



# the Webfooted Astronomer

News from the Seattle Astronomical Society

October 2007

## What a Sumptuous Solar System!

During the Seattle Astronomical Society's September 19 meeting, Dr. Ron Hobbs guided us through the Solar System with his captivating presentation — Barnstorming the Planets.

In his youth, Hobbs dreamed of becoming an astronaut, and specifically, the opportunity to explore Mars in person. But when he discovered this would not be possible, he joined The Mountaineers and dedicated himself to home-planet explorations. However, he never lost his fascination and passion for our magnificent universe and has followed every mission for space exploration since the early 1960s. In 2001 he became a Solar System Ambassador for NASA's Jet Propulsion Laboratory.

In his talk, Hobbs not only shared an impressive array of delectable photographs and intriguing verbal details about our Solar System, but also his evident enthusiasm. With graciousness and agility, he also answered the many spontaneous questions that his inspiring presentation evoked from the large audience.

Continued on page 2



*Dr. Ron Hobbs spoke on "Barnstorming the Planets" at the September SAS meeting. He'll be back again in December. Anita Eclissi photo.*

## NEXT MEETING

**October 17 — 7:30 p.m.**  
University of Washington  
Physics/Astronomy Building,  
Room A-102

### **Sonny Tremoulet: Master Scope Builder**

Sonny Tremoulet will bring his award-winning 16" f-4.5 Newtonian telescope and share about its design and construction, including the mirror which he created on his homebuilt, computer-controlled grinding, polishing and figuring machine.

The scope is outfitted with digital encoders that connect to a Sky Commander setting circles unit. He also built an equatorial platform for this telescope which allows it to track objects without manual adjustments.

If you've dreamed of making your own telescope, or would just like to understand the innards of a Newtonian reflector better, this is a wonderful opportunity to learn from and ask questions of an expert!

# SAS Calendar

**October 6-9** — one hour before dawn  
Venus, Saturn, Regulus, and the crescent Moon do a little dance these mornings.

**October 11** — New Moon

**October 13** — 7 p.m.  
Tiger Mountain Star Party (members only)

**October 17** — 7:30 p.m.  
Seattle Astronomical Society Meeting  
Guest speaker: Sonny Tremoulet, master telescope maker. Details on page 1.

**October 17** — 7 p.m.  
UW Observatory — Public viewing night

**October 19** — First quarter Moon

**October 20** — 7 p.m.  
Seattle Astronomical Society Star Parties  
◆ Green Lake, Seattle  
◆ Paramount Park, Shoreline

**October 20-22** — early a.m.  
Orionid meteor shower aks

**October 27** — 6:30 p.m.  
Amateur telescope makers SIG meeting  
Contact: atm@seattleastro.org

**November 7** — 7 p.m.  
UW Observatory — Public viewing night

**November 9** — New Moon

**November 10** — 7 p.m.  
Tiger Mountain Star Party (members only)

**November 21** — 7:30 p.m.  
Seattle Astronomical Society Meeting  
Tom Gwilym, topic TBA

*Sumptuous solar system continued from page 1*

Via photographs and the accompanying scientifically extrapolated theories from Mariner 10, Voyager, Mars Global Surveyor, Cassini, Hayabusa, the Mars Rovers, Rosetta, Mars Reconnaissance Orbiter, New Horizons, and other space probes, Hobbs piloted the audience past intimate views of Mercury; Venus; Mars and Phobos; Jupiter, Io, Europa; Saturn, Iapetus, Enceladus; Pluto, Charon, Nix, and Hydra; Eris and Dysnomia; Sedna; Ceres and Vesta...

A few stopovers, amongst the many fascinating destinations along our flight plan, were the "Pit Crater" on the flank of Arsia Mons on Mars; Tvashtar Volcano – erupting – on Jupiter's moon, Io; close-ups of the surface of Venus taken by the Russians; video of Mars' moon, Phobos, transiting the Sun; asteroid Itokawa taken by the Japanese; the Ice Fountains of Saturn's moon, Enceladus, spewing 300 kilometers into the atmosphere; the grand Himalayas of Iapetus, Saturn's "yin-yang" moon, and several detail-photos of its enigmatic surface – taken just a few days before the SAS meeting!

In fact, Hobbs' presentation was so well received that we've invited him back for our December 19 meeting. So mark your calendars, and get ready to be transported once again into the glories of space via Hobbs' marvelous collection of photos, scientific facts, theories, and his genuine devotion to the splendor of our Solar System. –Anita Eclissi ★

*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 (7" x 9.5") \$50; half page (7" x 4.75") \$30; less than half 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.*

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*From the president's desk*  
*By Jon Bearscope*

# Astronomy rain or shine

As the summer winds down and the leaves begin to change, and the winter constellations slowly start to appear on the horizon, we astronomers know what causes seasonal changes on Earth, and why the temperatures start to dip, and can almost “feel” the Earth orbiting around the Sun.

I know that as I sit here writing this, the universe is in motion, and although my chair isn't moving and my home is still sitting on its foundation, everything is moving pretty fast, and we have no control over the speed we're going or path we're on. It really is amazing if you think about this, and even better, we have the ability to simulate this motion right at home...without causing any damage!

The wonderful part about being as astronomer in today's era, is that almost every one of us has access to a computer. Planetarium software is more advanced than ever, and more accurately represents the night sky than ever before.

As the weather changes from good to bad in the Northwest, we are blessed with technological advances that allow to us to continue our studies and remain curious about the night sky on the worst of nights.

With my own software I can study the night sky, simulate planetary orbits, even put myself on Mars and orbit the Sun and try to imagine what it would be like to live on the Red Planet. I can ride a NASA spacecraft on it's journey into space, or watch the Earth move against the night sky. I can create observing lists, print star charts...the list goes on and on.

Armchair football coaches have nothing on us...we sit at the controls of the universe!

This year as our outdoor observing sessions slow down, I would highly encourage anyone, especially with children, to consider obtaining a good planetarium program and transform your own house into command central, and take over the universe.

Grab a cup of coffee or hot chocolate, grab the kids, and head INTO the night sky for an evening. Ask each other questions and simulate the results on the computer. Watch the Earth shrink as you ride a spacecraft to the Moon. Make mini-movies of orbital paths. Post your results and screen shots on the SAS forum.

In a nutshell, don't let the weather get you down as our seasons change. Keep interest in the night sky high on your list, and put your planetariums to the test.

The sky is yours rain or shine.



## SAS adds to traditional Moon-viewing festival

Volunteers from the Seattle Astronomical Society brought telescopes to the annual Moon Viewing Festival Aug. 25 at the Seattle Japanese Garden, a 3 1/2-acre formal garden that is part of the Washington Park Arboretum. The festival is an observation of the traditional Japanese celebration of Tsukimi, which honors the moon at the end of the autumn harvest season. The paths of the garden were lined with tea lights in paper bags, and there was traditional Japanese music and dancing, and storytelling about rabbits living on the moon and other legends.

Telescopes are not a traditional part of this festival, but in recent years a number of participants asked event organizers if they might arrange for some for better views of the Moon. They decided to give it a try, and last year was the first time SAS participated in the festival. Even though the Moon spent much of that evening hiding behind trees, the views were great when Luna showed her face, the response was overwhelmingly positive, and we were invited back again this year.



*A dancer in traditional Japanese garb during the Moon Viewing Festival at Seattle Japanese Garden. Maxine Nagel photo.*



*Left to right: Maxine Nagel, Roberta McGuire, Jon Bearscove, Jingchun Chen, and Mike Langley at the Seattle Japanese Garden. Photo by Maxine Nagel.*

Things looked a little shaky again this year as it was cloudy for most of the night, but the volunteers attracted a lot of interest and fielded questions about their telescopes. During the short times that the moon peeked out from behind the clouds there were some great views. Most of the festival participants got a closer look at the Moon than ever before, and their oohs and aahs indicated that they were excited and appreciative.

### SAS officers

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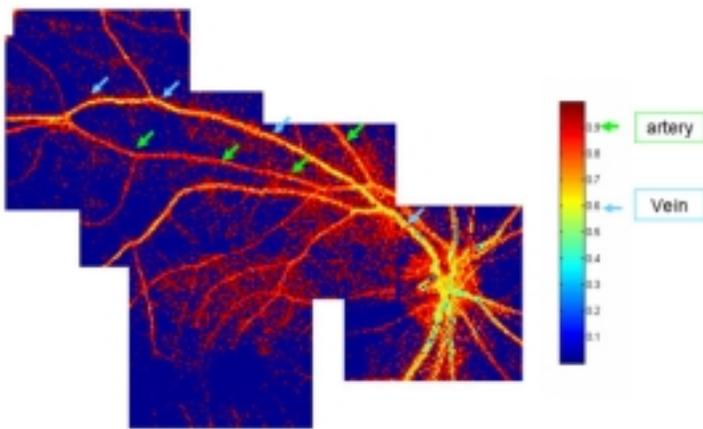
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# A Missile in Your Eye

by Patrick L. Barry

Satellite technology designed to catch ballistic missile launches may soon help doctors monitor the health of people's eyes. For the last 15 years, Greg Bearman and his colleagues at JPL have been working on a novel design for a spectrometer, a special kind of camera often used on satellites and spacecraft. Rather than snapping a simple picture, spectrometers measure the spectrum of wavelengths in the light coming from a scene. From that information, scientists can learn things about the physical properties of objects in the photo, be they stars or distant planets or vegetation on Earth's surface. In this case, however, the challenge was to capture snapshots of short-lived events—like missile launches! The team of JPL scientists designed the new spectrometer, called a computed tomographic imaging spectrometer (CTIS), in collaboration with the Ballistic Missile Defense Organization as a way to detect missiles by the spectral signatures of their exhaust.



*This three-color composite image from the computed tomographic imaging spectrometer shows the oxygenation of the blood in the arteries and veins of a human retina. (Arteries appear red, veins appear yellow.)*

But now the scientists are pointing CTIS at another fast-moving scene: the retina of an eye. Blood flowing through the retina has a different spectral signature when it is rich in oxygen than when it is oxygen deprived. So eye doctors can use a spectrometer to look for low oxygen in the retina — an indicator of disease. However, because the eye is constantly moving, images produced by conventional spectrometers would have motion blurring that is difficult to correct. The spectrometer that Bearman helped to develop is different: It can capture the whole retina and its spectral information in a single snapshot as quick as 3 milliseconds. “We needed something fast,” says Bearman, and this spectrometer is “missile-quick.”

CTIS is even relatively cheap to build, consisting of standard camera lenses and a custom, etched, transparent sheet called a grating. “With the exception of the grating, we bought everything on Amazon,” he says. The grating was custom-designed at JPL. It has a pattern of microscopic steps on its surface that split incoming light into 25 separate images arranged in a 5 by 5 grid. The center image in the grid shows the scene undistorted, but colors in the surrounding images are slightly “smeared” apart, as if the light had passed through a prism. This separation of colors reveals the light’s spectrum for each pixel in the image.

“We’re conducting clinical trials now,” says Bearman. If all goes well, anti-missile technology may soon be catching eye problems before they have a chance to get off the ground.

Information about other NASA-developed technologies with spin-off applications can be found at <http://www.sti.nasa.gov/tto>.

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

## Potluck Picnic and Star Party

Sixteen SAS members gathered at Green Lake Park August 5 to enjoy a lovely summer evening of camaraderie, delicious culinary creations, and the glories of the night sky at the second annual SAS potluck picnic and star party.



Most of us gathered about 5:30 p.m. for the potluck, though some arrived later for just the star party. We were also joined by many passers-by, who were delighted

to check out the views through our telescopes: Jupiter, the Ring Nebula, Albireo, and M13... Some of us stayed until 11:30 p.m. celebrating the night sky.

Thanks to everyone who attended — for sharing your conversation, cookery, telescopes, and laughter!

Anita Eclissi --VP Programs



### Own a print of Maxine Nagel's lunar eclipse collage

Maxine Nagel shot the above collage of the August 28, 2007 lunar eclipse from Bellevue between 1:51 a.m. and 5:22 a.m. You saw a print of it if you attended the September meeting. The dimensions are 7" x 36", it's got a matte finish and the price is \$45. If you would like to purchase a copy, contact Maxine at [maxinenagel@yahoo.com](mailto:maxinenagel@yahoo.com) or call in the evenings before 9 p.m. at 425.235.7516. There's also a solo shot of just the total eclipse available; see the back page.

Technical stuff: The images were shot with a Canon 20D t-mounted to a 6.3 focal reducer and Celestron 8GPS telescope (f10). Eleven separate images were put together in PhotoShop. Exposure times at ISO 400 ranged from from 1/640 of a second, at the beginning and the end of eclipse, to 3.2 seconds in middle of the eclipse.

# Calendar of Events in Space Exploration

Our September speaker, Dr. Ron Hobbs (pg. 1) compiled this list of upcoming space events.

|                    |                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------|
| 2007 October 4:    | <b>Sputnik 1 – 50<sup>th</sup> anniversary of launch of 1<sup>st</sup> Earth satellite</b>            |
| 2007 October (?):  | <b>Chang’e-1</b> – Launch of lunar probe from Xichang Satellite Launch Center                         |
| 2007 December 7:   | Equinox on <b>Uranus</b> – beginning of northern spring                                               |
| 2007 December 10:  | Equinox on <b>Mars</b> – beginning of northern spring                                                 |
| 2008 January 14:   | <b>MESSENGER</b> – First flyby of <b>Mercury</b>                                                      |
| 2008 February 5:   | <b>GLAST</b> (Gamma Ray Large Area Space Telescope) Launch                                            |
| 2008 March 12:     | <b>Cassini</b> – Close flyby (within 30 km) of <b>Enceladus</b> , moon of <b>Saturn</b>               |
| 2008 April (?):    | <b>Chandraayan-1</b> – Launch of Indian lunar orbiter                                                 |
| 2008 May 25:       | <b>Phoenix</b> will land in the Martian arctic                                                        |
| 2008 June 25:      | Solstice on <b>Mars</b> – beginning of northern summer/southern winter                                |
| 2008 July 1:       | <b>Cassini</b> – Beginning of 1 <sup>st</sup> extended mission                                        |
| 2008 July (late):  | Joint launch of <b>Planck</b> and <b>Herschel</b> from Guiana Space Center                            |
| 2008 September 5:  | <b>Rosetta</b> – Flyby of asteroid 2867 Steins                                                        |
| 2008 September 10: | <b>STS-125</b> – Final servicing mission to the <b>Hubble Space Telescope</b>                         |
| 2008 October 6:    | <b>MESSENGER</b> – Second flyby of <b>Mercury</b>                                                     |
| 2008 October 31:   | <b>Lunar Reconnaissance Orbiter/LCROSS</b> – Launch from KSC                                          |
| 2008 November 1:   | <b>Kepler</b> – Launch from KSC of mission to search Earth-like planets                               |
| 2008 December 5:   | <b>Deep Impact</b> mothership – Flyby of comet <b>85P/Boethin</b>                                     |
| 2008 December 15:  | <b>Orbiting Carbon Observer</b> – Launch of NASA Earth Science mission                                |
| 2009 March:        | <b>DAWN</b> – <b>Mars</b> gravity assist flyby                                                        |
| 2009 August 11:    | Equinox on <b>Saturn</b> – beginning of northern autumn                                               |
| 2009 September 30: | <b>MESSENGER</b> – Third flyby of <b>Mercury</b>                                                      |
| 2009 (Fall):       | <b>Mars Science Laboratory</b> – Launch window opens for Mars rover                                   |
| 2009 (Fall):       | <b>Phobos-Grunt</b> – Launch of Russian/ESA sample return mission                                     |
| 2010 June:         | <b>Juno</b> – Launch of NASA <b>Jupiter</b> orbiter, 2 <sup>nd</sup> <b>New Frontiers</b> Mission     |
| 2010 June:         | <b>Hayabusa</b> – Sample return capsule lands with samples of <b>Itokawa</b> (?)                      |
| 2010 July 10:      | <b>Rosetta</b> – Flyby of asteroid <b>21 Lutetia</b>                                                  |
| 2011 February 14:  | <b>Stardust-NExT</b> – Flyby of comet <b>9P/Tempel 1</b>                                              |
| 2011 March 18:     | <b>MESSENGER</b> – <b>Mercury</b> Orbit Insertion                                                     |
| 2011 April 12:     | <b>50<sup>th</sup> anniversary of the 1<sup>st</sup> human spaceflight</b>                            |
| 2011 September:    | <b>DAWN</b> – Arrival at <b>4 Vesta</b>                                                               |
| 2011 (Late):       | Launch of 2 <sup>nd</sup> <b>Mars Scout</b> Mission                                                   |
| 2012 April:        | <b>DAWN</b> – Departure from <b>4 Vesta</b>                                                           |
| 2013 August:       | <b>BepiColumbo</b> – Launch of ESA/Japan joint <b>Mercury</b> orbiter                                 |
| 2014 May:          | <b>Rosetta</b> – Arrival at Comet <b>67P/Churyumov-Gerasimenko</b>                                    |
| 2014 November:     | <b>Philae</b> – Rosetta lander touches down on <b>Comet 67P/C-G</b>                                   |
| 2015 February:     | <b>DAWN</b> – Arrival at <b>1 Ceres</b> , the 1 <sup>st</sup> dwarf planet to be explored             |
| 2015 July 14:      | <b>New Horizons</b> – Flyby of <b>134340 Pluto</b> & moons, <b>Charon</b> , <b>Nix</b> , <b>Hydra</b> |
| 2019 July 20:      | <b>50<sup>th</sup> anniversary of the 1<sup>st</sup> human landing on the Moon</b>                    |
| 2019 December:     | <b>Orion 13</b> – First human landing on the Moon in almost 50 years                                  |
| 2114 February 19:  | The next aphelion of <b>134340 Pluto</b>                                                              |
| 2237 September 15: | The next perihelion of <b>134340 Pluto</b>                                                            |
| 2257 March 29:     | The next perihelion of <b>136199 Eris</b>                                                             |

**Note:** Launch events are estimates, subject to variable amounts of uncertainty. Celestial events are more certain as they are constrained by the laws of celestial mechanics.

**NEXT MEETING**  
**October 17, 2007**

Sony Tremoulet,  
master telescope  
builder

Details, page 1

RETURN SERVICE REQUESTED

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*SAS member Maxine Nagel shot this image of the Aug. 28, 2007 lunar eclipse at 3:37 a.m. from Bellevue. See page 6 to find out how to order a print of this photo, or an 11-image collage of the eclipse.*