



Roanoke Valley Astronomical Society

Amateur Astronomy News and Views
In Southwestern Virginia



Volume 28—Number 6

June 2011

Third Time's the Charm!

By Genevieve Goss

RVAS has officially participated in Astronomy Day 2011! After two cancellations on a Friday and Saturday evening due to

inclement weather, a hardy group of seven **RVAS** members dared Mother Nature



and managed to pull off a public observing session at the Mill Mountain Star overlook on Sunday, May 8. Although a few clouds persisted, **RVAS** members **Jeff Suhr**, **Jiri Kolejka** and **John Goss** set up their telescopes and began to offer views of the moon and, as twilight



progressed, Saturn and some of its moons. Also in attendance to interact with the public were **Carol Mesimer**, **Clark Thomas**, **Vipin Trivedi** and **Genevieve Goss**.



As with previous public sessions on Mill Mountain, people of all ages and interests

were in attendance. Many expressed awe at the images seen through the telescope and gratitude for the viewing opportunity made possible by our club. Members answered many questions about astronomy, the universe and **RVAS**.

Club member wins First Place in Astronomical League essay contest [\(More on Page 2\)](#)

Club Member Writes Award Winning Essay

Club member **Peter Steidel** is the recipient of the first place Horkheimer/O'mera Youth Journalism Award. His winning essay, entitled "The Seas of Mercury and the Moon", was featured in the [May issue](#) of the RVAS newsletter.

Peter is 13 years old and attends Northside Middle School in Roanoke. He was born in North Dakota and moved to Roanoke with his parents when he was two. He



Peter Steidel

has two dogs, Edison and Tara. He is into astronomy and uses the family refractor for observing.

He is a straight "A" student and wants to study physics or computer science at MIT when he goes to college. He loves to read and is into computers and knows some basic scripting. His idols are Stephen Hawking and Nikola Tesla.

When the Universe Was a Hot Potato

By Jack Gross

Celestial spheres were probably invented by the early Greeks several hundred years before the Christian era. Some vague references suggest Eudoxus of Cnidos (circa 409-356 BCE), or perhaps Archimedes of Syracuse (circa 287-212 BCE) should be credited with the idea. But, I wouldn't bet the farm on that. As early as the 6th century BCE, Pythagoras thought that the stars were attached to a crystal sphere and each of the seven planets was also attached to a separate sphere. As these spheres rotated they made a harmonious sound. This music of the spheres idea rings awfully close to contemporary cosmology theories that suggest that sound waves are responsible for the creation of the universe as

we know it ... "I blow thru here, the music goes 'round and around, whoa-ho-ho-ho-ho-ho, and it comes out here."

One of the few remaining examples of celestial spheres is from early Greco-Roman antiquity. It is a 2nd-century Roman marble copy of a Greek sculpture of Atlas kneeling with a celestial globe on his shoulders. The sphere is carved with constellation pictures in low relief. It shows the night sky and 41 (some sources say 42, but then astronomers are not known for agreeing on anything mathematical) of the 48 classical Greek constellations listed by Ptolemy. The sculpture is at the National Archaeological Museum in Naples, Italy. It

stands seven feet tall, and the globe is $25\frac{1}{2}$ inches in diameter. It is called the Farnese (Far-nay-say) Atlas because of its acquisition by Cardinal Alessandro Farnese in the early 16th century.

The mythology behind the statue is also interesting. The Romans borrowed most of their star lore from the Greeks, who in turn borrowed from Mesopotamian astronomy, but one account of the story goes like this: Atlas was a Titan, one of the original gods who ruled the earth before the Olympians overthrew them. Atlas made the mistake of siding with his brother Cronus in a war against the Olympian Zeus. In punishment, he was compelled to support the weight of the heavens on his shoulders.

He was temporarily relieved of this burden by Heracles, better known by his Roman name "Hercules", who needed the Titan's aid in pilfering the Golden Apples of the Hesperides. This, the eleventh, of Hercules' twelve labors came about when his cousin, Eurystheus, challenged him to retrieve the Golden Apples of the Hesperides. The Hesperides were three Daughters of Evening, (no, not that kind of ladies - they were Sunset goddesses) who were assigned by Hera to guard certain golden apples which she had received as a wedding present. These were kept in a grove and surrounded by a high wall. A hundred-headed dragon was assigned to the guard duty.

Heracles had been told that he would never get the apples without the aid of Atlas. The

Titan was only too happy to oblige, since it meant being relieved of his burden. He told the hero to hold the universe while he went to snatch the apples - but first, Heracles would have to do something about the nasty dragon. This was swiftly accomplished by means of an arrow over the garden wall. Then Heracles took the world while Atlas went to snatch the apples. The heist was successful and Atlas returned, but in the meantime he had realized



What is the Ultimate Science?

By Clark M. Thomas

There has long been a debate about what is the premier science. Ever since physics emerged from metaphysics, the king of sciences has been physics and mathematics.

Physics is expressed by mathematics, as are all other sciences. When we go beyond the data that can make up any science we return to metaphysics. Metaphysics can look and sound like physics, but is ultimately more guess than hypothesis. As scientists have developed increasingly sophisticated tools to test and measure their hypotheses, the realm of metaphysics has seemingly been pushed farther way.



Newton

A common rival to physics is chemistry. However, most chemistry can be expressed by physics. Nevertheless, there comes a point in chemistry where molecular and organic properties emerge that cannot be easily expressed by reductionistic physics. After a point, complex chemistry transcends physics. Likewise, as biology emerges from chemistry, the higher levels of existence, humans included, cannot be reduced to physical and chemical phenomena.

In science and philosophy there is a thing

called Occam's Razor, which is a sobriquet for the law of the minimum. In plain English, we can reduce something to its minimal elements, but not beyond. A change in quantity can yield a change in quality, which is the law of dialectics. In dialectics, entities can emerge from others; or one entity can express itself qualitatively differently when there is a quantitative change. The classical example is that of H₂O expressing itself as ice, water, or steam according to temperature changes.

The current fad in science is to look for the so-called "god particle." Billions have been spent looking for the Higgs-Boson particle, which is supposed to give mass to energy expressing itself as matter. Even if that particle is found and its action verified, there will still be many unanswered questions. Always, there is the key question of ultimate origins, which no particle can answer.

Even if we were to witness at a safe distance the actual big bang in our visible universe, it

doesn't explain what preceded that big bang, and what may be beyond our universe itself.

Only one science can embrace all others: astronomy. Twenty-first century astronomy investigates everything from the molecular



Euclid

[\(Ultimate](#) Continued on page 8)

Planets In The Morning

By Neal Sumerlin

One of the more pleasing aspects of astronomy is the extent to which it is utterly predictable. The North Star will never appear in the southern sky, the Southern Cross will never be visible from Virginia, and if Orion is high in the southern sky at midnight, it must be December. And yet it is the astronomical objects or phenomena that do not follow long-understood patterns which have provided the insights needed to advance our knowledge of the universe beyond our planet. One of the oldest of these phenomena is the movements of the planets in our sky. They certainly follow a pattern—or perhaps more accurately, each follows its own pattern—but ones that do not exactly correspond with that of the stars.

Six of the eight classical planets (sorry, Pluto-lovers) were known to the ancients, as they are all naked-eye objects. There is our own Earth, of course, then Mercury, Venus, Mars, Jupiter and Saturn. Mercury and Venus never venture too far from the Sun in our sky, while Mars, Jupiter and Saturn complete full circles around the sky in periods ranging from two to thirty years. The discoveries of Uranus and Neptune had to wait for the era of telescopic observations.

This means that when I am asked what time Saturn is visible in the evening sky, there is no automatic answer as there is with the Orion Nebula. I can tell you when Saturn is visible *this year* (April through August), or *tonight* (any time after dark, starting out halfway between the horizon and the zenith, to the south), but there isn't anything like the always-correct answer for the Orion Nebula of

"pretty much any time from November through February, every year".

One can make sense of this by assuming that all astronomical objects revolve around a central and stationary Earth. It certainly looks that way. But the more closely you observe how the planets move, the more ad hoc assumptions you would be forced to make. Why do Mercury and Venus never appear on the opposite side of the sky from the Sun? Why does Mars, when it is at its largest and brightest, appear to slow down and reverse its night-to-night motion among the background stars? There is a central principle in science known as Occam's Razor. When there are several alternative explanations for a phenomenon, the simplest explanation is most likely the best. Copernicus' choice to put the Sun rather than the Earth at the center of his universe—that was an aesthetic choice as much as any other. Beauty in science lies in simplicity.

Right now we are the beneficiaries of one of those periodic planetary alignments that make it easy to see several planets at once. Four of the five naked-eye planets are grouped closely together in the pre-dawn skies for the next couple of weeks, and three of them for the next month or so. Sunrise is around 6 a.m. EDT in Lynchburg. The first of these four planets to rise above the horizon is Jupiter, around 4:30. (These times are for Lynchburg, Virginia and for a flat horizon; your times may differ.) Starting around 5 a.m., Mars, Venus and Mercury rise, in that order, all grouped very closely together. Venus is by far the brightest of

([Planets](#) Continued on page 11)

Astro-Quiz

By Frank Baratta

Other than Ptolemy, who has had the most proposed constellations accepted?

Answer to Last Month's Astro-Quiz: Sagittarius is a constellation of Sumerian origin, subsequently adopted by the Greeks. Within the constellation is the famous "Teapot" asterism, the brightest star in the handle of which is Sigma Sagittarii, a star called Nunki, meaning "of Enki," the Sumerian god of water. The name was applied to a group of stars representing Eridu, the most ancient city in Mesopotamia, and is reputed to be the oldest star name in use.

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to the pursuit of astronomical observational and photographic activities. **Meetings are held at 7:30 p.m. on the third Monday of each month, at Western Va. Community College Natural Science Center, 3102 Colonial Ave. S.W. Roanoke, Virginia. Meetings are open to the public.** Observing sessions are held one or two weekends a month at a dark-sky site. Yearly individual dues are \$20.00, Seniors \$18.00. Family dues are \$25.00, Senior Family \$22.00. Student dues are \$10.00. Articles, quotes, etc. published in the newsletter do not necessarily reflect the views of the RVAS or its editor.

RVAS web page: *<http://rvasclub.org>*

Officers/Executive Committee/Editor

Paul Caffrey, President (*president@rvasclub.org*)

Michael Good, Vice President (*vicepresident@rvasclub.org*)

Mark Poore, Secretary (*secretary@rvasclub.org*)

Jeff Suhr, Treasurer (*treasurer@rvasclub.org*)

Randy Sowden, Immediate Past President (*immediatepastpresident@rvasclub.org*)

Roanoke Valley Astronomical Society (RVAS)

Monthly Meeting Minutes

May 16, 2011 - 7:30 p.m.

Virginia Western Community College, Natural Science Center

Attendance - 24

Treasurer's Report

Checking Account Balance - \$3,805.54

Certificate of Deposit Value - \$8,642.19

Observing Reports - various members shared observing reports

Horkheimer/O'Meara Award - Michael Good announced that club member, Peter Steidel, is the 1st place recipient of the Astronomical League's prestigious Horkheimer/O'Meara Award. Congratulations Peter!

Presentations

Space Shuttle History - Dave Godman

Saturn Approaching Porrima - John Goss

Copeland's Septet - Michael Good

For those members who did not attend the May RVAS meeting, here are more detailed directions for how to find the new location for our monthly meeting:

Take I-581/220 South to Colonial Avenue exit.

Turn left at the stop light at the end of the exit ramp

Go through the third light and turn at the next left onto Winding Way Road. This is just beyond the VWCC Community Arboretum

Turn left into the parking lot at the top of the hill.

The Natural Science Center is the first brick building on the left, next to the large glass greenhouse. The entry door is on the right side as you face the building.

[Directions](#) Continued on page 8)

[\(Directions\)](#) Continued from page 7)

Park anywhere in Lot 1 except where special permits are required.

This address may help those using GPS: 3102 Colonial Ave., SW Plan on arriving early for a stroll through the arboretum! A path extends from the Natural Science Center terrace to

[\(Universe\)](#) Continued from page 3)

how pleasant it was not to have to strain for eternity keeping heaven and earth apart. So, he told Heracles that he'd have to fill in for him for a little while longer while he rested a bit.

Herck, who hadn't fallen off a turnip truck recently, feigned agreement to this proposal, but

said that he needed a cushion for his shoulder, and he wondered if Atlas would mind taking back the burden just long enough for him to fetch one. The Titan graciously obliged, and Hercules strolled off, forgetting to return. And that's why you see the Farnese globe sitting on Atlas' shoulders and not on Hercules' - proof that no good deed goes unpunished!

[\(Ultimate\)](#) Continued from page 4)

makeup of our bodies, to potential life on ex-planets, to the dynamics of star systems, to the interactions between bubble universes. It examines the workings of big bangs, and it looks at systems as they construct and deconstruct themselves. Astronomy nourishes philosophers.

Astronomy (unlike astrology) neither includes nor excludes God or fateful forces, because

"the divinity" is ultimately unprovable through science and logic. The lesser can never fully know the ultimate greater. For whatever answers about divinity we choose to seek we must go to mysticism and belief, or maybe just open skepticism. This great barrier between the temporal lesser and infinite totality puts all scientific and belief systems on the same plane, which might be our future portal to world peace.

Awards, Shuttles, and Cake at the May RVAS Meeting

By John Goss

One of the benefits of belonging to the RVAS is enrollment in the Astronomical League, the nation's largest federation of astronomical societies. The League offers various annual awards, including the Horkheimer/O'Meara Journalism Award, which is open to young people 8-14 years old. This year, RVAS President Paul Caffrey and Vice President Michael Good are proud to announce that the winner is RVAS member Peter Streidel who penned "The Seas of Mercury and the Moon," which appeared in the club's May newsletter (May 2011, page 4). And to make it even sweeter, the award comes with a \$1000 cash prize. Congratulations Peter!

The general topic of the May meeting was the Space Shuttle program. Rand Bowden lead with his account of attending the latest launch at Cape Canaveral. He went to the Cape, obtained a permit and pass, and waited. And waited. And waited until NASA announced a launch de-

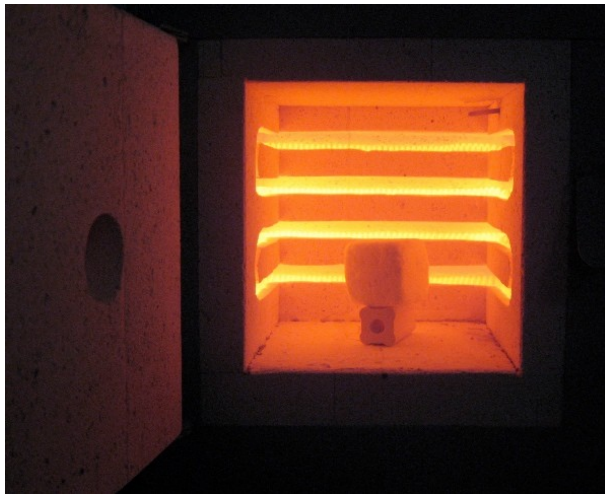
lay of a week. For his efforts, Rand still has the parking pass as a souvenir. The Shuttle Endeavor finally launched eight hours before the RVAS meeting.

Next, John Goss gave a demonstration on why the famous shuttle insulation tile is ideal for

the application. Some requirements for the tile are that it needs to have a low thermal conductivity and low heat capacity for heat protection, a low density for weight reduction, and a high emissivity for efficient radiant heat emission.

All these properties came into play when John heated a shuttle tile cube to 1450°F in a small kiln. He took it out with a pair of tongs, placed it on a brick, and then picked it up with his bare fingers.

There was no screaming, not even any grimacing. John explained that the tile's high emissivity quickly radiated the heat from its corners. The low heat conductivity prevented



[\(May Continued on page 10\)](#)

the corners from quickly drawing heat from inside the tile. Hence, he was able to pick it up, but he still could not touch the tile's faces, at least until a couple of minutes had passed. Cool! Err, hot! No, cool!

Dave Godman took the RVAS audience on a trip down memory lane by covering shuttle history while infusing his own experiences when, as a young man, he lived near Cape Canaveral.

The era began on April 12, 1981 when the Shuttle Columbia began its first mission, STS-1, which lasted only 55 hours. (As an aside, Dave noted that STS stands for "Space Transportation System" and that each mission is designated by the next successive number.)

Dave went on to explain the ongoing modifications of the external solid rocket boosters and of the huge central fuel tank. NASA soon realized that the central tank really didn't need to be painted white, freeing the weight of hundreds of pounds of dried paint.

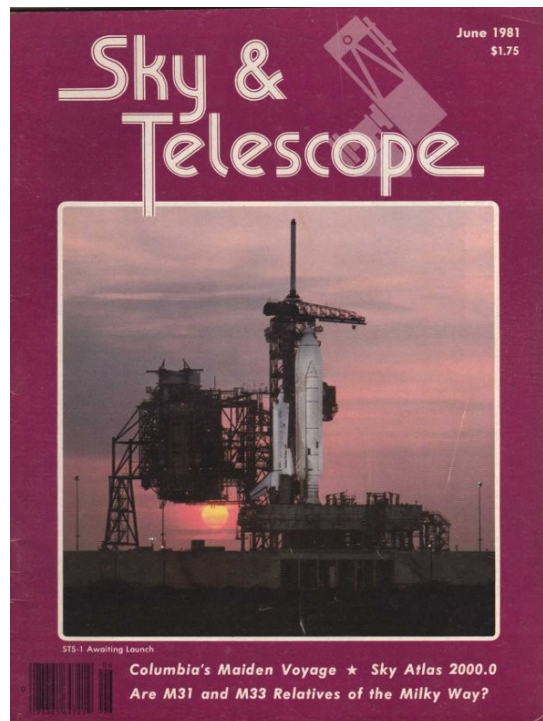
It's hard to believe that, with all the various missions ferrying supplies to the International

Space Station, and placing satellites — including the Hubble Space Telescope — into orbit, the program is nearing the end of its 30 year

run. As mentioned earlier, on the morning of the RVAS meeting the Shuttle Endeavor lifted off for its last time. The next launch is scheduled for July 8, 2011. It will be the shuttle Atlantis' final mission, STS-135.

At the end of the meeting, RVAS member **Vipin Trivedi** did something quite unexpected. He presented the RVAS with a special cake honoring the fellowship that

the club provides. After a round of applause, RVASers jumped right in and enjoyed the much appreciated dessert. The RVAS wishes to thank Vipin for his heartfelt kindness!

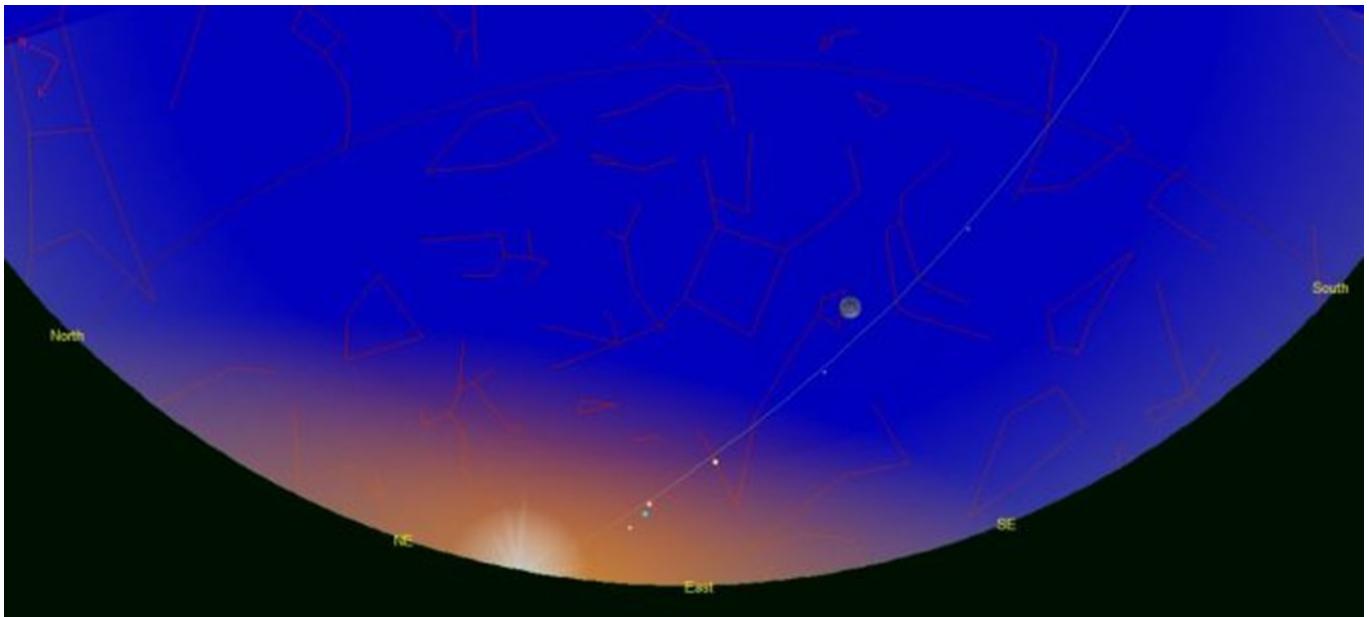


these four, followed by Jupiter, Mercury and Mars.

Mars and Mercury will be hardest to see, both because they are fairly dim in an increasingly bright morning sky, but Mercury because it will be so close to the Sun, tending to get lost in its glare. Binoculars will help you spot it.

Once the Sun has come into your view, however, QUIT USING THE BINOCULARS! I do not want to be responsible for anyone damaging his or her eyes by accidentally viewing the Sun through an unfiltered optical device.

Here is the eastern sky as seen from Lynchburg at 6 a.m. EDT:



The Sun is just getting ready to rise, and the waning crescent moon is above and to the right of sunrise. The thin blue line running diagonally is the ecliptic, the line along which the Sun, moon and planets will be found in our sky. Above and to the right of the moon is Neptune; below and slightly to the left is Uranus.

But these are telescopic objects—you won't see them with your naked eye.

Lower down are four planets. From right to left (and top to bottom) they are Jupiter, Mars, Venus and Mercury. These relative positions won't change much over the next few days. Mercury will change the most. It is swinging ever closer to the Sun and will soon be lost completely to sight until it emerges on the "other side" of the Sun in the early evening sky.

You may have noticed that this covers all of the planets except Saturn! Saturn is literally on the other side of the sky, visible in early evening. To see why these planets all look close together from our point of view, and Saturn

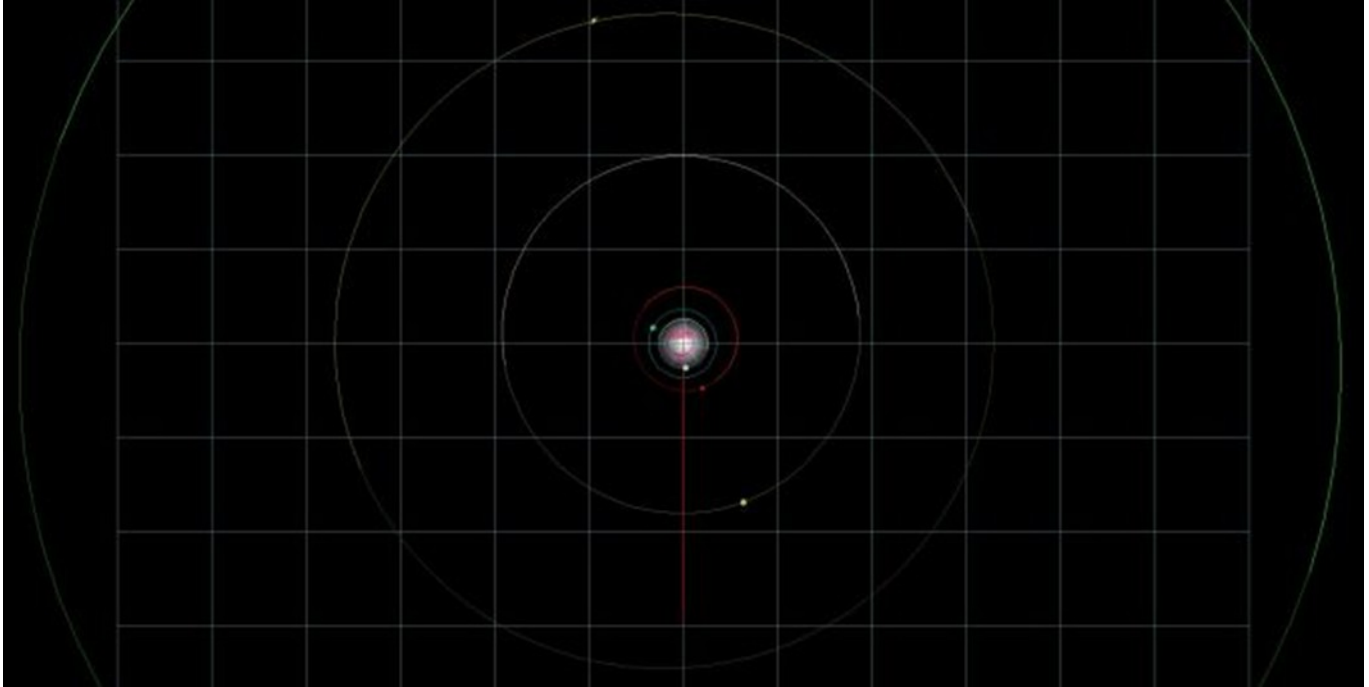
does not, take a look at this diagram:

Generated by the same software as for the previous diagram (The Sky), this looks down on

the solar system from above the Earth's north pole. The outermost planet visible at the top is Saturn. The next planet moving in toward the

four planets come into view just before the Sun does.

Visualizing in three dimensions, and seeing the same thing from multiple perspectives, is one



Sun is Jupiter, at the bottom. Earth is a green dot at about the 10 o'clock position around the Sun. The innermost planet is Mercury, followed by Venus, then the Earth, then Mars, Jupiter and Saturn.

Can you see how the four planets line up as seen from Earth? And can you see how Saturn appears in the opposite direction? The Earth spins on its axis in a counter-clockwise direction as seen from this vantage point, so these

of those skills that not everyone possesses. I hope these diagrams help! And even if this doesn't click for you, you can still enjoy the same planets our distant ancestors saw. Knowing how things work doesn't make the sight any less wondrous.

CALENDAR OF EVENTS

By Frank Baratta

MONTHLY MEETING: Monday, June 20th, 7:30 p.m., Western Va. Community College Natural Science Center

3102 Colonial Ave. S.W.

Roanoke, Virginia

(Directions in May issue, pg. 9, map pg. 10.)

Celebrate the Summer Solstice with an Ice Cream Social!!

Meeting Topic: *"Our Unnatural Night"*

A discussion of the latest in the ongoing battle
against light pollution---facilitated by John Goss



RVAS WEEKEND OBSERVING SESSIONS: Unless otherwise indicated, observing sessions are held at Cahas Mountain Overlook, milepost 139 on the Blue Ridge Parkway.

- ◆ **Friday and Saturday, June 24th and 25th.** Sunset is at 8:32 p.m. Astronomical twilight ends at 10:21 p.m. The Moon sets at 3:52 and 4:48 p.m., respectively.
- ◆ **Friday and Saturday, July 1st and 2nd.** Sunset is at 8:32 p.m. Astronomical twilight ends at 10:21 p.m. The Moon sets at 3:52 and 4:48 p.m., respectively.
- ◆ **Future Sessions:** July 22nd and 23rd and 29th and 30th.

ROANOKE CITY PARKS and RECREATION PUBLIC STARGAZE: Saturday, June 25th, 9:15 p.m., Cahas Overlook, Milepost 139 Blue Ridge Parkway. Non-members must register with Parks & Rec. at 540-853-2236. Members can call 540-774-5651 for information. (Next session: July 23, 9:15 p.m., Cahas Overlook.)