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, starting at 7:30 P.M., as follows:

1st. Thursday
Cranbrook Institute of Science
580 Lone Pine Rd.
Bloomfield Hills, MI

3rd. Thursday
Macomb County Community College
South Campus
Building B, Room 216
14500 Twelve Mile Rd.
Warren, MI

Membership is open to those interested in astronomy and its related fields. Dues are as follows:
- Student...$8
- College...$12
- Senior Citizen...$12
- Individual...$17
- Family...$22

Sky and Telescope Magazine is available for $16.00 per year, and Astronomy Magazine for $14.00 per year.

Send membership applications and dues to Russ Patten, 31300 John R. Apt. D, Madison Hgts., MI 48071.

Make checks payable to the Warren Astronomical Society.

OFFICERS
President: Riyad Matti 548-7511
1st. V.P.: Ken Strom 977-9489
2nd. V.P.: Clyde Burdette 749-3295
Secretary: Bev Bakanowicz 573-4871
Treasurer: Russ Patten 588-0799
Librarian: Tom MacLaney 541-8198
Deep Sky Group: Doug Bock 758-9389 — Meets at Northern Cross Observatory, Fenton, MI
Lunar Group: Alan Rothenberg 355-5844 — Meets at Stargate Observatory, Ray Center, MI

MAILING ADDRESS
Warren Astronomical Society
P.O. Box 474
East Detroit, MI 48021

WARREN ASTRONOMICAL SOCIETY PAPER
Editor: Ken Kelly / 839-7250 Send all articles to THE WASP, 19209 Mapleview, Detroit, MI 48205.

NEWSLETTER EXCHANGES: Send your Newsletters to: THE WASP, P.O. Box 474, East Detroit, MI 48021.

NOTE: Newsletters or change of address notices sent to other addresses may not reach the Editor.

STARGATE OBSERVATORY
Observatory Chairman: Clyde Burdette / 749-3295

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 12.5 inch club-built Cassegrain telescope under an aluminum dome. The Observatory is open to all members of the club in accordance with 'THE STARGATE OBSERVATORY CODE OF CONDUCT'.

THOSE WISHING TO USE THE OBSERVATORY MUST CALL BY 7:00 P.M. (IN THE EVENING OF THE OBSERVING SESSION. Lectures are given at Stargate Observatory each weekend. The lecture will be either Friday or Saturday night, depending on the weather and the lecture's personal schedule. The observatory is located at N. Lat. 42° 45’ 43.5”, W. long. 82° 55’ 25.6”, Alt. 206m.

LECTURER’S LIST

Lecturers should check with Camp Rotary to determine whether the Scouts are staying at the camp and to inform the Ranger the day and time of the lecture. If you cannot lecture on your scheduled weekend, please make arrangements to switch weekends with another lecturer or call the Chairman as early as possible. The lecturers for the coming weekends are:

May 20/21 Clyde Burdette ....749-3295
27/28 Frank McCullough ....683-4082
June 3/4 Jim Yax ..........465-9897
10/11 Steve Aggas .........469-8773

June 17/18 Bob Keller ......781-6853
24/25 Jon Root ............937-0869
July 1/2 Riyad Matti ....548-7511
8/9 Russ Patten ....588-0799
The Lunar and Planetary Group will meet at 7:00 P.M. at Stargate. The Beginner's Group will meet at the same time and place. We will make sketches of the planets.

Meeting at Cranbrook Institute of Science, 7:30 P.M. A full program of activities is planned.

Meeting at Tom Ott's house, at 7:30 P.M. Call 879-0244 for further information.

Meeting at Macomb County Community College, 7:30 P.M. A full program of activities is planned.

Summer Solstice Party at Doug Bock's. The Lunar & Planetary Group will meet at the same time. We will use the large scopes to observe Mars and draw what detail is visible.

The Lunar and Planetary Group will meet at 7:00 P.M. at Metropolitan Beach. Occultation of Regulus at 7:30 P.M. Bring your filters and a camera. Also, bring some hamburgers and Hot Dogs for an Occultation Cookout Party. We will observe and draw Mars, soon afterward.

### Ephemeris for Comet 1988a - Liller

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Source of elements: Minor Planet Circular 12953
On Saturday April 30, the annual observatory repairs and general clean-up was held at Stargate.

Three major projects were scheduled to be completed:
1. Paint the inside of the dome (flat black)
2. Paint exterior of doors (royal blue)
3. Patch sidewalk around the observatory

A good turnout of club members resulted in those things being accomplished. In attendance were the following:

Clyde, Ann & Timmy Burdette
Ken Kelly
Alan Rothenberg
Dale Flamand & three sons
Riyad Matti
Beverly Bakanowicz
Mike O'Dowd
Francis & Liz Stabler
Bob Keller & son
Yvonne Flores

Spirits were high, everyone working hard and cooperating to get the messy job done.

A slight mishap, due either to the full moon or Murphy's law, sent a can of paint sailing through the air, obviously attracted to the Earth’s center of gravity, however, the observatory's carpeted floor overcame this inertial tendency. The crew responded splendidly to minimize the damage. No problem, the carpet was due for replacement and plans are already underway to acquire a new one anyway.

The two-inch diagonal has been recoated and is back at the observatory.

Much more work is slated during 1988, if you'd like to help out, let one of the officers know, we can use all the help we can get, no matter how small. The more people that pitch in, the easier of a time we’ll have getting all the projects completed.

A big "THANK YOU!" to all those who helped out at Stargate.

Clyde Burdette
Observatory Chairman
SURVEY RESULTS
By Michael O'Dowd

At the last W.A.S. meeting a survey was handed out to find out the groups knowledge and opinions on things relating to cosmology. The same questioner was handed out to two other groups of people. The cosmology group and to my co-workers at Creative Industries of Detroit.

The number of surveys were as follows, 5 for the cosmology group, 11 in the W.A.S. group and 16 for the general public. Though these numbers may seem small, some significant differences showed up.

The purpose of this survey was to compare the results of these three groups of people, the cosmology group, the W.A.S. members and the general public.

The results of this survey are on the next two pages.

EDITOR'S REMARKS

1. Although 100% of the Cosmology group believe in the theory of Relativity, no one in this group said they were very familiar with it. On the other hand, although 12% of the general public said they were very familiar with it, only 50% said they believed in it. Believing in it seems to be in inverse proportion to being familiar with it.

2. Although 25% of the general public believe in miraculous creation, no one in this group said the universe was less than 10 billion years old. On the other hand, although 10% of the Warren group said the universe was only 6,000 years old, no one in this group said they believe in a miraculous creation.

3. Although 100% of the Cosmology group said they believe in Relativity, only 60% of them believe in the expansion of the universe, and only 40% believe in the Big Bang! These are surprising results in view of the implications of the theory of Relativity.

OUR COVER: The Editor wishes to thank Eric Hallman and his wife for the drawing on the cover. The equation on the blackboard is one of the equations in the Lorenz Transformation, first derived by the Dutch physicist H. A. Lorenz, who showed that the basic formulas of electromagnetism are the same in all frames of reference in uniform relative motion only when these transformation equations are used. Einstein discovered their full significance a number of years after they were first derived.
### 1. How interested in cosmology are you?

<table>
<thead>
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<th>Somewhat Interested</th>
<th>Not Very Much</th>
<th>Don't Care</th>
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<td>0 %</td>
<td>0 %</td>
<td>0 %</td>
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<tr>
<td>WAS.</td>
<td>18 %</td>
<td>82 %</td>
<td>0 %</td>
<td>0 %</td>
</tr>
<tr>
<td>GEN.</td>
<td>14 %</td>
<td>40 %</td>
<td>46 %</td>
<td>0 %</td>
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### 2. Do you know what the speed of light is?

- (Yes) 100 %
- (No) 100 %

### 3. How well do you understand how stars shine?

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<th>Not Very Well</th>
<th>Not At All</th>
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<tbody>
<tr>
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<td>100 %</td>
<td>0 %</td>
<td>0 %</td>
</tr>
<tr>
<td>WAS.</td>
<td>67 %</td>
<td>33 %</td>
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</tr>
<tr>
<td>GEN.</td>
<td>25 %</td>
<td>69 %</td>
<td>6 %</td>
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### 4. Do you know what a supernova is?

- (Yes) 100 %
- (No) 100 %

### 5. Do you know what a black hole is?

- (Yes) 100 %
- (No) 100 %

### 6. Do you believe that black holes exist?

- (Yes) 80 %
- (No) 20 %
- (Not Sure) 56 %

### 7. Do you know what the Milky Way is?

- (Yes) 100 %
- (No) 90 %
- (Not Sure) 10 %

### 8. Have you ever observed the Milky Way?

- (Yes) 100 %
- (No) 90 %
- (Not Sure) 62 %

### 9. Have you ever observed a galaxy before?

- (Yes) 80 %
- (No) 73 %
- (Not Sure) 31 %

### 10. Do you believe that life exists elsewhere in the universe?

<table>
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<tr>
<th></th>
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<th>Probably</th>
<th>Don't Know</th>
<th>Definitely Not</th>
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<tr>
<td>COS.</td>
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<tr>
<td>WAS.</td>
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<td>30 %</td>
<td>30 %</td>
<td>10 %</td>
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<tr>
<td>GEN.</td>
<td>30 %</td>
<td>50 %</td>
<td>12 %</td>
<td>6 %</td>
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</table>
11. **DO YOU KNOW WHAT THE DOPPLER EFFECT IS?**  
   (Yes)  (No)  
   COS. 100 %  -  
   WAS. 100 %  -  
   GEN. 14 %  86 %  

12. **DO YOU BELIEVE THAT QUASARS ARE THE MOST DISTANT OBJECTS IN THE UNIVERSE?**  
   (Yes) (No) (Don't Know)  
   COS. 20 %  40 %  40 %  
   WAS. 18 %  18 %  64 %  
   GEN. 6 %  -  94 %  

13. **HOW FAMILIAR ARE YOU WITH EINSTEIN'S THEORY OF RELATIVITY?**  
   (Very Familiar) (Somewhat Familiar) (No Understanding Of It)  
   COS. - 100 %  -  
   WAS. 8 %  84 %  8 %  
   GEN. 12 %  50 %  38 %  

14. **DO YOU BELIEVE IN EINSTEIN'S THEORY OF RELATIVITY?**  
   (Yes) (No) (Don't Know)  
   COS. 100 %  -  
   WAS. 64 %  -  36 %  
   GEN. 50 %  -  50 %  

15. **HOW DO YOU BELIEVE THE UNIVERSE CAME TO BE?**  
   (Big Bang) (Miraculous Creation) (Big Bag - Miraculous Creation)  
   (Always Was, No Beginning) (None Of Above) (Don't Know)  
   COS. 40 %  -  40 %  
   WAS. 64 %  -  18 %  
   GEN. 15 %  25 %  38 %  

16. **DO YOU BELIEVE IN THE EXPANSION OF THE UNIVERSE**  
   (Yes) (No) (Don't Know)  
   COS. 60 %  20 %  20 %  
   WAS. 72 %  10 %  18 %  
   GEN. 70 %  -  30 %  

17. **APPROXIMATELY HOW OLD DO YOU BELIEVE THE UNIVERSE IS?**  
   (6,000 yrs) (12,000 yrs) (10 billion yrs) (15 billion yrs) (20 billion yrs)  
   (Infinitely Old) (Don't Know)  
   COS. -  -  40 %  -  
   WAS. 10 %  -  10 %  35 %  45 %  
   GEN. -  -  6 %  -  6 %  

18. **HOW DO YOU BELIEVE THE UNIVERSE WILL END?**  
   (Big Crunch) (Expands Forever) (No End) (Don't Know)  
   COS. -  -  20 %  80 %  
   WAS. 20 %  40 %  10 %  30 %  
   GEN. -  6 %  30 %  64 %  

19. **DO YOU BELIEVE THAT CREATION IS STILL CONTINUING?**  
   (Yes) (No) (Don't Know)  
   COS. 80 %  -  20 %  
   WAS. 80 %  20 %  -  
   GEN. 80 %  -  20 %
Ken Kelly, Editor
THE WASP
19209 Maplevue
Detroit, MI 48205

Dear Mr. Kelly:

I'd like to reply to your diatribe regarding my book "The Truth About the Heavens".

You entitled your article "The Cause of Sunspots" and, near the end you close it with the statement that "there is no consensus among astronomers as to the exact cause of sunspots".

You lead us to believe that magnetic fields cause sunspots, yet you don't explain how it happens.

I know magnetic fields are a characteristic of sunspots and I never said they were not, but mere association does not prove that they are the cause. All the minor bodies in our solar system have quantities of iron and nickel which are the strongest of magnetic materials. Surely when they melt at great depth and are carried to the surface by various gases, will generate strong magnetic fields. And as far as the Zeeman Effect is concerned, all it proves is that strong magnetic fields split spectral lines.

To get back to the beginning of the article regarding the boiling point of hydrogen, boiling points of liquids vary with atmospheric pressure. The average density of the sun is 1.4 grams per cubic centimeter. Hydrogen at that density, I'd have to consider a liquid.

Regarding the sun becoming a neutron star; What was the original mass of the sun? The sun is presumed to be 5 billion years old. On page 10 of my book, I stated that the sun was in all probability, as large as the star Sirius is today. When you take that into consideration, I'm sure the mass would have been large enough to form a neutron star.

Regarding the separation of the flares and sunspots; Most flares result from angular impacts on the sun and the explosion would exit along the line of impact. The heavier materials would go to greater depths and surface thousands of kilometers away. The rotational variation of the various latitudes of the sun as well as the different depths would also contribute to the separation of the flares and spots.

Your last sentence says my book is not a scholarly work. If you read my introduction, you would notice that I said my book was written for the average reader. My book is based on common sense science and basic physics. Now I'd like to ask you what would happen if a meteoroid of about 4 to 10 cubic meters of material impacted on the sun? Can you surmise as to the result?

Thank you for your honesty in printing this letter.

yours truly

Michael Cyrek
17149 Caldwell
Detroit, MI 48212
To answer your last question first, if a meteoroid of 10 cubic meters were to impact on the sun, it would be vaporized by the hot gases on the sun and the material would dissipate. We would not be able to detect it on earth.

Regarding your statement that "All the minor bodies in our solar system have quantities of iron and nickel", this is simply not true. Regarding the minor planets, of more than 1000 composition types measured to date, only 42 are type "M", or metallic. Most minor planets are silicatious (type "S") or carbonaceous (type "C"). I am not an expert in composition of meteorites, but Allen, in "Geophysical Quantities", says that 6% of meteorites seen falling are irons, and 2% are stony-irons. This compares well with the 4.2% found in minor planets.

Even if your hypothetical 10 cubic meter meteoroid were solid iron, there is a further problem which would prevent this material from remaining magnetic. I learned in my basic physics courses that when a magnet is heated above a certain temperature it loses all of its magnetism. I suggest you try this by actual experiment. According to Allen, the effective temperature of the sun is 5770 K or 6043 C. The melting point of iron is 1535 C, and its boiling point is 2750 C, so there is no possibility of such a body retaining its original magnetism. If your book were based on common sense science and basic physics, you would not make such statements. I suggest that you should go back to college and retake the basic physics courses for science students.

Correct me if I am wrong, but I can conceive of only one way to produce a magnetic field on a hot body such as the sun, and that is to have charged particles moving in a vortex or hurricane-like structure. This is the same way that a magnetic field is created in a coil of wire. This idea was originated by George E. Hale, who proposed that a sunspot is a vortex with a funnel shape in the outer parts of the sun. Inside it, gases are ascending, spiraling outwards, and as there is rapid expansion, there is considerable cooling to about 2000 degrees centigrade below the temperature of the surrounding bright surface of the sun. This cooling is responsible for the relative darkness of the spot area, and also for the formation of chemical compounds like titanium oxide, discovered by A. Fowler in 1908 in sunspot spectra. The rotation of charged particles within the funnel was thought to cause the magnetic field.

There may be a better explanation of how a magnetic field is created in a sunspot, but one thing is for sure, and that is that we can definitely rule out meteoric impacts as their cause. I suggest that you read "The Sun", by Giorgio Abetti or any other good book on the sun, before continuing this discussion.

Regarding your assertion that hydrogen is a liquid on the sun, let me remind you that basic physics says that the state of matter (solid, liquid or gas) is determined foremost by its temperature. The sun is far too hot to contain any liquid whatsoever. At a temperature of 6000 C. the density is irrelevant, and hydrogen is a gas.

Regarding your assertion that the sun will become a neutron star, if you had read the explanation given by Burnham, you would have read that the mass of the core of the star has to exceed Chandrasekhar's limit. The original mass of the star is irrelevant.
Positions for the four brightest Minor Planets are listed for this time period. The opposition dates are as follows: (15) Eunomia, May 11; (43) Ariadne, May 27; (21) Lutetia, June 1; (2) Pallas, Aug. 25. The IRAS determined diameters are: Eunomia, 272 km.; Ariadne, 65 km.; Lutetia, 99.5 km.; Pallas, 523 km.

**EPHEMERIS FOR (15) Eunomia**

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**AT STANDARD STATION, LUNAR DISTANCE FOR ABOVE STAR 271 IS 58 KM**

**AT STANDARD STATION, LUNAR DISTANCE FOR ABOVE STAR 2012017 IS 56 KM**

**AT STANDARD STATION, LUNAR DISTANCE FOR ABOVE STAR 3520 IS 7 KM**