about Space Technology 5, see nmp.nasa.gov/st5. For an animation that helps explain to kids how ST5's antenna sends pictures through space, go to spaceplace.nasa.gov/en/kids/st5xband/st5xband.shtml ¤



January 2005

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	31	1
2	3	4	5	6	7	8 Tiger Mountain/Poo Poo Point Star Party (members only!)
9	10	11	12	13	14 Huygens descends into Titan's atmosphere (Descent begins 5 am	15 Awards Banquet 6:00 pm Greenlake, Paramount Star Party
16	17	18 Astro photography/ Imaging SIG Meeting	19 Saturn Madness, UW Astronomy	20	21	22 Amateur Telescope Makers SIG Meeting
23	24 SAS Board Meeting	25	26	27	28	29
30	31	1	2	3	4	5 Tiger Mountain/Poo Poo Point Star Party (members



February 2005

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5 Tiger Mountain/Poo Poo Point Star Party (members only!)
6	7	8	9	10	11	12 New Member Orientation Meeting Greenlake Paramount Park Star Party
13	14	15	16 SAS Meeting	17	18	19
20	21 SAS Board Meeting	22	23	24	25	26 Amateur Telescope Makers SIG Meeting
27	28	1	2	3	4	5

Origins: Fourteen Billion Years of Cosmic Evolution

Pacific Science Center, University of Washington, The Seattle Post-Intelligencer and Town Hall present the Seattle Science Lecture Series

Presented by Neil deGrasse Tyson
Astrophysicist & Director, Hayden Planetarium
American Museum of Natural History, NYC

Thursday, January 20 at 7:30 p.m.
At Town Hall

In the past decade a new synthesis of scientific knowledge has emerged, enabling the deepest questions of our cosmic beginnings to be addressed for the first time. In this illustrated talk, Tyson captures the epic sweep of cosmic evolution, highlighting an unbroken chain of events that links us, here and now, back to the big bang, fourteen billion years ago.

Tyson is host and executive editor of Origins, the recent four-part PBS-NOVA miniseries, and coauthor of the companion book.

His book, Origins: Fourteen Billion Years of Cosmic Evolution, is published by Norton.

Cost is $5.00 at the door.
For more information, visit http://www.townhallseattle.org.

Parking is immediately west of Town Hall or at the Convention Center, one block north on 8th

Town Hall — 1119 8th Avenue — Enter on 8th

2005 Awards Banquet

Speaker: Professor Toby Smith, "Uncovering Titan: Latest Cassini Results"

When:	January 15 , 2004
Time:	6:00-6:30 p.m. — No host bar 6:30 p.m. — Dinner served promptly
Where:	Rock Salt on Latitude 47° Restaurant & Catering 1232 Westlake Ave North Seattle, WA 98109
Cost:	$31.00 per person
Entrees:	Roasted King Salmon Prime Rib Vegetarian Lasagna
Your entree will come with:	Caesar Salad Baked Potato Bread & butter Coffee or Tea Dessert

Send your entrée choice and a check for $31 per person (made out to SAS) to:

Seattle Astronomical Society
ATTN: Banquet
P.O. Box 31746
Seattle, WA 98103

Space Bits

New Comet Now Visible to Naked Eye— Comet Machholz

A comet discovered earlier last year has now moved close enough to be visible without binoculars or telescopes by experienced observers under dark skies. Comet Machholz, C/2004 Q2, is a lovely sight in binoculars and, as of December 30th, was visible to the naked eye under a good, dark sky. The comet will be at its best, glowing at about magnitude 3.6 or 3.8, for the first half of January as it moves across Taurus and Perseus. Don Machholz of Colfax, California, discovered the comet — his 10th — last August 27th, when he swept up a dim, 11th-magnitude smudge in Eridanus with a vintage 6-inch f/8 reflector.

Link: http://skyandtelescope.com/observing/objects/comets/article_1396_1.asp ¤

Huygens is On Its Way

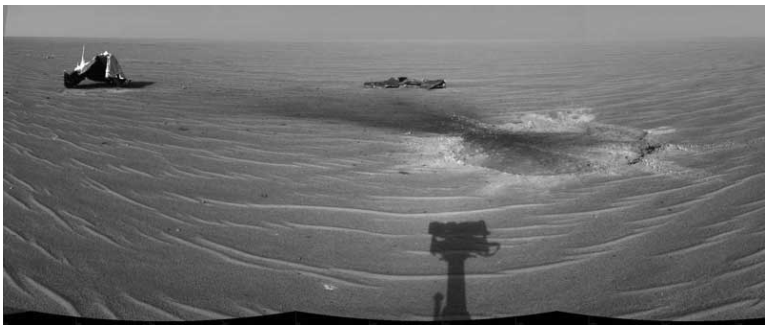
The European Space Agency's Huygens probe successfully detached from Cassini on December 25, and began its brief journey to Titan. The probe is currently dormant, though, and will remain this way for most of its 20-day journey to Saturn's largest moon. Four days before arrival, a triply-redundant alarm clock will wake the probe up, and it will prepare for arrival. On January 14, 2005, the probe will enter Titan's atmosphere, descending to the surface in about 2 hours.

Link: http://www.universetoday.com/am/publish/huygens_away.html?27122004 ¤

An artist's impression of the Huygens probe entering the upper layers of Titan's atmosphere at 22,000 kilometers per hour

Opportunity Finds its Heat Shield

NASA's Opportunity Rover has reunited itself with the heat shield that protected its entry into the Martian atmosphere almost a year ago, when it first arrived at Mars.



After it was ejected, the shield crashed to the surface nearly 2 km away from Opportunity's landing spot. The rover will study both the heat shield, and its impact mark - now the freshest crater on Mars. Engineers will have an opportunity to understand how the heat shield performed during atmospheric entry, and scientists will get a chance to see what's beneath the surface of Mars.

Link: http://www.universetoday.com/am/publish/opportunity_heat_shield.html?29122004 ¤

A New Twist on an Old Nebula

Credit: NASA, ESA and C.R. O'Dell (Vanderbilt University)

The shape of the Helix Nebula has always been a bit of a mystery to astronomers; some theorized that it's donut-shaped, or it could even resemble a snake-like coil. But new observations from the Hubble Space Telescope have helped to shed some light on this issue. Researchers tracked the speed of material being expended from the central dying star, and came to the conclusion that it's actually two gaseous disks which are perpendicular to each other. One disk was expelled 6,600 years ago, and the other was fired off 12,000 years ago.

Link: http://hubblesite.org/newscenter/newsdesk/archive/releases/2004/32/ ¤

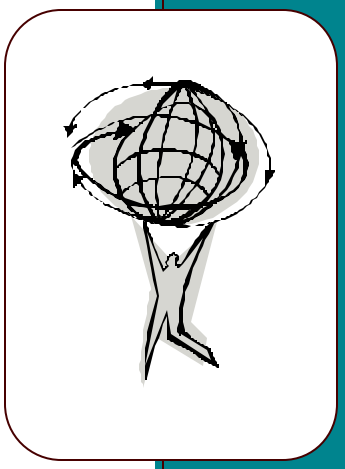
Some Stellar Facts

The surface temperature of Venus is hot enough to melt lead!
The surface can reach temperatures of 864 degrees F.. Lead melts at 662 degrees F.

The Moon has about 3 trillion craters larger than 3 feet in diameter.

There are 11 smaller galaxies orbiting the Milky Way, the closest of which is the Sagittarius Dwarf Elliptical Galaxy (SagDEG) at 80,000 light years from Earth (50,000 from the galactic center).

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

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E-mail: information@seattleastro.org

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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

☐	Full-Time Student Membership (copy of student ID required)	$10.00
☐	Individual/Family Membership(s), no print newsletter via mail	$25.00
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☐	1 year of Sky and Telescope Magazine (optional)	$33.00
☐	1 year of Astronomy Magazine (optional)	$30.00
☐	Donation (optional)	$_____
	Total amount enclosed:	$_____

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Address _____

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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.

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