ROANOKE VALLEY ASTRONOMICAL SOCIETY

NEWS ABOUT AMATEUR ASTRONOMY IN SOUTHWESTERN VIRGINIA

http://www.roavas.org

Vol. 20 No. 1 **January 2003**

OBSERVING OPPORTUNITY

Saturn Transits the Crab Nebula!

While they orbit around the sun, planets occasionally pass in front of noteable deep sky objects. Just such a line-of-sight event will happen on January 4 when Saturn transits M1 (a.k.a. the Crab Nebula).

The ringed planet, satellites in tow, will creep across M1 from east to west with ingress about 11 a.m. January 4 and egress about 4 a. m. January 5. This means that, weather permitting, club members will be able to witness the event on a scheduled weekend observing night—the evening of Saturday, January 4. So come to Cahas and don't miss it!

This should be an interesting combination in terms of the relative sizes, integrated magnitudes, and surface brightnesses of these two popular objects. Does Saturn's brilliance overpower M1's subdued presence? For once, the moon shouldn't be a problem as this event is 2 days past new. Observers and astrophotographers get ready!

For comparison's sake:

	Size	Magnitude	Surface Brightness
Saturn:	30" x 25"	-0.9 mag.	-2.9 mag./sq.arcmin
M1:	360" x 240"	8.4 mag.	11.6 mag./sq.arcmin

OBSERVING SESSION AT CAR DEALERSHIP?! ARE YOU CRAZY?!

The RVAS and Saturn of the Roanoke Valley

An observing session at a blazingly lit car dealership? You've got to be out of your mind! Well, that's exactly what the RVAS has in mind!

On December 9 John Goss spoke with the general manager at Saturn of the Roanoke Valley about having an observing session there focused primarily on Saturn. They thought it was a great idea to have an observing session at the car dealership and are willing to give a donation to the club of $100-$250 for the event. Objects would include the planets, notably Saturn, and other bright objects perhaps including the moon, double stars, and star clusters. The RVAS executive committee will need to work out the specific date and time but it is thought it should happen sometime between late February through March.

In addition to educating the public, the plan is that the club leadership would also speak with the dealership about the benefits of reducing light pollution at the dealership through introducing different kinds of fully shielded lighting—great for reducing energy consumption and preserving the view of our night skies.

ARIZONA OBSERVATORY AND INN FOR SALE—ANY TAKERS?

Sleeping With the Stars

Stargazers with a few million dollars to spare take note: the famous Vega-Bray Observatory (which members Vince and Pyllis Talley have visited) and Skywatcher's Inn in Benson, Arizona, is on the market, with an asking price of $1.5 million. The property, which includes a bed and breakfast, working ranch and observatory on 55 acres along the San Pedro River, is about a 40-minute drive from Tucson International Airport. The owners had intended to donate the property to charity in their later years, but an early retirement and unexpected illness interfered with those plans, says agent Jade Bossert, of Century 21 First American in Tucson. One of the largest amateur astronomical observatories in the world, it comes with all the telescopes, the four-bedroom B&B facility, irrigated pastures, a private fishing lake with a dock and covered gazebo and two caretakers' residences.

SOCIETY ITEMS

Farewells . . . and Hellos

Like any other membership group, the RVAS is a dynamic collection of individuals and families that changes over time. People move, develop new interests, or experience any number of other situations that result in our club roster regularly requiring updating.

With the new calendar year having arrived, we thought it would be a good time to acknowledge the members who have left us since our current membership year began last July 1st. These include: Jim Elder (13), Mike and Liz Cooper (3), Phil Hoge (8), Steve Hubbard (12), Luke and Bobbie Huybrechts (10), Mary and Seymore Kaplan (2½), Robert Penn (3), and Patricia Perlingiero (1). The numbers in parentheses indicate how many years these individuals had been RVAS members. We wish all of these individuals "Clear Skies" and hope they will consider rejoining the RVAS in the future.

Now, while always acknowledging separations with some sense of sadness, we also have the upbeat side of new members who have joined us. So in case you haven't noted these newer names on our roster, we've welcomed the following over the same stretch of time: Phillip Akin, John Allen, Swanson ("Claude") and Mary Ann Childress, Andy Frank, Gary Hatfield, Blake Lipscomb, Clark Thomas, Jeffrey Wood and family, and Richard and Debbie Zue. Thanks to all these new members for becoming part of the RVAS family and supporting amateur astronomy in our area. We hope you'll all become regulars at club events and activities.

Mystery Object

Can you identify the below object?

E-mail your guesses to Dave Thomas at thomasde-ka8inl @worldnet.att.net

RVAS DECEMBER MEETING: A MEETING TO REMEMBER

The RVAS December Social Brings Members Together

It has become a tradition of the RVAS that the December meeting is a social full of food, friends, and conversation. Members met Monday December 16th to find out what's in the night sky, what's coming up in 2003, and what's new among themselves.

At midnight every New Year's Eve, there is an event which is not widely recognized in amateur circles, an event which lead Jack Horkheimer to pronounce, "How poetic, how wonderful!" In his Star Gazer episode "A Star for New Year's Eve," Horkheimer reveals an annual occurrence that he came across a few years ago. The brightest star in the night sky, Sirius, culminates (ie. reaches the meridian) at the stroke of 12 on New Year's Eve, no matter where you are on earth. He urges everyone to gaze thoughtfully at Sirius while bringing in the new year. Go outside. Look up. It will be there.

Late Fall and Early Winter Observing

The weather in December certainly wasn't conducive for much observing. However, Dave

(Continued on page 3)

Astro-Quiz

Suppose someone told you the Sun was at ecliptic longitude 0 and latitude 0, what constellation would the Sun be in, what would be its right ascension and declination, and what day would it be?

Answer to Last Month's Astro-Quiz: It has been said that "time" is that which is measured by clocks. But, in fact, a variety of measurement approaches have been developed for various purposes. These include forms of *solar time*, which is time in relation to the Sun, including the familiar *civil time* of the clocks used for our daily affairs; *sidereal time*, or time in relation to the stars; and other forms such as *atomic time*. *French Revolution Time* was a form of solar time devised in 1790 by the French Academy after the French Revolution. It was a decimal timescale that divided the day into 10 equal "decidays," each of which was in turn divided into 100 "millidays," with each of these divided into 1000 "microdays." The scheme was never fully im-

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to the pursuit of observational and photographic activities. Meetings are held at 7:30 p.m. the third Monday of each month at Center in the Square Roanoke. 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: $25.00; Student membership: $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.

Officers/Executive Committee: Paul Caffrey, President (345-2847); Katherine Hix, Vice President (334-2443); Carol Mesimer, Secretary (334-1177); Lynn Slonaker, Treasurer (774-5695); Dennis Stevens, Executive Committee Member-At-Large (989-8801); Dave Godman, Immediate Past President (774-3337); Dave Reese, Newsletter Editor (366-8775, dereese@mindspring.com), Dave Thomas, Mystery Object columnist (thomasde-ka8inl@worldnet.att.net), RVAS Message Line: 540-774-5651, RVAS Web page: http://www.roavas.org

RVAS DECEMBER MEETING, CONTINUED

(Continued from page 2)

Godman did see a bright meteor streaking across the sky. Perhaps he was fortunate enough to glimpse a Geminid! Hopefully, January will bring clearer skies during the dark of the moon. Then, we will be able to see the items Paul Caffrey highlighted during his talk "What's Up for December and January." Paul said it best, "The planets are back!" Both Jupiter and Saturn will be giving splendid views for the next 5 months. Venus dominates the morning sky, reaching greatest western elongation (from the sun) on January 11. Mars is also in the morning sky, but not yet a showpiece--just wait for this summer! For the deep sky observer, there are many winter Milky Way open clusters and late fall galaxies with which to keep busy. Why not give M36, 37 and 38 in Auriga a try?

You never know when the next comet will give an impressive show. Mark Hodges discussed Comet Kudo-Fujikawa 2002X5 which was found on December 14. My, how news travels fast! For the first half of January it will be in Hercules and Aquila, and possibly be a naked eye object. It will reach perihelion on January 24 when it has entered Capricornus and has physically moved inside the orbit of Mercury. Keep your fingers crossed about this unexpected visitor as comets can be full of surprises!

Every year brings something new, astronomically. John Goss read a list of interesting events in the 12 months ahead:

Jan. 4 Saturn will transit the Crab Nebula,
May 7 A sunrise transit of Mercury,
May 15 A total eclipse of the moon,
July 17 Mars will pass just north of the early morning moon,
Aug. 27 Mars will reach its best opposition this century,
Nov. 18 The Leonid meteor shower may give another great show,

and, of course, the eagerly anticipated RVAS picnic and stargaze on September 20.

A Final Song for 2002

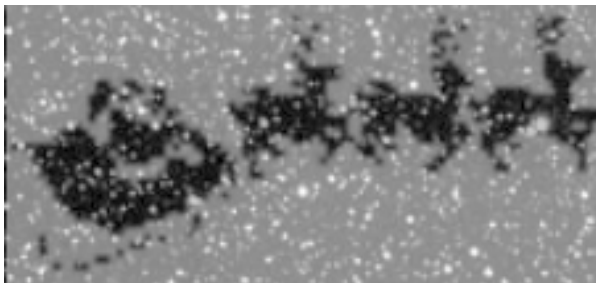
Once the presentations were completed, there remained one last activity to ready the crowd for the waiting snack goodies: a chorus of Monty Python's "Galaxy Song." In its first verse, Eric Idle reminded us all that our earth is but a speck moving through the vastness of space:

Just remember that you're standing on a planet that's evolving
and revolving at 900 miles an hour,
It's orbiting at 19 miles a second, so it's reckoned,
the sun that is the source of all our power.
The Sun and you and me, and all the stars that we can see,
are moving at a million miles a day,
In the outer spiral arm, at 40,000 miles an hour,
of the Galaxy we call the Milky Way...

After a rousing sing-a-long, exhausted members and guests gathered around the refreshment table to fill up with crisp vegetables, cookies, brownies, cookies, brownies, cookies...you get the picture. It was a great evening capping off a great year for the RVAS. Your club's officers wish everyone a super 2003 that is packed with an assortment of transits, comets, eclipses, meteors, planets, clusters and

Someone wants to buy a 10-13 inch reflector. Does anyone have one for sale? Call John Goss at 540-966-4606.

Last Month's Mystery Object



Sleigh Nebula

The mystery object for December is a newly discovered
object that seemed to appear around the first day of December.

It seems the photons from the nebula were not behaving according to the laws of physics. No matter which direction telescopes were pointed the image was there.

Everyone who looked at the nebula was filled with a sense of peace and good cheer.

The image finally faded around the first day of the new year. The hope is that it will reappear next year and for many years to come.

JANUARY RVAS MEETING

Milky Way Morphology or "You Are Here."

Have you ever seen the poster of the Milky Way with an arrow pointing to a spot in one of the spiral arms proclaiming "You are here?" January's meeting of the RVAS will feature a tour of our galaxy, showing where we are and why the night sky looks the way it does. Why are there many bright stars in the winter sky while autumn has so few? Why are galaxies the highlights of the spring sky? Why are there so many globular clusters in or near Sagittarius? Join us for the answers to these and other questions when we meet on January 20 under the warm

AN HISTORICAL NOTE

Can you believe it?

From the Sky and Telescope Mailbag (July 1961):

Question: How many telescopes are there in the United States having apertures of 20 inches or more?

Answer: According to G.P. Kuiper and Barbara M. Middlehurst's book "Telescopes," there are 49 in this country. Of these, 35 are reflectors, 12 refractors, and four are Schmidt cameras.

TWO YEAR-END OBSERVING ACCOUNTS

The Local Group

A year-end observing session brought a small group of RVAS members together. Isaac Campbell, (YES! THIS WAS THE REAL ISAAC AND NOT ULYANA HORODYSKYJ AS WAS MISTAKENLY REPORTED IN THE LATEST ISSUE OF the REFLECTOR!) delighting in his new 15" Discovery scope, viewed the Christmas Tree Cluster and its associated Cone Nebula along with Hubble's Variable Nebula. Bill Jones was enjoying a night off from work as he focused his efforts on the Herschel List, particularly NGC1788.

Mark Hodges continues to be amazed by his new 22mm Nagler eyepiece, concentrating on Jupiter. John Goss, accompanied by one of his students from the Observational Astronomy class, zeroed in on the Eskimo Nebula, Saturn, and M78 & M79. (No, John didn't bring his new scope...the 17.5" Discovery!) Paul Caffrey, using his 13.1" Dobsonian, commented on his observations of M42 and M97. Mahesh Tailor continued work on his Messier List, knocking off M41 and M109 (a challenge!). Michael Good reverted to visual observing for the evening, catching NGC 891 (an edge-on spiral in Andromeda) in Isaac's telescope.

I have received several interesting and friendly e-mails from a group of French amateur astronomers located in southwest France. You may want to check out their website http://www.astrosurf.com/gap47/. The astrophotos and other pictures will render it understandable even if you don't speak French!

To those of you who have enjoyed visiting NRAO in Green Bank...noted radio astronomer Grote Reber (whose original radio telescope from 1937 is located on the grounds at Green Bank) passed away on December 20, 2 days before his 91st birthday.

To all RVAS members, happy observing in 2003!

Genevieve Goss

This is a highly unofficial RVAS club viewing report for December 27, 2002:

Tonight was an official RVAS date for Cahas, and the skies were very clear with scattered clouds. I was eager to visit with all the other club members who would be there, some showing off their gifts from Santa. So I loaded up my trusty Orion 8" f/4, and made it up 221 (avoiding the barricades on the Parkway between 220 and Adney Gap), and then south along the ice-covered Parkway with recently cleared tree damage. Finally, the viewing site was my reward. I could hardly find parking space, with so many of us already there. There was C. Thomas, CMT, Clark M. Thomas, C. M. Thomas, clarkt7, Mr. Thomas, and me, Clark. The seven of us had a wonderful time in the brisk December air.

I don't know how the others fared, since I was so busy with my scope. I was there from 7:15 to 8:30. During that time I enjoyed the mag 5+ skies and reasonably steady viewing conditions. Temperature threatened to turn my fingers into ice, as gloves could not be used for detail work. Breeze was about 10mph.

I was able to see these Messier objects: M42, M43, M35, M36, M37, M38, M1, and M78. Additionally, I was able to see Saturn's Cassini Division and nice detail in its southern hemisphere. Castor was a real treat at 133x with my new $50 Orion Expanse 6mm (66 degrees AFV). Castor A was white, and Castor B was creamy, both textbook. The split was sharp, and a bit better than I got at 100x with my 8mm Lanthanum Superwide.

The only "disappointments" were seeing M1 as a grey blob, not filamentary. But a larger scope might help. I couldn't locate the Blue Snowball, as clouds blocked the view. Also, I got cold and tired, since nobody else would talk with me (HA! HA!); so I went back home sooner, rather than later.

Hopefully this Saturday's January 4th transit of Saturn over M1 will be a clear night, and that some "big guns" will show up to help lowly peons like me see the event in all its glory.

Add to your Astronomy library

Do you need to fill out your library of Astronomy magazines? Or do you need to replace any missing issues? Below are back issues of Astronomy magazine that are yours for the asking:

May 1981, July 1992
Feb, Apr, May, Oct 1995
Mar, June, July, Aug, Sept, Dec 1996
June, July, Nov 1997
July, Nov 1998, June 1999
April, Oct, Dec 2000, Feb 2001

Leonid photo from November 2002 by member Gary Hatfield of Thaxton, VA

BOOK REVIEW-SECOND OF THREE REVIEWS OF THE EFFECTIVE OBSERVING OF DEEP SKY OBJECTS

Visual Astronomy of the Deep Sky

Roger N. Clark, Cambridge University Press, 355 pages, hardcover, 1990

Of all the astronomy books that have been issued in the past 40 years, this is one of a handful that should be required reading for all amateurs interested in effective deep sky observing. Dr. Roger Clark carefully presents the relationship the telescope has with the other half of the optical system--the human eye. Before *VADS* was published, not much had been written about this important subject.

How does the eye respond to various levels of lumination? What occurs during dark adaptation? What role does surface brightness play? To answer these questions, Dr. Clark covers the physiology of the eye and what can be seen at very low lumination levels. As it turns out, more than you might think! His conclusions are supported by many graphs and charts that describe retina features, contrast discrimination, wavelength response, brightness sensitivity, angular size perception, and the phenomena of averted vision. If you like detailed graphs with subtle implications, this is for you!

Very Useful Conclusions for the Observer

Visual Astronomy of the Deep Sky presents interesting conclusions, some of them contrary to what many of us were taught:

1. *The greater the angle an object subtends, the greater the sensitivity of the eye to it.* Greater than 4-6 degrees of arc, the eye's sensitivity is fairly constant. This implies that for very faint objects, the magnification should be increased until they subtend at least 240 arc minutes.
2. *For a given background (the night sky has a surface brightness of about 24.5 magnitude/square arcsec), less contrast is needed to see a larger object.* Again, the eye is most sensitive to objects that are at least 4-6 degrees in apparent size.
3. *The eye's ability to see a point source, such as a star, increases as the background illumination gets dimmer.* Dark sky sites are better for this reason.
4. *If an object is at the threshold of detection and smaller than the optimum angle, more magnification will make it easier to see.* This explains why it is easier to see dim extended objects at a high magnification than at a low one. High magnification does not enhance contrast; it enlarges angular size and thereby increases perception.
5. *Peripheral vision is best when the object appears 8° to 16 ° off axis in the direction of the nose.* This results directly from the physiology of the eye. The technique of averted vision: If you're using your left eye, then direct your gaze to the upper left of the object. For the right eye, look to the upper right.
6. *For the detection of the faintest objects, the light must accumulate on the retina for around 6 seconds.* The eye has an exposure time, not too unlike photographic film.
7. *Telescopes of equal aperture and good, clean optics that do not scatter light will show identical views of deep-sky objects at the same magnification, regardless of their f/ ratios.* An f/5 scope will give the same image as an f/10 as long as the magnification is the same. Of course, the f/5 optics will be more susceptible to coma.
8. *The telescope's maximum magnification limit is found by dividing the eye resolution (1800 arcseconds when the light is extremely dim) by the telescope resolution. The limit is 330x per inch of objective.* This is a result of the eye's apparent angular resolution dramatically decreasing as the object's surface brightness decreases. The limit given is much higher than the 50-60x per inch most of us were taught.

Examples of Recording Your Observations

Chapter 6 gives a case study of M51, the Whirlpool Galaxy. Dr. Clark covers its brightness profile as well as its visual appearance at different magnification and apertures. This section clearly puts to work the graphs and charts introduced in the prior chapters.

We have all seen pictures of deep sky objects and have tried to envision what they would look like through our telescopes. Photography is great for gathering light but does not accurately portray what the eye really sees. Hand drawn images can fill that need. Techniques and materials including pencils, paper, lighting and scale are described. Amateurs are encouraged to try their hand. It does take practice, but then again, so does effective observing.

The Appearance of Deep Sky Objects Through the Eyepiece

Examples of the appearance of deep sky objects through various apertures comprises the second half of the book. How does M74 look through an 8-inch scope? A drawing accompanies the description for this low surface brightness galaxy in Pisces:

M74 is often regarded as the most difficult Messier object to locate. With a diameter of 9 arc-minutes and a total magnitude of 9.0, M74 ought not to be hard. The difficulty is probably due to improper use of magnification. Again, guides often suggest using low powers, since the average surface brightness is low at 22.4 magnitudes per square arcsecond. But most of the light is concentrated in the small nuclear region about 40 arcseconds in diameter. So at low power the galaxy can look like a field star. Higher powers show the nuclear region as a disk. In the 8 inch under only moderate skies, 188x gave the best view.

About 60 other objects, both easy and challenging, are similarly discussed: Planetary nebulae from the hard-to-find NGC 246 to the ever popular M57, distant galaxies from the faint M100 to the tricky M33, diffuse nebular regions such as M8 and M42, both open and globular clusters including ancient M67 and huge M13.

If you can, add this book to your astronomical library. However, that may be difficult since *Visual Astronomy of the Deep Sky* is out of print. In a recent correspondence, Dr. Clarke said, “Unfortunately, Cambridge U. Press lost the plates so there was only the first press run. Now, the only hope of getting a copy of the book is on the used book market.” Missing plates! Ugh! Imagine the pit in his stomach when he heard that! The book can be found by InterLibrary Loan with the nearest copy coming from Virginia Tech. More information about the observing work of Dr. Clark can be found at his website:

Society Calendar of Events and Activities for January 2003

JANUARY MEETING: Monday, January 20th, 7:30 p.m., fifth floor meeting room, Center in the Square, Roanoke. Tonight's meeting will feature a program by John Goss entitled "Milky Way Morphology, or 'You Are Here'," an engaging talk on the shape of our galaxy and why things look the way they do. Join us!

"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, 3rd and 4th.** Sunset is at 5:15 p.m. Astronomical twilight ends at 6:48 p.m. The Moon sets at 6:06 and 7:12 p.m., respectively.
- **Friday and Saturday, 24th and 25th.** Sunset is at 5:36 p.m. Astronomical twilight ends at 7:07 p.m. The Moon rises at 12:42 and 1:53 a. m., respectively.
- **Friday and Saturday, 31st and (Feb.) 1st.** Sunset is at 5:44 p.m. Astronomical twilight ends at 7:13 p.m. The Moon sets at 4:55 and 6:00 p.m., respectively.
- **February Sessions:** 21st and 22nd; and 28th and (Mar.) 1st.

FRANKLIN CO. PARKS DEPT./RVAS PUBLIC STARGAZE: The next session is March 8th. These public sessions are intended for Franklin residents. All RVAS members, especially those able to bring telescopes to assist, are welcome to attend. RVAS members should contact Frank Baratta for further information.

ROANOKE CITY PARKS DEPT./RVAS PUBLIC STARGAZE: Saturday, January 11th, 6:30 p.m., Fallon Park, Dale Avenue (Rt 24), Roanoke. Free. Call 540-853-2236 to register. (Next month: February 22nd, 6:30 p.m., Cahas Overlook.)

RVAS EXECUTIVE COMMITTEE MEETING: Meetings are now held the first Tuesday of each month; contact one of the officers regarding specific location and time information.

ROANOKE VALLEY ASTRONOMICAL SOCIETY
8229 HUNTERS LANE
ROANOKE, VIRGINIA 24019-6810

ADDRESS CORRECTION REQUESTED