

OBSERVING TIPS

Will it be Clear Tonight?

You don't need to be a weatherman to figure out whether tonight's sky will be cloudy or clear.

By James Moeller

Everything is ready; it looks like it's going to be a beautiful night. You've planned ahead to insure that you have everything you'll need. Even the meteorologist on television is predicting clear skies! Upon arriving at your observing site however, you discover a large sheet of clouds rapidly moving in and obscuring the skies.

Does this sound familiar? It happens to every amateur astronomer sooner or later. Yet with some very basic weather-wise knowledge it can be avoided. There is much merit in the sky lore that farmers and mariners have perfected over the centuries, yet in today's electronic, satellite-scrutinized world, some of these basics have been forgotten. You don't need a barometer, hygrometer, anemometer, thermometer, or any other "ometer" to predict immediate sky conditions.

(Continued on page 3)



JULY MEETING PROGRAM

An Evening with the Milky Way and Mars

by John Goss

The evening began with a 5 minute video of the dynamic Jack Horkheimer expounding the virtues of two summertime open clusters--M 6 and M7. They are easily visible this time of year in the constellation Scorpius. Somewhat later during the meeting another Horkheimer video was shown emphasizing beauty of the Milky Way from a dark sky site. A double dose of Jack in one meeting!

Member John Goss discussed daytime observing and lunar occultations. Several times this year different planets will be occulted by the moon. A list of these events, as well as tips on how to view them, are on the RVAS website under the Events page.

The feature presentation was a short, but very informative, video from NASA explaining how astronomers have determined the structure of the Milky Way

galaxy. This was no small achievement. After all, how can you ascertain the shape of something you're inside of and can't see clearly? Orbiting spacecraft have given us photographic mosaics of the galaxy taken in infrared, ultraviolet, radio and x-ray light.

One of the big things that brings people to the club is the chance to observe and share their enthusiasm of astronomy. After the indoor business, members gathered on the Market Square to do just that with a public viewing of Mars. For the next hour or so, Market patrons had the opportunity to examine the Red Planet and witness its ensuing dust storm. The six telescopes lured close to 50 curious passers-by to the eyepieces. The evening was warm, the sky was clear, and the city folk were friendly--not a bad way to conclude the day!

Thank you go to telescope owners Paul Caffrey, Mike Good, Mike Haynie, Katherine Hix, Bruce Jones, and Carol Mesimer, and to Frank Baratta for obtaining the necessary city permits.

AUGUST MEETING PROGRAM

Campbell to speak on AZ Astro Camp

If you read your July newsletter and attended the July meeting you would have noticed that Isaac Campbell did not give his talk on the Arizona astronomy camp which he attended this summer. It was decided that Isaac would present his talk at the August meeting instead.

So please come and you'll surely be treated to an interesting program as Isaac describes the people, projects, and equipment he was able to work with during his recent summer astronomy camp experience.

SOCIETY BUSINESS

Member Emails Needed

As you may already know, each year the RVAS spends more to copy and mail our monthly newsletter than on any other single item in the budget. To hold the line on these costs, we're considering offering an on-line version of the newsletter to members who are agreeable to receiving it in this form rather than hard copy.

We'll be checking with members on this soon. But to do so, we need to ensure that our club email directory is correct and as complete as possible. If you have not been getting our periodic emails, then we probably don't have your email address. Or your address may have changed and ours is out of date. (At this time, we know of at least two members, David Thaler and Jim Wright, for whom

our email addresses are no longer current.)

Take a moment and confirm your email address or add it to our directory. Our membership, mailing and email lists are maintained by Frank Baratta, so please send your email address to him as soon as possible. Frank's email address is starhiker@worldnet.att.net. Having your email address will also ensure that you're included late-breaking news about club or astronomical events.

Greenman Foundation Update

Ray and Carleen Green man excitedly report that they have just received and deposited a generous \$10,000 grant from JMM Charitable Trust, a private foundation in Floyd, VA! The money is being used to hire a professional grant writer named Pat Thearin, a long-term friend of the Greenmans who has a reputation for excellent work. Pat will also be assem-

(Continued on page 3)

Mystery Object

Can you identify the below object?



Astro-Quiz

Though in virtually opposite areas of the sky, the stars Vega and Sirius are directly related as signposts of the Sun's motion through the galaxy. What is this relationship?

Answer to Last Month's Astro-Quiz: While we tend to generalize that the Sun rises due east at the beginning of spring, this isn't true for all places. This is because the *vernal equinox*, the beginning of spring, is an instant, not an hour, day or other interval of time. The Sun only rises due east for those places on the north-south line for which the instant of sunrise is exactly the instant of the equinox. For the next band of places, the sun as it rises is already farther along the *ecliptic*, its apparent yearly path through the constellations, and farther north along the horizon.

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 \$15.00 (Family membership: \$22.50; Student membership: \$7.50). For information, call the RVAS Message Line at 540-774-5651.

Officers/Executive Committee: Dave Godman, President (774-3337); Paul Caffrey, Vice President (345-2847); Carol Mesimer, Secretary (334-1177); Lynn Slonaker, Treasurer (774-5695); Bill Jones, Executive Committee Member-At-Large (962-7786); John Goss, Immediate Past President (966-4606); Dave Reese, Newsletter Editor (366-8775, dereese@mindspring.com) RVAS Message Line: 540-774-5651, RVAS Web page: <http://rvas.home.att.net/>

Greenman Update

(Continued from page 2)

bling the new Greenman Foundation Web site, which should be up and running soon. With her help Ray and Carleen hope to accelerate the telescope and observatory project. Way to go, Greenmans!

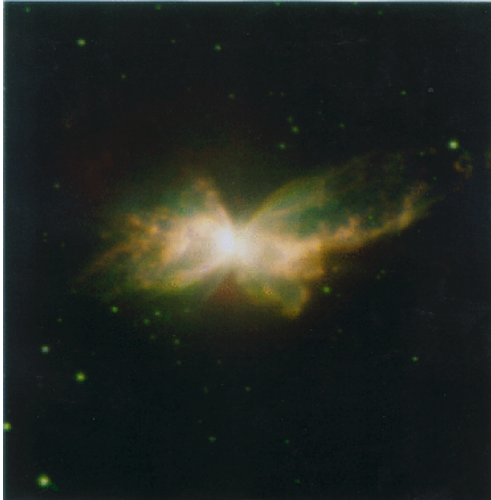
Thanks to Ray and Carleen for the picture of the famous 24-inch "Ulmes" telescope shown on the previous page.

Will it be Clear Tonight? Continued

(Continued from page 1)

With only your eyes and a sense of direction you can make amazingly accurate predictions about the potential cloud cover and atmospheric stillness over the next twenty four-hour period.

Last Month's Mystery Object



NGC 6302, The Bug Nebula

Well, well! It appears that Dave Thomas of Lynchburg is, so far, the undisputed king of the mystery objects! Yes, folks, last month Dave was the one and only to quickly and correctly identify this object, the Bug Nebula. What's with all the rest of you?! ☺

The Bug Nebula is a bipolar nebula located in Scorpius. In fact, it is interesting to note that several members viewed this object through the editor's scope prior to this newsletter.

Where Clouds Come From

The goal is not to make weeklong weather predictions, but to find out if clouds will spoil your evening's observing session. In order to do this it is necessary to have some idea of what generates clouds.

In short, clouds are composed of fine water droplets. The cloud droplets condense on to miniscule dust particles called condensation nuclei, which are simply any of the ubiquitous dust particles found in even the purest arctic air. The amount of condensation nuclei varies from one region to the next, but there are typically between a thousand to a million nuclei in every cubic inch of air. The nuclei's average size is about a thousandth of an inch in diameter.

ENCROACHING CLOUDS
that might spoil a night's observing can often be predicted if you know how to interpret certain weather signs

Condensation can't occur however, without a third factor coming into play—temperature. Warm, moist air

must be cooled enough so that water vapor condenses into droplets, much like the droplets that form on the outside of a cold soda can in the summer. Air is cooled either when it radiates away heat, as it does at night (causing dew to form on corrector plates), or when it is lifted to a higher altitude. Whenever condensation occurs in a rising parcel of air that has the same temperature, pressure, density, and humidity throughout, a cloud forms.

When the air is cooled even further, these water droplets increase in size until they are heavy enough to fall in the form of rain or snow. The approach of a cold front usually cools the air sufficiently to generate not only clouds, but plenty of precipitation too. In this situation the air behind the cold front is cooler than the air in front of it. The cold air sinks because it is denser and therefore pushes under the warmer air. This raises the warm air, which causes it to cool and form clouds. Because warm air can hold more moisture than cold air, these conditions usually mean some precipitation will fall. In the spring severe thunderstorms may form.

(Continued on page 4)

MOVING?

To be sure that you'll receive the newsletter and other Society notices, don't forget to give us your new address. Call the RVAS message line, (540) 774-5651.

Upcoming Activities and Events

◆ Annual Picnic—Saturday, September 15

The annual RVAS picnic and star party is scheduled for Saturday September 15 at Franklin County Recreational Park. A map will be included in the September newsletter and posted on the RVAS web site.

◆ VAAS—Saturday, October 13

On Saturday October 13th, the RVAS will be hosting the annual convention of the Virginia Association of Astronomical Societies at Virginia Western Community College. The day will begin with astronomical lectures by experts in the field and end at a star gaze on the Blue Ridge Parkway.

Your help is needed! Please see last month's newsletter for more information and contact John Goss at (540) 966-4606.

Will it be Clear Tonight? Continued

(Continued from page 3)

The air in a cold front is usually dry and therefore not conducive to cloud formation. Although stratus clouds sometimes accompany the front, the lack of moisture behind the front means that the sky will clear, usually within a few hours. The mixing of the warm and cool air masses however, often causes turbulent conditions to prevail for several hours afterward.

When a warm front approaches your area the warm air rises over the heavier, colder air near the surface and is cooled as it moves upward. This is a much slower process and can generate sheets of clouds and rain that can hang on for days.

Certain types of clouds can tell you a lot about what to expect in the sky because they are associated with certain types of weather. The most common type are cumulus clouds, the clouds we see in the summer that resemble large, puffy cotton balls. Meteorologists often refer to them as "fair weather cumulus" because they usually tell of fair weather with no abrupt changes in the near future. Be sure however, to note if they appear to be building higher in the sky, especially in late afternoon. This often presages strong thunderstorms. Such thunderstorms are usually brief, and because they are heat-driven, subside by nightfall.

Low clouds that look like solid sheets with little or no apparent surface detail are stratus clouds, so called because they are layered or stratified. Stratus clouds are associated with warm fronts, which almost always bring on high humidity levels with some form of precipitation. Stratus clouds may linger for hours or days.

Occasionally, cumulus and stratus clouds mix producing stratocumulus clouds. Usually you see these clouds gathering before storms. They have some visible surface details, so their height can be estimated. If you look in the direction of your prevailing winds, you may even notice that they appear to be getting lower, like stratus clouds. Should this be the

case, precipitation is almost guaranteed.

Know Which Way the Wind Blows

In addition to cloud types, wind direction is also a key factor in estimating sky conditions. In the northern Temperate Zone of the Western Hemisphere, the prevailing wind direction is from southwest to northeast. A wind that comes from the west or northwest usually means there will be little change in the weather.

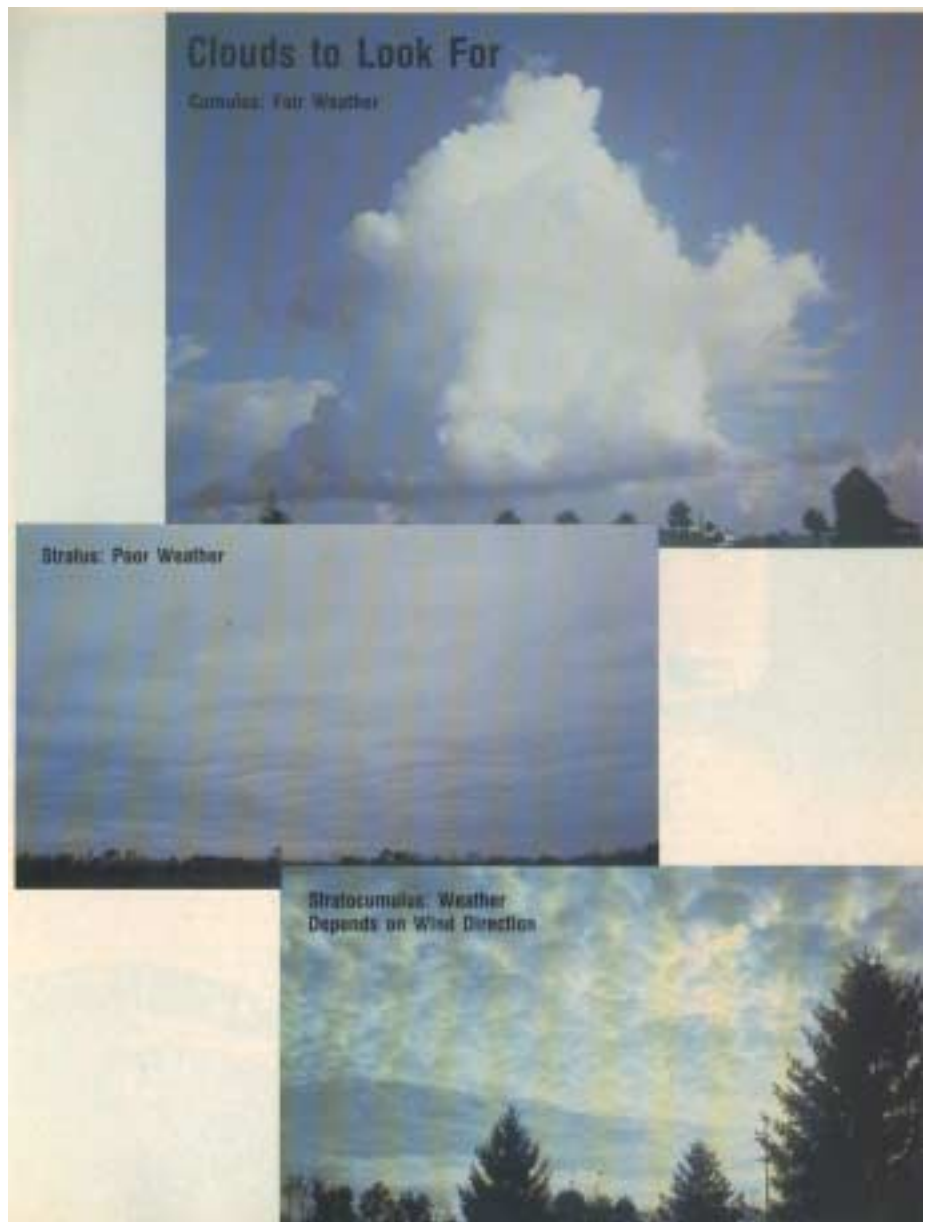
The one exception to this rule is if you

have a large body of water to either your northwest or west, in which case you can count on having more clouds than you otherwise might. This phenomenon is called the "lake effect." When air moves over an open body of water, it causes some of the water to evaporate. The influx of moisture into the atmosphere can generate clouds as

(Continued on page 5)

**"Some are weatherwise;
some are otherwise."**

*Ben Franklin, Poor Richard's
Almanac, 1735*



(Continued from page 4)

far as 200 miles downwind from the body of water.

A breeze from the southwest will usually not obscure your skies immediately, but it will warm things up a bit, as well as increase the humidity. Within a day or two however, you will begin to see clouds approaching from the southwest, and sometimes rain will follow.

There is a very easy way to determine if your skies will be fair or cloudy. Go outdoors and stand with your back to the wind. Generally speaking, low pressure will be on your left and high pressure will be on your right. With a high-

pressure system (fair weather, clear skies), the winds circulate in a clockwise direction and come out of the northwest. With a low-pressure system (deteriorating conditions), the winds circulate in a counterclockwise direction and so come out of the south. Thus, a wind blowing south to northeast usually means increasing clouds; the closer the wind gets to being from the northeast the sooner the clouds will move in.

Putting It All Together

Making predictions of sky conditions is relatively simple as long as you know the basic rules of what goes into

making the weather happen. Only two other conditions need to be mentioned—no wind and variable winds. These two are the best types to have, especially if a cold front has swept through your area the day before. The sky should be quite clear, and because there is little or no wind, turbulence shouldn't be a problem.

This lack of wind turbulence results from equivalent thermal conditions on the ground and aloft and explains why viewing conditions are sometimes better in the winter than in the summer. During the summer the ground is heated by the Sun, and when there are no clouds we experience "radiational cooling" at night. As the ground gives up its heat, currents of warm air rise, which in turn agitate the atmosphere and make objects appear to boil in the telescope.

This problem can be minimized if you observe in the late hours from a grassy area (which cools down faster than concrete or blacktop), but then you often have to contend with heavy dew. During the winter however, the Earth's surface isn't heated enough during the day to have much radiational cooling occur at night. Consequently, the air overhead isn't stirred up by rising air currents and is much calmer. The best time to begin observing in the winter is about two hours after sunset.

"Some are weatherwise, some are otherwise," wrote Ben Franklin in Poor Richard's Almanac in 1735. Amateur astronomers often have their plans foiled by the weather but fail to use it to their advantage. Using the described methods, I have been able to maintain a 90 percent accuracy rate in my predictions, which means that most of the time I can predict when my skies will be clear or cloudy. In the long run it means less disappointment and more observing.

Reprinted from Astronomy Magazine, December 1989, pp. 74-77.

James Moeller is an amateur astronomer from Kirkville, New York. At the time of this article he had been an amateur meteorologist for ten years.

Ed. Note: One of the most useful articles I have ever read.



Society Calendar of Events and Activities for August 2001

AUGUST MEETING: Monday, August 20th, 7:30 p.m., Fifth Floor Meeting Room, Center In The Square. The evening will offer several short talks by members on astronomy subjects.

AUGUST "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, 10th and 11th.** Sunset is at 8:17 p.m. Astronomical twilight ends at 9:55 p.m. The Moon rises at 11:51 and 12:21 a.m., respectively.

-- **Friday and Saturday, 17th and 18th.** Sunset is at 8:09 p.m. Astronomical twilight ends at 9:44 p.m. The Moon sets at 7:29 and 8:16 p.m., respectively.

-- **September Sessions:** 7th and 8th; 14th and 15th. (Note that the 15th is the annual RVAS picnic and star party.)

SCIENCE MUSEUM SKYWATCH PUBLIC STARGAZE: Due to budget cuts, Science Museum Skywatch public stargazes have been suspended till further notice.

ROANOKE PARKS DEPT./RVAS PUBLIC STARGAZE: Saturday, August 18th, 8:30 p.m., Cahas Overlook, milepost 139, Blue Ridge Parkway. Free. Call 540-853-2236 to register. (Next month: September 8th, 8:15 p.m., Cahas Overlook.)

FRANKLIN CO. PARKS DEPT./RVAS PUBLIC STARGAZE: The next session is November 10th, 5:45 p.m.

RVAS EXECUTIVE COMMITTEE MEETING: No meeting information is available at this time.

RVAS Annual Picnic: Saturday, September 15 at the Franklin County Recreational Park

**ROANOKE VALLEY ASTRONOMICAL SOCIETY
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ADDRESS CORRECTION REQUESTED