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Star Points for December 2011

"Five Planets in December Skies"

by Curtis Roelle

In This Issue:

December offers a chance to see, at different times of the night, all five naked-eye planets. It requires patience and some effort and perhaps an alarm clock. The tour begins at dusk and ends at dawn. Each of them, except Mercury, will be visible all month, so it's not necessary to catch them all on a single night.

Each will be visible to the unaided eye. A telescope will show more detail, especially with Saturn and Jupiter.

May as well start with the brightest planet, Venus. Early in the month it shines low in the southwest during bright evening twilight. By 5:00 p.m. EST Venus is less than 15° above the horizon. It's the brightest "star" in the sky.

This is a good place to recall that an outstretched fist is about 10° across. This works for just about everyone as long as they are using their own fist. So 15° is about 1½ fists.

If your horizon is clear, Venus will be visible for at least another hour. It will be sinking, but the sky will also be compensating by getting darker, making it easier to see.

Venus also gets higher each night than at the same time on the night before. By year's end, Venus is more than 30° above the horizon at 5:00 p.m., taking more than two hours to subsequently set.

Next planet is the second brightest. At 6:00 p.m. in early December, Jupiter is already high in the east. Though you don't really need it, the Moon can be used for finding Jupiter this week. On Monday night (Dec. 5) Jupiter is below and to left of the Moon and, on Tuesday, to the lower right.

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WASI Holiday Dinner

For WASI members and their families

December 14, 2011, 7 p.m.

Bear Branch Nature Center

(more information on page 4)

President's Message for December

by Jim Reynolds

Happy Winter Solstice & Merry Christmas to all!

It's been a great year for The Westminster Astronomical Society. I've very much enjoyed serving as president. We've all had a lot of fun working on public outreach, star parties, the summer picnic, and all manner of related celestial events. We've had some new members join our "family"; I'd love to see more new faces in 2012.

The new WASI Facebook page is up and running. If you have a Facebook account, be sure to look us up. If you're already a Westminster Astronomical Society member on Facebook, please feel free to post astronomical information (events, pertinent articles, news, etc.).

The December "eating meeting" is coming up, so be sure to mark your calendars for December 14th, and bring your appetite! Our last planetarium show for 2011 is scheduled for December 3rd. I hope that 2012 is an even better year for our club.

Since this is my last article of the year, I am going to keep this very short and wish everyone a very safe and happy holiday season.

Regards,
Jim Reynolds

Welcome, New WASI Members!

WASI extends a warm welcome to the following new members.

Sarah Feustle of Reisterstown, Maryland
Brad and Sara Stuart of Westminster, Maryland

Star Points *continued*

By 9:00 p.m. Jupiter is at its highest. It rises a little earlier each night, so by year's end Jupiter reaches this high point in the southern sky a little past 7:00 p.m.

The third planet up is Mars. It should be rising in the eastern sky and well above most trees by 2:00 a.m. The bright star to its upper right is the bluish Regulus, the heart of Leo the lion. Mars' ruddy color stands out in contrast with Regulus.

The fourth planet is the ringed world Saturn. Prior to morning twilight at 6:00 a.m. it is fairly high, more than 25° above the southeast horizon. By year's end it will be even higher at the same time.

During your observation look for two bright side-by-side stars low in the southeast. Saturn is the left one. To the right is the bright star Spica, in Virgo.

Mercury, our fifth and final planet, appears low in the morning sky at mid-month and requires a clear, flat horizon without hills, trees, or buildings. For about a week starting around December 15, look for Mercury low in the southeast sky, less than 10° over the horizon. Scanning the horizon with binoculars can help. On the 22nd the Moon is to Mercury's upper right.

Speaking of Mars, a couple of space missions to the Red Planet were recently launched. To conserve fuel, Mars missions are launched during periodic seasons or windows when the planets are favorably aligned. On November 8, Russia launched Phobos-Grunt, a soil-sample mission targeted for Mars' largest moon Phobos. More on that below.

On November 26, the U.S. launched the Mars Science Laboratory (MSL). MSL will be carried across the Martian surface aboard the back of the latest Mars rover, named Curiosity. It is currently on an eight-month coasting journey to Mars.

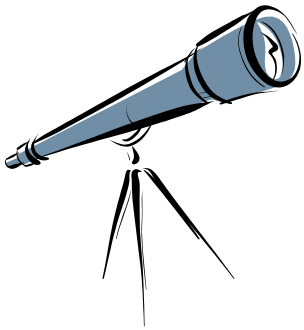
Now, back to Phobos-Grunt. Contact with the spacecraft was lost before it had a chance to leave Earth orbit. It has become, like UARS (see October Star*Points) before it, the latest large satellite destined for an uncontrolled re-entry back to Earth. Unlike UARS, Phobos-Grunt's fuel tanks are full and could survive re-entry and crash to the surface.

Currently, Phobos-Grunt is expected to re-enter in December. For re-entry predictions, I rely on the Aerospace Corporation's re-entry predictions web page (reentrynews.aero.org/).

So, get out and look at the planets this month, especially if you get a new telescope for Christmas. But first a little advice. Some telescopes come with finder scopes used to help locate objects. A finder looks like a tiny telescope mounted on the side of the main instrument. The finder is a useful tool, but only if it's aligned properly. So follow the instructions that came with your telescope so that when you center an object, such as a planet, in the finder's cross hairs, it will appear in the center field of view in the main telescope. An unaligned finder is one major source of frustration for new telescope owners.

"Star Points" by Curtis Roelle appears in the Carroll County Times *on the first Sunday of each month. Visit the website at* http://www.starpoints.org or send email to StarPoints@gmail.com.

Upcoming Events



Soldiers Delight Public Stargazing December 10, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills

WASI Holiday Dinner December 14, 7 p.m., at Bear Branch Nature Center (BBNC); see a description below

WASI Member Observing Weekend December 16 & 17 at BBNC

WASI HOLIDAY DINNER

On Wednesday, December 14, we will have our annual holiday dinner at Bear Branch Nature Center. As usual, it will be a potluck-style affair held in the auditorium. We'll start eating at 7:00 p.m. The dinner is for the exclusive enjoyment of WASI members, who are welcome to bring their families or a guest.

The club will provide plates, cups, utensils, and beverages. All you need to bring is your appetite and, if you can, a dish to share (along with a spoon, fork, or other serving instrument). The dish can be a main dish, salad, side dish, or dessert. Please bring enough to serve 8 to 12 people.

If you plan to attend, please send a message to the WASI mailing list (WASI_Astro@yahoogroups.com) to say what dish you'll be bringing and the number of people in your party. We hope to see you there!

25 Years Ago...

by Curt Roelle

July to December, 1986

3rd Quarter, 1986

Astrocon-86, the Astronomical League annual convention for 1986, was held at the College of Notre Dame Baltimore campus. The Baltimore Astronomical Society (BAS) was the convention's host society. Most active BAS members were also WASI members, so WASI provided essential support for the event.

WASI members among the convention personnel included convention co-chairmen Mike Potter and Dave Pessagno, paper chairman Barry Willen, co-treasurers Blaine Roelke and Nancy Raab (now Nancy Roelke), proceedings chairman and photographic-video chairman Curt Roelle, the late Walt Richards as convention photographer, plus others who played various "gopher" roles.

Organizations participating in the August convention included the Association of Lunar and Planetary Observers (ALPO), International Occultation Timing Association (IOTA), International Amateur-Professional Photoelectric Photometry (IAPPP), International Halley Watch (IHW), and the L5 Society.

Speakers and VIPs included David Levy, Stephen Edberg, Space Telescope Science Institute Director Riccardo Giacconi, Sky & Telescope's Stephen O'Meara, and keynote speaker Ben Mayer.

One of the biggest highlights for me was the bus field trip to the U.S. Naval Observatory in Washington. The convention coincided with one of the decade's best Mars oppositions. Visitors were treated to views of Mars through the eyepiece of the historically famous 26-inch Alvan Clark refractor — the very telescope Asaph Hall used to discover Mars' two moons Phobos and Deimos in 1877. It was a very memorable evening for everyone.

In other news, NASA's Dr. John Pearl visited the September meeting and discussed the then-recent 1986 flyby of the planet Uranus by the Voyager 2 space probe. Steve Rice started a new column in the MDA entitled "The Eagle Eye Observer." The column included observing reports by Steve and other WASI members.

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25 Years Ago…

4th Quarter, 1986

A mid-week partial solar eclipse on Wednesday, October 3, had members gathering at Curt Roelle's house on Salem Bottom Road with their telescopes. During the eclipse about 65% of the Sun was covered. It was enough obscuration for people to distinctly detect the reduced sunlight.

WASI members relax following their successful observation of the October 3, 1986, partial solar eclipse. Front row, left to right: Carole Sakamoto, Robert Sier Jr., Blaine Roelke, Andrew Demario Jr., Todd Tonner, and Steve Rice. Back row: Curt Roelle, Cheryl and Shannon Roelle, Charlie Mantel, and Dennis Mishler.

Comet P/Halley continued receiving attention. Michael A'Hearn (University of Maryland), a Discipline Specialist with the International Halley Watch, addressed the November meeting. *(More recently Dr. A'Hearn was Principal Investigator for NASA's Deep Impact comet mission and its 2005 impact with Comet Tempel 1.)*

The December star party at Blaine Roelke's Keymar observatory was well attended by a dozen or more members. Four stragglers managed to catch our final glimpse of Comet P/Halley through Mike Potter's 17.5-inch equatorial telescope. The same gang of four had also been together 14 months previously for our first successful visual observation of the comet. The four were Todd Bonner, Steve Rice, Robert Sier Jr., and myself.

By December the club had 38 registered members.

Re-thinking an Alien World: The Strange Case of 55 Cancri e

Forty light-years from Earth, a rocky world named "55 Cancri e" circles perilously close to a stellar inferno. Completing one orbit in only 18 hours, the alien planet is 26 times closer to its parent star than Mercury is to the Sun. If Earth were in the same position, the soil beneath our feet would heat up to about 3200°F. Researchers have long thought that 55 Cancri e must be a wasteland of parched rock.

Now they're thinking again. New observations by NASA's Spitzer Space Telescope suggest that 55 Cancri e may be wetter and weirder than anyone imagined.

Spitzer recently measured the extraordinarily small amount of light 55 Cancri e blocks when it crosses in front of its star. These transits occur every 18 hours, giving researchers repeated opportunities to gather the data they need to estimate the width, volume, and density of the planet.

According to the new observations, 55 Cancri e has a mass 7.8 times and a radius just over twice that of Earth. Those properties place 55 Cancri e in the "super-Earth" class of exoplanets, a few dozen of which have been found. Only a handful of known super-Earths, however, cross the face of their stars as viewed from our vantage point in the cosmos, so 55 Cancri e is better understood than most.

When 55 Cancri e was discovered in 2004, initial estimates of its size and mass were consistent with a dense planet of solid rock. Spitzer data suggest otherwise: About a fifth of the planet's mass must be made of light elements and compounds — including water. Given the intense heat and high pressure these materials likely experience, researchers think the compounds likely exist in a "supercritical" fluid state.

A supercritical fluid is a high-pressure, high-temperature state of matter best described as a liquid-like gas, and a marvelous solvent. Water becomes supercritical in some steam turbines — and it tends to dissolve the tips of the turbine blades. Supercritical carbon dioxide is used to remove caffeine from coffee beans, and sometimes to dry-clean clothes. Liquid-fueled rocket propellant is also supercritical when it emerges from the tail of a spaceship.

On 55 Cancri e, this stuff may be literally oozing — or is it steaming? — out of the rocks.

(*Continued on next page*)

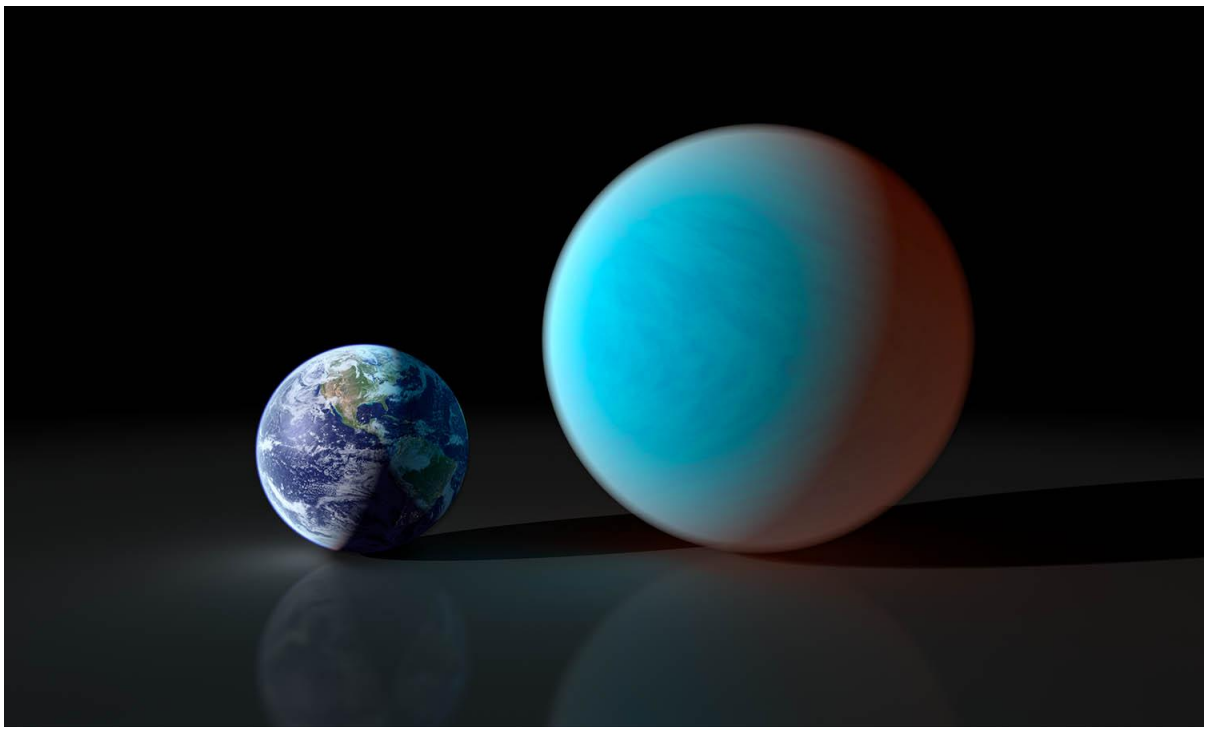
With supercritical solvents rising from the planet's surface, a star of terrifying proportions filling much of the daytime sky, and whole years rushing past in a matter of hours, 55 Cancri e teaches a valuable lesson: Just because a planet is similar in size to Earth does not mean the planet is like Earth.

It's something to *re*-think about.

Get a kid thinking about extrasolar planets by pointing him or her to "Lucy's Planet Hunt," a story in rhyme about a girl who wanted nothing more than to look for Earth-like planets when she grew up. Go to http://spaceplace.nasa.gov/story-lucy.

The original research reported in this story has been accepted for publication in *Astronomy and Astrophysics*. The lead author is Brice-Olivier Demory, a post-doctoral associate in Professor Sara Seager's group at MIT.

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



Artist's rendering compares the size Earth with the rocky "super-Earth" 55 Cancri e. Its year is only about 18 hours long!