



# Roanoke Valley Astronomical Society



News About Amateur Astronomy  
in Southwestern Virginia

Volume 27 – Number 6

June 2010

## Let Your Fingers Do the Walking For Astronomy Apps

By John Goss

There was a time when telephones were used exclusively for talking. Of course, those days are long gone. Today's cellphones typically run and display many software programs, called "apps." The May meeting of the Roanoke Valley Astronomical Society featured some of the apps that are astronomy related.

Guest speaker, **Raphael Steinbach** of Redshift, discussed the Redshift app for the iPod Touch. As with many "planetarium" programs, Redshift easily can represent the layout of the sky and display interesting celestial events. One fascinating feature that received a big "Wow!" was its ability to depict a flight to another planet. Just picture approaching and orbiting Mars by accessing your iPod.



More programs were demonstrated by **David Thaler** on his iPod Touch. APOD for your iPod was very interesting. Dave demonstrated scanning a moon map (MoonMap Lite), checking out NASA missions, and finding out what is happening in the sky and when (iEphemeris). He also showed a few other apps including "Star Walk", "SkyVoyager," and "Planets."



Today's new computer innovation is Apple's iPad and **Paul Caffrey** showed off his with a planetarium program called "Distant Suns." While this is certainly not an expensive app, running at about \$4 for the

full version, it gives a good representation of sky events. The "lite" version is free.



RVAS member **Mark Poore** wrapped up Astro-App Night by showing off what his iPod Touch (and iPhone, which, unfortunately, does not have access to a signal in downtown Roanoke) and Motorola Droid - Android OS can do.

### iPod Touch & iPhone

myLite Flashlight (Free) - programmable flashlight - can be set to red for night vision. A real red flashlight is better though.

Astronomy Flashlight (99 cents)- created specifically for astronomy. Tap on and off. However, it is still pretty bright.

Astronomy Picture of the Day (Free) - Can pinch and stretch - also share with a friend - press I for more information.

Pocket Universe (\$2.99) - full featured pocket planetarium. Display rendered based on your location and time. Pinch/Stretch - rotate. Very much worth the \$3.

### Motorola Droid - Android OS

Compass (free) - Works just like a pocket compass - location derived from internal GPS on the phone.

Google Sky Map (free) - Full featured pocket planetarium. Display rendered based on your GPS location and time. Fantastic application.

GPS Status (free) - Displays longitude, latitude, and altitude.

Iridium Flares (free) - Displays date, time, mag-

nitude, altitude, azimuth, and satellite name of flares visible from your location. Displays flare path overlaid on a land map for reference.

Moonstats (free) - Moonrise, moonset, lunar phase (in percentage), altitude, azimuth, sunrise, and sunset.

MyTracks (free) - Records your travel (by car, foot, bike, etc.) based on GPS readings and displays on a Google Map. Can save and share maps with friends and family. Also records distance traveled and elapsed time.

Scope Trader (free) - Smart phone access to the popular website.

Solaris (free) - Solaris website states, "3D "live" interactive astronomy of Earth's aurora, extreme ultraviolet solar flares and sun spots - downloaded from space and retrieved to your phone. Uses NASA STEREO and NOAA polar orbiter spacecraft data. Phone vibrates when geomagnetic storm level increases."

After the evening's presentations, we now have a better idea of what today's cell phones can do. And yes, you can still talk on them, too.

The RVAS would like to thank **Raphael Steinbach** for joining in the demonstrations, and all its members for participating in a fun and educational evening.

**Mark Poore** deserves special thanks because it was he who, not only suggested the idea for the evening's program, but also brought the digital visualizer that projected the electronic displays for all to see.

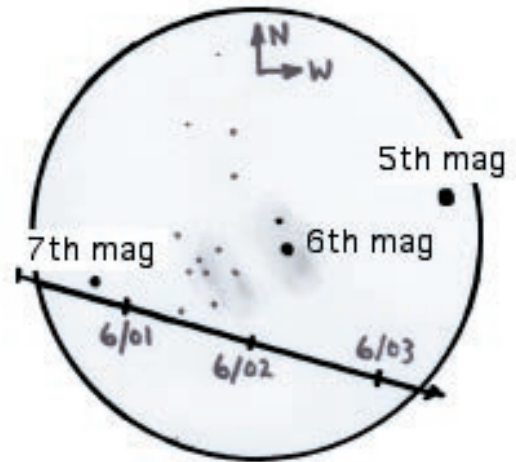
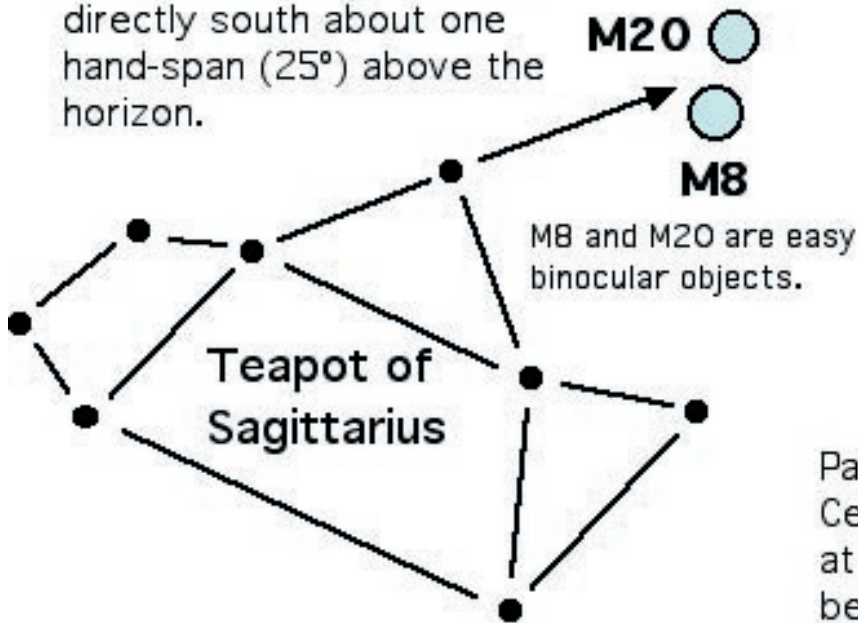


Astronomy programs on Mark Poore's Android

# Observing Challenge:

## Asteroid Ceres passing south of M8 on June 1, 2, and 3

At 3:00 a.m., Sagittarius is directly south about one hand-span (25°) above the horizon.



Path of 7th magnitude starlike Ceres as it crosses M8. Location at 3:00 a.m. with the field of view being 40 minutes which is about that of a low power eyepiece.

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 the Center in the Square in downtown 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. Family dues are \$25.00. 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*

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**John Goss**, Vice President ([vicepresident@rvasclub.org](mailto:vicepresident@rvasclub.org))

**Mark Poore**, Secretary ([secretary@rvasclub.org](mailto:secretary@rvasclub.org))

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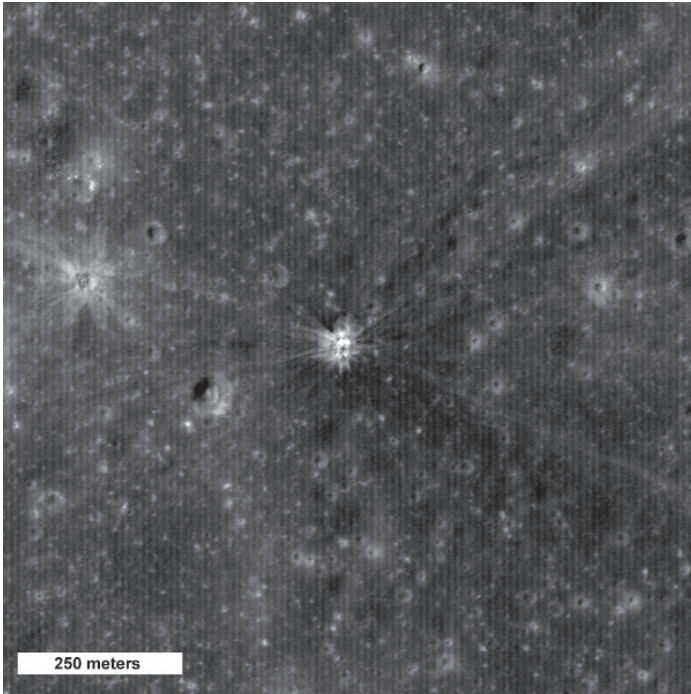
**Paul Caffrey**, Past President ([pastpresident@rvasclub.org](mailto:pastpresident@rvasclub.org))

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# WHAT CAUSED THESE EXTREMELY RECENT LUNAR CRATERS?

BY DAVE THOMAS



The Lunar surface is peppered with meteorite craters, all of natural origin. There are some craters on the Moon that are not natural.

During the Apollo years in space exploration all the missions were powered by the mighty Saturn V rocket. The Saturn V consisted of three stages, the first and second, the S-IC, and the S-II, and the third stage designated S-IVB.

The first two stages powered the spacecraft into Earth orbit. The third was used to complete Earth orbit, and to perform the Trans Lunar Injection, TLI, that powered the Apollo into Lunar orbit.

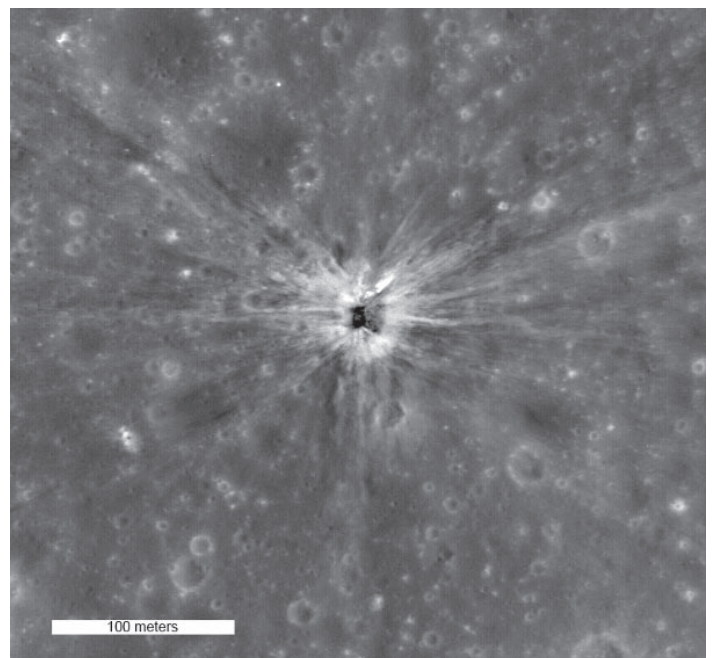
Once the S-IVB stages were separated from the spacecraft they impacted the Lunar surface producing craters as shown in the accompanying NASA photos.

On April 14th 1970, the Apollo 13 Saturn S\_IVB upper stage impacted the Moon north of Mare Cognitum. The impact crater (seen here below) was roughly 30 meters in diameter.

On Feb. 4, 1971 a crater of about 35 meters in diameter (seen at left) was formed when the Apollo 14 S\_IVB impacted the lunar surface.

If an object the size of these two rockets were to accelerate to Earth, with its much greater gravity, imagine the damage that could be done with a direct hit to a densely inhabited city.

If one of those objects also were to have a ground penetrating point and a large nuclear weapon, imagine the giant crater that could be created. Happily, no man-made evil has ever impacted the Moon. There's more than enough technological evil on Earth.



# M51 is a Flower in the Night Garden

By Michael Good



This is the time of year that the Whirlpool galaxy starts hollering at me. My disease does not let me ignore the noise; I am forced to clean my telescope optics, cool down the camera, beg neighbors to turn off lights and proceed to re-capture light from this masterpiece in the sky, year after year.

I might even argue that a TRUE astrophotographer is NEVER satisfied with his or her work. Data capture for this image involved multiple nights totaling 5 hours of photons, all shot at about f6.8 with a Celestron 14", flocked tube, no dew shield, running through an A07 tip-tilt mirror to the SBIG ST10xme.

AIP4WIN was used for deconvolution, and Photoshop CS4 was used for data combining. Levels, Curves, gamma-logs, linear stretches,

selective Unsharp masks, free-hand selects with feathers ... all these words are strange to the normal optical astronomer, but everyday to the astrophotographer. I simply cannot drive the level of detail as seen with my same equipment from those others sharing my disease who live out west. What a joy it must be to shoot from sharp, dark, photometric skies.

My image captures three larger background galaxies, and at least 50 other background galaxies. I still remember the first time I saw Tony Hallas' "Anonymous Galaxies" around M51. Also shot with a 14" telescope, Tony used M51 as a FOREGROUND object.

You have to just smile when you think about how large and beautiful our Universe is. The Heavens truly declare the glory of God.

# RVAS Elections for 2011

By Randy Sowden

Dear RVAS members:

At our June meeting we will be voting for new club officers. This will be an atypical year for club elections. Often the President serves for the maximum of two one-year terms, and then the Vice President moves on to become President – and someone steps up to be Vice President, and that cycle continues for another two years.

This year I do not intend to run for a second term as your President, because we now have two very small children at home. Also, John Goss will be serving as Vice President of the Astronomical League, and thus does not intend to serve as an RVAS officer in 2010.

So far we have one person who has offered to run for Vice President, for which I am very grateful. We need someone to step up and become President. If you believe that this is a role you can assume for 2010, then we would love to hear from you. I am certain that you

would find the experience to be very enjoyable, and you can certainly count on the former leadership to help out as much or as little as you wish. If this is a role you think that you can fill please let John or me know as soon as possible. By the way, you don't have to be an "expert" astronomer.

Clear Skies,  
Randy Sowden

## *THE EDITOR COMMENTS:*

Fellow sky nuts, you would be nuts to turn down becoming an officer of the nationally admired RVAS. We are known as one of the finest medium sized astronomy clubs. Key to our perceived greatness is our core group of many members who share their private astronomical passions with the group, and with everybody else who loves the night skies. Writing for the newsletter is just one way to contribute. We are open to your contributions. See you at this month's June meeting.

## Frank Baratta's Astro-Quiz

***This Month's Astro-Quiz:*** This gray-blue band seen low to the eastern horizon just after sunset is often mistaken for cloud or haze. What is it?

**Answer to Last Month's Astro-Quiz:** Of the 48 constellations listed by the ancient astronomer Ptolemy, Argo Navis is the only one no longer recognized. Its large size—if it were still recognized, it would be the largest of the 88 listed today—made it cumbersome to deal with. In 1752, French astronomer Nicholas Louis de Lacaille divided Argo Navis into Carina (the keel), Vela (the sails) and Puppis (the poop deck). When the constellation was split, the Bayer designations of its stars were also split, such that Carina received alpha, beta and epsilon, Vela received gamma and delta and Puppis received zeta and so on.

# Blending Interests: Astronomy and Quilting

By: Carol Warner Mesimer

The National Museum of American History has in its collection a wide and varied assortment of items. Included in the collection is a quilt made by Sarah Ellen Harding Baker, "Solar System." Sarah made this quilt in 1876 in Iowa. In the 19th century opportunities were limited for women. Sewing was nearly mandatory for young girls to master. By 1876, women did have more leisure time to pursue interests besides clothing their families and incessant housework. One acceptable interest women could follow was astronomy.

Sarah lectured on astronomy in several towns in Iowa, using the quilt she made as a visual aid. I can imagine her reading about astronomy and seeing the drawings in her books. This quilt shows the solar system as an overview, including a comet's path. Interestingly, it shows 8 planets, a number we're back to today.

Fast forward 100 years to Parma, OH. There I am, laying flat on my back on a concrete driveway in heavily light polluted OH, trying in vain to find Comet Haley. No such luck. What I could do was to work a needle and thread, and was developing an interest in quilting. I had been sewing since I was a very small child, so quilting wasn't too much of a stretch.

Fast forward another 20-odd years and you get to NASA's Astronomy Picture of the Day. <http://antwrp.gsfc.nasa.gov/apod/ap031017.html> On October 17, 2003, their picture was of a quilt made by Judy Ross, of Point Roberts, WA. It was displayed for a year at the Mt. Lick Observatory visitor center, and was also displayed at the International Quilt Festival in Houston, TX, 2006. [www.quilts.com/](http://www.quilts.com/) Over 50,000 people attend this event on a yearly basis. "The Sky's the Limit"

was a very popular exhibit, and traveled around the country. Another quilt at that exhibit was "Starbirth". [BlueHeronQuilts: Starbirth revisited.](#)

Associated with Quilts, Inc, is an online group called QuiltArt. [Quiltart: Contemporary Art Quilters on the Internet.](#) One of the challenges that grew from this group is the Fast Friday Fabric Challenge. The last Friday of the month, a topic is issued, and quilters have a week to complete their piece. Outer Space was one of their topics.

Posted on October 17, 2009, Lisa Broberg Quintana made a quilt for this challenge, "Ursa Major."

Other quilters have also included astronomy in their fiber art. Just as the ways to observe the heavens are unlimited, so are the ways to incorporate images into fiber art. Applique, piecework, fabric painting and embellishing are just a few ways to get image to fabric. Several quilters have mastered this process in their quilts, and one of the most prolific

is Ann Harwell. [http://quiltartisannharwell.com/astronomy\\_gallery.php](http://quiltartisannharwell.com/astronomy_gallery.php)

If quilting isn't your hobby, or you don't have a quilter that will take pity on you and make you an astronomy quilt, I have a solution: Drop by this site and pull out your credit card: <http://www.etsy.com/shop/stellarquilts> Quilts can be custom made, or you can order what is already completed. Prices vary from \$150 to \$12,000.

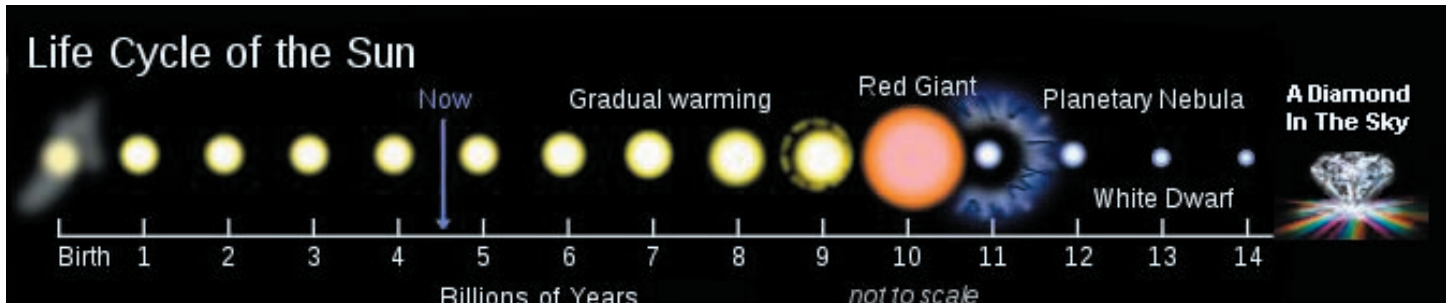
So far, I've not done a lot in astronomy quilts. In 2003, I did include "Eclipse" as one of my Journal quilts for that year's exhibit. Considering how fast and easy this small quilt was to make, I should consider making more with an astronomical subject. Anyone up for a workshop?



"Eclipse 2003" - Carol Mesimer

# THE LIFE OF OUR SUN FROM BIRTH TO DIAMOND

BY JACK GROSS



*Twinkle, twinkle, little star,  
How I wonder what you are!  
Up above the world so high,  
Like a diamond in the sky!*

Were Sisters Ann and Jane Taylor (1793–1824), astrophysicists? Or, had they just spent the night at a Holiday Inn Express? Probably neither, but their poem, which became the lyrics for this familiar childhood tune, was certainly prophetic.

Our Sun is presently enjoying a sojourn on the main sequence, but it has some awesome surprises in store later in its life cycle. According to our present theory of stellar evolution, after exhausting most of its supply of nuclear fuel, it will slowly cool and swell to gargantuan proportions and become a red giant star. Its outer layers will engulf Mercury and then will expand well beyond the orbit of Venus, close to that of Earth.

Not content with this macho display of power, our Sun will then collapse, placing tremendous pressure on its helium core, forcing the helium nuclei there to fuse into heavier elements. Avoiding the fate of more massive stars, our Sun, like all stars with similar masses, will skip the supernova

explosion and eventual fate of becoming a neutron star or a black hole. Instead, the helium nuclei in its core will continue to fuse into carbon. As the fusion pressure once again builds within the Sun, it will jettison its outer material, creating a planetary nebula, and the core will become a white dwarf.

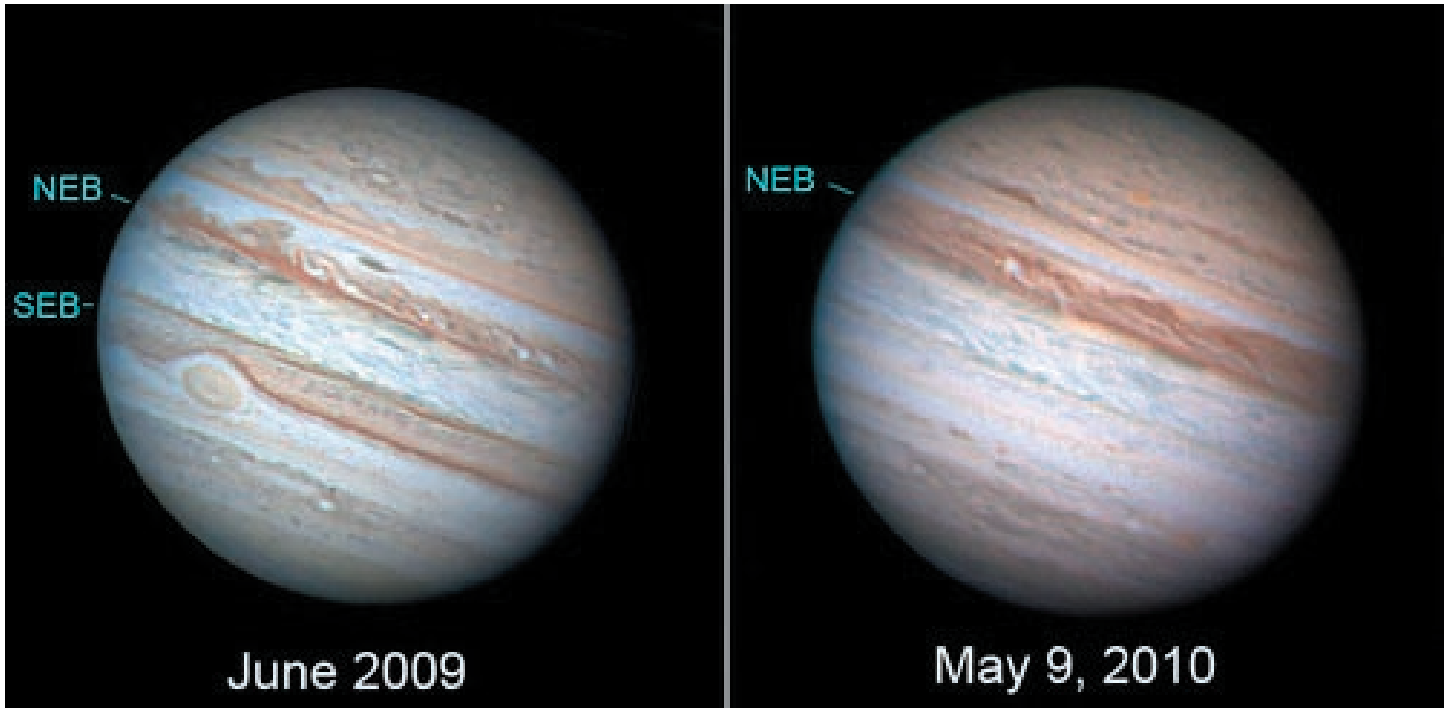
With a surface gravity now 100,000 times that of the Earth, our white dwarf Sun has become a very strange object. The heavier atoms in its atmosphere sink toward the core and the lighter ones remain at the surface. Some white dwarfs are known to have almost pure hydrogen or helium atmospheres, which are the lightest of elements. Also, the powerful gravity pulls the atmosphere close around it in a very thin layer. If it were on Earth, this atmosphere would be lower than the tops of skyscrapers!

Underneath the atmospheres of our future-Sun and many other present-day white dwarfs, scientists think there is a 30 mile thick crust:

At the bottom of this crust is crystallized carbon. Since a diamond is nothing but crystallized carbon, our old solar system would have "a diamond in the sky."

# Jupiter 2010 Will Not Be the Jupiter of 2009

By Clark Thomas



Jupiter is an illusion called a planet, for us anyway. What we are seeing is not the hard planet, but the tops of its massive cloud system. As with all planetary cloud systems, there are many dynamics which we barely understand.

Even a modest telescope reveals that giant Jupiter has very contrasty bands, more so than those of Saturn. Jovian bands are constantly changing, just as the seemingly "permanent" great spot changes.

Last year we Jupiter fans saw a planet with prominent bands embracing both the northern and southern hemispheres. Then Jupiter went behind the Sun, becoming a morning object now working its way toward our evening sky.

Jupiter is now in Pisces, and will be a nice object in the evening around the time of this year's VAAS. This year's view of Jupiter should be quite different from last year's. Right now,

Jupiter does not show its south equatorial belt adjacent to the great spot. Who knows what it will show to our VAAS visitors?

Look closely at the two images above (courtesy of <http://io9.com/5536688/jupiter-loses-a-stripe>). You will see that the area where the southern dark band has been is still intact, though of a different color.

A popular theory suggests that there is a temporary layer of light clouds now above the dark layer we saw last year. How and why that top layer was formed is still unknown. Equally unknown is why or when the obscuring layer will next disappear.

Jupiter is just one example of a night sky that appears to not change, but is rapidly changing. Only great distances make changes appear to be slow. Jupiter, fortunately, is close enough for us to see change near real time.

# M95 in Leo Gives Up its Secrets

By Michael Good



Discovered by Pierre Mechain in 1781, this galaxy was added to Charles Messier's famous list only four days later (Wikipedia). It is a barred spiral about 33 million light years from us in the middle of the Leo constellation. The inner ring is approximately 2000 LY in diameter.

Numerous background galaxies stand out in this image, and even more so when the raw summed luminance data is "stretched" in such a fashion as to overexpose the galaxy details but highlight faint background data.

Earlier images of this galaxy failed to bring out details. This year the Celestron 14" was brought to bear on this galaxy starting in late April (data thrown out due to poor seeing), and continuing through a nice chain of moonless clear nights into May (thank you, God!).

The resulting image, while still lacking some of the details available in the data, still is a quantum leap over prior efforts, bringing out nice details in the arms and core, including flocculence between in the inner arm and the outer bands. This image is being sent using Adobe's PDF in an attempt to preserve color details that

jpeg encoding discards. The attached image represents not hours, but days of work. It required many nights of opening my observatory, cooling the telescope and camera, finding and centering and training the auto-guider and focusing the image.

My C14\_M95 pc folder has 195 files, 7 folders, and 955MB of data - almost a GIGabyte for this one image.

Dark frames, flat frames, bias frames, color data, luminosity data, processed images, aligned images, summed images, Photoshop images - the list goes on and on. Noel Carboni's Photoshop astro-plugin helped create this image, but in particular extensive use of the Levels command allowed precise adjustment of the displayed image to the actual data histograms for the captured signal data per color channel (using Don Goldman's equalized color filters for my SBIG CCD camera).

The final image presented is a crop from the original size, in part to avoid a nice satellite trail that destroyed the bottom of one of the 15 minute sub-exposures for luminance.

# 467 Years Late, Nicholas Copernicus Finally Gets A Decent Burial

By Clark Thomas

Nicholas Copernicus (1473 to 1543), author of the heliocentric view of the Solar System, has finally been identified within his unmarked grave and given a decent burial, thanks to modern DNA analysis and other forensics.

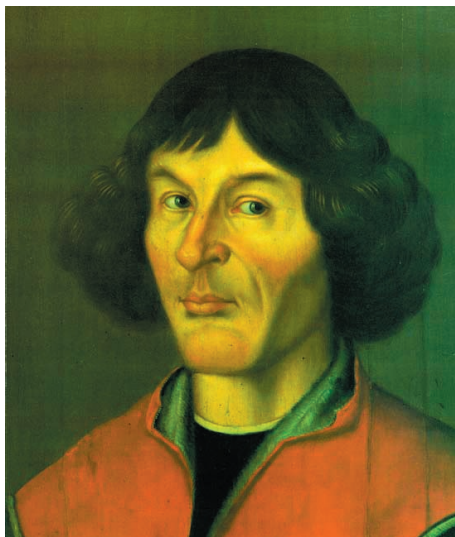
During his life in the 16th century this once obscure astronomer challenged the prevailing view that the Sun and everything else revolves around the Earth. He got around the lack of observed annual trigonometric parallax for the stars: Rather than saying the Earth is stationary, Copernicus simply and brilliantly said the stars are far away.

His model alone could not explain celestial observations any better than did the much older Ptolemaic model. There was no physical foundation for the new model until Galileo. Furthermore, his views irritated the Roman Church just when Martin Luther was becoming a threat.

Now, almost 500 years after he was laid to rest in an unmarked grave, the great man has a name plate associated with his bony remains. His burial inside a tomb in the cathedral in Frombork, on Poland's Baltic coast, where he once was a church canon and doctor, shows how the Catholic Church has reconciled both with the man and his ideas.

Unlike the more celebrated Galileo, Copernicus worked in a remote part of a remote country. He was not friends with a pope. Whereas

Galileo had the benefit of a telescope, Copernicus had to rely on mathematics and naked-eye observations, because the telescope was not yet available.



His granite tombstone identifies him as the founder of the heliocentric theory, as well as a church canon, a cleric ranking below a priest. During his life Copernicus was not known as a pious man, having kept a mistress in violation of his vows. He was also suspected of being a sympathizer of Lutheranism.

Fortunately, he died before the Church turned with fury against his ideas. Later, Galileo's ideas nearly cost his life, and he spent years under house arrest.

Today's Roman Catholic Church harmonizes science and religion. In 1992 Pope John II belatedly rehabilitated Galileo. Today you can find a magnificent Vatican observatory in Arizona. Today's Church believes in the Big Bang.

Copernicus' major treatise, *On the Revolutions of the Heavenly Spheres*, was published at the end of his life. He received a copy of the printed book on the day he died, May 21st of 1543.

(Information for much of this article is from: <http://www.washingtonpost.com/wp-dyn/content/article/2010/05/22/AR2010052200817.html?hpid=sec-world>)

# Calendar of Events

by Frank Baratta

**MONTHLY MEETING:** Monday, June 21st, 7:30 p.m., Center in the Square, Roanoke. Tonight's program will feature a journey to the Moon and all its fascinating features. Also, we will launch our newly elected crew of leaders to the Moon and beyond.

**RVAS WEEKEND OBSERVING SESSIONS:** Observing sessions are held at Cahas Mountain Overlook, milepost 139 on the Blue Ridge Parkway.

- ◆ Friday and Saturday, 4th and 5th. Sunset is at 8:37 p.m. Astronomical twilight ends at 10:29 p.m. The Moon rises at 1:35 and 1:59 a.m., respectively.
- ◆ Friday and Saturday, 11th and 12th. Sunset is at 8:41 p.m. Astronomical twilight ends at 10:34 p.m. The Moon sets at 8:15 and 9:14 p.m., respectively.
- ◆ July Sessions: 2nd and 3rd; 9th and 10th.

**ROANOKE CITY PARKS and RECREATION PUBLIC STARGAZE:** Saturday, June 12th, 9:45 p.m., Cahas Overlook, milepost 139, Blue Ridge Parkway. Nonmembers must register with Parks & Rec. at 540-853-2236. Members can call 540-774-5651 for information. (Next session: July 10th, 9:30 p.m., Cahas Overlook.)

**FRANKLIN COUNTY PARKS DEPT. PUBLIC STARGAZE:** Saturday, July 31st, 9:30 p.m., Franklin Co. Recreational Park. For Franklin County residents, who must register with Parks & Rec. at 540-483-9293. RVAS members can call 540-774-5651 for information. (Next session: TBA.)