

Event Horizon

January 2005

Volume 12 Issue 3

January Observing

By Greg Emery

January offers a new beginning in our civil life. We can pay taxes for the new year, change ourselves with New Years' resolutions, and force ourselves to think twice when writing the date. The stars and planets do not show any such discontinuity however. The constellations of fall are setting in the west and those of late winter early spring rising in the east.

Orion, Gemini and Taurus are dominant features of the evening. Sirius in Canis Major is a beacon to all. The presence of Sirius (The Scorcher), on the coldest of evenings, reminds all of us that the "dog days" of summer are at least 6 months away. The warmth of the dog days of summer were attributed to the belief that the higher temperatures of summer were due to the Sun and Sirius being present in the daytime sky together.

In my few years of interest in astronomy, the cold of the January nights (and February) signal to me that it is time to put my averted vision (or is it averted imagination?) into high gear. Winter/Spring is the time for galaxies. Following on the heels of the twins we have the great Lion, Leo, rising from the east, which also means Coma Berenices, Canes Venatici , Hydra and eventually Virgo. Ursa Major is coming overhead. We are no longer looking into the galactic plane, we are viewing closer to the galactic pole. We can now see a host of galaxies, actually there are 36 galaxies scattered among these constellations. The faint fuzzies are always of interest to me. They do not necessarily stimulate the artistic of the brain, as various nebulae or star clusters can. No, galaxies allow for observing the distant past. We are viewing distant worlds as they existed millions of years ago. The photons from these distant islands have been travelling since before Australopithecus or Peking Man crawled on to the scene, since before recorded history, since before Microsoft.

Galaxies often appear as faint, non-descript patches in small scopes. It takes patience and some good sky to

peek out the detail from the image. I was shocked last year when someone described all the detail they could see in a galaxy, in my own scope! I spent some time looking at the image myself – yes you could see it, although I had missed a good part of it. Take the time to stop and look, use averted vision, tap the optical tube (lightly with a finger). The detail is there, train yourself to see it.

Saturn in Gemini and Jupiter in Virgo will continue to yield nice views. Saturn comes into excellent viewing position by 2100. Saturn was at opposition yesterday (January 13, 2005). Jupiter, becomes good for viewing late in the night or early morning. During January Jupiter will rise between 2300 and 2340 and approach zenith while the sun is coming up in the morning. Mars is in Ophiucus in January. The distance between earth and mars is slowly decreasing as we near our closest approach to the Red Planet for the next few years in November. Venus is dipping behind the Sun and will be lost in the glare by February.

The International Dark-Sky Association



Photo credit NOAA

By building awareness of light pollution and offering solutions, the International Dark-Sky Association (IDA) plans to make a better world for astronomers. Light pollution also has an impact on economy since many lights used at night are simply wasting energy, especially when they are shone up into the sky.

The IDA is a non-profit organization provides resources to its 2000 worldwide members reduce light pollution. You can check them out here darksky.org

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Upcoming Events

Event: HAA meeting

Date: Friday February 11, 2005 7:30PM

Location: The Spectator building.

Admission: Free. Everyone is welcome!

Subscription Offer for Members

Members of the club are eligible for a discount on Sky & Telescope Magazine subscriptions.

The regular annual rate is \$49.95 (U.S.). HAA members pay only \$39.95 (U.S.).

Contact Ann Tekatch for information on how to sign up; tekatch@sympatico.ca 905-575-5433

Email Reminder notice

We send email reminders before each meeting which describes the location, time and topic of the general meeting.

If you're not on the list, make sure that you receive your reminder by sending a note to: publicity@amateurastronomy.org

Domain Name and Web hosting for the Hamilton Amateur
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Event Horizon is a publication of the Hamilton Amateur Astronomers (HAA).

The HAA is an amateur astronomy club dedicated to the promotion and enjoyment of astronomy for people of all ages and experience levels.

The cost of the subscription is included in the \$25 individual or \$30 family membership fee for the year. Event Horizon is published a minimum of 10 times a year.

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Chair's Report

by Glenn Muller

Man, the suspense is killing me; after a successful spring-loaded launch from the Cassini spacecraft, at the time of this writing the Huygens probe is just days from entering the Titan atmosphere.

Titan. Atmosphere. Those two words together evoke the same sense of mystery once associated with the surface of Venus, the canals of Mars, and the far side of the Moon. The fact that all those questions, and more, have been answered through the technological advances of only the past five decades are yet another sign that a new Renaissance is upon us.

With a diameter of 5,150 km, larger than Mercury, aptly named Titan was discovered by Christiaan Huygens 350 years ago this March (25th). Since then it has tantalized astronomers and scientists alike with the possibilities hidden beneath its hazy shroud. Although analysis and speculation have provided some clues, the only way we'll get definitive answers anytime soon is if our little probe hits its target – and you've got to admit that a seven year trip involving gravity assists from Earth, Venus, and Jupiter, a few loops around Saturn's system, then a gentle push with a little side spin from it's host carrier is a mathematical snooker shot if ever there was one.

Cassini's near flawless performance, so far, lends great optimism that Huygens will follow suit but there is more at stake here than mission expectations. The probe was supplied by the European Space Agency and, following the shattering loss of the Mars Beagle Lander, a failure here could be a crushing blow for the ESA – and I thought I was stressed.

Still, by the time you read this we'll know if the three parachutes opened, the imagers, meters and sensors worked, and the transmitter relayed everything from the 2½ hour descent back to the spacecraft. If the "fog" is not too thick, the onboard visible imager may briefly provide a bird's eye view of the alien world; but I'm still hedging my bets on whether the landing will be wet or dry.

In the fictional *Imperial Earth*, Arthur C. Clarke, a scientist who has written a word or two, described Titan's landscape this way:

During the long winter, some of the methane in the atmosphere condenses in local cold spots and forms shal-

low lakes, up to a thousand kilometers square but seldom more than a few meters deep, and often covered with fantastically shaped bergs and floes of ammonia ice. [p. 17]

The sled was now driving down a narrow valley flanked by beautiful ammonia cliffs, tinted every possible shade of blue from the palest sapphire to deep indigo. Titan had been called the most colorful world in the Solar System-not excluding Earth; if the sunlight had been more powerful, it would have been positively garrish. Although reds and oranges predominated, every part of the spectrum was available somewhere, though seldom for long in the same place. The methane storms and ammonia rains were continually sculpting the landscape. [p. 53]

Clarke's underlying premise of a mining colony is entirely within the realm of probability. Moons are gaining favour as settlement posts, not only for their minerals but also as staging areas for more ambitious projects. However, those grandiose dreams are for future generations; for those of us tracking the events of the here and now - all we want is a peek.

Glenn invites your comments on these topics or any aspect of the club. He can be reached via chair@amateurastronomy.org

**Telescope for sale**

V-Optic Telescope For Sale: Value \$350. Selling for \$250. Never used.

76mm x 700mm

VOTS 70176

Eyepiece: H20mm, H12.5mm, SR4mm

Barlow lens: 2X

Finder scope - 5 x 24

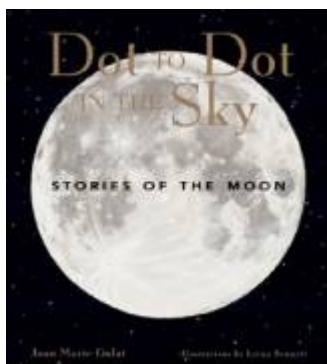
Magnification - F700.200 = 35x; F700: 12.5 = 56x; f700:4 = 175x

With Barlow - lens 35 x2 = 70x; 56 x2 = 112x; 175 x2 - 350x

Email or call 905-628-0376; blueheron@nas.net

Book Review

Reviewed by The Emery's



DOT TO DOT IN THE SKY – STORIES OF THE MOON

By Joan Marie Galat

Illustrations by Lorna Bennett

Published by Whitecap Books, Vancouver, B.C.

2004, ISBN: 1-55285-610-0 , 64 pages, paperback, full colour illustrations , \$16.95 CDN.

(third in the DOT TO DOT IN THE SKY series, the other two books are STORIES OF THE STARS and STORIES OF THE PLANETS).

I see the Moon and the Moon sees me...

Did you know that according to an ancient English myth, the Moon shines her light to protect the people who saved her from the horrors of an evil bog? Or that the Hawaiian goddess, Hina, makes her home on the Moon? Or in Japan, fireflies are said to have come from the Moon's 'tears of love'?

Of all the heavenly bodies, the moon has held a special fascination for humanity, inspiring myths, folklore and superstition throughout history. DOT TO DOT IN THE SKY – STORIES OF THE MOON introduces children to many of these legends from cultures around the world. The book is more than a collection of myths. Each chapter also contains fascinating sidebars that explain the more scientific aspects of the moon such as gravity and tides, phases, eclipses and geology. There is also a glossary at the end.

While adults will almost certainly recapture some moon magic reading the stories within this book, what do children think of it? We read the book to our children and here are a couple of their comments:

"I liked the facts that came with each story." (Monty, age 7)

"My favourite parts were the pictures. I loved the ones of the moon princesses, but I didn't like the scary goblin creature." (Mimi, age 5)

The overall consensus? Two thumbs up from the kids, and two from the parents!

Web Watch

Title: A Breeze from the Stars

Description: Every December, our solar system is pelted with breeze of Helium gas from Ophiuchus. This interstellar Helium breeze is monitored with ACE (Advanced Composition Explorer, the spacecraft launched in 1997).

Massive densities of an interstellar can drastically affect the space environment of the solar system, luckily this breeze is too small to harm us.

You can also listen to this report via streaming audio on your computer, see the audio link on the web-site.

Read or listen to the full report here:

Site: http://science.nasa.gov/headlines/y2004/17dec_heliumstream.htm

Title: Why do Workouts Work?

Description: Astronauts have difficulties with muscle atrophy. It seems there's more to maintaining muscles than just simple exercise in outer space. NASA scientists have some clues that may help everyday life on Earth. Read the full report here:

Site: http://science.nasa.gov/headlines/y2004/10dec_muscles.htm

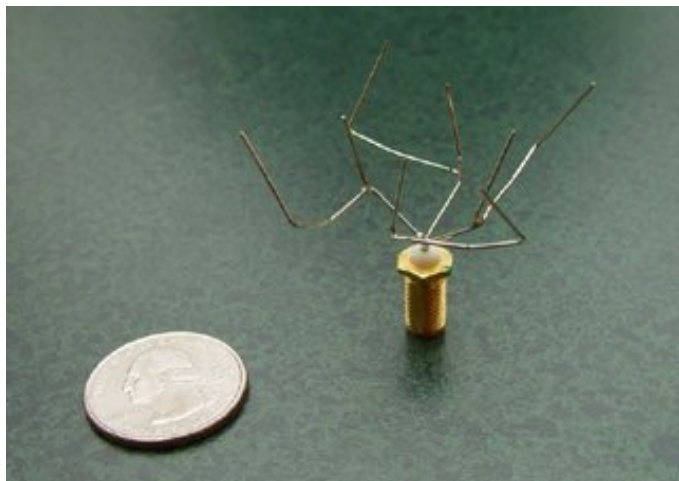
NASA's Space Place

Antennas, Designed by Darwin

by Patrick L. Barry

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.



Evolved antenna

“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 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.

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

Council meetings

All club members are welcome to attend the council meetings. Contact info@amateurastronomy.org for details.

February 2005

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<p>For observing info, Rob Roy 692-3245, Greg Emery greg.emery@mohawkcollege.ca, or Mike Spicer at DeBeneEsse2001@aol.com http://amateurastronomy.org/events.php</p>																																																																																									
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