



# THE WASP

THE JOURNAL OF THE WARREN ASTRONOMICAL SOCIETY



The above photograph shows much of the detail visible in a six inch reflector of the area at the western edge of the Mare Nubium. Nights of good seeing will highlight some details more sharply.

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MARCH 1978

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The Warren Astronomical Society  
P.O. Box 474  
East Detroit, Michigan 48021



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; Student- \$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 of each month at Cranbrook, and the third Thursday of each month at Macomb County Comm. College, in the student union building.

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Roseville Michigan, 48066- 776-8735

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Assistant  
to the Editor:

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### **OBSERVATORY SCHEDULE**

Lectures for the coming month are listed below.

Mar. 3/4 ..... Dave Dobrzelewski ..... 778-9715  
Mar. 10/11 ..... Louis Faix ..... 781-3338  
Mar. 17/18 ..... David Harrington ..... 879-9767  
Mar. 24/25 ..... Dennis Joswik ..... 754-2037  
Mar.-April 31/1 ..... Peter Kwentus ..... 771-3283

The lecturer may select either the Friday or Saturday, depending on the Weather and their personal schedule.

In the future, some of our younger members will be assisting the senior lecturer. These members are, Bob Dennington, Dave Locke, Doug Holmes and Joe Tocco.

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## **•buy – sell – trade•**

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WANTED: Used telescopes any size or type. Lou Faix as President has been contacted by many people about such items. Give Lou a call, 781-3338

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For Sale... Telescope assembly ..... 8" f.6 Coulter mirror in Aluminum cell./2.14"(minor axis) elliptical diagonal, mounted in brass & aluminum 4 vane spyder./ 10"dia. aluminum telescope tube, 5011 long. Only \$125.00

- ALSO--- Heavy duty 10" rings for telescope mount. Cost \$42. Now Only \$25.
- PLUS--- 4" O.D.- 24" long, black iron stand is ready to accept 3 legs
- and an Equatorial head (Pacific) Cost\$25. Now Only \$15.
- AND--- A 22½ lb. counter weight for a 1" Dia. shaft. Cost \$23. Now Only \$15.

For more information, call Roger Civic, 776-8735.

The January 19, 1978 meeting of the Warren Astronomical Society was opened at 8:15 p.m. by President Lou Faix who welcomed all members and guests. Our balance in the treasury stands at \$257.47. Dennis Jozwik, Observatory Chairman, announced that the finder on the telescope at Stargate is fixed. He also had the focusing tube repaired. Regrettably, he asked that whoever knew of the whereabouts of the missing clock and radio to please inform him and no questions would be asked. The articles are valued at \$50 to \$60. Members were asked about the advisability of securing a 6 inch F/4 or F/5 mirror for Stargate.

Doug Bock and Mike Newberry were recipients of Messier Certificates. Mr. Faix informed members that a minimum of 70 objects must be sighted in order to qualify for the award. Honors for the Stargate November Messier contest went to Doug Bock, first; and Michael Smith, second.

Sky & Telescope magazine has raised rates by \$2 as of July 1978. Members unanimously approved the action.

Ray Bullock then took the floor to inform members of the availability of the Observer's Handbook for 1978. A lecture series on Space Colonization will be held for five weeks at Cranbrook on Wednesday evenings. The fee will be \$7 for students and \$12 for adults. He also spoke of a field trip to Ontario Science Center to be held in April. More details will follow.

Jim Palowski has donated a Star Atlas to the society and it will be raffled off at the February meeting.

Larry Kalinowski will be heading up a new group in telescope making. About 20 people indicated a desire to join such a class and also their confidence in Larry's unique talents and capabilities. More news will be forthcoming on this most worthy project.

Frank McCullough, program chairman, disclosed that the next Cranbrook meeting will feature eclipse slides and movies. Then, on Thursday February 16, Dennis Jozwik will show professional shots of planets from outer space. Loretta Caulley will give a review of Carl Sagan's book, "Dragons of Eden."

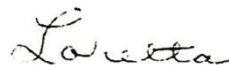
In March, talks on comets at both Cranbrook and Macomb are scheduled. All members are invited to display their cameras, mirrors etc., for an "Amateur's Night."

Pete Kwentus then showed members movies of Eclipse 1977. Pictures of members aboard the cruiser, "Fairsea", were well received.

After intermission, mention was made of a planned cruise in June 1978 to Alaska. The eclipse over Winnipeg, Canada in February of 1979 was discussed by Pete Kwentus. He described the rugged terrain of the province and assured members that he would work out travel arrangements as economically as possible.

Pete then resumed the eclipse cruise film showing. The meeting closed at 10:50 p.m.

Respectfully submitted,



Loretta D. Caulley

Secretary

THE B.A.O. GUIDE TO EFFICIENT OBSERVING  
Part III -Keeping an Observing Record  
-R. Bullock

Now that you are set up outside with your observing list, star charts, camera, et cet., you begin to observe.

Keeping a record of your activity is important, whether you are photographing or just observing for the fun of it. Naked-eye observations should also be recorded.

A record lets you keep track of objects you have observed in the past. I know the very day I first spotted Mercury and where I was when I saw it. The same holds for Uranus. That may mean very little to anyone else, but think how complete my memoirs will be when I publish them (after I become world-famous, of course).

All the great astronomers of the past kept records, there is no reason why amateurs shouldn't do the same.

The staff at the BAO found it most helpful to have a prepared log sheet ready for

recording  
pertinent data; it  
saves much time  
and effort in  
trying to write in  
the subdued light  
of night. (Indeed,  
the BAO staff find  
writing arduous  
enough in broad

OBSERVATIONAL AND PHOTOGRAPHIC LOG SHEET

SITE, _____		DATE, _____		TIME, _____ - _____			
OBJECT	ACTIVITY	FILM	EXP#	f/	SEC.	METHOD	COMMENTS

daylight!) We reproduce here, in reduced size, such a log sheet.

The data should include your observing site, date, time started and finished. 'Object' column refers to what you're looking at. 'Activity' = what you are doing (observing, photographing, drawing, spectroscopic analysis, etc.) The next five columns are for recording photographic data: type of film, exposure number, f/ratio, time of exposure in seconds, and method used (afocal, prime focus, eyepiece projection, etc.). When your film is processed you can check back and see which combination of time and exposure gave the best results. 'Comments' can be anything from remarks about the object ("Wow I Saw Sirius' companion.") to judgment on the weather conditions or the magnification used to resolve both members of a close double.

CONT. →

This type of log sheet is for use out in the field and is not intended to be the permanent record of observations. The permanent record should be organized from the data you have on the field log. (You won't care to make a permanent record of every photograph you took; and no, the 'field log' is not the object you sat on to rest your weary bones.)

The permanent observing record can be loose-leaf paper in a notebook, or 3x5 index cards. Data should include the date, location, times, type of instrument used and weather conditions. Then simply list what you observed. It can be organized as to Messier objects first, then NGC, or doubles; or list them in the order they were observed. Your record will mean more to you if you state: "Jupiter at 250x. Beautiful! Three equatorial bands, red spot faintly visible. Occultation of IO."

Different objects will require different comments of course. Compare the magnitude of the variable you see to another known star's magnitude. What is the position angle you see for the companion of Pollux? How long did it take you to find M-81? Did you find it at all? What time did you see that meteor and in what direction did it fall?

Your observing record can be as sketchy or as detailed as you want it to be, and in the future it will remind you of the proper exposure you used to get that striking photograph of Uranus 4' away from Alpha Librae on April 25, 1978. Most of all it will bring to mind the many hours of enjoyment you had making first hand observations of the splendor of the heavens.

(Let me lay to rest one of the snide remarks circulating about the competence of the staff of the Bullock Astronomical Observatory, the one regarding the first time Bullock saw Mercury and where he was when he saw it. It was NOT in a thermometer in the doctor's office.)

## THE APPRENTICE ASTRONOMER'S NOTEBOOK

Louis J. Faix

Just as summer is the time for observing the star clusters of the Milky Way, spring is the season for scanning the realm of the galaxies. Late winter provides an ideal opportunity to sharpen up our observing skills of the island universes by practicing on the galaxies in Ursa Major and Canes Venatici.

The following list should provide amateur astronomers with an interesting variety of visual rewards for an evening of celestial searching. A telescope of 3" aperture or larger will be required to fully appreciate the structure of these billion star giants, but many can be viewed with a 2" glass. The bright central cores will stand out in all but the brightest urban areas, but a rural dark sky is required to resolve the delicate arm structures of the face on spirals. For those who don't mind an hour's drive, the skies between Almont and St Clair provide nearly optimum contrast.

<u>NGC #</u>	<u>MESSIER #</u>	<u>RA</u>	<u>DEC</u>	<u>MAG</u>	<u>TYPE</u>
3031	81	9 hr 51 m	+69.3°	7.9	Sb
3034	82	9 hr 52 m	+69.9°	8.8	Irregular
5457	101	14 hr 91 m	+54.6°	8.	Sc
4258	-	12 hr 16 m	+47.6°	9.5	Spiral
4736	94	12 hr 49 m	+41.4°	7.9	Sb
5055	63	13 hr 14 m	+42.3°	10.1	Sb
5194/5	51	13 hr 29 m	+47.4°	8.	"Whirlpool"

M81 and M82 are bright galaxies well known to most amateurs. They conveniently fit into the same field of view when a low power eyepiece is used. At a distance of 7,000,000 light years M81s spiral structure is well defined with a fairly sharp outer edge and bright arcs at the ends of the major axis. Tipped at about 45° to the line of sight, the core is well defined and exhibits a granular structure. M82 was originally classed as an irregular galaxy but is now believed to be an exploding spiral seen nearly edge on. The visual impression resembles fat silver cigar with a skewed dark band. Dust patches permeate the northern extension and a massive diagonal lane all but bisects it. This is an extraordinary and easy object for astrophotographers.

M101 is a very large, face on, class Sc spiral. In spite of its 8th magnitude rating, it is really very faint because the light is spread over such a large area. While this giant is over 15,000,000 light years away, it still has a photographic diameter of 22 arc minutes and is best seen at low powers. Like all galaxies of this class, the core is fairly small and has a fluffy appearance which is surrounded by a soft sheen with some brighter nebulous patches. Really dark skies are required to appreciate this beauty.

Although nearly the same distance away as MIDI, the Sb galaxy M94 is only 7' x 3' in size. The image is dominated by a brilliant central core. By comparison, the tightly wound arms are quite faint.

NGC 4258 in Canes Venatici is a large, bright, pearl shaped spiral. A bright nucleus is surrounded by an arm structure mottled by numerous dark condensations.

Another Sb galaxy is M63. Somewhat larger (10' x 3') than M94, this galaxy is impressive in small telescopes. It has an odd appearance with one end more pointed than the other. The brilliance of this galaxy varies dramatically in different references for no apparent reason. It is quite faint and southeastern Michigan skies are inadequate to resolve the delicate arm structure.

The last and most magnificent galaxy on this month's list is M51, better known as the Whirlpool. It is really a double system composed of an 11' x 7' face on Sc spiral and a smaller (3') irregular companion joined by a connecting luminous bridge. In 8, 10 and 12" telescopes at our Stargate observatory, the spiral structure is quite evident. Smaller telescopes and darker skies may do as well. The arm structure can be traced for at least one and a half revolutions. Several bright patches of nebulosity have been seen in the kinked northern arm with the writers 10" Newtonian. A number of faint point light sources, probably stars in our own Milky Way, have been seen amongst the arms opposite the companion. This is an excellent object for black and white astrophotography.



EYEPIECE IMPRESSION M51

# SKY CALENDAR FEBRUARY 1978

Information for helping teachers and students observe the sky

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>Evening Planets: The brightest "star" visible as the sky darkens is Jupiter. High in the SE sky at dusk, Jupiter passes just S of overhead around 9 p.m. Local time Feb 1 and 7 p.m. on Feb 28. Look for Jupiter north of Orion, about 1/4 of the way from his belt to the North Star. To the east of Jupiter and close to Pollux in Gemini is bright reddish Mars. In its motion across the night sky, Mars follows Jupiter by 2 hours. Saturn is very close to Regulus in Leo, and is a full magnitude brighter than that star. On Feb 1 Saturn rises just over an hour after sunset. See Feb 15. A line from Jupiter to Saturn roughly indicates the ecliptic. Mars is midway between them and 4° N of ecliptic. Use star map below for plotting the planets this month and moon Feb 14-22.</p> <p>5 Mars and Pollux are 4° apart tonight. Look at Mars, Pollux and Castor each evening this week. On which night will the three objects appear in a straight line? Find out by observation.</p>	<p>6 Thin waning crescent moon rises in ESE one hour before sunrise. From continental U.S. it is just over 24 hrs before tomorrow's invisible New Moon phase.</p> <p>7 New Moon. Not visible. Two hours after sunset, Saturn is 15° up, 5° N of E. Note Regulus 2° below it. Hold your thumb at arm's length. Does the width of your thumb cover Saturn and Regulus? Try it.</p>	<p>1 Mars and Pollux 5° apart tonight. In two nights they will be 4.5° apart, the same distance as Castor is from Pollux. Look for the 3 objects about 25°-35° up in E 1 hr after sunset.</p> <p>8 Thin waxing crescent moon sets tonight as twilight ends. Tonight and next few evenings, look for earthshine on moon's dark side. Watch moon set farther N each night as it enters the part of its orbit over earth's N hemisphere.</p>	<p>2 One hour before sunrise: Moon</p> <p>9 Mars (magnitude -0.8), Pollux (mag +1.1), and Castor (+1.6) appear in a straight line tonight. Pollux, between the other two objects, is 4.5° from Castor and 3.2° from Mars.</p>	<p>3 One hour before sunrise: Moon</p> <p>10 Mars is 3° from Pollux tonight. Compare their separation to the length of Orion's belt, 2 3/4 degrees.</p>	<p>4 Venus, now only 3° from the sun, is lost in its glare and sets within 15 min of sunset. At month's end, Venus will be 9° upper left of the setting sun and will set 40 min after sundown. On what date will you first see Venus?</p>	<p>11 Saturn is the 3rd planet to come to opposition this winter. All 3 planets will remain visible in the evening sky for several months. Jupiter will disappear into western evening twilight in June, Saturn in July, &amp; Mars in Sept. or Oct.</p>
<p>On Feb 15, the three bright evening planets will each be located 2.6° from a nearby star. An angular separation of 2.6° is about half the distance between the Pointer stars in the bowl of the Big Dipper. (Those two stars, 5.4° apart, are used to locate the North Star.) The three pairs of objects separated by 2.6° are: Saturn-Regulus, Mars-Pollux, and Jupiter-Zeta Tauri (the tip of the Bull's southern horn). See this month's star map, where planet positions are plotted for February 15.</p>	<p>14 One hour after sunset: Pleiades</p> <p>Moon tomorrow</p> <p>Aldebaran</p> <p>Moon at First Quarter tonight</p>	<p>15 Saturn at opposition—rises at around sunset and is visible all night. Earth passes between Saturn and sun. Watch moon's southern edge pass just N of Aldebaran tonight. In the Arctic, the moon will occult the star.</p>	<p>16 One hour after sunset: Jupiter</p> <p>Moon tonight</p> <p>Moon tomorrow</p> <p>Betelgeuse</p>	<p>17 Mars 2.6° south of Pollux. Tonight, Mars appears closer to this star than it will be again during the rest of the 20th Century. Which is similar to Mars in color, Pollux or Castor?</p>	<p>18 One hour after sunset: Castor</p> <p>Pollux</p> <p>Mars</p> <p>Moon</p> <p>Procyon</p>	<p>25 Look for moon in daytime each morn until March 7. Tonight moon rises 3 hrs after sunset. Why does moon rise farther south each night? Moon is in Virgo, entering the part of its orbit below the earth's equator.</p>
<p>19 Use binoculars to see 6th mag Uranus 1.6° ESE (lower left) of Alpha Librae. This 3rd magnitude star passes due south about 2 hours before sunrise. Now beginning retrograde, Uranus will pass 4° N of Alpha Apr 26.</p>	<p>20 Jupiter, 2 months past opposition, now resumes direct (eastward) motion against the stars. In 7 weeks it will go from Taurus into Gemini, and by May 31 it will be 13° east of tonight's position. Saturn-Regulus 3° apart.</p>	<p>21 One hour after sunset: Saturn</p> <p>Regulus</p> <p>Full Moon tomorrow</p>	<p>22 Full Moon. Select a place with unobstructed horizon 13° S of W and 10° N of E. Watch moon rise very nearly same time as sun sets. Moon in opposition. See Feb 15 and 23.</p>	<p>23 This morning, watch moon set very nearly same time as sun rises. Tonight moon rises 5° N of E about 1 hr after sunset. Watch moonrise point shift farther south each night.</p>	<p>24 Moon rises due east tonight, about 2 hours after sunset. Moon sets tomorrow more than one hour after sunrise and sets later each morning.</p>	<p>26 One hour before sunrise: Spica</p> <p>Moon</p>
<p>26 One hour before sunrise: Spica</p>	<p>27 One hour before sunrise: Moon</p>	<p>28 2 hrs before sunrise: Using binoculars, find 3rd mag Alpha Librae 2° below moon. Note this star is midway between Spica and Antares. Alpha will be useful for locating Uranus next 7 months. See Feb 19. Mars-Pollux 3° apart.</p>	<p>Regulus</p> <p>ECLIPHTIC</p> <p>Use this map of the zodiac for plotting as described in box before Feb 1.</p>	<p>Castor</p> <p>Pollux</p>	<p>25 Look for moon in daytime each morn until March 7. Tonight moon rises 3 hrs after sunset. Why does moon rise farther south each night? Moon is in Virgo, entering the part of its orbit below the earth's equator.</p>	<p>26 One hour before sunrise: Spica</p> <p>Moon</p>

Magnitudes of the Planets: Venus -3.4 (but sets in bright twilight; see Feb 4); Jupiter -2.2 to -2.0; Mars -1.0 to -0.2; Saturn +0.3. Motions against star background during February: Mars retrogrades (moves west) 5.5°, crossing from Cancer into Gemini Feb 3. See Feb 1, 5, 10, 12-13, 28. Saturn retrogrades 2.2°; this change in position may be noted as Saturn increases its distance from Regulus (1.6° on Feb 1, 3.6° on Feb 28). Jupiter retrogrades only 0.6° Feb 1-19, moving to within 2.6° NE of Zeta Tauri. For detailed maps of apparent paths of these 3 planets, see *Celestial Calendar* in Sept and Oct '77 Issues of *Sky and Telescope*.



# SKY CALENDAR MARCH 1978

Information for helping teachers and students observe the sky

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<b>5 PLANETS IN EVENING SKY:</b> Best dates March 9-31. This is last chance to see all five naked-eye planets at once until late May and early June 1980, when they'll all again appear in eve. Venus 3.4°; Jupiter 3.4°; Saturn 0.2°; Mars 0.2°; Mercury 0.2°.	<b>Where to look:</b> Venus sets in west 3/4 hr after sun Mar 1, increasing to 1 1/4 hr after by Mar 31. Although it is brightest planet, Venus doesn't appear so now because it is in bright twilight. Mercury is visible most of March close to Venus. See boxes Mar 7-31 for details. Locations in mid-twilight (45 min after sunset): <i>Jupiter</i> , very bright, high in SSE to SW, 16° N of Betelgeuse; <i>Mars</i> , high in ESE to SSE, 3.0° to 5.6° from Pollux; <i>Saturn</i> 25° up in E on Mar 1 to 55° up in SE on Mar 31; near Regulus.	25 min after sunset: Try to find Mercury 2.8° lower right of Venus. Use binoculars and look 5° S of due west. You will need an unobstructed view to see Mercury, very close to horizon. It gets higher each evening.	One hour before sunset:  Antares	One hour before sunset:  Moon at last quarter	At sunset: Venus is 8° above horizon and 4° to left of sun. About 20 minutes later Venus should be easily visible to the unaided eye. Beginning next week use Venus as a guide to Mercury.	Venus will be a prominent "evening star" this spring and summer. It will pass Jupiter in May, Saturn in July, and Mars in August. Sky Calendar will feature these events.
Mercury higher 12 and easier to see this week as it increases angular distance from sun. Tonight Mercury 1.4° upper right of Venus, 40 min after sunset.	40 min after sunset: 13 Mercury 1.9° upper right of Venus. Can you locate all five naked-eye planets?	One hour after sunset: 14  Moon tomorrow  Aldebaran  Pleiades	14 min after sunset: Mercury 2.9° upper right of Venus. Face west.	One hour after sunset: 16  Moon  Jupiter	One hour after sunset: 17  Venus  Mercury  Castor  Pollux  Mars  Moon tonight  Procyon	One hour after sunset: 18  Venus  Mercury  Mars
45 min after sunset: Mercury 4.5° upper right of Venus. Watch Mercury get lower, fainter this week.	One hour after sunset: 19  Saturn  Regulus	One hour after sunset: 20  Saturn  Moon	One hour after sunset: 21  Saturn  Regulus  Moon	One hour after sunset: 22  Saturn  Regulus	One hour after sunset: 23  Saturn  Regulus	Two hours after sunset: 25  Moon  Spica
45 min after sunset: Mercury 4.5° upper right of Venus. Watch Mercury get lower, fainter this week.	2 hrs before sunrise: Note 3rd magnitude star 4° lower left of moon. It is Zubenelgenubi or Alpha Librae. It has a 5th-magnitude companion 4' (4.0° apart tonight)	Why is Mercury fading and getting lower? It is starting swing between earth and sun, and less of it is seen, and less of it is seen (4.0° apart tonight)	One hour before sunrise:  Moon this morning	Mercury has now faded to first magnitude. Still easy to see, it is 3.9° from Venus. 45 min after sunset:	Last quarter (Morning half moon). 45 min after sunset: Mercury 4.2° from Venus.	On the evening of March 31st Mercury is of magnitude 1.2 and is fading 0.2 magnitude per day. On what date will you last see this planet? Inferior conjunction will occur April 11.

Sunrise/Sunset East Lansing: Mar 1 7:14 a.m./6:27 p.m.; Mar 16 6:49 a.m./6:45 p.m.; Mar 31 6:22 a.m./7:03 p.m. EST.