THE ORION NEBULA
The creation of new suns, observable in real time, as seen in one of nature's most splendid stellar nurseries.

Drawing by Dave Dobrzelowski
The W.A.S.P. is the official publication of the Warren Astronomical Society and is available free to all club members. Requests by other clubs to receive the W.A.S.P. and all other correspondence should be made to the editor at the above address. Articles should be submitted at least one week prior to the general meeting.

W.A.S.

Warren Astronomical Society
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2nd V.P.: Dave Dobrzelewski 979-3273
Treasurer: Nancy Tomczyk
Secretary: Connie Shannon 885-4283

The Warren Astronomical Society is a local, non-profit organization of amateur astronomers. The Society holds meetings on the first and third Thursdays of each month. The two meeting locations are listed below:

1st Thursday - Cranbrook Institute of Science
500 Lone Pine Road
Bloomfield Hills, MI

3rd Thursday – Green Acres School
Cousino at Holmes
Warren, MI 48092
264-2509

Membership is open to those interested in astronomy and its related fields. Dues are as follows and include a year's subscription to *Sky and Telescope*.

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<tr>
<th>Membership Type</th>
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Stargate

Observatory Chairman: Dave Dobrzelewski 979-3273

Stargate Observatory is owned and operated by the Warren Astronomical Society in conjunction with Rotary International. Located on the grounds of Camp Rotary, Stargate features a 12½" club-built Cassegrainian telescope under an aluminum dome. The observatory is open to all club members according to the "Stargate Observatory Code of Conduct."

Lectures are given at Stargate Observatory each weekend. The lecture will be either Friday or Saturday night, depending on the weather and the lecturer's personal schedule. If you cannot lecture on your scheduled weekend, please call the Chairman as early as possible or contact an alternative lecturer. Those wishing to use Stargate must call by 9:00 p.m. on the evening of the observing session. The lecturers for the coming month are:

April 24/25 ........................... Lou Faix 781-3338
May 1/3 .............................. Dave Harrington 897-6765
May 8/9 .............................. Frank McCullough 725-4736
May 15/16 .............................. Jim Yax
May 22/23 .............................. Dave Dobrzelewski 979-3273

Emergency back-up lecturers:

April 24/25: Doug Bock 533-0898
May 8/9: Alan Rothenberg 355-5844

The cover.

The Orion Nebula drawn by Dave Dobrzelewski. More of Dave's excellent drawings appear inside this issue.
The meeting was called to order at 7:45 p.m. by Doug Bock, pinch-hitting for Frank McCullough.

Announcements were made of old and new business. Bob Wilson won the telescope raffled off at the recent photo show.

Doug discussed new observing times at Stargate.

There will be a meeting March 22nd at Dave Harrington's house. Those attending the April shuttle launch should meet to coordinate last minute details.

Election of new officers will take place at the May 21st general meeting.

W.A.S. awards in the field of astronomy will be made at the April 16th business meeting.

Cranbrook meetings will start at 7:30 p.m. instead of 8 p.m.

Spring campout will be May 22-25. D.A.S. and Livonia members are invited to attend.

W.A.S. decals are available at .50¢.

W.A.S. took in $130.00 on raffle tickets at the recent photo show.

Dave Dobrzelewski reported good attendance at Stargate.

Alan Rothenberg reported the tragic accident at the space center.

Doug Bock reported that the regional meeting will be held July 17-19 at Ohio Wesleyan University in Delaware, Ohio.

During the break members posed for a new group photo.

Pete Kwentus was the first speaker of the evening and he gave a talk on "Testing Shutter Speeds." Paul Strong gave a talk on Sir William Herschel’s 200th anniversary of the discovery of Uranus. Paul has put together information, maps, photos, etc., to commemorate this anniversary. Paul's information, etc. was on display during the break. Frank McCullough was the final speaker of the evening and he put on his program "Space Shuttle".

Respectfully submitted,

Connie Shannon
Secretary
Drawings from the sketchbook of Dave Dobrzelwelewski

That one does not need an elaborate astrophotography setup to record first-class images of astronomical objects is beautifully shown by the fine drawings of Dave Dobrzelwelewski. Spanning the range from pure art to exact science, the drawings vividly portray a personal view of the earth and Cosmos in a way no photos could. They tell us as much about Dave as they do about the objects portrayed. Look these drawings over carefully. To me they are what amateur astronomy is all about. The captions on all drawings are Dave's own words. -Bob Wilson
The Summer Triangle and Milky Way rising out of the ENE.

The ringed glory of Saturn, and its inner satellites. June, 1978

An open, moon-washed field with Gemini and Auriga framing Jupiter. April, 1978

Shadow transit of Io on Jupiter with Red Spot. December 4, 1975
New Films - Old Galaxies

Studious readers of “Sky & Tel” could not help but notice the recent rash of articles relating to amateur astrophotography, which have mentioned a new special purpose black and white negative film. In the last six months, Kodak has started commercial marketing of a film they call Technical Pan - 2415. While not the sort of thing you will find at the corner drugstore, it is readily available at some of the better camera shops and most photographic supply houses. It supposedly is a new label on the old SO-115 film, which the Great Yellow Father never chose to market commercially. It has been a long time since I did any B/W astro work and the fear of being left behind in the onward rush of amateur proficiency prompted me to invest in a roll for experimentation.

TP2415 has several meritorious features, but, like most “technical” films, can be a bit temperamental and leaves little room for exposure or processing errors. On the plus side, Kodak claims an extraordinary resolution capability of 320 line pairs per millimeter. The significance of this becomes evident when it is noted that the old B/W workhorse film, Tri X, and the specially made astrophoto films, series 103a and IIIa, only have resolutions of 80 lp/mm. The best color positive slide films suitable for deep space photography only resolve 100 lp/mm. In essence, TP2415 should make your telescope resolve small detail like a telescope with a three to four times longer focal length. In lay terms, bigger enlargements can be made without sacrificing clarity.

Of course the fine grain property is not achieved without compromise. What is given up is the reciprocity function. Unlike the 103a and IIIa series, TP2415 suffers from severe reciprocity failure making it unsuitable for long exposure, deep sky photography unless it is hyper-sensitized.

Depending on your point of view, the film's ultra high contrast (gamma factor to those in the know) is either a great asset or a terrible liability. With standard development processing (D-19 for 4 minutes @ 20°C) the contrast index of 2.9 makes the film unsuitable for most snapshot pictures. I haven't tried it yet, but Kodak says the extreme contrast can be diminished by development with various diluted solutions

Where Pm = minimum absolute pressure in "Hg after pump down.  
B = barometric pressure (use 29.9 "Hg) 
n = number of purge cycles

I failed to follow my own advice in sensitizing some film for tests on galaxies M51 and M65/66, and lived to regret it. I only purged the treatment tank twice leaving nearly 1% residual and misread the table and treated for 40 hours at 40°C. As a
result, the film was under-sensitized and all pictures were underexposed, although useable images were achieved. Exposures were 12 minutes with no filter, 22 minutes with a "Galaxy filter," (more about that in the future), and 24 minutes with a Wratten #25 red filter. The twofold increase in exposure with the deep red filter was woefully inadequate as one might expect. There just isn't much red H-alpha light in a galaxy. The Galaxy Filter images were the best, although in all fairness, it must be said that there was very little light pollution fogging on the unfiltered negatives. Twelve to fifteen minutes has been my fogging limit with sensitized ASA 400 color slide film. Obviously the slower TP2415 could go longer but fogging would develop more rapidly once encountered due to the high gamma factor. Resolution of detail inside the spiral arms of M51 was truly noteworthy. Several tiny field stars were evident and the star clouds of the galaxy were readily distinguished. I have never gotten this kind of detail with other films. The asymmetric arms of M66 were conspicuous as was the inclined form of the spiral M65. NGC 3628 is a tenth magnitude edge on spiral galaxy in the same field with M65/66. Its intense dark dust lanes and central bulge were readily defined. It is hard to imagine how Messier missed seeing this beauty.

In summary, Technical Pan 2415 is a film with much potential for amateur astrophotographers who are willing to make the step to hyper-sensitizing. It is well adapted to deep sky work in moderate light pollution areas. While promising exceptional images, its high contrast characteristic could lead to some critical exposure requirements for lunar and planetary photography.
Twilight Astronomy
by Brad Vincent

While the winter fades away into a rumor known as spring, thoughts turn to shedding the standard warm clothes for more civil attire for observing. During the winter months, when dinner is finished, one usually bundles up to head outside for an enjoyable evening. The skies are black and after 10 minutes or so for dark adaptation, you're on your way. Not so in the spring and summer! We have to sit around and wait for the stupid sun to go down. This is a pain during the work week. It means much shorter observing sessions. The timing is bad since the planets have returned from migration and anxiously await.

Now I'm not proposing that we tell the Big Guy to rearrange the pattern of nature to fit the WAS schedule. But the time of twilight can be made enjoyable. It's a good time to test the old eyesight while the stars slowly appear. For those dedicated soles that use only the telescope and rarely the binoculars, now is the time to use them. Most of us will find the twilight orientation to be different. We are used to the pattern after an hour of darkness. Such is the challenge!

Also, when those bright stars first come out, we find it easier to see the shape of the constellation that the basic star maps carry. Gone are the background stars that can tend to confuse the picture in dark skies. The moon, if out, can be observed in comfort in a light sky. No worry about having to put it off as the last item of the evening due to "eye burn" after dark adaptation (Let me now correct the awful rumor that I scream in pain when I see the full moon through the :scope for the first time).

The other interesting items in twilight are the planets themselves. Venus is better able to identify its crescent shape with its glare cut down. I've come to the point now where I won't observe it at all in a dark sky. Jupiter and Saturn are pleasant to see. Their glare is cut down also and the cloud bands take on a soft (though more difficult to define) hue. More can be seen without the glare.

If observing with a friend, you can make it a contest to pick out specific objects first. I tried this the other week and lost. I need new glasses, over a year late on my next checkup (really, I'm not kidding!). And of course, like I said earlier, the binoculars get more use. And it needn't be astronomical, either. Seeing the setting sun reflect off a jet in the distance is indeed a unique sight. Also, any jet trails in the air provide the opportunity to look for their shadows cast above.

So get out there, you guys. Quit complaining about the daylight savings time and see the heavens in a different light.
The Milk Way

We live on the edge of a great spiral arm. It is one of the three main gaseous arms that make up our galaxy.

The Orion arm, so called because of the prominent constellation of the same name, is the most important one to us-it contains our sun and the rest of our solar system. This arm lies between the other two.

The one arm, Perseus, is furthest from the galactic core, being approximately 12,000 parsecs (1 parsec - 3.26 light years) away. With the remaining arm that is nearest the core, Sagittarius is only 7,500 parsecs distant, Although the galaxy does have a few more spiral arms, they are fainter and less obvious.

As we come to the central bulge of the galaxy there are 3 types of objects that are quite common here and have been known to exist for at least the last couple of decades.

Planetary nebulae are the first ones followed by globular clusters and then the RR Lyrae variables. These last objects are old stars that change in brightness going from maximum brilliance to minimum brightness in a period of about a day.

Taking into consideration that the first 2 objects mentioned are also very old. Further observation of this area show other stars that are of similar age so that it can be said that the stars in the central bulge are mainly population II. Population II stars being described as very old stars that have existed since the Universe began or very near this time. They also do not contain any elements heavier than hydrogen or helium.

The central bulge itself is made up of generally dense clusters of very old stars with a thin mixture of gas and dust. Moving towards the center once again, we come across rings and discs of hydrogen gas. Further in we find that the stars are becoming a thousand times more numerous than they are around our sun, at a distance of 33 light years this number becomes 60,000 times greater.

As we approach closer to our goal, intense x-ray radiation is encountered along with very strong infrared radiation. Continuing onward we detect several million stars that closely pack the central region of the galaxy. These stars along with compact clouds of ionized gas spin around the galaxy at a relatively fast rate of once in 10,000 years, as compared to our sun with a rate of once in 230 million years. This rapid rate for the central region would seem to imply that there is an extremely massive object at the very core of the galaxy.

We stop short of the core for there is an intensely brilliant source of light a 100,000 times brighter than our sun. Although dust and gas also obscures the core from radio waves detected coming from it, the diameter of this object approaches 10 astronomical units (1 astronomical unit = 93 million miles).

What finally lies at the very core of the Milky Way Galaxy? One concept is that it is a massive black hole of which the compacted stellar matter at the core spirals into and as a result gives off tremendous amount of radiation. However, this is not the only conjecture of what lies at the galactic core, several other theories have been advanced on this and can be found in most well written books on galaxies.