Imagination is more important than knowledge

—Albert Einstein
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.

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 - Macomb County Community College
K Building
14800 Twelve Mile Rd.
Warren, MI

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.

<table>
<thead>
<tr>
<th>Category</th>
<th>Dues</th>
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<tr>
<td>Student</td>
<td>$12.00</td>
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<td>Senior Citizen</td>
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</tr>
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</table>

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:

January 23/24 ...................... Jim Yax
January 30/31 ...................... Dave Dobrzelewski 979-3273
February 6/7 ....................... Marty Kunz .......... 477-0546
February 13/14 ..................... Ray Bullock .......... 879-9458
February 20/21 ..................... John Root .......... 646-7908

Emergency back-up lecturers:
Doug Bock 533-0898
Dennis Jozwik 754-2037
Don Misson 727-9083

The setting sun backlights one of his 8” reflectors in this beautiful photo by Doug Bock.
LETTER FROM THE EDITOR

During the three years that I have been a WAS member, the WASP has always been fun to look at, entertaining, educational, and even sometimes inspirational to read. I hope to maintain the high standards set by the many editors who have preceded me.

Everyone has their own approach to astronomy. I enjoy the "wonder-of-it-all" aspects of astronomy. To me, it is adventure and romance of the highest order (not to mention being fun). I think "hobby" is much too small a word to describe my interest in astronomy. The covers and some of the contents of the WASP will no doubt reflect this attitude. I hope you’ll like what you see.

On the cover I would like to use club-member astro (or terrestrial) photos exclusively. (I will use my own if I have to.) Please don’t be shy about giving me a new or old photo you've always liked. They don’t have to be great. I think we'd all rather see an effort by a fellow member than something taken by a pro at some huge observatory. (The submitted photos must be prints, B&W or color, any size. If you have a slide, spend a couple bucks and get a print made.)

Articles, drawings, cartoons, puzzles, news bits and gossip on any aspect of astronomy are welcome. Write about your telescope, or the time you went to a famous museum or observatory, or all the astrophotos you’ve messed up, or the religious experience you had looking at M-31, or an account of a night’s observing (Lou Faix wrote a nice one a while back), or why you love astronomy, or the occultation you saw (or missed), or the variable stars you’re following, or the object you can never find, or your review of an accessory you just bought, or a book review, or ANYTHING. Your article does not have to be a contribution to science, though technical papers are always welcome.

Get the idea? Write something short or long, funny or serious, but please write something.

We’ll print whatever you submit, misspellings and all. Unedited and unchanged,

I look forward to your next WASP article.

Bob Wilson
4429 Holmes
Warren, Michigan 48092
SPACE SHUTTLE UPDATE

Submitted by Frank McCullough

On January 21st, the excitement of seeing a launch again was becoming so intense, I was forced to run to a phone and start calling, hopefully to receive nothing but positive information about acquiring passes to the launch and also to find out that NASA had things so together at the Cape, that they could give me a definite launch date, which they had rumored to lift off on March 14th.

Well, my friends there will be a launch. I think we've all known that for two or three years. Slowly, but surely, they are zeroing it down from what Decade they will launch, to one to three years they will launch, to-what year they will launch. Now! They are so bold as to pick a month and even a day they will launch, being the 14th day in March.

Don't hold your breath on the day and maybe not even the month!! I called Kennedy Space Center in Florida and found out what some of us already knew, that there would be a launch on March 12th, two days before the Shuttle lift. What a weekend!!!

The good news is there will be a launch on March 12th. A rocket is to lift off, carrying a weather satellite into orbit in the early evening on that Thursday.

The bad news comes in two parts. There will be no lift off of the shuttle before the 17th of March. The lady at the Space Center informed me all information she has received about the Shuttle is vague and uncertain.

It could be April! Maybe?!? Now for part two of the bad news!

My first call went out to NASA Headquarters in Washington D.C. In the past a letter or even a phone call to obtain a parking pass in the NASA facilities was almost a sure thing. Upon talking to the secretary, she informed me there is a great demand for tickets. People have been requesting tickets since 1977, which makes sense. The shocking remark is that NASA, due to its financial cutbacks, has only allocated 850 lots (facilities for the public see the launch). In the past at least a couple thousand people have hoarded into the facilities. Not to be denied, I requested to go to a higher source. She instructed me I was as high as I was going to get. As I choked on my tears and started convulsing at the phone, I believe she took pity on me. She told me to write a letter addressed to NASA Headquarters, in care of herself and she would do everything in her power to get them to cough up a couple of tickets or passes for the cars. She proceeded to inform me of the August launch and that she felt they would issue far more passes on the second liftoff. I said thank you and we hung up.


Keep the Faith, it'll be clear on eclipse day!!!

The Eternal Optimist
The pages of this publication have, from time to time, contained reviews of contemporary books about astronomy. With only a slight revision on that theme, I should like to comment on another book with which I am now engaged. The book was received as a Christmas gift. It is titled "Astronomy for Everybody" and was authored by, none less than, Simon Newcomb. LLD, Professor U.S. Navy, retired.

It could be suggested that I have gotten a little behind in my reading, but I have never claimed to be able to keep up with today's rush of new data. The book was published in 1902. In light of today's knowledge, it is with fascination that we can review the status of the astronomy of eighty years ago. Being a shutterbug myself, I immediately turned to Chapter Three, which discussed Astronomical Photography. To my amazement, the entire status of astronomical photography was reviewed in two pages, 1-2! The first reference was to Professor John William Draper of New York who made a daguerreotype plate of the moon. A little reference research revealed an amazing fact! Neither the father, nor his better known son, Henry, did any of the work for the famous "Henry Draper Catalogue" of stellar spectra and classifications. The chapter concludes with an interesting speculation:

“So rapid has been the progress during the last few years that the greater part of the astronomical work of the future seems likely to be done by photography.”

Turning to the chapters on the Sun, it is interesting to note that the source of the Sun's energy was believed to be the continuation of gravitational collapse. Einstein's theories on the transmutability of energy and matter (E = Mc²) and the fusion of atoms were still many years away. Based on the gravitational hypothesis, it was calculated that our star could not be more than a few tens of millions of years old and was already in its later life stages. The present state of science can date Earth rocks back three billion years with argon/thorium techniques. Darwin's work on evolution leads us to the knowledge that dinosaurs died out 125 million years ago. It is difficult to appreciate how the best minds of the early twentieth century could have been so far off on the age of the Sun.

The section on Mars is resplendent with hits and misses. The presence of an extremely thin, non-aqueous atmosphere was well known. While the polar ice caps were thought to be quite thin (wrong), the structure was properly surmised to be water, snow and "carbonic" compounds. The diameters and masses of Deimos and Phobos had already been calculated to fairly high levels of accuracy. A most interesting discourse on the canals of Mars, points out the lack of agreement in the arrangement of those vague and mysterious markings. Between the lines, the author's skepticism of Percival Lowell's highly detailed maps creeps out. Nevertheless, the existence of the canals was a foregone and accepted fact; only their nature and structure was still in doubt. Without supporting logic, the author tacitly implies these must be vegetation markings.
The book never really comes close to cosmology at all. The nearest approach can be found in section II of the Appendix in some brief comments found under the heading, "Aspect of the Sky" (whatever that means?).

"Not only to the ordinary beholder, but to the learned student of the heavens, the most wonderful feature of the sky is the Milky Way. This is a girdle apparently spanning the sky and perhaps, in reality, spanning the entire universe of stars, uniting them, as it were, into a single system - one 'stupendous whole'.”

Nowhere in the book is the term galaxy to be found. Another two decades would elapse before Vestro Melvin Slipher and Edwin Hubble would combine their talents and tell the world of the true nature of spiral nebula. At that moment, the universe known to Simon Newcomb shriveled into a tiny segment of a much, much larger reality. The uniqueness of our Milky Way would be lost as a faceless member in an uncountable mass of island universes.

So what good does it do to read old books? How can we benefit today from the yellowed and musty pages of a century ago? The science and times of Simon Newcomb look so dull and riddled with error; what lesson can the modern intellect extract? A very simple, but a very important lesson, the lesson of keeping an open mind and never believing 100% in what you think is known to be true. A century from now the solutions to our great unsolved riddles will be common knowledge. Quasars will be explained, the missing neutrinos will be found, quarks will be all counted and the critical mass of the universe will be weighed. No matter how clear and rational some of our current beliefs may seem, they will be shattered on the anvil of continuing scientific investigation. Just as much of the thought and effort of Newcomb’s time proved to be little but fruitless fancy, so to future generations will have to unlearn some of the scientific error our age is creating. The most useful tool of science is not a bigger telescope or a more powerful cyclotron it is an open, searching mind.
A PEEK at the PEAK
from the Nightside Observatory (RIK & DELORES HILL)

I have been using the Kitt Peak blink comparator on some fields I have been monitoring for new variables. So far I have no results but then it has only been two or three months. The original intent of the program was to detect novae, but unless one can immediately blink the plates there is little value in such a program. Probably the best method for detecting novae is visually in fields well known to the searcher. This enables rapid identification. That is extremely important in that the astronomers want very much to catch more novae on the rise.

Now that I have been at Kitt Peak for a year now I have had a lot of opportunity to talk to professional astronomers about the amateur astronomer and the relationship of the two. There seems to be quite a dichotomy on this issue. There is one group that says the amateur is incapable of good data, gathering and that anything they do is worthless. Fortunately these types are in the distinct minority. The majority feel that the major amateur observing organizations, AAVSO and ALPO, are providing an indispensable service to the science. They find the data to be, for the most part, reliable and solid. So, VSOers and LPOers, keep observing! The system really works and works well. I have seen all sorts of data being used, dwarf novae, long period variables, Cepheids, nebular variables, and have heard many astronomers say that in many cases the histories of these objects are only maintained by the amateur. Recently, a planetary astronomer told me that in light of the demise of the U.S. space program and NASA the history of the weather on other planets is now completely left to the amateur. If the amateur astronomer does not monitor the planets it will simply be left undone as a void in their observational history. The same is true for the variable stars.

I am sure that most of you have heard that Dolores, myself and David Levy have been chosen to host the 1981 Spring meeting of the AAVSO. It will be a celebration in honor of the 70th year of the Association’s existence. We have quite a meeting planned so far. The hotel to be used is the Plaza International, right next to the campus of Univ. of Ariz., AURA headquarters, Kitt Peak Hqtrs, and the Planetarium. We will have three days for tours and there will be three all day tours to take. One tour to Kitt Peak Nat’l Observatory, another to Mt. Hopkins and the MMT, and a third to and through the downtown facilities like the Optical Sciences Center, the Lunar and Planetary Labs, Kitt Peak’s Downtown facilities, and the Flandrau Planetarium. The meeting will begin on a Wed. morning 22 Apr. 1981. Wed., Thur., and Fri. will be for the tours. On Tue., evening we will have an informal dinner (Dutch) for early arrivals. Wed. evening we will have a poolside social hour with a cash bar. Thur., Janet Mattei has scheduled the Council Meeting with informal speakers that evening. Dr. Kathy Imhoff will speak to us about T Tauri and other nebular nascent stars and she will be followed by Dr. James Leibert, winner of the 1980 Trumpler Prize for his thesis on “Spectrophotometric Investigations of White Dwarf Stars”, who will be speaking to us about the work he has been doing on dwarf novae and the data he has gotten from the AAVSO. Both of these People have been making extensive use of AAVSOers’ observations. On Fri. evening, there will be an observing session at David Levy’s. He now has some 60 telescopes so I think there will be enough to go around! Sat. is the scientific paper session and banquet. At this time it looks as though we will have Bart Bok as speaker. We hope to have a farewell breakfast on Sun. morning to wrap up the meeting. All in all a full four days!
The BEGINNING experiences of a NOVICE

Since my astronomical observations must, at present, be made without the benefit of a shelter or observatory, I find myself with some inconveniences.

First, I find the clear nights to be very cold this winter, especially if there is a brisk wind blowing. On several occasions, after getting my new Celestron C8 all set up, I decided it was much too cold for me. This prompted me to program my HP 97 Hewlett-Packard programmable calculator to provide me with the “chill factor” temperature. If this temperature is much below the zero mark, I stay inside and content myself by writing programs, reading or watching TV. How sweet it is!

**Operation of Prgm. to determine Wind Chill Temperature**

Wind Speed (Kts) 15 *  ➔
Temperature (°F) 21  ➔ -3.3 °F (Chill Factor Temperature)

X ≈ Y ➔ -19.6°C (  "    "    )

(The Program for this calculation follows my write-up.)

Second, it would be inconvenient for me to use a sidereal clock at the end of my 100' extension cord without a table or shelf or a permanent 110 volt 60 cycle connection. My solution here was to develop a program for my HP 97 which will automatically run off a tape providing GMT and LST for predetermined intervals. For times in between these calculated, I can interpolate. Of course, I could also set my Casio Timer to sidereal time and add a correction factor. It looks like a correction of ten seconds per hour (or one second per six minutes) would be the proper correction, at least for this part of the year.

**Operation of the Sidereal Time Program**

Constant for the year (1981) 17.361678 A ➔ Additional Consts.
Longitude for Obs. site 82°55'12" W (if west, CHS) 1982 17.377582
Enter as 82.5512 CHS R/S ➔ 1983 17.393506
Number of Days from 0 Jan. 36 B ➔ 1984 17.409421
Desired time intervals 15sec
(Enter as) 0.15  ➔ 1985 17.359625
f C ➔ 1986 17.375540
Initial time, 8 PM + 5 + 12 or 25hrs
(Enter as) 25.0000 C ➔ 25.0000

(The LST Prgm. is based on the mathematical step by step calculations shown in Aubrey Jones' “Mathematical Astronomy With a Pocket Calculator”. The Chill factor Prgm. Is based On a Prgm by P. Karras, PPC Journal, May,1979) Note: The initial time could have been entered as 1.0000 (1 hr) and the number of days from 0 Jan as 37 which would produce the same results.

John J. Wetzel

The programs follow:
The "Great Conjunction" of 1980-81

Robert C. Victor, Abrams Planetarium, Michigan State University

As you sweep your eyes down the page, think of these frames as part of a time-lapse movie and note the positions of Jupiter and Saturn in the month of December. Their separation from one another continues to grow, until by March 4, 1981, the two giants are about 1° apart. For this reason, the conjunction of January 29, 1980, was the last chance to see either of the two planets in the same field of view.

A triple conjunction of these two bodies within a month would be a rare event. Since the conjunction of March 4, 1981, will be the last chance to see both planets in the same field of view, it is advisable to copy the positions of the three planets in the month of December. The position of Jupiter and Saturn will be seen in the same field of view as the conjunction of March 4, 1981.

In the closing weeks of 1980, soon after Voyager's explorations, Solar System and Earthbound observers will notice another kind of object gradually closing in on the famous ringed planet: Ten-times-brighter Jupiter will pass a bit more than one degree to the south of Saturn. Not since 1961 have the two giant planets appeared closer.

The first pairing occurs on the morning of December 31, 1980; the unusual planetary duo will rise in the east in the middle of the night and will be high in the south as morning twilight begins. For the next month the planets separate very slowly, until on January 1, 1981, they are 1° apart. Then they come back together for their second conjunction, on March 4. The pair will rise in the east within a few hours after sunset and remain visible the rest of the night.

In late March, Jupiter and Saturn are at opposition to the sun and visible all night. Then 1° apart, the two planets are low in the east at dusk, high in the south at midnight, and low in the west at dawn.

The planets' separation may vary until mid-May, when they'll be nearly 3° apart and high in the south at dusk. Then on the evening of July 23, Jupiter passes Saturn for the first time. This conjunction event of their triple conjunction occurs again in late August and early September. The planets will appear in the west-southwest during evening twilight.

As if a triple conjunction weren't enough of a treat, about a month after it's over, Venus will form a rare and beautiful compact trio with Jupiter and Saturn. From August 24 to 27 the groupings will be about 3° wide, low in the west-southwest during evening twilight:

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<th>Year of triple conjunction</th>
<th>601 BC to 3000 AD</th>
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<td>Time</td>
<td>In years</td>
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<tr>
<td>563-562 BC</td>
<td>40</td>
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<tr>
<td>523-522 &quot;</td>
<td>377</td>
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<td>146-145 &quot;</td>
<td>139</td>
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<td>7 &quot;</td>
<td>338</td>
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<tr>
<td>332-333 AD</td>
<td>39</td>
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<td>411-412 &quot;</td>
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<td>452 &quot;</td>
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<td>2913-2914 &quot;</td>
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The triple conjunctions are listed in order of decreasing separation from Jupiter and Saturn. The dates are given in the order in which the conjunctions occur, from left to right. The dates are given in the order in which the conjunctions occur, from left to right.

What often is there a triple conjunction? Jupiter advances along its orbit about 30° per year compared to Saturn's 12°, gaining on Saturn 18° annually. Therefore about 20 years will elapse between successive times Jupiter overtakes Saturn, and at least one conjunction must occur every 20 years. But if the earth passes both planets with an interval of about 40 years, then, as seen from the earth, a triple conjunction must occur; this is because the orbital motion of the earth makes the planets appear opposite to one another, or back up, against the background of distant stars. Jupiter overtakes Saturn a second time, while going westward (backwards), and then a third time after both planets have resumed eastward motion. And we get three conjunctions within seven months.

Such a series occurred in Pisces in 7 BC, and it has traditionally been referred to as the "Star of Bethlehem." Now, in 1980-81, for only the eleventh time since then, we have another triple conjunction, this time in Virgo, the constellation of the zodiac which happens to lie in direct opposition to Pisces. Let astrologers make something of that! There's more: In 1981, Jupiter overtakes Saturn for exactly the 100th time since they passed in 7 BC!

In the 3600-year interval from 601 BC to 3000 AD, Jupiter overtakes Saturn 30 times, and of these, the years that these passages have associated triple conjunctions. This implies an average waiting time of 180 years between triple conjunctions, but the actual interval can vary widely, from 40 years to nearly 380.

To be better able to see the current appearance of Jupiter and Saturn; their next conjunction (a single), will be on May 28, 2000, and the event will be seen in the sun's glare. The following one (another single) will be on December 21, 2020, when Jupiter will pass only one-tenth of a degree south of Saturn; the event will be seen in the southwestern evening sky.

After 1980-81, the next triple conjunction between Jupiter and Saturn will not occur until 2238-2339, more than 24 centuries from now.

Enjoy this one!