



# RVAS

Roanoke Valley Astronomical Society



News About Amateur Astronomy  
In Southwestern Virginia  
<http://www.roavas.org>

Vol. 22 - No. 5

May 2005

## M87 - GALAXY WITH A TWIST



*Image by Mike Good*

*By Clark Thomas*

The night skies are full of surprises. Some of them are easy to spot, if we know where to look. Some of them are hard to spot even when we know where to look. Others, such as comets and supernovae, pop up at random times and random locations across the celestial dome. Truly, it's not just the moon and planets moving around up there.

One of the most interesting objects is now high in the night sky for our observing. The

massive elliptical galaxy in the Virgo Cluster, M87, is 60 million light years distant, and is a whopping 500,000 light years wide. M87 hosts a jet of gas with two bright spots. This 8000 light year long jet is most likely material spiraling away from a super massive black hole in the center of this super massive galaxy. As other material spirals into the event horizon of the black hole, some just barely avoids capture, and it shoots outward for thousands of light years in the form of a visible-spectrum jet that can be seen by some amateurs.

RVAS astrophotographer, Michael Good, has just taken an image of M87, which shows this jet as a bright streak. Your writer recently went after it with his black ceramic light bucket, but could not visually make it out on a night of excellent transparency, but average seeing. Mike Good's CCD was focused on this object for five minutes, and the human eye is at best a 1/10 second imager.

Nevertheless, it is said by the Skyhound ([http://www.skyhound.com/sh/archive/apr/M\\_86.html](http://www.skyhound.com/sh/archive/apr/M_86.html)) that under exceptionally stable conditions the jet can be seen with a scope as small as 10 inches. Yeah, if you are in West Texas or the Arizona desert, and conditions are supremely stable. Anyway, I'll keep trying on nights when the seeing is very good. I didn't visually see the Horsehead on my first attempt either.

The next time you are looking at Markarian's chain of galaxies, and M87, think about the super massive black holes that reside in the inner depths of these massive stellar denizens. We can't directly see black holes with any size telescope; but we can occasionally see their effects on visible matter, such as jets.



## MYSTERY OBJECT

Hay, Eye bet you can't identify this object.

Send your best guess to Dave Thomas, our Mystery Object Columnist, at

thomasde-ka8inl@worldnet.att.net

## IMPORTANT NOTICE

As of April 24, 2005, the RVAS website will no longer have a forum to exchange ideas and information. Webmaster, Mahesh Taylor, has taken the forum offline because use most of the membership never utilized the opportunity to exchange ideas and information. This is a shame, because the possibilities for the forum were endless.

# APRIL 2005 RVAS MEETING NOTES

By Secretary, Mark Hodges

There were 28 members present for April's meeting. This was the club's annual astrophoto contest and social.

**Katherine Hix** called the meeting to order and asked for observing reports, **Mark Hodges** and **Mike Overacker** reported on their trip to NEAF (Northeast Astronomy Forum) in New York. While at NEAF, **Solarscope Inc.** contributed a standard edition Solarscope to the club. ([www.solarscope.com](http://www.solarscope.com) for info about the scope). Please everyone send a thank you email to Solarscope for their contribution and a big thanks to Mike for obtaining it.

**John Goss** presented the deep sky object of the month, an interesting asterism near the sickle of Leo called the Sailboat cluster. John will also be at Mill Mountain Zoo on May 7th during the Zoo's Migratory Bird Day doing solar observing and publicizing the club.

A reminder, that the club will be observing Astronomy Day on May 14th this year. We will be set up at 2 locations, downtown Roanoke from 6:00 until 10:00pm on the Market and at the Explore

Park overlook from 7:00 until 11:00pm. A sign-up sheet has been started. If you would like to sign up for either location please call Katherine and let her know which location and for how long you can help out. You don't need to have a telescope to help out.

**Dave Godman** and **Mark Hodges** gave a short program on Barn Door camera tracking platforms that they have built. Dave built a simple and easy to use single arm platform using a large metal hinge and a drive screw that is turned by hand. Mark built one a bit more complicated called a double arm platform and using an electric motor to drive the screw.

There were 5 entries for the astrophoto contest this year.

**Mike Overacker** won 1st place for a photo of the Venus transit from June of last year.

**Brian Callahan** (the son of James Callahan) won 2nd place with an afocal shot of the crescent moon.

**Mark Hodges** won 3rd place for a photo of the Orion constellation taken with his barndoor tracker.

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to pursuit of observation.

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 membership is \$25.00; student membership is \$10.00. For information, call the RVAS Message Line at 540-774-5651. Articles, quotes, etc. published in the newsletter do not necessarily reflect the views of the RVAS, its editor, officers, or individual members.

**RVAS web page:** <http://www.roavas.org>

**Officers/Executive Committee :** **Katherine Hix**, President (334-2443); **Mike Overacker**, Vice President and Newsletter Editor (776-3092); **Mark Hodges**, Secretary (774-5039); **Lynn Slonaker**, Treasurer (774-5695); **Bruce Jones**, Executive Committee Member-At-Large (774-3844); **Paul Caffrey**, Immediate Past President (345-2847); **Dave Godman**, Past President / New Member Coordinator (774-3337); **John Goss** and **Genevieve Goss**, Outreach Coordinators (966-4606); **Frank Baratta**, Membership and Public Viewing Coordinator (774-5651); **Mahesh Tailor**, Web Master (776-5472)

## THE LOCAL GROUP

By Genevieve Goss

The Local Group was well-represented at the 14th Annual Northeast Astronomy Forum and Telescope Show, held April 16-17 in Suffern, NY. The Rockland Astronomy Club, in collaboration with Sky & Telescope magazine, hosted this gear extravaganza which has expanded to include speakers, presentations and solar observing with more than a dozen solar scopes. Mike Overacker and Mark Hodges arrived there

on Saturday morning and made a bee-line for Televues' display to buy eyepieces. Both returned just in time for last Monday's RVAS meeting.

RVAS members John and Genevieve Goss have set themselves up for disappointment in their local observations by the inevitable comparisons between a clear, dark night in southwestern Virginia and the ones they experienced on their recent trip to

Chile! Touring Cerro Tololo and the renowned amateur observatory at Mamalluca paled in comparison to their solo observing sessions in the Elqui and Hurtado valleys of the Andes Mountains.

Looking ahead to summer, RVAS will give presentations at several area libraries using Night Sky Network materials. If you would like to a part of this activity, please notify one of the RVAS officers or Night Sky Network Coordinators.

## NEAF 2005 - FUN AND STUFF

By Michael Overacker

It was a dark and stormy night..... NOT!

NEAF – North East Astronomy Forum. It is the East Coast event to attend if you are into astronomy. I had never been able to attend, but this year, it fell on my 4 day break from the Fire Department, plus I had a holiday, so that gave me a 6 day break and NEAF was right in the middle of it. I spoke with Mark Hodges since he had attended before, and he decided he wanted to go as well. We decided to split costs, and travel in Marks' truck. NEAF was on Saturday, April 16th and Sunday, April 17th. Mark thought it would be a good idea to head to Suffern NY on Friday, April 15th, and return on Monday, April 18th since we both wanted to hear Phil Platt give his talk on "Bad Astronomy". His time slot was at 4:00 PM Sunday afternoon, so if we headed back to Roanoke after his talk, we would arrive around 2 AM on Monday morning. We just decided to spend another night. That was a great move.

excessive. We arrived in Suffern NY Friday afternoon. The weather was beautiful. We got "misdirected" one time, but it turned out kind of cool. As we were working our way back to the Interstate from our wrong turn, we passed what looked like 3 deer statues on a front lawn. That is when one of the statues moved and we realized that they were live deer. Live deer on a front lawn in New Jersey, not more than 10 feet from the road, acting like nothing was going on around them. It was a surreal moment that I will not soon forget.

After arriving at the hotel and getting settled in, we caught a bite to eat at Friendlys and made it an early evening to get up early for the show. We got up at 6 AM Saturday morning, got a quick bite to eat and headed for Rockland Community College, the site for NEAF. We got in line for tickets, bought our two day passes, and got in the "Dash for the TeleVue table" line, which also happened to be the main entry line. When the doors finally

### LAST MONTH'S MYSTERY OBJECT

One of the first nebulae recognized as a spiral galaxy, M88, is our Mystery Object for the month of April.

One of the brightest members of the Virgo cluster of galaxies it shines at magnitude 9.6. It is located on the sky at RA 12h 32m, Dec. 14 deg, 25 m and lies at a distance of 60 million light years.

M88 has a diameter of about 130,000 light years and is moving away from us at about 2000 kilometers per second.



The trip was long, but not

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## NEAF 2005

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opened, the line from the door went down the stairs to the main floor, then directly to the TeleVue table. I had a good spot, about 15 people back from the front of the line. Al Nagler had a good selection of eyepieces for sale, and it just so happened that I wanted to buy some of them. I bought a 9mm Nagler, a 8 – 24mm Click Stop Zoom, a 32mm Plossl, and a 2" Big Barlow. I left the table not even spending \$500. However, the rest of the tables were still waiting for the arrival of my wallet. However, I have no complaints. I picked up great deals on The Sky Six, Images Plus, a TMB Dielectric 2" diagonal, a long baseplate, assorted sky maps, stuff for my dob from Moonlite, and I won a door prize from Burgess Optical.

The courtyard outside the fieldhouse was full of solar telescopes. And I mean big scopes. There were Coronado 80mm and 90mm SolarMax scopes, and other 4 inch and larger apochromatic refractors with Coronado filters. The best view belonged to Barlow Bob and his 102mm TeleVue and 2 Ha Coronado filters. One filter was mounted in front of the main objective, and a second was mounted internally in front of the focuser. This combination, along with a Denkmeier binoviewer gave the most incredible solar views I have ever seen. The contrast was excellent, the detail was razor sharp, and the sun had more solar activity that Sunday than I have ever seen before. Hedgerows, flares, prominences, sunspots, filaments, and remarkable

changes in color were there for the viewing. I don't know if I will ever put together a solarscope with that kind of capability, but I sure am glad that Barlow Bob did. I will not soon forget it.

I had a chance to listen to Mel Bartels, builder of unusual lightweight reflector telescopes. After his talk, I had a chance to talk with him. We knew each other, but have never met. I host [www.melbartels.com](http://www.melbartels.com) on my web server. When I introduced myself, a wide grin swept across his face. He recognized the name immediately, and we proceeded to talk about his website and new telescopes. That

alone was worth the trip. Both days were full of buying accessories I needed, finding equipment I wanted but couldn't justify the cost, and networking with vendors for the upcoming VAAS Convention. It was two exciting, informative, tiring, and "way too short" days. After a good night sleep Sunday night, we left for home Monday morning, with the truck a little fuller with the booty collected from our excursion. Arriving back home at around 4 PM, it was some quick rest before the RVAS meeting that evening.

Would I recommend it to other members? Absolutely!



*Photo by Michael Overacker*

*On display at NEAF 2005, a newly designed telescope from A&M Advanced Telescopes in San Dona de Piave, Italy. That's right, not part of a telescope, but a complete telescope. The corrective optics are mounted with the secondary assembly. "Way Cool" is not enough to describe this optical system.*

# A BRIEF DISCUSSION ON LASER POINTERS

By David J. Thaler, DO FACD

Laser devices have been available commercially for many years. Lasers may be found in every grocery store as part of the bar code readers, in CD and DVD players, and of course as pointing devices. Recently, there have been media reports of laser pointers interfering with the operation of commercial aircraft. The misuse of lasers is not a new phenomenon. Goldfinger tried to kill 007 with a laser in 1964. What has changed?

The typical red beam laser could be purchased 15 years ago for \$600. Today that same red beam pointer can be purchased in any convenience store for \$3.95. It is the appearance of the green beam laser now available at ever decreasing prices that seems to be the problem.

A red laser uses a semi conductive crystal (a diode), which is energized by electricity to excite the electrons to a higher energy state. When the electrons fall back to a lower energy state a photon is emitted. The emitted photon

causes other photons of the same wavelength, phase and direction to be emitted. Green emitting diodes, however, are not readily available. A green pointer uses an infrared emitting diode to produce an infrared beam. This then causes a second lasing crystal to produce a light of a different wavelength that is then converted to green through a frequency doubling process. The human eye perceives the green light beam as 40-40X brighter than the red beam. The red beam laser pointer can be seen at no more than ½ mile. The green beam, on the other hand, can be seen as much as 2 miles away.

The government does not regulate the sale of lasers and no law restricts their use except local laws, which can ban their use in specific circumstances. The FDA does regulate the manufacture of lasers and rates them in 4 categories based on the emitting power. CD and DVD beams are category 1, laser pointers category 3 and industrial lasers category 4.

Category 3 lasers, as found in the typical pointer, produce about 5 milliwatts. This degree of emission

is not likely to cause eye damage except at close range, generally less than 10 feet. There have been reports in the medical literature of damage to the retina in children exposed to laser at close range. This is due to the refractive property of the cornea and the lens, itself a type of crystal. This property increases the irradiance (W/cm<sup>2</sup>) to the retina by 105 so that an irradiance of 1 W/cm<sup>2</sup> at the cornea increases to 10kW/cm<sup>2</sup> at the retina, a value similar to looking into the sun.

Lasers produce a narrow focused beam that is difficult to aim accurately. How then can a laser pose a threat to aviation?

Since the 1990's, there have been > 400 reports by pilots of lasers being aimed at aircraft. There were more than a dozen reports in December 2004 alone. Pilots have reported changing course and momentarily losing their orientation from laser activity. The typical laser only stays sharp for 6 meters, expanding until it can be 15cm. wide by the time a pilot sees it. The result to the pilot can

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## ASTRO-QUIZ

If you traveled to the star Mintaka, toward what constellation would you need to look to find Earth?

Answer to Last Month's Astro-Quiz: Most know that Crux, the Southern Cross, is the smallest constellation, but which is the largest and which the most average? First, determine the "surface" area of the Celestial Sphere like any other sphere, using the formula most of us have long forgotten,  $A = 4\pi r^2$ . Remember that the circumference (C) of the sphere is given by the formula  $C = 2\pi r = 3600$ , so  $r = 3600/2\pi$ . When we substitute this into the area formula, we arrive at a surface area of 41,253 square degrees. Divide this by 88, the number constellations, and we find the average to be 469 square degrees, almost exactly the size of the constellation Phoenix. Meanwhile, Hydra, at 1,303 square degrees is the largest, just a bit larger than Virgo, at 1,294.

## **UPCOMING EVENTS**

### **ASTRONOMY DAY - SATURDAY, MAY 14, 2005**

Astronomy Day for the year 2005 will be held on Saturday, May 14th, 2005. This year, RVAS is attempting to expand our outreach to the community by holding Astronomy Day at two locations.

#### **Astronomy Day - Market Square**

The Market Square event will be held next to the Center in the Square building just off Campbell Avenue. The times for the Market Square event will be 6:00 PM to 10:00 PM. RVAS members are invited to assist at this location if possible.

#### **Astronomy Day - Explore Park**

The Explore Park event will be held at the first overlook on the Explore Park Spur Road off the Blue Ridge Parkway. The times for this event are 7:00 PM to 11:00 PM. RVAS members are also invited to assist at this location as well.

The more help we have, the better we can handle any large crowds. Please let any of the RVAS officers know if you would like to help with either of these events. Please, if you intend on setting up your scope at any of these events, let us know so we can make plans for your scope and/or equipment.

### **ALMOST HEAVEN STAR PARTY - SPRUCE KNOB, WV - JUNE 2-5, 2005**



NOVAC is pleased to announce that we will be holding our first regional Star Party at Spruce Knob, West Virginia on June 2-5, 2005. The event will be held at The Mountain Institute in one of the darkest areas on the east coast at an elevation of about 4200 feet. Please check the web site for more information. We will be adding details over the next few weeks. <http://www.novac.com/AHSP/index.php>

Registration is now open and it can be done completely on-line. If you have questions, send an email to [AHSP@NOVAC.COM](mailto:AHSP@NOVAC.COM).

Mid-East Region of the Astronomical League (MERAL) is also planning to hold their annual meeting at the event, so please try to send a representative from your club if possible. All proceeds will go to the Virginia Outdoor Lighting Taskforce - [VOLT.ORG](http://VOLT.ORG) to support efforts to fight light pollution.

### **GREEN BANK STAR QUEST II - GREEN BANK, WV - JULY 6-10, 2005**

Combining Optical and Radio Astronomy at One Event!

Come join us July 6th-10th, 2005 under the very dark skies of West Virginia for the 2nd annual Green Bank Star Quest at the National Radio Astronomy Observatory in Green Bank, WV. By day checkout all the NRAO has to offer, like the new multi-million dollar Visitor's Center, and free tours of the facilities: including the 100 meter GBT – which is the world's largest fully steerable radio telescope. Star Quest will have 4 days of lectures, imaging classes, vendors, raffles, kids activities and nighttime optical observing on over six acres of camp sites at the low price of \$ 75.00 for a party of two or \$ 100.00 for a family. For more information contact Joe Gonzalez at (304) 626-5012 or visit our web site at [www.greenbankstarquest.org](http://www.greenbankstarquest.org)

Register before 3/15/05 to receive a 10% discount off your total registration fees, just write Early Registration Deal on the registration form and submit it before 3/15/05!!

### **VAAS 2005 - VIRGINIA WESTERN COMMUNITY COLLEGE - ROANOKE, VA - NOVEMBER 5, 2005**

RVAS is happy to announce that Roanoke is the host city for the Annual Convention of the Virginia Association of Astronomical Societies (VAAS). This year's convention will be held at Virginia Western Community College on Saturday, November 5th, 2005. For more information, please visit the website at: <http://www.vaas2005.com>

## LASER POINTERS

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be an unpleasant and dangerous interference in vision, even without direct beaming into the cockpit.

Visual disturbances that a pilot might experience include glare, flash blindness and afterimages.

Glare is the dazzle that occurs when exposed to light relatively brighter than the surrounding light. An example is the light from car headlights at night. Residual effects of glare include spatial disorientation and loss of situation awareness.

Flash blindness is visual loss during and following exposure to a light flash of high intensity. An example is the temporary loss of vision after exposure to a flashbulb. This may last several seconds to a minute.

Afterimage is a persisting image perceived after the physical stimulus is removed. This can manifest as the essential form, motion, and brilliance of color.

Pilots maintain low lighting in the cockpit to prevent saturation of the retinal cells, thereby increasing night vision. Sudden exposure to bright light can result in loss of night adaptation. Commercial pilot exposure to laser beams have resulted in vision impairment and interfered with pilot ability to control aircraft. These occur during the critical takeoff and landing approach phases of flight, a time when pilot attention and vision is particularly critical. For this reason FAA Order 7400.2D (Procedures for Handling Airspace Matters; Part 8) which regulates outdoor laser use in the National Airspace System (NAS) have been revised to protect critical airspace against the adverse effects of laser activity.

In summary, green beam lasers are becoming more common as the cost continues to drop. These lasers are perceived by the human eye as 40X brighter than red beam. At close range lasers can cause permanent damage to the retina. At distance the typical pointer does not have the power to cause permanent damage nor are they easy to aim accurately. They can,

however, cause interference to the vision of flight crew during the critical takeoff and landing phases of flight even if not intentionally directed at the aircraft.

### References

1. Laser Pointer Abuse Threatens Air Safety: Fahrenthold, D.A. and Dwyer, T.; The Washington Post January 27, 2005
2. Laser Airplane Danger Does Not Add Up: Chapman, G.; Faculty of Applied Sciences Simon Fraser University [fas.sfu.ca/news/laser-terrorism](http://fas.sfu.ca/news/laser-terrorism)
3. Laser Pointers; Their Potential Affects on Vision and Aviation Safety: Nakagawara, V.B. and Montgomery, R.W.; DOT Report DOT/FAA/AM001/7 National Technical Information Service Springfield, VA. 2161
4. How It Works; Laser Pointers Draw Attention to Themselves: Austen, I The New York Times Jan 20, 2005
5. Personal correspondence: Paul Bunt, 757 Captain, UPS

## \*\*\* IMPORTANT - DUES AND SUBSCRIPTION NOTICE \*\*\*

It's renewal time for RVAS memberships, most of which expire on June 30, 2005. If your membership expires at another time, you'll receive a special notice. If you want to know now when your membership expires, call **Frank Baratta at 774-5651**. Membership categories are:

**INDIVIDUAL (\$20.00 per year)** - RVAS and Astronomical League membership for you.

**FAMILY (\$25.00 per year)** - RVAS and Astronomical League membership for you and your family.

**STUDENT (\$10.00 per year)** - RVAS and Astronomical League membership for a full-time student.

Make checks payable to "RVAS," and forward to: **Lynn Slonaker, RVAS Treasurer, 3548 Kenwick Trail, Roanoke, VA 24018.**

**MAGAZINES:** Members may subscribe to *Astronomy* (\$29.00) and/or *Sky & Telescope* (\$32.95) at the indicated substantial club discount rates. Subscriptions are sent to the publishers each April 15th, August 15th and December 15th. Renewal payments should be submitted by whichever of these dates is at least 4 months prior to the expiration of your magazine(s). Orders may be added to dues payments, or submitted separately

# ***Society Events and Activities for May 2005***

**MONTHLY MEETING:** Monday, May 16th, 7:30 p.m. Hopkins Planetarium, fourth floor, CenterInThe Square, Roanoke. The evening's program will be Geographical Information System of Mars by Dr. Fred Hoffman. Also speaking is a student from the Roanoke Valley Governors School, discussing her Science Fair Project.

**"MEMBERS ONLY" WEEKEND OBSERVING SESSIONS:** Unless otherwise noted, observing sessions are held at Cahas Mountain Overlook, milepost 139 on the Blue Ridge Parkway.

Friday and Saturday, May 6th and 7th. Sunset is at 8:15 p.m. Astronomical twilight ends at 9:56 p.m. The Moon sets at 6:44 and 7:51 p.m., respectively.

Friday and Saturday, May 27th and 28th. Sunset is at 8:32 p.m. Astronomical twilight ends at 10:21 p.m. The Moon rises at 12:55 and 1:33 a.m., respectively.

June Sessions: 3rd and 4th.

**FRANKLIN CO. PARKS DEPT./RVAS PUBLIC STARGAZE:** Saturday, May 28th, 9:15 p.m., Franklin Co. Recreational Park. For Franklin County residents; RVAS members welcome to participate. Call the RVAS Message Line, 540-774-5651, for information. (Next session: August 27th, 8:30 p.m., FCRP.)

**ROANOKE CITY PARKS DEPT./RVAS PUBLIC STARGAZE:** Saturday, May 7th, 9:00 p.m., Cahas Overlook, milepost 139, Blue Ridge Parkway. For City, County and other area residents; RVAS members welcome to participate. Call the RVAS Message Line, 540-774-5651, for information. (Next session: June 4th, 9:15 p.m., Cahas Overlook.)

**RVAS EXECUTIVE COMMITTEE MEETING:** To be announced.

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