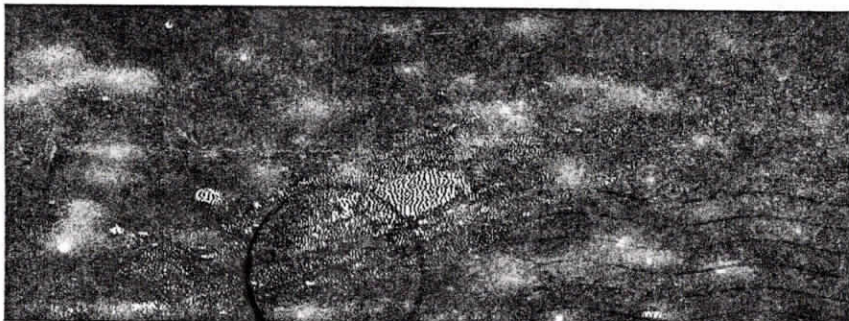


degree south and half east of Zeta which is encased in a very faint puff of nebulosity.

A much more famous object lies just to the north, namely IC 434, the nebula containing the Horsehead. It is extremely faint, being just detectable in an eight inch as a broad faint band of light running roughly north-south. It is tapered toward the south end, with the dark Horsehead being about halfway down the east side. I have seen the Horsehead vaguely in an eight inch under superb conditions and I have heard reports of it being visible in a six, but it usually takes a ten inch to observe it seriously. The Lumicon H-Beta filter does help the nebula's visibility, but it is still a tough object. For a final target, try the only bright globular cluster visible in northern winter's skies, M79, located in Lepus about 3.75 degrees south and one west of Beta. A 2.4 inch refractor shows it as a small but not terribly faint fuzzy ball of light, with six inch apertures revealing some faint stars around the edges. An eight inch at high power resolves all but the core, while a ten inch makes it look rather pretty.



The Prairie Astronomer

c/o The Prairie Astronomy Club, Inc.

P.O. Box 80553

Lincoln, NE 68501



First Class Mail

Next Meeting December 26, 1991



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THE *Prairie* Astronomer

Happy Holidays!



A PLANETARY GRAND TOUR: EARTH -- OUR BIRTHWORLD

by *Carolyn Collins Petersen*

"Let the sweet fresh breezes heal me
As they rove around
the girth
Of our lovely mother planet,
Of the cool green
hills of Earth."

— Rhysling, *The Blind Singer of the Spaceways From THE GREEN HILLS OF EARTH* by Robert A. Heinlein

Imagine yourself hanging in orbit around the earth. Looming below is a blue-green globe that is so unlike Mercury and Venus, yet was formed in the same solar nebula over 5 billion years ago.

A few clouds float lazily across the surface of this world, occasionally obscuring the view of what lies below them. Not for this world the yellow, smothering clouds of Venus! We see great oceans stretch across vast expanses of the planet, ending abruptly against rocky shorelines of equally vast land masses. Scattered across the land masses are a variety of colors and shapes — snow-topped mountains, wind-blown sand dunes, lush green river deltas and jungles, golden plains, and endless forests. On the night side, splashes of light

twinkle like jewels in the darkness; here and there an electrical storm flashes within towering thunderheads.

Earth — our birthworld! There it floats, in a “life zone” of comparative safety — ninety-three million miles from the heat of the Sun, yet close enough to sustain life on its surface. The earth’s gravity holds an ocean of air — nitrogen, oxygen, argon and a myriad of other elements that blanket the planet. Water flows freely across the surface, evaporating in the heat of the sun, rising through the atmosphere to form clouds, and ultimately falling back to earth as rain, hail, or snow. At its warmest, the atmosphere rises to a temperature of 120 F (48 C); and plunges to -150 F (-101 C) at its coldest.

The highest elevations on Earth are mountains, which tower up to 29,000 feet (8839.2 m) above sea level. Below the salt waters of the oceans lie deep trenches stretching down over 7 miles (11.2 km) into dark undersea canyons. In between are relatively temperate lands, where life has taken hold in millions of forms.

We thrive on this planet because the conditions are right for our survival. But, that’s no surprise — it’s the planet of our birth, and if we survive here, it’s because we evolved here.

The Earth spins on its axis, taking 23 hours and 56 minutes to complete one rotation. It revolves around the Sun at a speed of 18.51 miles (29.8 km) per second, completing one revolution in 365.26 days.

It would be easy to think that we know all there is to know about the Earth, but we would be wrong. Before the advent of spaceflight, we knew the Earth was round, what its atmosphere was composed of, what size the earth was, and so on. Nothing prepared us for the emotional jolt of “seeing” the Earth as a planet — first from Low Earth Orbit (LEO), then from the Moon, and finally from an “over-the-shoulder” photograph produced by Voyager as it sped away toward the outer planets. That picture showed the Earth-moon system, hanging against the black of space — something that humans have never before seen.

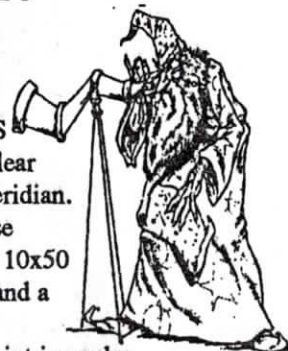
The Earth has been under fairly constant satellite scrutiny for thirty years since the first Sputnik successfully orbited the Earth on Oct. 4, 1957. In the three decades since that time, hundreds of orbiting probes have focused on the earth — photographing its surface, sniffing its atmosphere, and peering at our home planet through sophisticated mechanical eyes. They have given us a new look at this planet of ours — and provided us with a planetary yardstick against which to measure other worlds as we search the cosmos for planets like our own.

Around the Earth orbits the Moon at a scant distance of 238,000 miles (384,404 km). Ghostly, seemingly magical and mysterious, pockmarked with craters, and

Observing Chairman's Report

by Dave Knisely

THE NEXT SCHEDULED STAR PARTY WILL BE FRIDAY, JANUARY 3rd AT THE ATLAS SITE. Mid winter offers us some cold and hopefully clear skies, with many Milky Way targets being near the meridian. High overhead is the faint remnant of a relatively close supernova, M1, the Crab Nebula. Visible in a pair of 10x50 binoculars, this object can be found one degree north and a half west of Zeta Tauri, and can be disappointing to beginners. It shows up in small apertures as a small faint irregular fuzzy patch, with large instruments revealing only a diffuse “W” shape with little other detail. Using a ten inch and the Lumicon UHC filter, the nebula does show some vague dark detail and hints of scalloping on the edges, but the filaments which give the object its name are extremely difficult to see.



In Auriga is the fine open star cluster, M38, located 1.5 degrees south and a half east of Sigma. It is rich and easy to resolve in small apertures, with a six inch revealing over 100 stars. It has an unusual wedge shaped gap on the north side. A small faint cluster, NGC 1907, lies just to the south and shows many faint stars in a six or eight inch. Also in Auriga is the nebulous cluster NGC 1893, located 1.5 degrees east of 16 Aurigae. It is a moderate sized “Y” shaped group of stars, with small scopes revealing only about 15 members. Larger instruments show about 25 to 30 stars in the group, with a ten inch showing hints of a faint nebulosity mixed in. Nebular filters greatly enhance the nebula, with a ten inch and the OIII filter revealing some light and dark detail.

Orion is, of course, the king of nebular constellations. The great Orion Nebula in the sword of Orion is the easiest to see, with even small apertures revealing much detail if low power is used. Many people with large apertures give it only a quick look. However, they miss much if they don’t kick up the power and view deep into the central mass near the dark feature known as “The Fish’s Mouth”. It is loaded with beautiful light and dark filamentary detail which should impress anyone. I frequently use up to 230x on this area, and I will often study it for as long as a half hour. There are several other interesting nebulae in Orion. M73 is a small diffuse puff located about two degrees north and 2.5 degrees east of Zeta, and shows little detail. Large apertures will make it easier to see, showing it as a broad diffuse fan of light with a star near the center.

Just east of Zeta is a large faint nebula, NGC 2024. A six inch RFT will show it as two dim fuzzy areas separated by a narrow dark band running roughly north-south. Eight or ten inch instruments will show some irregular dark detail, but Zeta must be kept well out of the field. In the area is another diffuse nebula, NGC 2023, which is visible in a six inch as a faint star about half a

The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc., and is free to all club members. Membership status and expiration date are listed on the mailing label. Membership dues are: Junior Members and Newsletter Only Subscribers...\$10/yr; Regular Members...\$26/yr; Family Memberships...\$29/yr; Address all new memberships, renewals, or questions to THE PRAIRIE ASTRONOMY CLUB, INC., P.O. BOX 80553, LINCOLN, NE 68501. For other club information contact one of the following officers: Dave Knisely (Pres)223-3968, Eric Hubl (V.Pres)423-6267, Ron Veys (Sec)486-1449, Lee Thomas(Tres)483-5639, Jack Dunn (2nd V. Pres)475-3013. All newsletter comments and articles should be sent to Newsletter Editor JOHN LORTZ, 12023 PARKER PLZ #105, OMAHA, NE 68154 no later than 10 days before monthly club meetings. Club meetings are held the last Tuesday of each month at Hyde Observatory in Lincoln, NE.

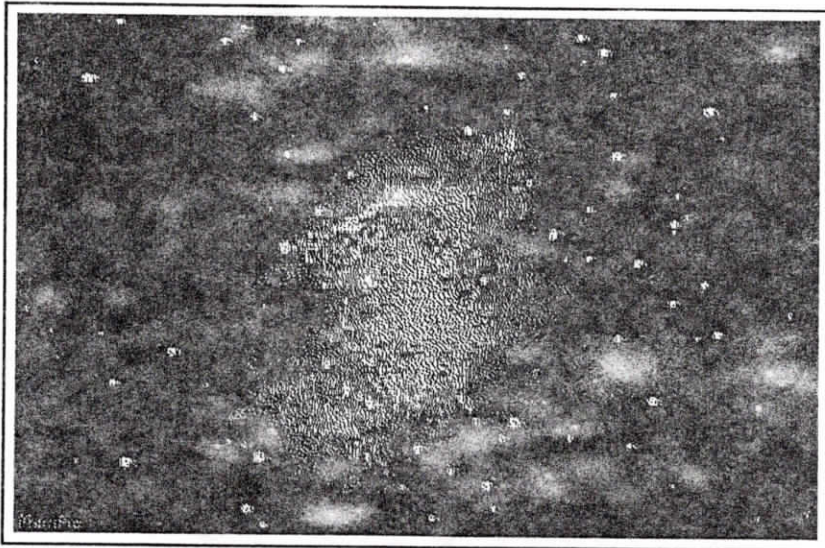
President's Message

by Dave Knisely

MERRY CHRISTMAS, HAPPY NEW YEAR, and just wait for that credit card bill!

FIRST: the meeting date will be December 26th (Thursday) at 7:30 p.m. at Hyde Observatory. We may have some people with new telescopes at the meeting, so be sure and attend. It will also be a chance for some out of town people to see old friends again.

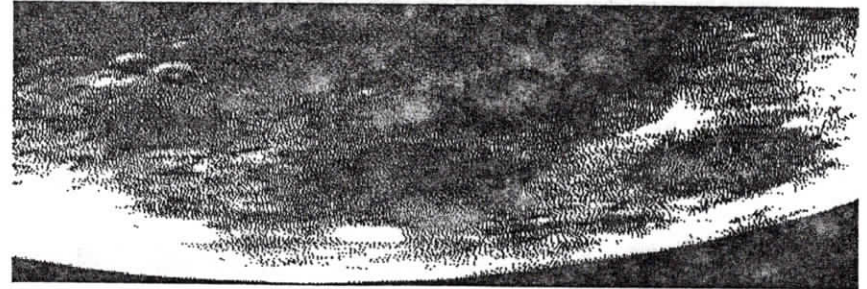
SECOND: the first meeting of the 1993 Mid-States Regional Convention Committee will be held TUESDAY, JANUARY 21st, at 7:30 p.m. at Hyde. This will be the organizational meeting, so if you wish to head up a sub-committee, be sure and attend (or you may get appointed anyway). We will decide what we will have to do to hold the convention, and how to split up the work. We have a lot of help, but we could use some more, so please think about what you might do.



ever-changing over a cycle of 27.32 days — the moon inspired the arts of timekeeping and calendar-making. It influences the ocean tides of earth, and the wanderlust of humans. So many astronomers have studied its surface — longed to climb its mountains and stir its 'seas' of dust.

It was onto this rocky, airless, low-gravity satellite of earth that Neil Armstrong stepped for the first time, on July 20, 1969. With that step, humanity made its first tentative stirrings into the cosmos. The moon remains a first step — an outpost of space from which future human crews will leave on voyages of discover to the planets beyond — Mars, Jupiter, Saturn, Uranus, Neptune and Pluto.

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About the 1991 PAC Financial Statement:

The club's bookkeeping system is on a purely cash basis. This means that, if we happen to receive money from items that we're going to sell, but we haven't paid for them before the arbitrary cutoff date of the statement, our income will be overstated. The reverse also holds true, of course. However, with the exception of some observatory operations (such as payment of sales taxes, which is now done on a yearly rather than quarterly basis), this statement is not heavily impacted by this peculiarity.

As usually we also look especially good because we are not paying for newsletter publication costs (with the exception of buying John Lortz's subscriptions to magazines, which are way less expensive than if we were shelling out for all the printing and postage.)

And, note that the club received \$144.50 in outright donations during the past year, with notable contributions from businesses employing several of our members. And, despite rapidly plummeting interest rates, the club's money market account managed to earn nearly \$200. All told, 1991 was a very good year for the treasury.

Your treasurer should be back from Acapulco in time for the December meeting—but, if not, carry on without me.

L. Lee Thomas

The Planets this Winter.

*By William A. Becker
President, Chicago Astronomical Society
and Cosmic Quarterly Editor*

Mercury begins 1992 high over the eastern horizon before sunrise and is well placed to try observing at this time. As January passes, it will slide closer toward the Sun, making it a more challenging target to observe as it does so. On January 3, Mercury can be found near the slim crescent of the waning Moon. On the 10th, Mars and Mercury will pass slightly more than half a degree away from each other. Mercury has another close encounter on the 19th when dim Uranus shares the same region of morning sky with the barren innermost planet. An even dimmer world, Neptune, will be less than two degrees separated from Mercury on January 21, but viewing the three outermost members of our solar system (Uranus, Neptune, and Pluto), will be next to impossible in the dawn twilight. As February opens, Mercury disappears into the Solar glare headed for superior conjunction on the 12th. After several days, watch for it to reemerge over the western horizon at sunset. On March 6 you can spot Mercury about four degrees to the south of the two-day-old crescent Moon at dusk. On March 9 it will be eighteen degrees above the western horizon at sunset, the greatest distance put between it and the Sun before plunging again into the Sun's glare enroute to its March 26 inferior conjunction.

Venus also holds a spot in the morning twilight before Sun up. Throughout January, it will rise around 4 am. On New Year's Day, Venus can be located around five degrees north of the waning Moon. By month's end, the Moon will pass within one degree of Venus. In February, Venus visits some of its celestial neighbors making stops throughout the month, such as being less than a degree north of Uranus on the 7th, and then less than half a degree south of Neptune on the 8th. On February 19, Venus is nine-tenths of a degree north of Mars and finishes up this month on the 28th a scant one-tenth of a degree north of Saturn. Finally in March, our sister world continues to hover in the east over the predawn twilight, but begins to show signs of edging closer toward the Sun as the weeks pass.

The Earth and Moon will begin this year with our planet at perihelion on January 3, placing us as close to the Sun as it will be get for the remainder of 1992. The next day, January 4, will be New Moon, which will result in an annular eclipse seen only in the Pacific basin. The only parts of the United States that will see some of this event will be Hawaii, where Honolulu will see 80% of the Sun's face masked by the Moon, and parts of the West Coast from the Rockies to the Pacific shore. Only from Los Angeles, and places surrounding it, will maximum annularity be seen, but only as the Sun sets. Chicago will not see this event.

January 12 is First Quarter, and the 19th is the first Full Moon of 1992 at 3:28 pm. January closes the month with Last Quarter Moon on the 26th. February kicks off its lunar calendar with New Moon on the 3rd at 1 pm, the 11th brings First Quarter, the Moon is Full at 2:04 am on the 18th, and Last Quarter falls on February

25. March winds up this quarter with the following lunar cycle: New Moon at 7:22 am on the 4th, First Quarter on the 11th, Full Moon is reached at 12:18 pm on the 18th and Last Quarter is on March 25. Do not forget that the Vernal Equinox falls on March 20 at 2:48 am, bringing spring officially back to the Northern Hemisphere.

Mars does not want to be left out of the fun, so on January 3 it will pass just north of the lunar limb in the morning predawn sky. If you can find the "Red Planet" after it rises around 5 am, you can see Mars as it passes four degrees south of distant Uranus on January 29. The most interesting collection of worlds in the February skies starts off the month on the 1st as Mars, Uranus and Neptune share a dance with the crescent Moon. Neptune will stand within a third of a degree to the north of the Moon and Uranus will remain just about a full degree to its south with Mars looking on also near the southern lunar limb. After that, Mars will rise earlier and rise higher in the east as March approaches. On the 1st, it will stand again near the Moon, making it easier to find. On March 6, Saturn will be two-fifths of a degree north of Mars. During the month, watch Mars continue to rise earlier and earlier, from around 5 am at the start to 4 am by month's end.

Jupiter in January will rise after sunset. Look for it in the east around 8 pm. It will remain as an all night viewing target all quarter long, and crosses the meridian near 2 am in January. By March, Jupiter will cross the meridian around 10 pm and will sink below the western horizon by 5 in the morning. The Earth will pass directly between the Sun and Jupiter on February 28, putting the Jovian World at opposition as we would see it that day.

Saturn will be absent from our vantage point on Earth during the middle of this quarter. As January opens, Saturn will be inching farther and farther into the bright evening twilight and will set by 5 pm. It will undergo a close pass by the two-day-old sliver of a Moon, just three degrees off the southern lunar limb on the 6th. Saturn will be in conjunction on January 9 as it heads around the backside of the Sun to reappear in the late February morning sky, just ahead of the dawn. March will bring Saturn up earlier week by week so look for it in the east around 4 am. To make it easier, find the Moon on March 1 or on the 29th, then you should spot the "Golden Ringed World" just four degrees to its south.



PRAIRIE ASTRONOMY CLUB, INC. FINANCIAL STATEMENT

November 30, 1991

BEGINNING CHECKING ACCOUNT(S) BALANCE 12/1/90		\$1,452.06
<u>Operating Income</u>		
Membership dues		\$1,374.00
Sales to members		\$568.37
Observatory operations:		
Sales of posters, etc.	\$579.20	
Sales Taxes collected	\$37.96	
Donations to observatory	\$388.95	
Total observatory revenue	\$1,006.11	
(Less):		
Inventory purchases	\$329.26	
Trust Fund share of sales (20%)	\$115.85	
Donations pass-through	\$388.95	
Sales tax payments to NDR	\$4.86	
Total observatory expenses	\$838.92	
Net revenue to club from Hyde operations		\$167.19
Donations to PAC		\$144.50
Magazine subscriptions sales to members		\$320.50
Atlas Site key fees		\$290.00
Transfers from savings account		\$0.00
Miscellaneous income		\$0.00
TOTAL OPERATING INCOME		\$2,864.56
<u>Operating Expenses</u>		
Sky & Telescope subscriptions		\$950.00
Newsletter expenses		\$0.00
Postal expenses		\$64.12
Member sales items		\$603.34
Astronomical League dues		\$103.70
Magazine subscriptions for members		\$356.50
Atlas Site expenses:		
Property taxes	\$50.84	
Insurance	\$200.00	
Capital improvements	\$0.00	
Miscellaneous expenses	\$20.50	
Total Atlas Site expenses		\$271.34
Transfers to savings account		\$500.00
Miscellaneous general expenses		\$41.80
TOTAL OPERATING EXPENSES		\$2,890.80
NET OPERATING INCOME		(\$26.24)
ENDING CHECKING ACCOUNT(S) BALANCE 11/30/91		\$1,425.82
MONEY MARKET BEGINNING BALANCE 12/1/90		\$2,939.58
Transfers	\$500.00	
Interest	\$187.79	
MONEY MARKET ENDING BALANCE 11/30/91		\$3,627.37
TOTAL INCOME (LOSS), FISCAL 1990-1991		\$661.55