



# Roanoke Valley Astronomical Society

Amateur Astronomy News and Views  
In Southwestern Virginia



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## October RVAS Meeting: The Many Facets of the RVAS

By John Goss



*Watching the ISS*



*The meeting gets underway*

Monday night October 17 saw a flurry of activity among RVAS members. It was the night of the monthly meeting.

Things began even before the meeting officially commenced. **Mark Hodges** gathered the crowd outside at 7:15 to watch a pass of the International Space Station. Right on time it appeared in the west slowly arcing towards the east. Reaching -2nd magnitude, it disappeared in the Earth's shadow three minutes later about 30° above Mill Mountain.

A week before the meeting, three RVAS members held a telescope viewing session at Virginia Mountain Vineyard's annual "Wine, Moon, and Stars." Well over 200 people saw the moon and Jupiter through scopes belonging to **John Goss**, **Roger Pommerenke**, and **Michael Good**. Because of the success of the event, VMV would like the **RVAS** to return next year. So, mark your calendars for October 19, 2012!

*(Meeting Continued on page 5)*

# Target: Earth!

By Neal Sumerlin

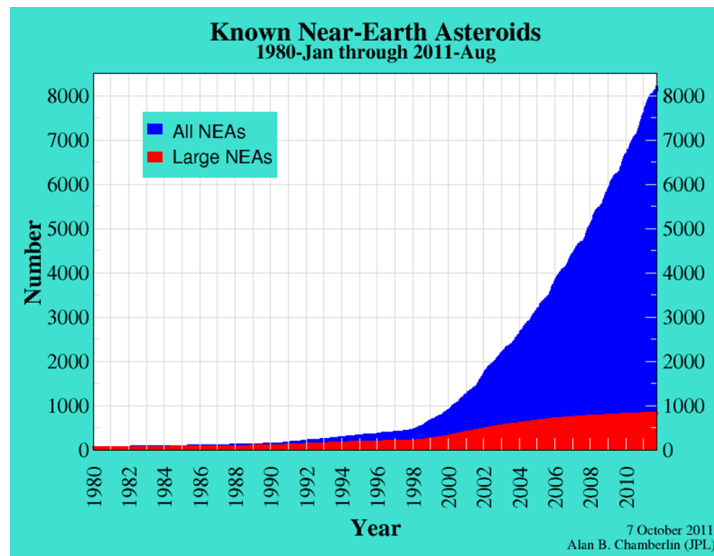
One of the best arguments, perhaps THE best, for a human presence in space is the certainty that there will someday be a civilization-killing asteroid or comet headed our way. It has happened in the past—just ask the dinosaurs—and it will happen again. If we haven't developed the ability to protect ourselves from such a danger by then, we probably deserve our fate.

Contrary to what many people assume and popular movies depict, the solution is not to plant a nuclear weapon and blow the thing apart. Where would the fragments go? Most of them would continue right along the same path that intersects the Earth, and we would have traded

death by an artillery shell for death by shotgun pellets. The far better path is to apply a gentle nudge while the object is far away from the Earth, just enough to make it miss. The farther out we can do this, the more gentle that nudge can be.

This means there are two parts to a protective scheme for the Earth: detection and mitigation. NASA has actually been directed by Congress to catalog 90% of potentially hazardous asteroids by 2020, and since this 2005 mandate, much progress toward that goal of detection has been achieved. A few weeks ago NASA announced that they had achieved the

90% goal for the larger asteroids (larger than 1000 meters in diameter). The graph below shows the cumulative total of all near-Earth asteroids discovered, as well as the total for those larger than one kilometer. A little thought about the shape of these curves will convince you that most of the recent discoveries have been of objects smaller than one kilometer.



Detecting objects this small requires big telescopes. The objects are visible only by reflected sunlight, and most asteroids are rather dark. There are several dedicated programs using large, wide-angle instruments that scan the sky nightly. It will take a while to get to

the 90% level for all such objects, however. Why not 100%? The number of objects increases as the size gets smaller, sort of like the distribution of boulders, rocks, pebbles and sand on a beach: a few boulders, more rocks, even more pebbles, and LOTS of grains of sand. We've found the boulders and rocks. Now we're looking for the pebbles and grains of sand.

But don't think that a small object can't be dangerous. Is a bullet that only weighs a few ounces dangerous? Not if you drop it on your

(Target Continued on page 3)

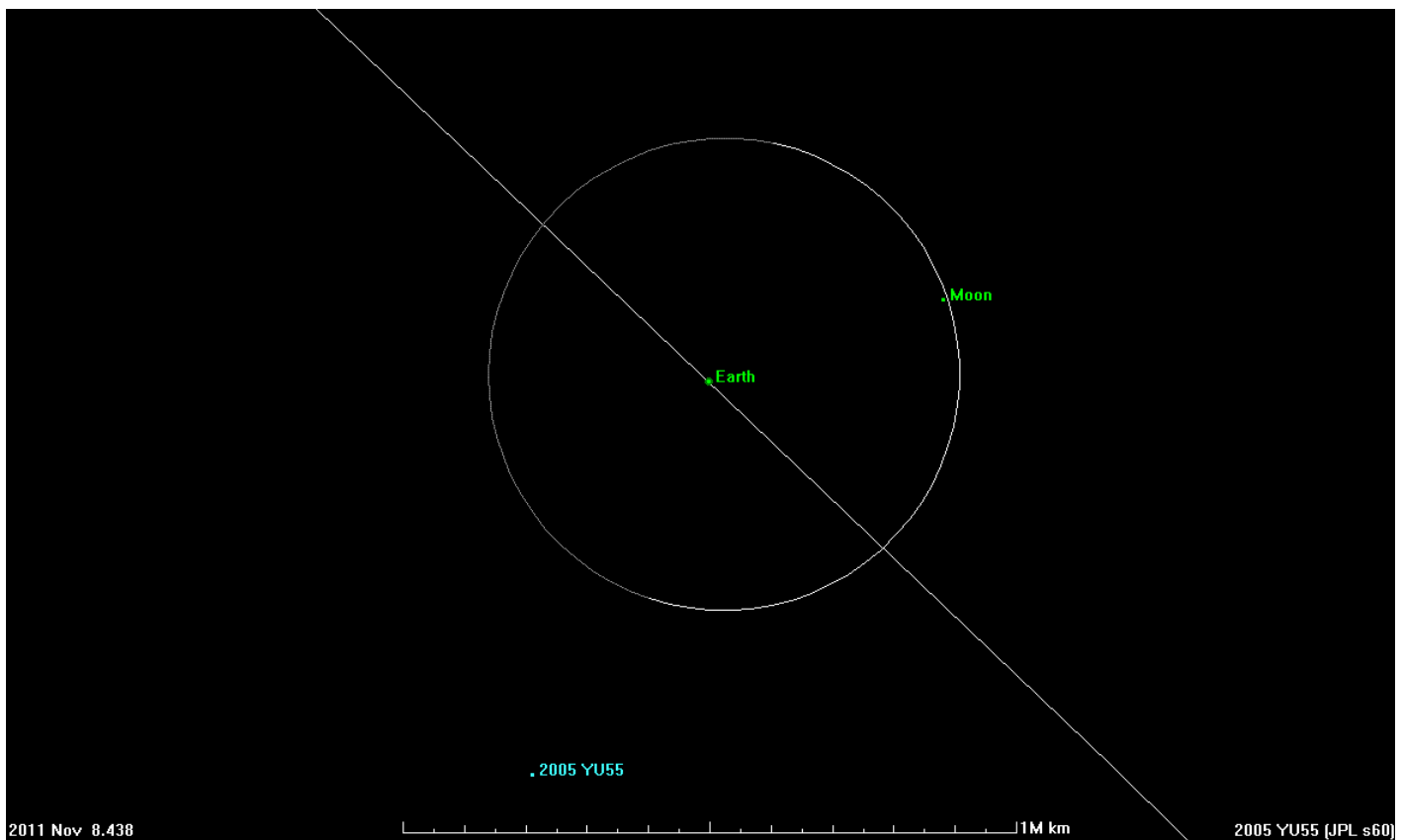
foot. But put it into a gun, give it a velocity of 400 meters per second, and you don't really want to get in its way. Even a relatively small object traveling at a typical speed of 40 kilometers per second relative to the Earth can have an impact equivalent to thousands of Hiroshima-sized atomic bombs.

### Asteroid 2005 YU55

Which brings us to Asteroid 2005 YU55 and its rendezvous with the Earth on November 8th. No, we aren't going to be hit. But it's going to be a very near miss. The asteroid will pass between the Earth and the moon, and it will be going FAST. Take a look at the animation below (click on it):

The asteroid is approximately 400 meters in diameter. Were it to collide with the Earth, the impact would be around 10,000 times as energetic as a standard Cold War-era hydrogen bomb.

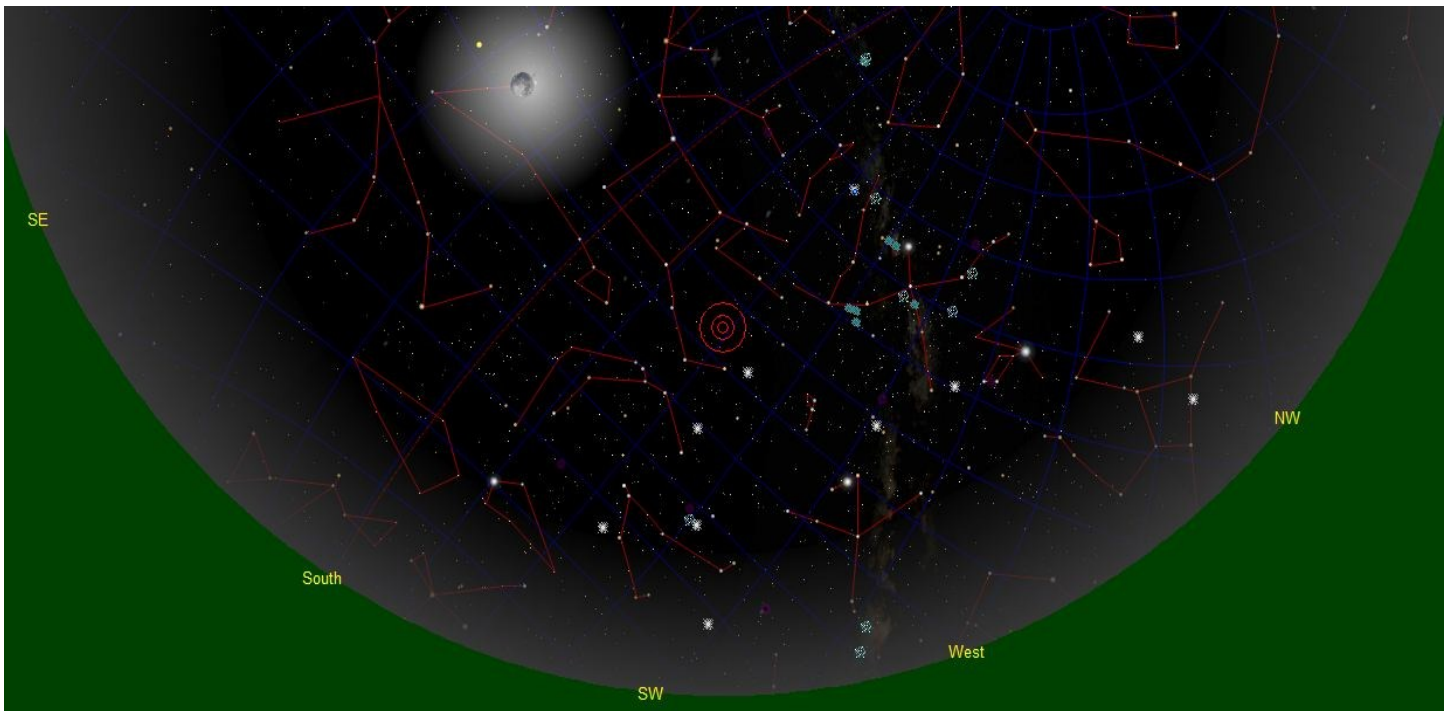
Can you see it as it passes? Only with a small telescope, and it will be a difficult object to catch even then. It will be at its brightest on the evening of November 8th, and a good time to catch it will be between 9 and 10 p.m. EST. (We will have just come off daylight saving time the weekend before.) Unfortunately, there will be a nearly full moon nearby, which makes the task harder. The moon really is an astronomer's worst enemy sometimes! Where to look? I spent a fruitless hour looking for online finder charts, with no success



([Target](#) Continued from page 3)

whatever. So here is my crude attempt to give you some idea of where it will be—in the bull's eye below. Realize that it will be moving FAST. By midnight in the Eastern time zone, it will have moved inside the square of Pegasus that lies above it in this image. The moon and Jupiter (yellow dot) are above and to the left of the square of Pegasus. The cardinal directions on the horizon line tell you which way to look.

If you have at least a six-inch scope, you may have a shot at it. For those used to using these coordinates, it will travel from approximately RA 21h 45m Dec +15° at 9 p.m. EST, to RA 22h 15m Dec +16° 30' at 10 p.m. Happy hunting!



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An observing report aimed at helping people find one of the solar system's smaller members, the asteroid Vesta, was given by **Clark Thomas**. He showed how to find the little planetoid while explaining its nature. After giving people the tools on finding Vesta, Clark left it up to the members to pick it out themselves as it glides among the background stars of Capricornus.

next to the dim smudge of M101. Congratulations, Clark! Not many people have seen an individual star lying at a distance of 21 million light-years.

Astro-imaging is becoming more and more popular. **Clem Elechi** gave an update on his experiences learning this fascinating field of amateur astronomy. He discussed his equipment setup: his camera, and his telescope's mount and optical assembly. He made the ob-



*Roger Pommerenke's photo of Jupiter and the Galilean satellites*



*Clark Thomas talks about Vesta*



*Clem Elechi talks about his astro photography experiences*

Clark also presented a report on his attempt to spot the recent supernova in M101. He visited Sunset Field on the Parkway with members of the Blue Ridge Astronomy Club. Even though the supernova faded since its discovery, Clark was successful in spying it twinkling

servation that as the hobby is pursued, less of it is "Greek" and more of it is knowable. But he also made everyone laugh when he revealed that, even though he has been enjoying astro-imaging for a couple of years, he still makes embarrassing mistakes — such as for-

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[\(Meeting Continued from page 5\)](#)

getting to remove the lens cap!

Next up to bat was **Roger Pommerenke** reprising his appearance at this year's "Wine, Moon, and Stars." At the winery, Roger amazed the wine sippers by showing them the moon as he was taking pictures of it through his telescope. His set up was a big hit — the moon on the computer screen grabbed everyone's at-

tention. Roger demonstrated to the RVAS members how he did it with his refractor, camera and computer. He made it seem so simple!

The final presentation tied into **Clark Thomas'** earlier discussion of Vesta. **Michael Good** described NASA's Dawn mission first to Vesta and later to Ceres, the largest planetoid. Keep your eyes on this mission as it will surely make important discoveries!



*Virginia Mountain Vineyard*



*The Moon on Roger Pommerenke's Laptop*



*Michael Good on the NASA Dawn mission*



*Telescopes at the Wine Festival*

# Zeno and the Blind Sufis

By Clark M. Thomas

Back in classical Greece - where the best philosophers figured out that the world is round, that atoms exist, and we can never prove what we know - another thinker took up the "paradox of the arrow." His name was Zeno of Elea, and what he set forth helps us understand how relativity and quantum motions are related.

Zeno asked us to consider an arrow in flight, which he said cannot fly, because at any one time it is at rest. However, it also flies within distance and time to its destination, which means it is also at any one time not at rest, or so it would seem. Is time therefore a unit, or a continuum? Does it proceed in a granular way, or as a stream? If granular, how are the points linked? If as a stream, how do we stop the stream at any point?

Centuries later the Sufis, a mystical offshoot of Islam, presented us with the parable of several blind Sufis who together met an elephant for the first time. Each one was given the opportunity to touch the elephant, and thereby understand what he was touching. One touched the tail, and said an elephant is like a rope. Another touched a leg, and concluded elephants are like trees. Another touched its side, concluding elephants are like walls. One touched his ear, and guessed an elephant is like a large leaf. And so forth. All were right; and all were wrong.

What do Zeno of Elea and the mythical blind Sufis have in common with each other, and with astronomy?

We all are like Zeno and the Sufis. We imagine what we see of the cosmos is a still photo, when in fact it is a moving picture. Our personal vision is a perspective and a time point in the cosmic flow. Fortunately, mathematics and instruments allow us to compare different aspects of the visible universe, improving our guesses about it all. If all the blind Sufis had been allowed to compare their observations they might have gotten much of the essence of an elephant.

Zeno remains more elusive. We struggle, as did Einstein, with the dual concepts of classical and quantum mechanics. How can one reality be dual? We need a bridge. That bridge is "elasticity." I have earlier explained how the accelerating electron stretches, then pops, as it begins its journey. Lately, electrons have been measured to have a football shape, implying they are stretchable. Even neutrons have been deduced to have a rounded cube shape when compressed in neutron stars.

The world around and above us is also the world inside us. To better understand the universe is to increasingly understand ourselves. But we must always remember what Socrates said (loosely quoted): The more I know, the less I know.

## Astro-Quiz

If the Moon is in its full phase as seen from Earth, what phase would the Earth be as seen from the Moon?

**Answer to Last Month's Astro-Quiz:** Over the centuries there have been many star maps and catalogs. But those of Flamsteed and Draper involve a bit of a misnomer. What we know as Flamsteed numbers (e.g. the "61" in 61 Cygni) were actually assigned in 1783 by J.J. Lalande in a French edition of the Flamsteed catalog. Meanwhile, the name of the Henry Draper catalog recognizes his pioneering work with photographic stellar spectra, but the catalog was actually published by Annia Jump Cannon and Edward C. Pickering in 1918 to 1924.

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*

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**Clark M. Thomas**, RVAS Newsletter Editor ([cmtastronomy@hotmail.com](mailto:cmtastronomy@hotmail.com))

# Notice

## **The Heart of Virginia Fall Star Party to be held in Goochland County November 18-20**

The location is the Heart of Virginia Scout Reservation, west of Richmond, in a rural location away from city lights. The site is convenient to I-64, has wide open space, excellent facilities (including full bathrooms with hot showers) and a large dining hall where the Richmond Astronomical Society will be serving refreshments and where astronomers can warm up.

We hope that a lot of astronomy enthusiasts will attend and show their support so that the Scout Reservation can continue hosting this event. The fun begins Friday afternoon November 18 at 4:00 PM with an astronomy club social and runs through noon on Sunday, November 20. It's hard to find a better site that is as convenient and has a dark sky.

Cost of the event is only \$15 which includes camping and refreshments. Heated bunkroom lodging is available for an additional \$6 per person.

Details and directions are at the link below. Please join us if you can and please pass this invitation along to any other astronomers that may be interested.— this should be a great event!

<http://bradysaunders.net/camp/starparty.html>

Google Map location:

<http://g.co/maps/f9zc9>

# CALENDAR OF EVENTS

By Frank Baratta

**MONTHLY MEETING:** Monday, November 21<sup>st</sup>, 7:30 p.m., Virginia Western Community College, Roanoke. The evening program to be announced .

**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, November 18<sup>th</sup> and 19<sup>th</sup>. Sunset is at 5:08 p.m. Astronomical twilight ends at 6:38 p.m. The Moon rises at 12:30 and 1:37 a.m., respectively.

◇ Friday and Saturday, November 25<sup>th</sup> and 26<sup>th</sup>. Sunset is at 5:04 p.m. Astronomical twilight ends at 6:36 p.m. The Moon sets at 5:32 and 6:34 p.m., respectively.

◇ Future Sessions: December 16<sup>th</sup> and 17<sup>th</sup>; 23<sup>rd</sup> and 24<sup>th</sup>.

**ROANOKE CITY PARKS and RECREATION PUBLIC STARGAZE:** Saturday, November 26<sup>th</sup>, 5:45 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: December 17<sup>th</sup>, 5:45 p.m., Cahas Overlook.)