

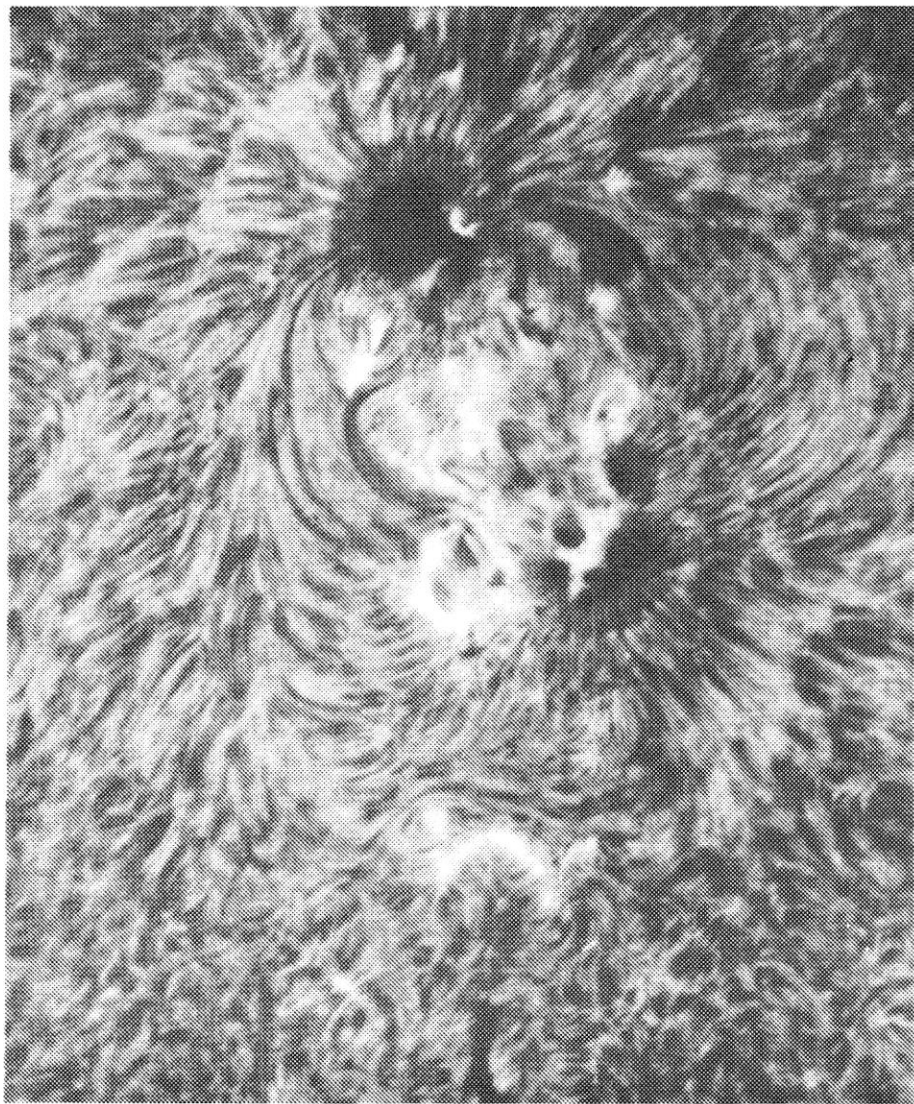
VESPA

Latin, for WASP



No.6

Vol.1



THE JOURNAL OF THE WARREN
ASTRONOMICAL SOCIETY

JUNE 1977



The Warren Astronomical Society (W.A.S.) is a local nonprofit organization of amateur astronomers. Membership is open to all interested persons. Annual dues are as follows: Students, K-12 \$9.00- College \$11.00, Senior Citizen \$13.50, Individual \$16.00, Family \$21.00, the membership fees listed here include a one year subscription to Sky & Telescope Magazine.

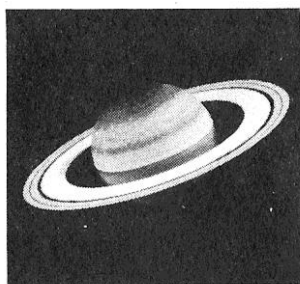
Meetings are held on the first Thursday at Cranbrook, and the third Thursday of each month at Macomb County Comm. College, in the student union bldg.

THE EDITOR: Roger A. Civic 26335 Beaconsfield
Roseville, Michigan 48066 776-8735

Cover: Sunspots, using a Hydrogen Alpha solar filter.

First Annual Astronomical Invitational Star Bowl.

SCORES:	SAS -	KAS -	MSU -	GRAA -	WAS -	DOAA
	200	150	238	220	62	190
FINALS:	SAS	DOAA	MSU			
	135	260	95	DOOAA the Winner!		



The planet Saturn is a good object all this month. Located in Cancer, midway between Pollux and Castor, near the Beehive cluster. This month the 40" ring system is tilted 18° to our line of sight. The ball of the planet is 18" in Dia. Take a look, you will enjoy it.

OBSERVATORY SCHEDULE

Lectures for the coming month are listed below.

June •• 3/4 •••••Kim Dyer •••••835-2037
 June ••10/11 •••John Root •••••464-7908
 June ••17/18 •••Frank McCullough ••••791-8752
 June ••24/25 •••Diane McCullough ••••791-8752

The lecturer may select either the Friday or Saturday depending on the weather and their personal schedule. If the Lecturer wishes, they may call upon the four new assistant lecturers. They are Bob Dennington 779-6345, Dave Locke 335-8429, Doug Holmes 645-1970, and Joe Tocco 573-8547. If you want help, Call.

MINUTES OF THE WARREN ASTRONOMICAL SOCIETY
APRIL 21, 1977

The general meeting was called to order by President, Pete Kwentus at 8 P.m.

Dolores Hill read the minutes of the March 17 meeting. (There was no May issue of the WASP).

John Root proposed increasing the versatility of the telescope at Stargate by mounting a 4" f/15 with a 3X Barlow. After some discussion it was agreed that the matter should be raised when the observatory chairman is present. It was proposed to improve the 'scope's photographic capabilities.

Louis Faix and Pete Kwentus discussed an idea they and Frank McCullough had to sponsor a Regional astrophotography contest with Cranbrook as a possible location.

Dave Dobrzelewski announced a Detroit Astro. Soc. banquet to be held May 7 at Chiaves.

Elections for officers of the WAS are to be held at the May 19 general meeting. Nominations can be made by contacting John Root, Diane McCullough, and Dennis Jozwik or at the general meeting.

Larry Kalinowski announced a class on the Construction of Drive Correctors sponsored by the DAS. It will be held April 22 at Mercy College.

The evening's program included a talk by Peter Fingerelli on his science fair project, "Stellar Magnitudes". Dave Dobrzelewski presented a talk on the History of Cosmology.

After the meeting was adjourned at 10 P.M., Pete Kwentus presented slides of the campout at Stargate and Doug Bock presented slides of the First Annual Astronomical Invitational (Star Bowl) held April 16.

Minutes respectfully submitted,



Dolores H. Hill, Sec'y.
Warren Astronomical Society

Much Adieu About Nothing or What to do to Say Adieu to Dew

BY
RIK HILL

It is spring again. Now bears and amateur astronomers (and ATM's) come out of their months of hibernation to test their skills on the spring and summer skies. They drag out the neglected or brand new equipment, kick off the layer of dust, and make new acquaintance with the long forgotten denizen of those warm spring nights ... dew. For the reflector fan, it's dripping off the secondary- the refractor fanatic finds it as a film on his objective and both find fogged eyepieces. Some know what measures to take, but, too many go indoors and call off their celestial wandering on account of dew.

The easiest problem to cure is fog on the eyepieces. Since thermal inequality means little here all you need do is warm them some. One way to do this is to simply hold it in your fist for a minute or two, since you only have to raise the temperature of the optics above the dew point, it should not take much longer than this. Another way, which is more of a preventative measure than a corrective one, is to carry the eyepieces in your pocket. Of course, not in the same pocket as this would surely decrease their life expectancy. But, since only two or three favorites are in use in an evening, a like amount of empty pockets should be made available. This will keep the eyepieces warm enough to prevent such fogging.


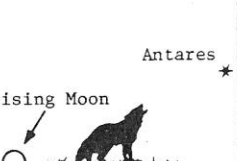
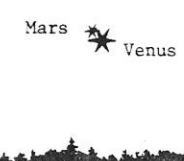


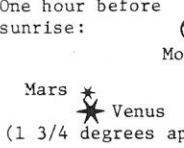




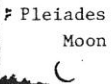

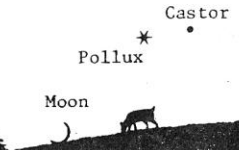
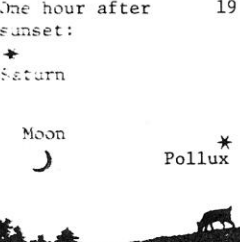


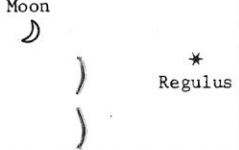
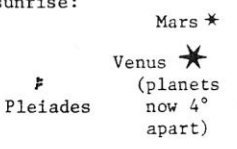
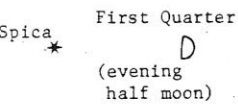
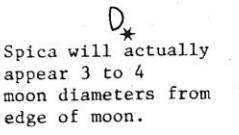
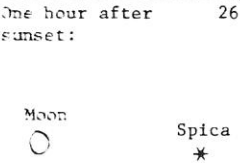

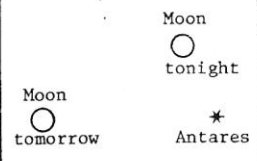
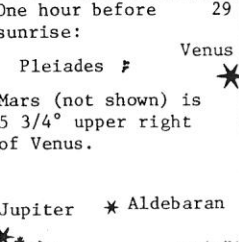

Dewing is caused from the temperature of the glass being lowered below that of the dew point. In the case of the refractor objective we have a large piece of glass surrounded by metal- a form of aluminum or steel normally- which is excellent for conducting too much heat away from the lens. Several things can be done to counteract this effect. The first is to keep that objective clean! Water vapor is coaxed into forming droplets by the presence of dust against the cold glass. All you need do is eliminate the dust, and you limit the problem.

Most refractors come equipped with a tube which extends out from the objective called a "dew cap". Unfortunately, in many cases this is a misnomer. Some of these telescopes come with no dew cap at all. If yours has a dew cap, check to see if it is long enough. It should be about one and one half times the diameter of the objective. It should not exceed two times though, for this

can literally destroy resolution, by setting up currents inside the cap causing the same effect as the atmosphere does on those "twinkle" nights of winter. A dew cap made from a nonmetallic material is preferred. The best cap would be of an absorbent material like cardboard, this would draw moisture away from the inside of the cap. But, if you already have a metal cap, don't despair; it can be lined with such absorbent or non-conductive material, nonmetallic items such as black blotting paper, felt or velvetine (again black) or cork (which now comes in 1/16" and 1/8" self adhesive sheets). Of course there are those who use electronic, battery operated means for warming the objective. These are fine for those who know how to construct such devices, and they work for most purposes. But, if you are like me and on those steady moist spring nights enjoy challenging Dawe's limit, you will find that these will decrease such performances of your objective. They warm all too well and set up slight currents before the objective. All in all a properly constructed dew cap and clean objective will eliminate the problem.

William Herschel was one of the first reflector users to analyze the problem of dewing within such instruments. His profound realization was that the best nights are dew laden and dew will form on the best nights (some close relative of Murphy's or Gumperson's Laws, no doubt). He talks of tubes sweating and dripping more and more as the night goes on. By then, (dread), the secondary fogs on our scopes and our scopes are useless. Once again, there are solutions both preventative and corrective.

In the planning of your telescope you can do several things. One is to use a nonmetallic tube and secondary holder. Cardboard -carpet tubing-is best for reasons like those associated with the refractor. The secondary holder is a bit harder to make nonmetallic, but, if you can isolate the mirror from a metal to glass contact, it will help. The same applies to the main mirror, though it is not as likely to fog or dew over. If you have a tubular secondary holder, a good way to eliminate dew is to install a small flashlight bulb wrapped tightly in aluminum foil (don't short it out!) behind the secondary within the tube. Any appropriate source of power may be run in along a spider arm. This bulb should be activated at the first sign of dewing and

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>Evening Planet: Saturn is brightest object in western sky at dusk, except for Capella which is much farther north and lower. On June 1, Saturn is 17° lower right of Regulus and sets 4 hrs after sun. On June 30, Saturn is 14° lower right of Regulus and sets as twilight ends, 2 hrs after sun. Morning Planets: Venus is most brilliant morning "star". It rises north of east 2 hrs before sun Jun 1 and about 2 1/2 hrs before on Jun 30. Through telescope Venus appears like a half moon at midmonth (see Jun 15). Reddish <i>Mars</i> is close to Venus all month. On June 1-3 the planets are 1.2° apart; by the 18th they are 3° apart, and by the 30th 6° apart. See diagrams for changing configuration of Venus-Mars. <i>Jupiter</i> emerges from sun's glare at month's end. See 6/29.</p>			<p>Full Moon, first of two this month, rises at sunset. One hour after sunset:</p> 	<p>One hour after sunset:</p> 	<p>Arcturus passes due south near end of evening twilight. "Follow the arc (of the Big Dipper's handle) to Arcturus, and drive a spike to Spica". Tonight, moon rises just before twilight ends, so sky doesn't get very dark.</p>	<p>One hour before sunrise: Planets 1 1/4° apart.</p> 
<p>Moon now rises more than 3 hrs after sunset, allowing more than an hour of very dark skies. Look for the two star clusters marked OCl on this month's map, and for Milky Way rising in east.</p>	<p>This month's map represents the sky about 1 1/2 hours after sunset tonight. Take map and flashlight outside, and identify the 9 stars of first magnitude or brighter and the one planet currently visible.</p>	<p>Note these objects in order from the west to the northwest: Regulus, Saturn, Pollux, Castor, and Capella. If you look at the same time, they appear a little lower each night. On what dates will you last see each one?</p>	<p>Last Quarter (morning half moon) is 90° (1/4 circle) west of sun. Moon visible in daytime sky until it sets in west around local midday.</p> 	<p>As the sky gets dark, use the Big Dipper to locate Leo with its bright star Regulus (see map): "If the Big Dipper sprung a leak, loudly would the Lion roar!" He doesn't like to get his back wet!</p>	<p>One hour before sunrise:</p> 	<p>One hour before sunrise:</p> 
<p>One hour before sunrise: Planets 1.9° apart; moon very close.</p>  <p>A spectacular sight!</p>	<p>One hour before sunrise: Planets 2° apart.</p>  	<p>One hour before sunrise:</p>  <p>(2.2° apart)</p> 	<p>Venus at greatest elongation, 46° west (upper right) of sun in morning sky. Venus remains visible in eastern morning sky until December, and will pass far side of sun (superior conjunction) in January 1978.</p>	<p>New Moon, not visible. Moon passes nearly between earth and sun. Beginning Saturday, moon will be visible in evening sky. Watch it pass bright zodiacal stars Pollux, Regulus, Spica, Antares.</p> 	<p>Altair now rises at about sunset. As sky darkens, use this month's map to locate Vega, Deneb, and Altair in eastern sky. They form the Summer Triangle, so named because it is visible all night in early summer.</p>	<p>One hour after sunset:</p> 
<p>One hour after sunset:</p> 	<p>One hour after sunset:</p> 	<p>Summer Solstice. Sun rises farthest north of east and sets farthest north of west today. Midday sun is highest of year. Today is longest day of year. Sun's path through sky gets lower next 6 months.</p> 	<p>One hour after sunset:</p> 	<p>One hour before sunrise:</p> 	<p>One hour after sunset:</p> 	<p>One hour after sunset: Keep in mind that moon appears too large on these diagrams.</p>  <p>Spica will actually appear 3 to 4 moon diameters from edge of moon.</p>
<p>One hour after sunset:</p> 	<p>One hour after sunset:</p> 	<p>One hour after sunset:</p> 	<p>One hour before sunrise:</p> 	<p>Full Moon rises in SE about 1/2 hour before sun sets in NW. Moon in Sagittarius, halfway around zodiac from sun's place. Bright moon makes Sagittarius hard to see. Wait a few days.</p> 	<p>Next month's map, <i>July Evening Skies</i>, can be used during June at the following times: Mid-June, 3 hrs after sunset; End of June, 2 hrs after sunset.</p>	<p>Summer and autumn 1977 will be poor seasons for evening planet visibility. Saturn is gone by mid-July; Mercury can be seen with difficulty late that month. Then, no naked-eye planets will appear within 3 hrs of sunset until November.</p>

[illegible]

East Lansing Sunrise: June 1 6:02 a.m.; June 16 5:59 a.m.; June 30 6:03 a.m. EDT
Sunset : June 1 9:10 p.m.; June 16 9:18 p.m.; June 30 9:20 p.m. EDT

turned off as soon as the dew is removed. If left on too long image deterioration will result from the excess heat.

In planning a refractor plan a dew cap. That's right, a dew cap or extension of the tube beyond the secondary. It is not only effective against dewing, but, also stray light and observer currents. For example, I have a factory bought 6" f/8 reflector which came in a fiber tube which extended only 4" beyond the secondary. I remounted it in a cardboard tube which extended 15" beyond the secondary or 2~ X the mirror diameter. The result was an immediate improvement in images and no more dewing! This was dramatized when at a star party consisting of 1 refractor; 2 6" f/8 Newtonians; and 2 Schmidt-Cassegrains, my 6" f/8 was the only scope that did not fog or dew over.

Another thing about that scope was the closed bottom or mirror cell. At my location I had trouble with the main mirror fogging occasionally. It does take longer to acclimate the optics, but, they remain clear and stable much better than they did before. Also, a small package of desiccant near the main mirror will ensure that dewing will not occur. I would not recommend any form of heat be applied to the main mirror. Whereas a refractor's objective will experience a certain small amount of performance decrease with the application of heat, a reflector's mirror will experience roughly twice the deterioration due to the simple fact that it is reflected light we are dealing with which affects our final wave front error twice as much as that of a refractor's.

Finally, a note to the owners of the catadioptric designs. Corrector plates are subject to dew quicker than any scope due to the thinness of these plates or shells. A dew cap with a cork or felt lining will usually solve the problem. Once, in a moment of desperation, I heated a dust cover and put that on the scope 'till the dew cleared. This worked for about ½ hour, but, then had to be repeated. Secondary's attached to correctors can cause a thermal problem, but, this can be solved by affixing a piece of cork or felt of the same diameter to the outside of the corrector or on the back of the secondary holder assembly.

So, now you have no excuse I'll bid you fair skies, good observing, and a fond a-dew!

The strange rings of Uranus

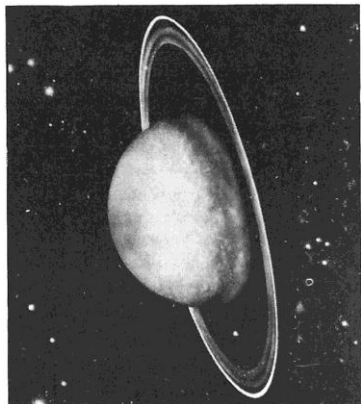
The recent discovery of apparent rings around the planet Uranus (SN: /19/77, p. 180) has grown more interesting still, with the possibility that there may be more rings than originally inferred and that the largest ring may be strangely irregular in shape.

The March 10 observations were in the form of a series of "dips" in the measured light from a star (SAO 158687) shortly before and after it was blocked out by Uranus itself. The blockage, called an occultation, was recorded by James Elliot of Cornell University, flying over the Indian Ocean aboard a NASA airborne observatory, as well as Robert Millis of Lowell Observatory, working at Perth Observatory in Australia, and other astronomers in India, Japan and South Africa.

Elliot's original speculation was that the inbound and outbound "mini-occultations" represented a number of individual objects, or moons, with diameters as large as 100 kilometers. Study and comparison of the observations, however, showed that the spacing and duration of the inbound mini-occultations was almost identical to those recorded after the planet had passed from in front of the star. It is extremely unlikely that individual moons would be spaced so regularly, so it is now felt that the starlight was blocked by the two sides of a series of rings. The light was not completely shut off—only reduced by about 50 to 90 percent—and Elliot concludes that the individual ring particles are probably smaller than 2 kilometers across.

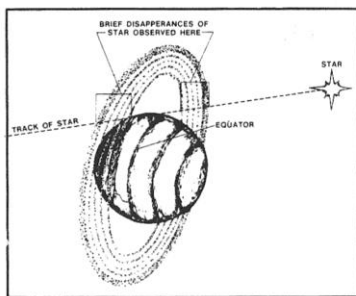
There seem to be five principal rings, which Elliot has labeled (beginning with the innermost one) alpha, beta, gamma, delta and epsilon, together occupying a band about 7,000 kilometers wide. Each of the four inner rings appears to be perhaps 10 kilometers wide, while the outer ring may be as wide as 100 kilometers. The outer ring may also be either thicker or more dense, since it occulted about 90 percent of the light from the star, compared with about 50 percent for each of the others.

Further study has now made the strange structures (far narrower than the rings of Saturn, the largest of which is more than 25,000 km. wide) seem even stranger.



Painting: R. Sternbach/NASA

Uranus with possible rings, showing their steep inclination to the ecliptic plane.



Occultation track as seen from earth.

Millis's data from Perth, although they missed the alpha and delta rings while the telescope was being re-centered (only the inbound occultations were visible from Perth), show two additional partial occultations *inside* the alpha ring. This could be evidence of two more rings, with the "shallowness" of the occultations possibly indicating that these rings are narrower or less dense than the others.

Still more perplexing is the matter of the wide outermost, or epsilon, ring. The inbound occultation, says Elliot, lasted about 7 to 8 seconds. The outbound occultation of presumably the same ring, however, lasted only 3 seconds. This translates to mean that the ring's inner edge is about 600 kilometers closer to the planet on the outbound side.



A close galaxy outside our Milky Way is the Large Magellanic Cloud. The color-enhanced ultraviolet light portrait above, taken by Apollo 16 astronauts on the moon, reveals only very hot stars and their spiral-like distribution. Blue represents black sky; red designates faint nebulae and stars; the other colors which vary in degree of saturation indicate areas in the Large Magellanic Cloud that appear "bright" to ultraviolet light.

NASA photograph.



Saturn Photo by D. Dobrzelewshi. Taken on Feb. 15, 1977 with Verichrome Pan 620 Film, ASA 125. $\frac{1}{2}$ Sec. expos. 40 mm eyepiece using the 12 $\frac{1}{2}$ " Stargate Cass. and a Kodak Duaflex II camera.

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The L.F.K. Astrophotographic Guide. Special price to club members--- \$1.00 Contact Larry Kalinowski.

DO IT YOURSELF, DRIVE CORRECTOR. DC or AC operation. Build it with my circuit board. Instructions and parts list included, \$ 5.00. See Jan. S&T'75 pg. 50 for more details. Larry Kalinowski, 776-9720.

Wanted: A new or used 8" mirror blank or tool to be used as a tool- to grind my mirror with. Call Chris Edsill at 774-0007 with offer.

10" f.7 Newtonian telescope. Factory mirror, yoke equatorial mount, portable, 70 power eyepiece. \$300, also a 40mm Polaris finder telescope 12X, \$25., 18mm Kellner eyepiece, \$18. All good condition. Call Doug Tracy, 882-4499.