



The Mason-Dixon Astronomer

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Star Points for April 2012

“Venus Burning Bright”

by Curtis Roelle

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NASA's Space
Place

As it has done for the past couple months, dazzling Venus continues to dominate the western evening sky. Mars is still riding high as well and, as Jupiter slowly sinks ever lower in the west, Saturn enters the evening lineup well placed for viewing.

Observing from a hill overlooking all buildings and trees during the first two weeks of this month, it is theoretically possible to view four major planets at once with the naked eye in the evening sky — five if you count Earth. Here is a quick tour that is good for the first half of April.

During evening twilight around 8 p.m., the most brilliant star-like object in the western sky is Venus. Between it and the horizon is the fainter gas giant Jupiter.

Orange-red Mars is high in the southeast. Once it gets a little darker out around 8:30 p.m. you could use Mars to help locate the star Regulus in Leo. Regulus, the “heart of the lion,” is just to the upper right of Mars. While Earth was catching up, Mars appeared to be moving backward in the sky toward Regulus in what is known as “retrograde motion.” By mid-month Mars will be resuming its forward motion.

Retrograde motion is a sort of optical illusion. Although Mars and Earth are traveling in the same circular direction around the Sun, sometimes Mars can appear to move backwards. A similar illusion is experienced when you're riding in a car that is passing another slower moving car. As you pass, the slower vehicle appears to be moving backward relative to your own car, although both are actually traveling forward.

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April Meeting: Wednesday, April 11, 2012, 7:30 p.m., at Bear Branch Nature Center

Speaker: Vanessa Thomas (WASI Vice President and MDA editor) will present “NASA's Curiosity Launch Tweetup.” See a description on page 5.

President's Message by Jim Reynolds

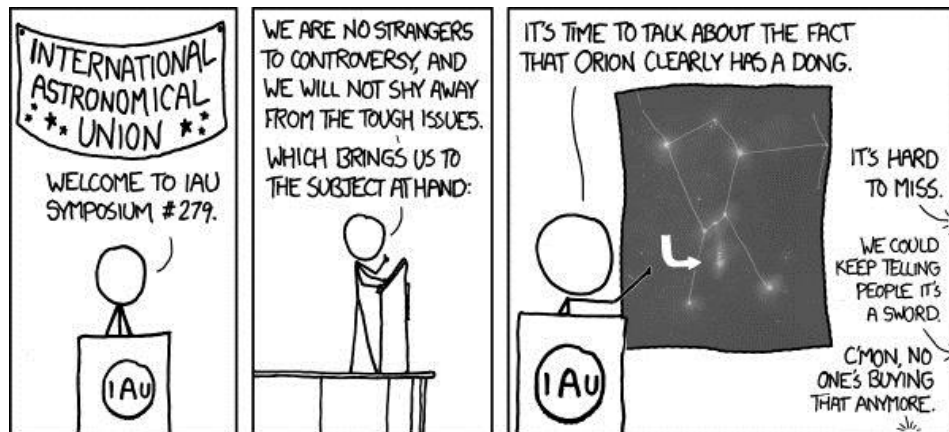
Greetings All!

March was a great month for the Westminster Astronomical Society. We had a star party at Soldier's Delight with over 70 participants!! That's super terrific. A huge "Thank You" to Skip Bird & Viacheslau Muryhin for their ongoing efforts at the Soldier's Delight star parties. Three cheers to Bob Clark for his relentless promotion of WASI events. Thanks Bob! You routinely go above and beyond the "call of duty" for WASI.

The Messier Marathon scheduled for March 24 met a similar fate as previous years. The alternative April nights will be as follows (thanks Curt):

Alternate: Saturday-Sunday night, April 21-22, Rain Date: Friday-Saturday night, April 20-21

I've noticed a heck of a lot more traffic on the WASI discussion group as of late. It's really great to see so many folks posting & replying. I have to admit I am not as quick on the draw for keeping up on the numerous posts, but I am trying.



Our March meeting featured Dr. Michelle Thaller from NASA Goddard. Dr. Thaller gave a wonderful presentation that was enjoyable to everyone. Steve Conard also provided an outstanding update on his unofficial (hopefully not unofficial for long) discovery of an asteroidal moon. Tom Lipka's long-awaited PowerPoint presentation had to be rescheduled for the April meeting, unfortunately. Tom set up the meeting's agenda, which was immensely helpful in keeping the meeting moving. Congratulations to all those folks who received their 2011 Night Sky Network public outreach awards!

A quick reminder for everyone doing public service: Please don't forget to log your volunteer hours into the WASI Night Sky Network log. This keeps track of the number of hours of public outreach our club members perform. Please see myself or Skip Bird if you need any assistance in logging your volunteer hours.

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Star Points, *cont.*

By 9 p.m. Saturn is about ten degrees above the western horizon. You may need to wait another hour for it to get higher, depending on your local obstructions. Saturn rises higher and near midnight is getting well placed for viewing through a telescope. Just about any telescope can reveal its delicate rings.

You could use Saturn to find the star Spica in Virgo. Spica is the bright star to Saturn's right.

Your best chance of seeing all four planets in the sky together during mid-April is between 8:30 and 9 p.m.

But now back to this month's big story: Venus. Because Venus' orbit is located inside of Earth's orbit, Venus never strays too far from the Sun in our sky. When in the morning sky, Venus will typically rise a little before the Sun. Likewise, when in the evening sky, it sets shortly after the Sun.

However, currently Venus' angular distance from the Sun — that is, the distance separating it and the Sun as seen in the sky — is about as great as it ever gets. What this means is Venus lingers for a long time in the evening sky. For several hours after sunset you can look out a window and still see Venus sinking slowly in the northwest.

One of the interesting things about Venus is that in a telescope Venus, like the Moon, shows phases. At the end of March, Venus' phase had changed from gibbous to a half-lit globe. During April, Venus' phase shrinks to a crescent and, by month's end, only 28% of its disc will be illuminated.

Venus orbits closer to the Sun than does Earth and hence is also traveling more rapidly. As Venus catches up to Earth, we see less and less of its sunlit side and view it as a shrinking crescent. Also, as Venus draws nearer to Earth its apparent size increases. During the month of April the apparent diameter of Venus, as seen from Earth in a telescope, increases by over 50%!

Venus presents an interesting target in April for readers with just about any size telescope. Can you detect the crescent phase of Venus? What is the lowest magnification at which the crescent is still visible in your telescope?

As far as surface markings on Venus go, don't expect to see any with your telescope. Venus is shrouded in thick clouds and its surface isn't visible. NASA's Magellan spacecraft did manage to map its surface through the clouds in the 1990s using synthetic aperture radar (SAR) technology. But all we see optically is the bright sunlit 100% cloudy atmosphere.

If you don't have a telescope, you could participate in one of the public April activities organized by the Westminster Astronomical Society. Go to WestminsterAstro.org and check the calendar tab for details.

"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.

President's Message continued

Project ASTRO is still looking for astronomer participants for the 2012-2013 academic year. Please let me know if you're interested in participating.

I'm looking forward to our April monthly meeting (04/11/2012) as well as our public & members-only observing at BBNC & Soldier's Delight. There is another star party scheduled for Soldier's Delight Natural Environmental Area for April 14th at 8:00pm.

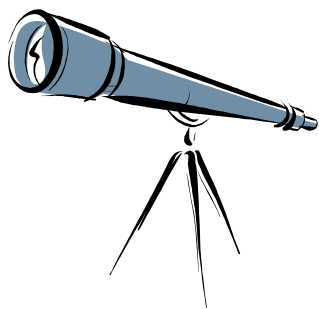
Clear skies everyone!
Jim Reynolds

Welcome, New WASI Members!

WASI extends a warm welcome to the following new members.

Stuart Benner of Hampstead, Maryland
Kenneth Lum of San Carlos, California
Daniel Mack of Germantown, Maryland
Jerry McFeeters of Frederick, Maryland
Steve Stapf of Crofton, Maryland

Upcoming WASI Observing and Events



Monthly Meeting April 11, 7:30 p.m., at Bear Branch Nature Center (BBNC)

Soldiers Delight Public Stargazing April 14, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills

WASI Member Observing Weekend / Messier Marathon April 21 (backup date: April 20), Marstown Observatory in New Windsor; for directions and updates, visit www.marstown.org

Delmarva Stargaze April 19 to 22, at Tuckahoe State Park's Equestrian Center near Queen Anne, Maryland; for more information visit delmarvastargazers.org

Astronomy Day April 28, all day, everywhere!

Planetarium Show April 28, 7:30 p.m., at BBNC

Northeast Astronomy Forum (NEAF) April 28 and 29, in Suffern, New York; for more information visit www.rocklandastronomy.com/NEAF

APRIL MEETING PROGRAM

In November 2011, WASI member Vanessa Thomas attended NASA's Mars Curiosity launch "Tweetup" at Cape Canaveral in Florida, a two-day outreach event for a lucky group of NASA's Twitter followers. Vanessa and other participants were treated to presentations from NASA officials and Curiosity mission team members, a tour of NASA's Kennedy Space Center and Cape Canaveral Air Force Station, and the opportunity to witness Curiosity's spectacular launch from the vantage point of Kennedy Space Center's press site. Vanessa will share pictures and stories from her experience.

Curt Roelle will also share his observations of NASA's ARTEX mission, which launched five sounding rockets from Wallops Island, Virginia, on the morning of March 27, 2012.

Message from Observing & Science Chair, Tom Lipka

Fellow Astronomers,

When last we met, WASI members, as well as visitors, were treated to a plethora of science at BBNC. The main event of which was the presentation by Dr. Michelle Thaller from Goddard. Not to be outdone, two WASI VIPs, Steve Conard and Brian Eney, demonstrated to those assembled what WASI members are doing on a regular basis, culminating in one of the best meetings that I personally have ever attended, and before a larger-than-normal audience! Kudos to everyone who helped to make it so!

One caveat to this however is that we now have set the bar pretty high as regards expectations for future meetings! Thus we are now tasked with at least trying to keep our Newtonian inertia moving along in a steady yet positive direction. However, it is virtually impossible despite the best efforts of emeritus members such as Curt Roelle and others, for the rest of us to regularly expect to see such high caliber speakers as Dr. Thaller at every meeting. As nice as that might be, it is not very realistic. WASI is not the only astronomy club in the area, and demands for speakers from the professional community are high, and often conflict with schedules is legion. Therefore WASI members need to "think and act locally" as a matter of course in order to fill empty niches, which tend to be more often than not. A second caveat for all to consider is the impression that we may have left with new and prospective members. It is my understanding that WASI picked up something like 9 new members after this meeting. No doubt some were impressed by the spectacular confluence of events and speakers that may have artificially inflated expectations for subsequent meetings. Again we may have set the bar quite high in terms of their expectations that our monthly meetings are routinely as dynamic as the last one was. I hate to be the one to apply the brakes to this notion but what we all experienced last meeting was almost an anomaly rather than the norm. Yet, this does NOT have to be so! Furthermore, whether or not the aforementioned expectations are warranted or accurate, I submit to the membership writ large, that we now have a major task before us to do our utmost to meet these higher expectations. Again, this boils down to **YOU** the WASI member becoming more proactive and contributory towards these ends. We cannot and should not come to expect that a "good meeting" arose because of a given guest speaker was involved or not. For as I stated previously, such speakers are more the exception rather than the rule. It is therefore incumbent upon all WASI members to insure ourselves, that our monthly meetings regularly attain similar results even in the absence of a keynote speaker from the professional community. Enough said!

In this month's installment, rather than rolling out yet another "new" idea for the membership to absorb, perhaps it's time to throttle things back a bit and to reflect upon what we have discussed so far. Turning (or slewing) to observing. As everyone by now is aware, our nemesis, the weather, conspired to completely wipe out the March iteration of the Messier Marathon at Curt's place. Yet do not despair! Our fallback dates are planned around the same period this month (April) at the same venue previously cited. See elsewhere in this newsletter and online for updates.

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During the period leading up to the original Messier Marathon dates, a “bright” supernova, *SN 2012 aw*, exploded on the scene from one of the very targets on our list of Messier objects, M95 in Leo, and whose light is just arriving after a roughly 38-million-year trip across the universe! As an illustration of time — relativity for what was happening here on the Earth at the time of *SN 2012 aw*, and in Maryland in particular, was called the late Eocene Period. Maryland (and much of the east coast) was bathed by a warm shallow tropical sea. There was no “eastern shore” as we now know it. The sea rolled right up to and just beyond the Baltimore-Washington area. Natural global warming had really taken hold and temperatures were globally much higher than they are currently and in fact among the hottest the world had ever seen. The dinosaurs had long since gone extinct. Plant life of the time consisted of tropical species — ancestors of modern palms, ferns and similar flora as were relatives of other plants that we all know today. The land fauna consisted of primitive ancestors of modern horses and elephants, and distant relatives of wolves living in a hot coastal savannah-like environment, while in the sea, giant sharks, primitive ancestors of modern whales, and even sea-going crocodiles prowled the waters! Over subsequent millions of years, the region has witnessed several major episodes of sea-level rises and regressions that would in (then) another 20 million years (or ~15 million years ago) produce some of the world's best fossil outcrops known as the world-famous Calvert Cliffs in southern Maryland. But that is another story! A little closer to the time period of *SN 2012 aw*, the asteroid that would crash into the region (near Cape Charles, Virginia) producing a giant 85-kilometer-wide crater at what will become the mouth of Chesapeake Bay was still some 3 million years away from its destiny. Yet when it does hit, the effects of impact will literally lay the subterranean framework for the ancestral Susquehanna River drainage system to begin coursing along its path to the sea that by the end of the last Ice Age, and again due to sea-level rise, would be submerged by the encroaching sea to become our beloved Chesapeake Bay! But I digress...!

Adding to the interest in the area of M95 today in 2012 AD, was our old friend Mars, just past a less-than-optimal opposition and having resumed its normal westward motion through the sky. In fact, a few days after our last meeting, Mars passed very close to the M95-M96 region, offering those with the time and clear skies the opportunity to observe this scenic juxtaposition just prior to the supernova's light reaching Earth. However, by the time that word of this supernova had gotten out several days later, the weather auguries were already forecasting worsening observing conditions in our area, which actually came to pass, such that only a couple of members had the chance to get out and attempt to capture these ancient photons! Hopefully the supernova will brighten or at least not fade by the time our skies again clear up! A smaller but no less appreciated consolation prize was provided by the likes of Venus (which is reaching greatest altitude), Jupiter (which has begun departing the evening sky), and the Moon, who have been treating us with their subtle and eternal orbital ballet of repeating conjunctions in the waning hours of evening twilight. At least the weather has not obstructed these events. And by the time we meet next, Saturn will be just a couple days before opposition herself, presenting a favorable ring-tilt of some 15 degrees. So at least the planets are doing their jobs for us!

Please also remember to document your observations of these and the myriad other events that have occurred *and* that you have observed in your observing log as discussed in my last missive to this newsletter! Online submissions are equally appreciated! Furthermore, remember that even a negative result is a result and should dutifully be recorded as should any equipment mishaps that over time, may help to build a knowledge base for surmounting and overcoming them! Clear Skies!



The Planet in the Machine

by Diane K. Fisher and Tony Phillips

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The “butterfly effect” is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real “butterfly effect” is driven by, for example, global winds and ocean currents, polar ice (melting *and* freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there’s the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth’s carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA’s Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth’s land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects — in other words, weather. They may become part of severe-weather warning systems and actually save lives. Other models aim to predict long-term effects — or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it — we hope.

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For a listing and more information on each of NASA's (and their partners') Earth data-gathering missions, visit <http://science.nasa.gov/earth-science/missions/>. Kids can get an easy introduction to Earth system science and play Earthy word games at <http://spaceplace.nasa.gov/ecosphere>.

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



CloudSat is one of the Earth-observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat's unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun's energy in the atmosphere. See an animation of this data simulation at www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html.