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THE OBSERVER

East Valley Astronomy Club

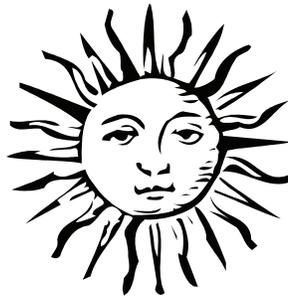
From the Desk of the President by Claude Haynes

A new year dawns – 2007 was a busy year for the East Valley Astronomy Club. The observatory drew over 10,000 visitors in its first year of operation. The club sponsored Astronomy Day activities in the spring, and hosted over 30 school and community star parties. With the departure of Win Pendleton to Colorado, we began hosting the monthly Sky Watch lectures and became more involved in Riparian Institute programs. We had glorious weather and strong participation at the All Arizona Star Party, and we had fun time at the Sol Invictus pot luck. All of

this through the efforts of many members of the club who volunteer so willingly to bring astronomy to the general public. I am grateful for all who make EVAC a vital asset for the community. 2008 also promises to be a busy year. Our January meeting speaker is Dr. Mark Bierner, Director of the Boyce Thompson Arboretum. This is the site of our monthly local star party, and will give us a chance to find out about any impact the current road construction project may have. I know that several of our

members are also volunteers at the Arboretum. Also, for “show and tell” please bring any astronomical gifts Santa may have left for you. It is always fun to see new toys and to get an honest appraisal of their benefits.

Keep looking up
Claude Haynes



The Backyard Astronomer Behold Orion by Bill Dellenges

Orion the Hunter straddles the meridian at 9:00 p.m. local time on January 25th. What better time to discuss its highlights! One Greek myth describes Orion as a mighty hunter who claimed he could exterminate all animals from the earth if he wished. Alarmed at his boast, Gaia, the Goddess of the Earth, sent a scorpion to dispatch the Hunter. After the confrontation, Zeus rewarded both combatants with a permanent place in the heavens. While Orion is only the 26th largest constellation (594.12 square degrees or 1.440% of the heavenly dome), for my money it is by far the grandest of the 88 constellations. Why? It has a disproportionate number of bright stars including the conspicuous ruddy Betelgeuse and blowtorch-like blue-white Rigel. The three distinctive second magnitude stars in its “Belt” catch the eye (even laypersons often ask, “What are those three stars in a straight line I see rising in the east?”). Orion also looks something like

what it's suppose to be, a human figure – a rare thing among constellations. Finally, its placement midway up in the sky at mid-northern latitudes makes for easy viewing. I want you to do something before aiming your 25”, 500x telescope at the Orion Nebula. Get a pair of binoculars. Any size as long as they are tripod adaptable. Steal them if you have to. Put them on a tripod and aim them at Orion's Sword (here, 10x70's or larger are best). It will be magically transformed from three faint stars into a stunning 2 degree long complex of stars and nebulae. With the binoculars you will still get, albeit small, a nice view of the Orion Nebula – it doesn't take that much power to see its gas. But now you'll also view the full glory of the sword. Notice the other two “Belt” stars are actually not single stars but small star clusters in their own right. Each is nicely placed on either side of M42. Viewing the entire Sword, rather than just M42, is

Continued on page 2

Upcoming Events:

- Deep Sky Star Party at Vekol Road – January 5*
- Public Star Party in Gilbert – January 11*
- Mesa High School Earth & Space Science Star Party – January 15*
- General Meeting at Southeast Regional Library in Gilbert – January 18*
- Zaharis Elementary School Star Party – January 25*

The Backyard Astronomer

Continued from page 1

a refreshing change of scenery, don't you think? Above M42 are the nebula NGC 1977 and star cluster NGC 1981. The latter, at the top of the Sword is shaped like a "W." Its top eastern-most star is a double star, Struve 750. The A-B pair magnitudes are 6.43 and 8.39. Separation is 4.3". A C-8 at 145x split them easily. EVAC member Silvio Jaconelli turned me onto this obscure double star (where does he find these things?). NGC 1977 contains 45 and 42 Orionis, the primary contributors of light representing the Sword's top star.

The crown jewel of Orion is of course M42, the Orion Nebula. So much has been written about this glorious nebula I'll only mention its source of illumination, the Trapezium. This is a spectacular six component multiple star. The main four stars (mag. 5.1 - 7.9) shaped like a trapezoid can be split in a Televue 85mm refractor at 29x. The E and F components are more challenging. Their magnitudes are 11.1 and 11.5 respectively and only about 4" away from their nearest Trapezium stars. Often I can bag E but F is difficult. My notes indicate I snagged both with a C14 once at 98x.

The "bottom" Sword star below M42 is the combined light of two stars. The brighter one is Iota Orionis, a triple star. A-B mag 2.7, 7.7, Sep 11.3". A-C mag 2.7, 11, Sep 50". An 85mm refractor split them at 100x. A few arc minutes to the southwest of Iota is Struve 747, an easy double to split. A-B mag 4.8, 5.7, Sep 36". Even my 8x50 binoculars made short work of them.

Now point your binoculars at Orion's Belt (here, use a binocular with at least a 6 degree field). I'll bet many a gazer has never noticed the rich star field surrounding its three second magnitude stars Alnitak, Alnilam, and Mintaka. Binoculars will reveal about 100 fainter stars clustered around the Belt stars. Notice how these stars spill out towards the west

and north. They are part of the Milky Way which intrudes into this area. Collectively, the region is known as Collinder 70.

One of my favorite multiple stars is Sigma Orionis, just below the eastern-most Belt star, Alnitak (Zeta Orionis). The primary is magnitude 3.8 and has a retinue of three other fainter stars pretty much in line - it reminds me of Jupiter and its moons. My 85mm refractor resolves the bunch at 100x. In the same low power field can be spied the triple star Struve 761.

Now swing over to Rigel (Beta Orionis), one of most luminous stars in the galaxy (57,000 times the luminosity of our sun). It's interesting to compare the absolute magnitude of Rigel and the Sun with their apparent magnitudes of +0.14 and -27 (respectively). If both were 10 parsecs (32.6 light years) away, their absolute magnitudes would be -7.1, and +4.8 respectively. Rigel is truly a stellar powerhouse. It's also a challenging double star. It has a 6.7 mag companion 9" away at position angle 202°. Can you find it in Rigel's glare? I managed it in an 85mm refractor at 100x.

One could write volumes on the splendors of Orion. But in the interest of brevity, let's look at one last unique object in the Hunter. The star cluster NGC 2169 can be found in Orion's up raised right arm near his elbow between the stars 67 and 70 Orionis. This modest little cluster would be otherwise forgettable if it weren't for the fact that its members form the number "37" in a correct or non-reversed field. It has also been likened to a shopping cart (Hidden Treasures, O'Meara, p. 182). Stop by this group, I'll bet it will put a smile on your face. EVAC's Don Wrigley introduced this object to me several years ago. I'm glad he did! I've been smiling ever since.



M42/M43

Orion

December-January 2007

Luminance: 12.5 inch RCOS RC at F/9

Color: Takahashi Epsilon 210 Astrograph

SBIG STL11000M Camera

Luminance is a Mosaic Image

Total Exposure Time for Luminance: 12 Hours 10 Minutes

Exposure time for Color: R 126, G 84, B126 all binned 1x1

Photo reprinted courtesy of Jon Christensen

2008: A Year of Sky Events

by Joe Orman

Photo Pages: joeorman.shutterace.com

Mark your calendar for these interesting alignments, conjunctions, occultations, eclipses & meteor showers in the year 2008. Times are calculated for Phoenix, Arizona; other locations may differ. Most will be easy to see with the unaided eye, some very challenging -- take a look! Constructive comments and corrections welcome. This list may be copied and distributed for non-commercial use, but it must be credited to Joe Orman.

- January 4 (morning): Crescent Moon, Venus and bright star Antares form triangle 7 degrees apart, in SE before sunrise. Antares 3 degrees above crescent Moon on morning of January 5.
- January 17-18 (night): Star cluster Pleiades (M45) just to left of gibbous Moon, in W about midnight (occultation for N. North America).
- January 19 (evening): Mars 2 degrees to upper right of gibbous Moon, in E after sunset (occultation for NW North America).
- January 21 (evening): Mercury at greatest elongation; easily visible on evenings of January 19 thru 26 low in WSW after sunset.
- February 1 (morning): Jupiter 0.7 degrees to lower right of Venus, low in SE before sunrise. Also bright star Antares 2 degrees to left of thick crescent moon, higher in SSE. Moon 10 degrees to right of Jupiter on morning of February 3.
- February 15-16 (night): Moon passes close to Mars; Mars 1 degree to lower left of Moon as they set in WNW about 3 a.m.
- February 20 (evening): Total lunar eclipse, in E after sunset (Moonrise 6:08 p.m., partial phase starts 6:45 p.m. MST, totality from 8:02 p.m. to 8:51 p.m., partial phase ends 10:08 p.m.). Bright star Regulus 3 degrees above moon, Saturn 3 degrees to lower left of moon.
- February 23-24 (night): Saturn at opposition; bright and up all night; 5 degrees from bright star Regulus.
- February 27 (morning): Mercury 1 degree above Venus, very low in ESE before sunrise. Mercury to upper right of Venus thru March 10 (at greatest elongation on March 3).
- March 5 (morning, daytime): Venus 3 degrees to lower left of crescent Moon, Mercury 1 degree to upper left of Moon (occultation for South America), very low in ESE before sunrise. During day, Moon occults Venus (disappears about 1:12 p.m., reappears 2:04 p.m.) in SW. May need binoculars or telescope to

see.

- March 14 (evening): First-quarter Moon one degree from Mars, near zenith after sunset.
- March 19: Spring equinox (10:48 p.m. MST). Sunrise straight east (6:33 a.m., azimuth 89.8 degrees), sunset straight west (6:40 p.m., azimuth 270.5 degrees). Always use proper eye protection when viewing the sun.
- March 26-27 (night): Bright star Antares one degree to left of gibbous Moon as they rise in SE around midnight.
- April 8 (evening): Star cluster Pleiades (M45) just to left of crescent Moon, in W after sunset (occultation for NE North America).
- April 11-12 (night): Mars one-quarter degree to lower left of first-quarter Moon, in WNW about midnight; set about 1 a.m.
- May 6 (evening): Mercury 2 degrees below thin crescent Moon, very low in WNW after sunset.
- May 12 (evening): Saturn and bright star Regulus 5 degrees to upper right of first quarter Moon, very high in S after sunset.
- May 13 (evening): Mercury at greatest elongation; easily visible on evenings of May 5 thru 20, low in WNW after sunset.
- May 22 (evening): Mars passes through Beehive star cluster (M44), high in W after sunset; set in WNW about midnight.
- June 7 (evening): Mars one degree to upper right of crescent Moon, in W after sunset (occultation for New Zealand).
- June 30 (morning): Star cluster Pleiades (M45) 1 degree to upper right of crescent Moon, as they rise in ENE about 3 a.m. (occultation for NE North America).
- June 30 (evening): Bright star Regulus one degree to lower left of Mars, Saturn 4 degrees to upper left, in W after sunset.
- July 8-9 (night): Jupiter at opposition; bright and up all night.
- July 10 (evening): Mars 0.7 degrees to lower left of Saturn, in W after sunset; bright star Regulus 6 degrees to lower right.
- August 12-13 (night): Perseids meteor shower. Gibbous Moon setting about 2:30 a.m. will interfere. Shower radiates from constellation Perseus,

Continued on page 13

Is a New Solar Cycle Beginning?

by Dr. Tony Phillips

The solar physics community is abuzz this week. No, there haven't been any great eruptions or solar storms. The source of the excitement is a modest knot of magnetism that popped over the sun's eastern limb on Dec. 11th, pictured below in a pair of images from the orbiting Solar and Heliospheric Observatory (SOHO).

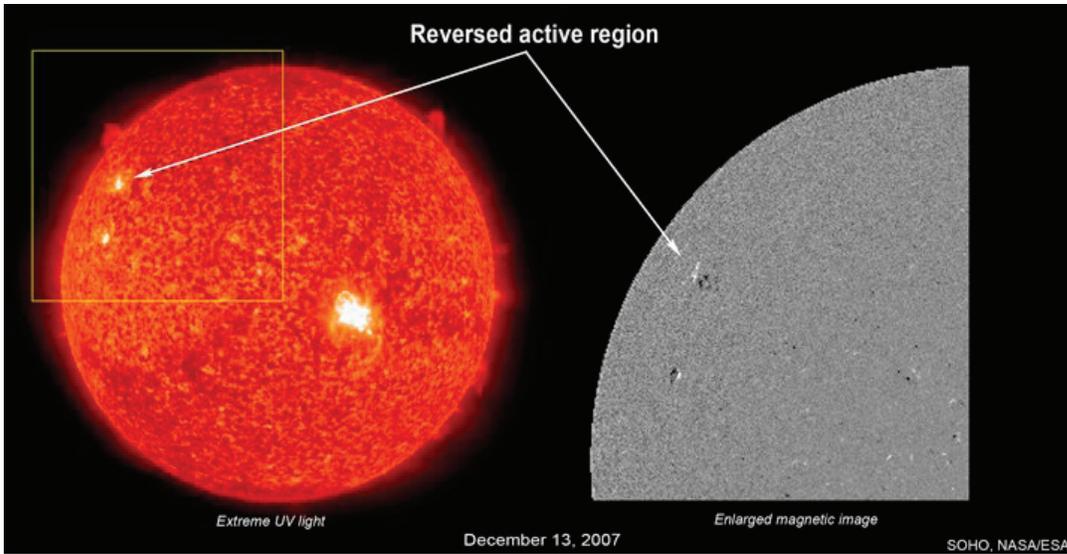
It may not look like much, but "this patch of magnetism could be a sign of the next solar cycle," says solar physicist David Hathaway of the Marshall Space Flight Center.

The region that appeared on Dec. 11th fits both these criteria. It is high latitude (24 degrees N) and magnetically reversed. Just one problem: There is no sunspot. So far the region is just a bright knot of magnetic fields. If, however, these fields coalesce into a dark sunspot, scientists are ready to announce that Solar Cycle 24 has officially begun.

Many forecasters believe Solar Cycle 24 will be big and intense. Peaking in 2011 or 2012, the cycle to come could have significant impacts on telecommunications, air traffic, power grids and GPS systems. (And don't forget the Northern Lights!) In this age of satellites and cell phones, the next solar cycle could make itself felt as never before.

The furious storms won't start right away, however. Solar cycles usually take a few years to build to a frenzy and Cycle 24 will be no exception. "We still have some quiet times ahead," says Hathaway.

Meanwhile, all eyes are on a promising little active region. Will it become the first sunspot of a new solar cycle? Stay tuned for updates from Science@NASA.



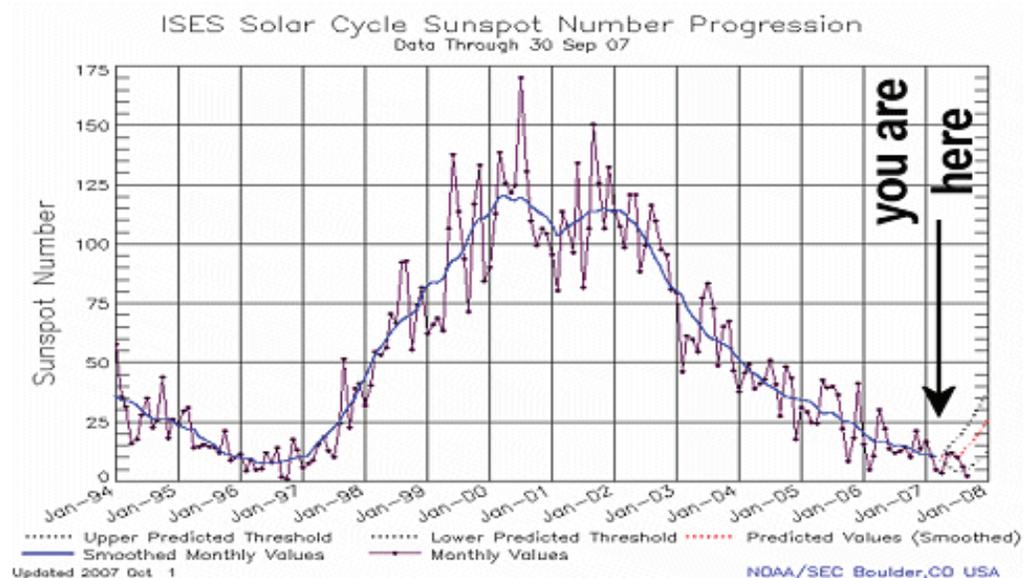
From SOHO, a UV-wavelength image of the sun and a map showing positive (white) and negative (black) magnetic polarities. The new high-latitude active region is magnetically reversed, marking it as a harbinger of a new solar cycle.

For more than a year, the sun has been experiencing a lull in activity, marking the end of Solar Cycle 23, which peaked with many furious storms in 2000--2003. "Solar minimum is upon us," he says.

The big question now is, when will the next solar cycle begin?

It could be starting now.

"New solar cycles always begin with a high-latitude, reversed polarity sunspot," explains Hathaway. "Reversed polarity" means a sunspot with opposite magnetic polarity compared to sunspots from the previous solar cycle. "High-latitude" refers to the sun's grid of latitude and longitude. Old cycle spots congregate near the sun's equator. New cycle spots appear higher, around 25 or 30 degrees latitude.



Solar Cycle 23 is coming to an end. What's next?
Image credit: NOAA/Space Weather Prediction Center.

January Guest Speaker

Educated at the University of Texas at Austin (BA in Botany 1968, PhD in Systematic Botany 1971), this month's guest speaker is Dr. Mark W. Bierner. Dr. Bierner is the Director of Boyce Thompson Arboretum and professor of Arid Lands Studies at the University of Arizona. Dr. Bierner has held positions at the University of Tennessee, St. Jude Children's Research Hospital (Memphis), Wild Basin Wilderness Preserve (Austin), Texas State University, Biosphere 2 (Arizona), Marie Selby Botanical Gardens (Sarasota), and the University of Texas.

Biodiversity is often defined as the variety of life and its processes; and it includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. Biodiversity was coined as a contraction of biological diversity in 1985, but the new term has arguably taken on a meaning and import all its own.

In a break from our usual astronomy-related talks, Dr. Bierner will conduct a presentation entitled *Biodiversity - Not Just for Scientists Anymore*. In it he will examine the definition and meaning of biodiversity. He will further discuss why some people claim there is a biodiversity crisis, in addition to what's happening at Boyce Thompson that's related to biodiversity.



Robert Burnham Jr. Memorial Fund

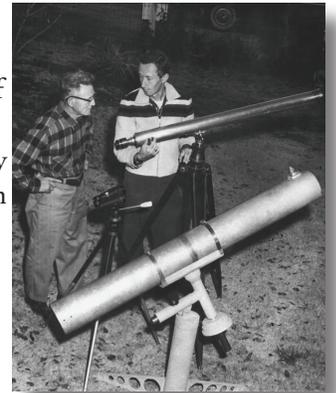
You can be a part of history as people from all walks of life coordinate their efforts to pay tribute to one of the most influential people in amateur astronomy. The East Valley Astronomy Club is proud to serve as fiduciary agent for a drive to place a permanent memorial to Robert Burnham Jr on the grounds of Lowell Observatory in Flagstaff, Arizona. It is estimated the memorial will cost approximately \$20,000. Any additional funds raised will be contributed to the Northern Arizona University scholarship fund for the benefit of astronomy students.

Robert Burnham compiled his three volume Celestial Handbook while working at Lowell Observatory as part of the Stellar Proper Motion Survey. This grassroots effort began on a Cloudy Nights discussion forum, and with the guidance of Burnham's sister, Viola Courtney, and her daughter Donna Cox, has grown to include numerous members of the astronomy community, including the honorary chairman of our fundraising committee Jack Horkheimer of the Miami Science Museum, better known for his PBS Star Gazer series.

For more information on Robert Burnham Jr please visit the official memorial website www.rbjm.org. If you wish to make an online donation, please use the PayPal link here:

<http://www.eastvalleyastronomy.org/rbjm.htm>

If you wish to make a donation by mail, please make check payable to Burnham Memorial Fund and mail it to EVAC, PO Box 2202, Mesa, Az., 85214-2202... or you can donate at a club meeting.



Robert Burnham Sr and Robert Burnham Jr at the telescope

○ **NEW MOON ON JANUARY 8 AT 04:37**

◐ **FIRST QUARTER MOON ON JANUARY 15 AT 12:46**

● **FULL MOON ON JANUARY 22 AT 06:35**

◑ **LAST QUARTER MOON ON JANUARY 29 AT 22:03**

THINKING ABOUT MORE APERTURE?

I am contemplating the sale of my 25" F5 Obsession (#620) later this spring, and thought I would make it available to any interested club member first. The telescope features a Galaxy primary mirror (.964 Strehl) along with a 3½" United Lens secondary mirror. Included with the standard Obsession components are the complete ServoCAT GoTo system - including *every single option available*: 2nd Generation CAT, 2nd Generation Argo Navis DTC with 10k encoders; CatTail Stalk; powered groundboard; wired and wireless handpaddles; Wireless232 system to interface with your laptop, etc. The telescope also features a dual-speed Feathertouch focuser; Obsession shroud; cable mirror sling; updated ALT encoder coupler; and a Telrad. Rounding out this observing machine are some custom covers from Astrosystems: Scope Coat; truss pole case; upper truss assembly case and secondary mirror cover. I'll even include a Werner MT-22 telescoping multiladder.



If you ordered this telescope today, equipped with all the options and accessories included here, it would cost over \$17,000 plus crating and shipping. I may also consider selling my custom 5' x 8' TNT trailer (new cost was \$3,175). I would be willing to sell the telescope for only \$9,000 or the whole shebang: telescope and trailer for \$11,000. If interested, I invite you to check it out at an upcoming star party!

Peter Argenziano 480-633-7479
Email: news@eastvalleyastronomy.org

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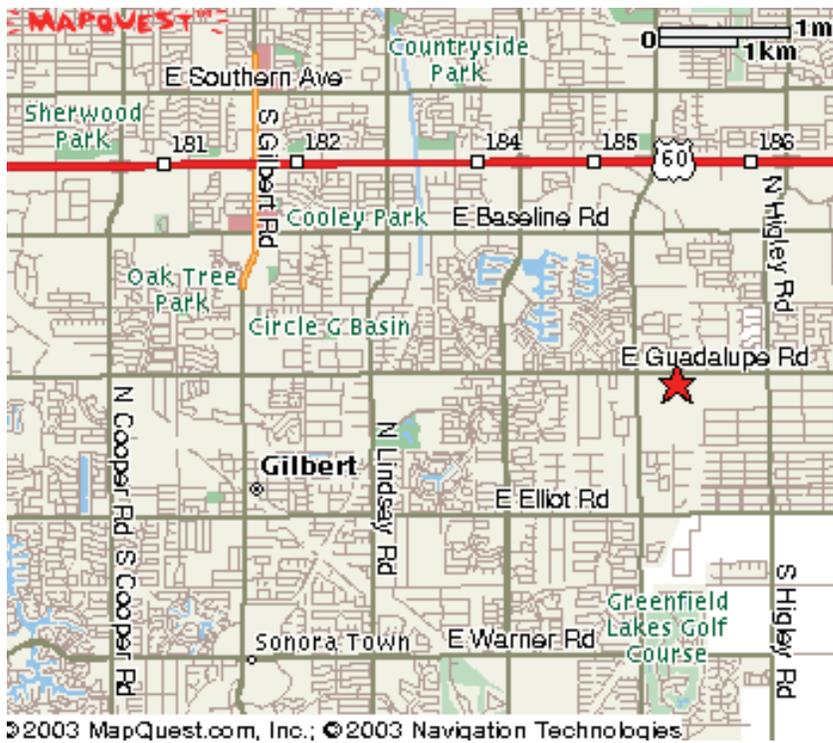
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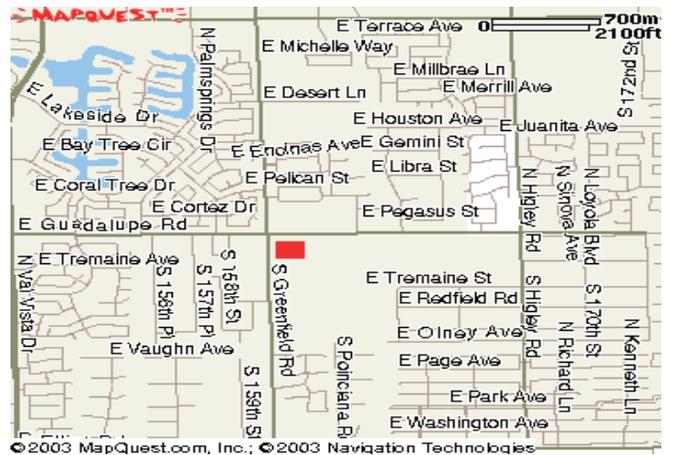


The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

Our meetings are held on the third Friday of each month at the Southeast Regional Library in Gilbert. The library is located at 775 N. Greenfield Road; on the southeast corner of Greenfield and Guadalupe Roads.

Meetings begin at 7:30 pm.

Visitors are always welcome!



2008 Meeting Dates

- January 18
- February 15
- March 21
- April 18
- May 16
- June 20

Southeast Regional Library
 775 N. Greenfield Road
 Gilbert, Az. 85234

All are welcome to attend the pre-meeting dinner at 5:30 pm. We meet at Old Country Buffet, located at 1855 S. Stapley Drive in Mesa. The restaurant is in the plaza on the northeast corner of Stapley and Baseline Roads, just south of US60.

Old Country Buffet
 1855 S. Stapley Drive
 Mesa, Az. 85204

Likewise, all are invited to meet for coffee and more astro talk after the meeting at the Village Inn restaurant located on the northeast corner of Gilbert and Baseline Roads in Mesa.

Village Inn
 2034 E. Southern Avenue
 Mesa, Az. 85204



JANUARY 2008

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

January 5 - Deep Sky Star Party at Vekol Road

January 11 - Public Star Party at Riparian Preserve in Gilbert

January 15 - Mesa High School Earth & Space Science Star Party

January 18 - General Meeting at Southeast Regional Library in Gilbert

January 25 - Zaharis Elementary School Star Party



In this new Hubble image of the galaxy M74 we can also see a smattering of bright pink regions decorating the spiral arms. These are huge, relatively short-lived, clouds of hydrogen gas which glow due to the strong radiation from hot, young stars embedded within them; glowing pink regions of ionized hydrogen (hydrogen that has lost its electrons). These regions of star formation show an excess of light at ultraviolet wavelengths and astronomers call them HII regions.

*Credit: NASA, ESA, and The Hubble Heritage (STScI/AURA)-ESA/Hubble Collaboration.
Acknowledgment: R. Chandar (University of Toledo) and J. Miller (University of Michigan)*

East Valley Astronomy Club -- 2008 Membership Form

Please complete this form and return it to the club Treasurer at the next meeting or mail it to EVAC, PO Box 2202, Mesa, Az, 85214-2202. Please include a check or money order made payable to EVAC for the appropriate amount.

IMPORTANT: All memberships expire on December 31 of each year.

Select one of the following:

New Member Renewal Change of Address

New Member Dues (dues are prorated, select according to the month you are joining the club):

<input type="checkbox"/> \$30.00 Individual January through March	<input type="checkbox"/> \$22.50 Individual April through June
<input type="checkbox"/> \$35.00 Family January through March	<input type="checkbox"/> \$26.25 Family April through June
<input type="checkbox"/> \$15.00 Individual July through September	<input type="checkbox"/> \$37.50 Individual October through December
<input type="checkbox"/> \$17.50 Family July through September	<input type="checkbox"/> \$43.75 Family October through December

Includes dues for the following year

Renewal (current members only):

\$30.00 Individual **\$35.00 Family**

Magazine Subscriptions (include renewal notices):

\$34.00 Astronomy **\$33.00** Sky & Telescope

Name Badges:

\$10.00 Each (including postage) Quantity: _____

Name to imprint: _____

Total amount enclosed:

Please make check or money order payable to EVAC

Payment was remitted separately using PayPal Payment was remitted separately using my financial institution's online bill payment feature

Name: Phone:

Address: Email:

City, State, Zip: Publish email address on website

URL:

How would you like to receive your monthly newsletter? (choose one option):

Electronic delivery (PDF) *Included with membership* US Mail **Please add \$10 to the total payment**

Areas of Interest (check all that apply):

<input type="checkbox"/> General Observing	<input type="checkbox"/> Cosmology
<input type="checkbox"/> Lunar Observing	<input type="checkbox"/> Telescope Making
<input type="checkbox"/> Planetary Observing	<input type="checkbox"/> Astrophotography
<input type="checkbox"/> Deep Sky Observing	<input type="checkbox"/> Other

Please describe your astronomy equipment:

Would you be interested in attending a beginner's workshop? Yes No

How did you discover East Valley Astronomy Club?

**PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org**

All members are required to have a liability release form (waiver) on file. Please complete one and forward to the Treasurer with your membership application or renewal.

Liability Release Form

In consideration of attending any publicized Star Party hosted by the East Valley Astronomy Club (hereinafter referred to as "EVAC") I hereby affirm that I and my family agree to hold EVAC harmless from any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), which may directly or indirectly be connected to EVAC and/or my presence on the premises of any EVAC Star Party and related areas.

I further agree to indemnify any party indicated above should such party suffer any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), caused directly or indirectly by my negligent or intentional acts, or failure to act, or if such acts or failures to act are directly or indirectly caused by any person in my family or associates while participating in an EVAC Star Party.

My signature upon this form also indicates agreement and acceptance on behalf of all minor children (under 18 years of age) under my care in attendance.

EVAC only recognizes those who are members or invitees and who also have a signed Liability Release Form on file as participants at an EVAC Star Party.

Please print name here

Date



Please sign name here

**PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org**

Ultraviolet Surprise

by Patrick L. Barry and Tony Phillips

How would you like to visit a universe full of exotic stars and weird galaxies the likes of which astronomers on Earth have never seen before?

Now you can. Just point your web browser to galex.stsci.edu and start exploring.

That's the address of the Galaxy Evolution Explorer image archive, a survey of the whole sky at ultraviolet wavelengths that can't be seen from the ground. Earth's atmosphere blocks far-ultraviolet light, so the only way to see the ultraviolet sky is by using a space telescope such as NASA's Galaxy Evolution Explorer.

About 65% of the images from the all-sky survey haven't been closely examined by astronomers yet, so there are plenty of surprises waiting to be uncovered.

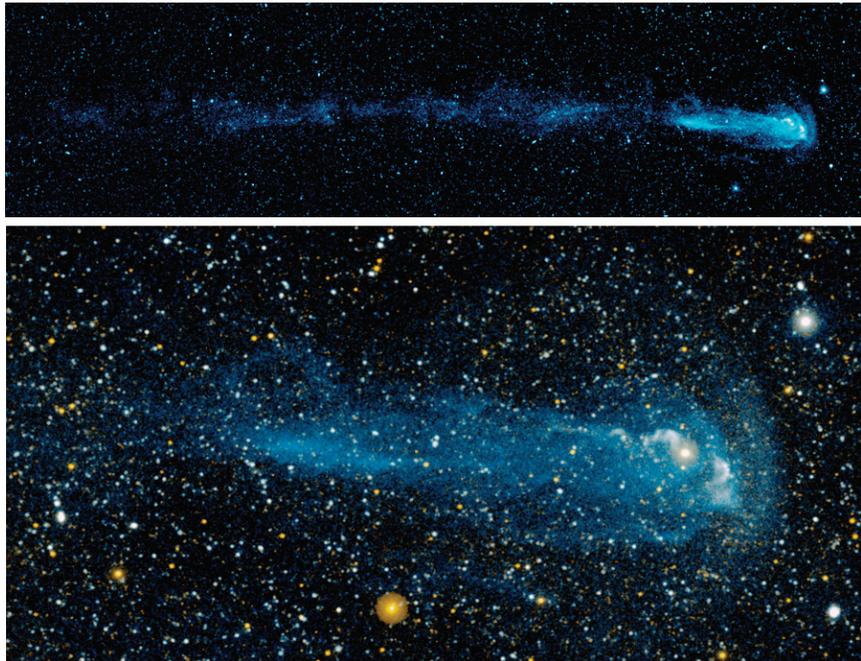
"The Galaxy Evolution Explorer produces so much data that, beyond basic quality control, we just don't have time to look at it all," says Mark Seibert, an astronomy postdoc at the Observatories of the Carnegie Institution of Washington in Pasadena, California.

This fresh view of the sky has already revealed striking and unexpected features of familiar celestial objects. Mira is a good example. Occasionally visible to the naked eye, Mira is a pulsating star monitored carefully by astronomers for more than 400 years. Yet until Galaxy Evolution Explorer recently examined Mira, no one would have guessed its secret: Mira possesses a comet-like tail 13 light-years long.

"Mira shows us that even well-observed stars can surprise us if

we look at them in a different way and at different frequencies," Seibert says.

Another example: In April, scientists announced that galaxies such as NGC 1512 have giant ultraviolet spiral arms extending three times farther out into space than the arms that can be seen by visible-light telescopes. It would be like looking at your pet dog through an ultraviolet telescope and discovering his ears are really three times longer than you thought!



Astronomers looking at new ultraviolet images from the Galaxy Evolution Explorer spacecraft were surprised to discover a 13-light-year long tail on Mira, a star that has been extensively studied for 400 years.

The images from the ultraviolet space telescope are ideal for hunting new phenomena. The telescope's small, 20-inch primary mirror (not much bigger than a typical backyard telescope) offers a wide field of view. Each image covers 1.2 degrees of sky—lots of territory for the unexpected.

If someone combing the archives does find something of interest, Seibert advises that she or he should first search astronomy journals to see whether the phenomenon has been observed before. If it hasn't, email a member of the Galaxy Evolution Explorer science team and let them know, Seibert says.

So what are you waiting for? Fire up your web browser and let the discoveries begin!

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

If It's Clear...

by *Fulton Wright, Jr.*

Prescott Astronomy Club

January 2008

Shamelessly stolen information from *Sky & Telescope* magazine, *Astronomy* magazine, and anywhere else I can find info. When gauging distances, remember that the Moon is 1/2 a degree or 30 arc minutes in diameter. All times are Mountain Standard Time unless otherwise noted.

January remains a good month to observe Mars. On the 1st it transits the meridian at 11:45 PM and on the 31st at 9:20 PM. It goes from 15 arc seconds in diameter to 12. It is also very high in the sky when it crosses the meridian. Often the seeing is steadiest right at dusk so look early, too. The bigger the telescope for observing, the better. See *Sky & Telescope*, Nov. 2007, p. 66 for details.

January should be a good month for comets. Comet Holmes might still be visible (see: <http://www.skyandtelescope.com/observing/home/10862521.html> for details). Comet Tuttle should appear (see: *Sky and Telescope*, January 2008, p. 73 for details). Of course, there are other internet sites with information. It is best to use binoculars and look when the Moon is out of the sky (December 26 - January 11, January 26 - February 10 for early evening observations).

On Tuesday, January 8, it is new moon so you can hunt for faint fuzzies all night.

A Mystery Observatory

by *Howard Israel*

On our latest astronomy lecture cruise, Madeline and I came across an astronomical observatory located on one of the highest points on the island of Tortola, British Virgin Islands. Our tour bus was taking us to a spot called "SkyWorld" a combination viewpoint- restaurant- gift shop located on the highest point in Tortola. Imagine our surprise when disembarking the bus we saw the Briarcliffe-Davis Observatory, built in 1984, situated next to the restaurant parking lot. Based upon the overgrowth of foliage surrounding the observatory, it was apparent it had not been used in quite some time.

We asked the tour guide, a life long resident of the island, if he knew anything about the observatory. He had no knowledge about it, other than it had been there as long as he could remember. When we returned home, I immediately looked for any reference to the observatory on several search engines and came up with just the photo to the right, but no information whatsoever about the observatory itself.

Based on its great location, condition of the building and dome, it's a shame to see this astronomical resource go to waste.

On Thursday, January 17, about 11:53 PM, you can see the Moon occult one of the stars in the Pleiades. With a telescope (the bigger, the better) look 45 degrees above the west horizon for the gibbous moon. The Moon will be close to the cluster for the whole night. This is also be a good night to look for volcanic domes on the Moon. Just north of the crater Hortensius (near Copernicus) is a field of 6 domes. See *Astronomy Magazine*, January 2008, p. 53 for more details. Again, the bigger the telescope, the better.

On Tuesday, January 22, at 6:12 PM (sunset 5:48 PM) the full Moon rises spoiling your chances of seeing faint fuzzies all night. However, about 15 minutes later, it should be dark enough to catch Mercury before it sets below the opposite horizon. You should be able to see Mercury a few days on either side of this date.



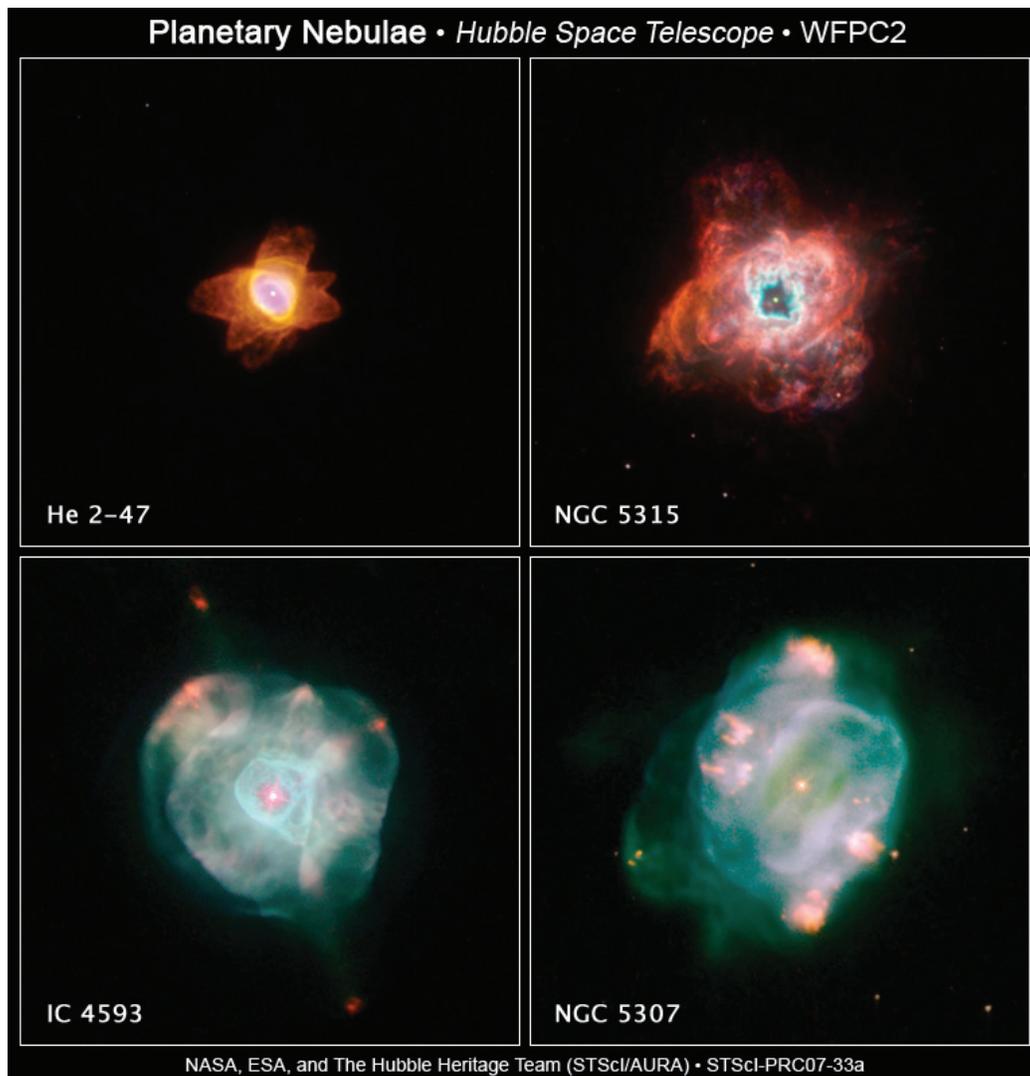
2008: A Year of Sky Events

Continued from page 3 which rises in NE about 10 p.m. Best time to look between moonset and morning twilight. Typical rate 50 meteors per hour.

- August 13 (evening): Saturn 0.5 degrees to right of Venus, extremely low in W after sunset. May need binoculars to see.
- September 6 (evening): Mars, Venus and Mercury form 3-degree triangle, very low in W after sunset. May need binoculars to see. Bright star Antares one degree above first-quarter Moon, in SSW.
- September 11 (evening): Mars 0.3 degrees to lower left of Venus, extremely low in W after sunset. Mercury 4 degrees to lower left. May need binoculars to see.
- September 22: Fall equinox (8:44 a.m. MST). Sunrise straight east (6:17 a.m., azimuth 89.5 degrees), sunset straight west (6:24 p.m., azimuth 270.3 degrees). Always use proper eye protection when viewing the sun.
- October 22 (morning): Mercury at greatest elongation;

easily visible on mornings of October 15 thru 28 low in E before sunrise.

- October 25 (evening): Bright star Antares 4 degrees to lower left of Venus, low in SW after sunset.
- October 31 (evening): Venus 5 degrees above crescent Moon, low in SW after sunset. Moon 7 degrees to left of Venus on November 1.
- December 1 (evening): Venus 4 degrees to lower right of crescent Moon (occultation for Europe, Africa), in SW after sunset. Jupiter 2 degrees to upper right of Venus
- December 28 (evening): Mercury 3 degrees below Jupiter, thin crescent Moon 2 degrees below Mercury, very low in WSW after sunset. May need binoculars to see.
- December 31 (evening): Venus 3 degrees below crescent Moon, in SW after sunset. To lower right, Mercury 1 degree to left of Jupiter, very low in WSW. May need binoculars to see.



DEEP SKY OBJECT OF THE MONTH



NGC 129 (Collinder 2) Open Cluster in Cassiopeia

RA 00h 29m 54.1s DEC +60° 13' 34" Size: 21.0' Magnitude: 9.8

Chart generated with Starry Night Pro

Hazy Red Sunset on Extrasolar Planet

The NASA/ESA Hubble Space Telescope has given astronomers a fascinating new insight into the atmosphere of a planet in orbit around another star. The observations provide evidence of the presence of hazes in the atmosphere of the planet HD 189733b.

A team of astronomers have used the NASA/ESA Hubble Space Telescope to detect, for the first time, strong evidence of hazes in the atmosphere of a planet orbiting a distant star. The discovery comes after extensive observations made recently with Hubble's Advanced Camera for Surveys (ACS).

The team, led by Frédéric Pont from the Geneva University Observatory in Switzerland, used Hubble's ACS to make the first detection of hazes in the atmosphere of the giant planet. "One of the long-term goals of studying extrasolar planets is to measure the atmosphere of an Earth-like planet, this present result is a step in this direction" says Pont. "HD 189733b is the first extrasolar planet for which we are piecing together a complete idea of what it really looks like."

The new observations were made as the extrasolar planet, dubbed HD 189733b, passed in front of its parent star in a transit. As the light from the star passes through the atmosphere around the limb of the giant extrasolar planet, the gases in the atmosphere stamp their unique signature on the starlight from HD 189733.

The planet itself, orbiting close to its parent star, is a 'hot-Jupiter' type of gas giant slightly larger than Jupiter. The proximity to its star results in an atmospheric temperature of roughly seven hundred degrees Celsius. Measurements of the way light varies as the planet passes in front of its parent star indicates that HD 189733b has neither Earth-sized moons nor any discernable Saturn-like ring system.

Hubble's ACS camera, coupled with a grism (a kind of cross between a prism and a diffraction grating) allowed the astronomers to make extremely accurate measurements of the spectrum of HD

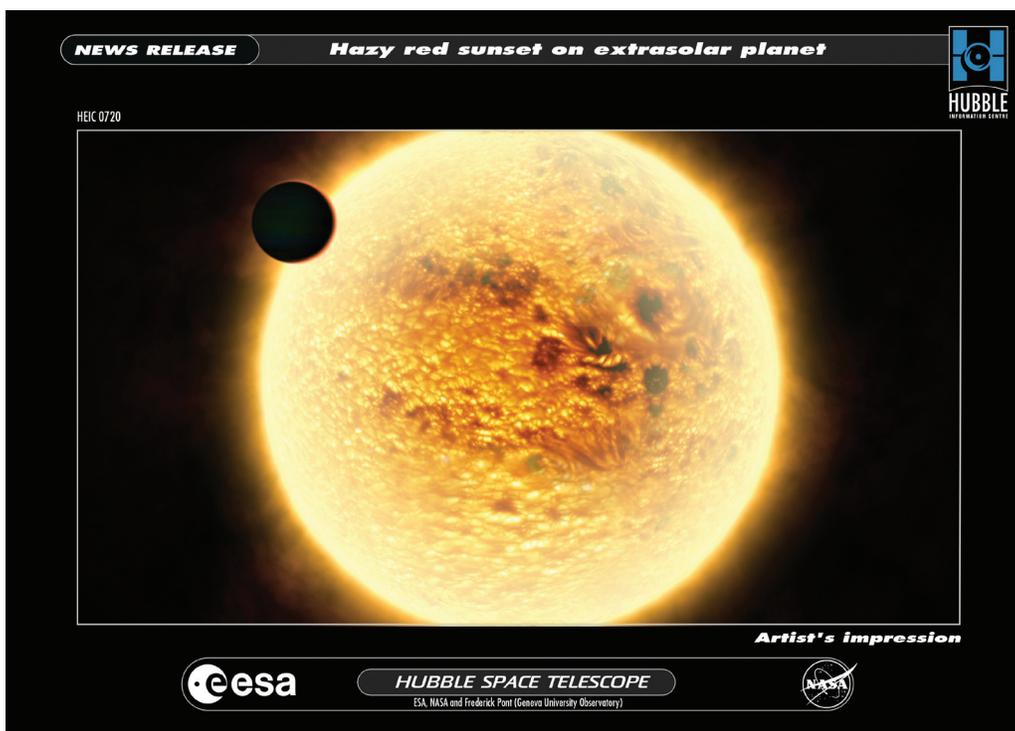
189733b, allowing conclusions to be drawn about the composition of the planet's atmosphere. The exquisite level of precision needed to make this observation can only, at the moment, be achieved from space. The combination of a large planet and relatively small parent star – only 76% of the diameter of our Sun – contributes to the success of this delicate experiment.

Where the scientists had expected to see the fingerprints of sodium, potassium and water there were none. This finding, combined with the distinct shape of the planet's spectrum, infers that high

level hazes (with an altitude range of roughly 1000 km) are present. So the atmosphere on HD 189733b would look very similar to a gorgeous red sunset over Athens! Venus and Saturn's moon Titan, in our own Solar System, are also covered with haze. According to the scientists the haze probably consists of tiny particles (less than 1/1000 mm in size) of condensates of iron, silicates and aluminium oxide dust (the compound on Earth which the mineral sapphire is made of).

As part of the observations of HD 189733, the teams of astronomers also needed to accurately account for the variations in the star's brightness during the set of observations. 'Starspots' like those seen on our own Sun may cover several percent of the star and are thought to be about 1000 degrees Celsius cooler than the rest of HD 189733's surface. It was found that there is a starspot on the star's surface which is over 80,000 km across.

The Hubble Space Telescope is a project of international cooperation between ESA and NASA. The Space Telescope European Coordinating Facility in Garching near Munich, Germany is responsible for Hubble's grism mode.



An artist's impression of the extrasolar planet HD 189733b seen here with its parent star looming behind. The planet is slightly larger than our own Solar System's Jupiter. Its atmosphere is a scorching eight hundred degrees Celsius. Astronomers have found that the sunset on HD 189733b would look similar to a hazy red sunset on Earth. Credit: ESA, NASA and Frederic Pont (Geneva University Observatory)

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