

THE PRAIRIE ASTRONOMER

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PRESIDENT'S REPORT SETS DATE FOR 1976 EDITION OF STAR PARTY/PICNIC

(As told to Lee Thomas)

What with camping club meets, Old Settlers Picnics, and a daughter's wedding, your president hasn't had time to do much more than notice some fine, clear skies from June 18-21. A few club members have been out to take advantage of the superb viewing --and I hope more had an opportunity to take to the telescopes on their own. These nights were some of the best in a season that has so far been a cloud watcher's delight.

(Editor's note: The so-called "drought cycle", which has been theoretically tied to the sunspot cycle is supposedly due to reach its peak this year and next. Did you notice, in an otherwise very dry year, how the solar outburst that produced bright auroral displays in late March was followed by a period of heavy rains in Nebraska--some of the best we've had in several years? And now, that the sun has settled down again, the farmers are back to wondering when the next thunderhead might yield a few drops. Cause and effect? Or just coincidence?)

Dr. Robert Manthey and Earl Moser took their telescopes out to Milford for the Lincoln Police Department boys camp on June 9th. This is a regular yearly affair sponsored by the department for kids with special problems--and it gives some of them their first look through a telescope. Earl reports there was a fine full

moon for them to see.

The club picnic and star party is scheduled for Saturday night, August 28. Unlike previous years, this one is to be held a week after the new moon, since the new moon falls during the Astronomy League Convention in Kitztown, Pennsylvania. Since we want to encourage any member who can to attend the convention, we don't want to schedule our club's yearly festival at the same time. Hence, the one-week delay. There will, of course, be more about the picnic in future newsletters. But now you can mark your calendar.

Date for the next Gateway sky show is July 8. We still need more telescopes and their owners to show the public what astronomy is all about.

JUNE MEETING SET FOR THE 29TH

The June meeting will be held at Olin Hall, Nebraska Wesleyan, June 29, at 7:30 p.m.

Program Chairman Jack Dunn is presenting "Spectrum: The Science Fiction Universe", a tape/ slide show. This planetarium program was originally presented about 2 years ago at Mueller Planetarium, but has been updated with many new slides since its debut.

BICENTENNIAL OBSERVATORY COMMITTEE MEETS, PLANS AUTUMN FUNDRAISING DRIVE

The Community Bicentennial Observatory committee met June 2.

It was generally agreed to follow the suggestion of a small group of business leaders with whom the committee had consulted, and delay plans for a general solicitation of businesses until late autumn. It might be possible at that time to obtain greater support from the business community, which is involved in larger Bicentennial projects at present.

It is estimated that about half the necessary funds have been donated or pledged. About another \$30,000 is needed to initiate construction, assuming that no modification in plans is made.

The planned Fall drive would mean that construction probably would be started in the Spring of 1977.

The committee also decided to present the project to the City Council at its regular open budget request meeting on August 12. This biyearly meeting is an opportunity for citizens and groups to make requests for specific appropriations before the Council begins its final budget hearings. It is hoped that the membership of the Prairie Astronomy Club

can provide a number of people who are willing to appear in support of the project. This doesn't mean you have to speak, just be present in a "show of strength", indicating that there is substantial support for the observatory. We'll have more information on this council presentation, and what to expect, at the club meeting June 29.

MILKY WAY GAS GLOW REPORTED

(Excerpted from UPI) Scientists have reported discovery of an extremely faint glow of light from the gas between stars in the Milky Way.

University of Wisconsin physicists have determined that the glowing gas has a temperature of almost 17,000 degrees Fahrenheit. The energy required to produce this temperature, they said, comes in the form of ultra violet light from stars 100,000 times brighter than the sun.

The Wisconsin scientists spotted the glow by using a Fabry-Perot spectrometer, one of the most powerful instruments of its kind in use for astronomical observations.

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JUPITER FACTS, THEORIES FLOW FROM PIONEER PROJECT SCIENTISTS' MEETING

(Excerpted from reports in The Wall Street Journal, New York Times, and Associated Press)

Scientists working on the mass of data produced by the twin Pioneer missions to Jupiter gathered at NASA's Ames Research Center in Mountainview, California in late May to compare notes. From their meeting emerged some fascinating tentative conclusions about conditions in and around Jupiter, and the origin of the solar system's largest planet.

It seems certain that the Great Red Spot is a massive cloud that rises about eight kilometers (roughly five miles) above the giant planet's main cloud deck. The top of the cloud is in the cooler reaches of the planet's atmosphere where it is cold enough for vapors of phosphorus to condense, giving it the dark reddish hue that earthbound observers have puzzled over for years.

The Pioneer data and computer simulations indicate the spot is actually a free-wheeling cloud that sticks up like a sore thumb high above bright clouds of ammonia crystals, according to Andrew Ingersoll, a planetary meteorologist from California Institute of Technology. The spot lies in a zone which flows westward, while the belt immediately to the south flows eastward.

Astronomers in the past year and a half have located four other red spots on Jupiter, helping to confirm theories developed with computers on how the spots are formed in the turb-

ulent Jovian atmosphere.

Although it is a huge cloud, the Great Red Spot is likely to exist indefinitely. Unlike the earth, where clouds come and go in ever-changing patterns, major weather features on Jupiter, once established, exist almost permanently.

The Pioneer data are also giving strong impetus to an evolving theory on how Jupiter, and hence the entire solar system, probably was formed. Since the beginning of the space age, scientists increasingly have grown convinced that the sun and planets initially congealed from a huge, nebulous cloud of interstellar gas which contained all the elements that now comprise the sun and planets. But they debate furiously over how the process began and whether it took millions of years or only a few hundred thousand.

With the aid of the Pioneers' heat and density measurements, scientists such as the Ames Center's James Pollack have deduced a history of Jupiter that would account for its present state. The giant planet, he says, is somewhat like a dying star that is gradually cooling. The Pioneers have confirmed and given exactness to measurements from earth that Jupiter is giving off twice as much heat as it is receiving from the meager sunlight that reaches it.

To account for this amount of heat, scientists calculate that the planet must have been extremely hot 4.5 billion years ago, but not so hot

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A Report to the Members

COMPLETE LISTING OF ITEMS IN CLUB LIBRARY...

Some months ago we promised a complete description of the club's library, so that members could easily spot items they might wish to read. Here it is--and all you have to do to check out publications is contact Joe

Hamersky, club librarian, at 488-7354, or check with him at the meetings.

And remember: additions to the library are always welcome. Don't throw away something astronomical--give it to the club.

Books

- Bernhard-Bennet-Rice, New Handbook of the Heavens. The New American Library, 1948. (3 copies)
- Cry, Donald Lee, Greenhouse World. Annular Publications, 1962.
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- Gamow, George, Biography of the Earth. The American Library, 1948.
- Goodwin, Frank L., Helpful Telescope Hints To Observers. (Paperback)
- Graham, E. C., The Basic Dictionary Of Science. MacMillan, 1965.
- Johnson, Gayland, Discover The Stars. Sentinel Book Publishers, Inc., 1952.
- Ley, Willy, Mariner IV To Mars. The New American Library, 1966.
- Mattersdorf, Leo, Insight Into Astronomy. Lantern Press, Inc., 1952.
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- Richardson, Robert Sand & Skilling, William T., Astronomy. Henry Holt & Company, 1947.
- Richardson, Robert S., The Fascinating World of Astronomy. McGraw-Hill, 1960.

Books (Continued)

- Viorst, Judith, Projects: Space. Washington Square Press, Inc. 1962.
- Webb, Rev. T. W., Celestial Objects For Common Telescopes, Volume I.
Dover Publications, 1962.
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Dover Publications, 1962.

PeriodicalsSky & Telescope

- 1957 - September
- 1964 - March
- 1965 - March, April, July-November
- 1966 - Complete
- 1967 - January-March, July-November
- 1968 - February, April, May, July-December
- 1969 - January-April, May, August-December
- 1970 - Complete

SCIENTISTS SPECULATE ON JUPITER'S EARLY EXISTENCE (Continued from Page 3)

as to become a tiny star. It's possible that when the original rotating solar nebula started to slowly contract, the bulk of the original material (mostly hydrogen with some helium and traces of other elements) moved toward the center of the nebula, where the sun was to form. But a big chunk of the hydrogen, helium and dust particles began to collect some distance from the center.

Within a few million years, this distant material formed a flat, rotating cloud, perhaps 600 million miles in diameter. For about a million years the rotating cloud slowly collected and shrank as the molecules and particles were pulled in by the increasing gravity. As its gravity built up, the cloud began collapsing at a faster rate. Over a period of about 70,000 years it shrank from 400 million miles across to only 10 or 20 million miles. Its internal temperature rose steadily as the particles and molecules slammed into each other.

For a long time, the rising internal heat pressure kept the cloud from collapsing too fast, explains Ames astrophysicist David Black. As the shrinking cloud grew hotter it reached a temperature at which hydrogen atoms started breaking up. This reaction soaked up energy and eased the internal heat pressure.

When the cloud reached that critical point, Mr. Black explains, there was a sudden, almost total collapse

of the gas. Within just three months, the cloud collapsed to a mass about 400,000 miles across. This rapid collapse sent the internal heat soaring, eventually reaching 90,000 degrees Fahrenheit. The developing planet emerged as a glowing red ball five times the present size of Jupiter.

Although searing hot, the planet failed to reach the enormous temperatures at which hydrogen atoms start fusing together in the reaction that powers the sun. Over succeeding eons, the planet continued to contract, getting rid of its heat, a process that continues to this day.

The Pioneer data, and the theory, conclude with a Jupiter containing a rocky core, 20 times the mass of earth. Surrounding this core is a huge envelope of liquid hydrogen and helium. Because of the extreme heat and pressure, the hydrogen (which is only a fourth as dense as water) takes on the properties of a metal, in the sense that it can conduct heat and electricity. Around this exotic envelope is a thick layer of ordinary hydrogen and helium.

David Morrison, research astronomer at the University of Hawaii, explored the bizarre Galilean satellites. Io, closest to Jupiter, is the most dense of the four--its density about the same as that of rock on earth's moon. "It is almost certainly rocky", Morrison said. The two farthest moons, Ganymede and Cal-

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NASA'S RELATIONSHIP TO "STAR TREK", "SIX-MILLION DOLLAR MAN", "THE BIONIC WOMAN," "SPACE: 1999" AND OTHER SCIENCE FICTION PRODUCTIONS
(--From a Press Release by NASA received by KLMS News)

The National Aeronautics and Space Administration continues to receive a large amount of mail relating to commercially-produced, space-oriented science fiction television and motion picture productions. Queries range from suggestions that the first Space Shuttle Orbiter be named the "USS Starship Enterprise" to "does NASA have a bionic man or woman?"

We are also asked why we don't design and launch spacecraft similar to those depicted on these shows, why our astronauts wear space suits and helmets, why they carry no arms and a variety of other technical and non-technical questions. We, of course, are pleased that these programs generate interest in the NASA mission of conducting advanced aeronautics research and continuing the peaceful exploration of space.

It should be pointed out, however, that NASA is carrying out its mission using the tested resources and technology we have developed. The producers of the science fiction shows are not bound by these limitations--the "Star Trek" series, for example, deals with spacecraft and intergalactic missions which are far beyond humankind's present capabilities. We do not object to this form of entertainment -- we do, however point out that it is fiction.

Whenever asked, we have provided technical advice to several shows.

And in some instances actual film footage purchased from NASA has been incorporated in the shows. An example is the opening crash sequence in the "Six Million Dollar Man" series. This and other motion picture and still photography in the NASA
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JUPITER DISCOVERIES, THEORIES

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listo are the least dense, and almost certainly consist of at least half water.

However, the visual observations indicate the reverse: the icy, outer moons appear to be covered with a dark, rock-like surface, while the inner moons are bright reflectors, suggestive of ice. Tentative explanations have Callisto, farthest out, and darkest, consisting of a mixture of water, ice and dark dust. Ganymede, a bit closer, could have undergone some melting from the primordial Jupiter. It could be a planet with a core of mud, a mantle of water, and a crust of ice.

Closer in, Europa may have undergone internal radioactive heating, which could have forced out what little water it had to the surface to form a bright, icy crust. Io, brilliant as if covered with ice, obviously is not when studied spectroscopically. And Pioneer instruments confirm by infrared analysis that there is no water on its surface.

THE NASA PUBLIC INFORMATION OFFICE Vs. "STAR TREK", ETC. (From Page 7)

library is available for purchase by the public.

Because we have received so many letters suggesting the Space Shuttle Orbiter be named the "USS Enterprise" and inquiries on bionic research, the following information is made available on these two subjects:

A number of names for the Space Shuttle Orbiters are under consideration, and Enterprise is among them. A selection is expected to be made late in the summer of 1976 and we are confident that, when the name is announced, it will be appropriate and acceptable to all Americans.

NASA has not produced a robot or endowed a human with the capabilities attributed to "The Six Million Dol-

lar Man" or "The Bionic Woman". "Bionics", or bioelectronics, or biomedical electronics, refers to the study of or development of electrical or electronic devices for use in physiological measurements (such as heart rate), biochemical measurements, and other areas of biomedical research and clinical medicine.

"Bionics", as it is most popularly used today, usually refers to areas such as robotics, artificial limbs, artificial organs, and computer control of systems to augment or replace the human operator.

NASA has done work in all of the areas mentioned above.

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