The Prairie Astronomer

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Hutchinson Trip a Big Success!

by Lee Thomas

A small group of PAC members journeyed to the Cosmosphere in Hutchinson, Kansas on the weekend of April 9. All the things that went wrong or didn't happen on our last expedition three years ago went very right and did happen this time out.

We saw two Omnimax films, SHARKS and THE DISCOVERERS. Neither film broke. The projector worked. Aside from some bothersome lint on a lens, things looked great. So, let it be known that the Lee Thomas Movie Critic Curse was either suspended for a day or never existed in the first place and the poor devil was the victim of cruel circumstance and has been carrying around an unfair burden of guilt (never being allowed to forget that disgruntled PAC pilgrims had traveled 240 miles to see 8 minutes of a film before it self-destructed, and It-Must-Have-Been-His-Fault-For-Being-a-Movie-Critic) for three long years. So there!

Whereas last time we peered longingly through a chainlink fence at a few rusting rocket sections in the locked storage yards of SpaceWorks and tried to identify what they were, this time we got a guided tour through he plant by the company's Vice President of Operations. We strolled among priceless space artifacts from both the American and Soviet programs, observed restoration and recreation works in progress, and talked to a craftsman working against an 8 a.m. the next morning deadline to complete a space suit.

We squished our way through the soggy grounds (it rained most of the time we were in Hutchinson, with tornados skipping about just to the south-- but who cares when you're having fun?) to look at rocket components. These included one with a sizable hole cut in its side, the better for a Soviet reconnaisance satellite orbiting overhead to snap a picture, verifying for treaty purposes that this particular missile really wasn't going to be able to hit Moscow.

And, we stood in awe at the ominous black form of an SR-71 spy plane stored away in an innocuous hangar at the Hutchinson Airport. The Hutchinson craft is one of only five remaining of 30-some built back in the days between Francis Gary Powers' U-2 visit to Russia and the advent of spy satellites in the early 70's. Of the others, only two are still being flown by NASA.

No matter how slight your interest might be in the hardware of aerospace, you can't help being caught up in the wonder at the opportunity to touch and peer into the mysterious orifices of so alien-looking a machine, knowing that its published specifications, speeds of Mach 3+ and altitudes of 100,000 feet, probably only hinted at its true capabilities. Even minus an engine and stripped of all its super-secret innards, and dwelling in dusty isolation next to polished Pipers and Beechcrafts in a commercial aviation hangar, the SR-71 is so obviously a creature of an alien environment that being in its presence is the next best thing to visiting that

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Welcome!!!

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inside...

While You Were Gone . . .

Secretary's Report by Jason Stahl

Astronomy Day has finally arrived. May 7th is the day, Mueller Planetarium is the place. If you would like to help out, contact Ron Debus to find out what you can do for Astronomy Day.

Last call for volunteers! On May 10, Hyde Observatory will be open to the public for the Solar Eclipse. The Eclipse is in the mid morning through early afternoon, so if you can, take a couple hours out of your day and come out to Hyde for the Annular Eclipse. Volunteers will be needed to help with the programs, telescopes, and crowd control. If you have equipment that can S-A-F-E-L-Y view the eclipse, you are encouraged to bring it to Hyde for public use.

At the March meeting Dave Scherping handed out some pamphlets and maps of Merritt Reservoir. If you need either one, pick one up at the April meeting.

I am happy to report that our attendance at the club meetings are growing very well this year, because they are growing to near capacity, come early to obtain your seat.

At the May meeting, Ron Veys will present part two of, "Building your Telescope." If you missed part one, you missed an informative presentation, don't miss part two. Thanks Ron for doing a super job on part one.

Our new site neighbor has started building his first home on the Southeast corner of his property. The foundation has been dug and probably poured by now. We will continue to update his progress as time wears on.

As a reminder, the second scheduled star party at Mahoney State Park is May 20th. Those interested should be at the park around sunset. Don't forget about the two dollar entry fee for the park. We will meet at the observing grounds located on the soccer field at the west side of the park. Hope to see you at the April meeting!

The Martin Canal

From the July 7, 1910 Park Rapids Enterprise
submitted by Rick Johnson

If there is one feature in astronomy which more than any other appeals to the public (Sic) imagination, it is the canals on Mars. Ever since they were discovered by Schiaparelli they have been taken as evidence of life on Mars approaching more or less to that of mankind, and the beautiful theories which have been woven about them have all the fasination (Sic) of the most imaginative romance. Mars is a dying planet and suffers terribly from want of water, and so, the Martians, who must be expert engineers, have constructed a series of canals from the snow caps at the poles, to catch the water when the snow melts, and turns it to the irrigation of the plains, much as the Egyptian fellaheen use the waters of the Nile.

It was therefore a great blow to the public when certain astronomers of eminence declared that there is no evidence whatever of any canals on Mars, and that what are mistaken for them are merely faults of observation or in the telescopes. Happily, Prof. Lowell of the Arizona Observatory, who is perhaps our greatest authority on the planet, not only adheres to the old canals, but declares that he has discovered a couple of new trenches, where there never was one before, and cuttings of such a size that if they are not new they must have evidently been noticed before. This is a great relief. The public will not lightly part with its canals on Mars.- - London globe

My first interest in astronomy was started by a 1953 article in a major magazine (Life?) that said that the upcoming 1954 opposition would be the first since the 200 inch telescope was built. The 200- inch telescope would, once and for all, settle the issue of the Martian Canals. My dad tried to help me build a 3-inch single element refractor but it was a total fiasco. Next we worked on a 6-inch f/8 reflector that ended up at f/12 but worked, sort of. And it was built in time for the opposition. It had no finder and a horrid homemade eyepiece. I have no idea what the power was but the eye lens was about 1/4 across so it probably gave about 125 power. I saw no canals just a reddish fuzz blob. It was years later I tried a decent eyepiece and found the mirror was excellent. I had been using a 2.4-inch refractor as the 6-inch gave such lousy images due to that eyepiece. I still have the mirror though the cardboard tube has long since died. Still, fuzz blob and all, like the 200 telescope, I saw no canals and there were none! Can I take credit for proving Lowell wrong?

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super-secret Air Force installation in New Mexico where they're hiding a crashed flying saucer and the corpses of 12 Little Green Men (you didn't hear it here first!). Or maybe knowing that the Aurora, the mysterious craft that Everybody Knows Exists But Nobody Will Talk About is, like the SR-71 twenty-five years ago, an invisible icon of this country's technological prowess: that we can still do it right if we want to-- or if we have to.

The SR-71 will be among several new exhibits at the much-expanded Cosmosphere when it opens next year. Groundbreaking is this spring. Our next trip, I suspect, will involve many more PAC members.

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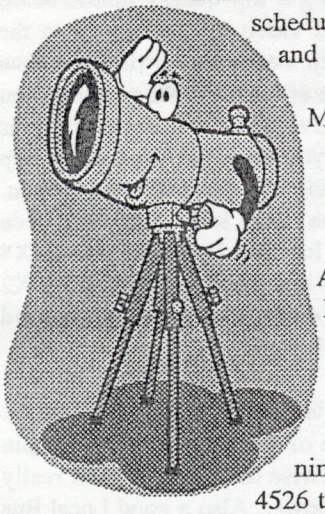
Observing Chairman's Report

by Jason Stahl



When the sun goes down, we come out and play. After all, "Astronomers Do It All Night Long." Be at our next scheduled star parties on May 6th and the 13th at the Atlas Site. The cloud/rain dates are the 7th of May, and the 14th.

Moon Phases for month of May:

Last Quarter is on the 2nd	New Moon is on the 10th
First Quarter is on the 18th	Full Moon is on the 24th

It has been some time since we have had a Meteor Shower Update. May fourth is the peek of the Eta Aquirids Shower. You can find the radiant located at 22h 24m, and a declination of zero. Comet Halley is the associated object, and you can see an average hourly rate of 20 with an average Duration of Maximum of three hours. The peek time is around 1a.m. for those who will go out on Wednesday morning.

Well, we have another Explosive visitor in our skies. This time M51 is the lucky winner. Located nine seconds from the core, this super nova is slightly less difficult to see than the super nova in NGC 4526 that occurred last month. A ten inch scope with moderate power will catch this fainting star. In a reflector the nova is on the west side of the core. Now is a perfect time to see M51 because from the site, M51 is North of Lincoln lights. This year may be an active time for Super Nova hunters across the world, let yourself be the next world renown astronomer. But you need to go out and observe the next Galaxy to be chosen to host the next visitor.

In the Northeastern section of Auriga, you will find an seventh magnitude Comet. Comet McNaught-Russell is a bluish-green comet without a large tail, is easily spotted in medium to large binoculars as the common fuzz ball shape. In a telescope, Comet McNaught-Russell takes shape. It will look like an oval fuzzy patch, similar to the carpet fuzz in your house. Get out and enjoy this wonderful Comet heading to the Northeast as time passes.

The return of the planet Jupiter rising in the east after sunset, promises to bring spectacular views before being punched in the back by Comet Shoemaker-Levy 9 in July.

Directly overhead in Coma Berenices, M53, located at 13h 12.9m, 18.10 degrees, and a magnitude of 7.7, this small Globular Cluster will be an easy beginning target this month to catalog into your Messier Log book. Another Globular Cluster that is little more difficult of find is in the Constellation Bootes. NGC 5466 is at 14h 05.5m, 28.32 degrees, mag. 9.1 is 1.6 minutes smaller than M53, but looks are deceiving, NGC 5466 is scattered about more than M53. NGC 5466's core is much fainter and harder to find, you may think this is an Open Cluster, but it is not.

In Leo, M96 is a small dense galaxy at 10h 46.8 min., 11.49 degrees shining at magnitude 10.1, M96 is only 7.1x5.1' in size, so look carefully and you will find this Particular Barred Spiral Galaxy pleasing to look at.

Also in Leo, larger and brighter than M96, NGC 2903=2905(formerly considered distinct), located at 9h 32.2m, 21.30 degrees, 9.6 mag., and 12.6x6.6'. This Barred Spiral+ is a great galaxy for any size telescope under dark skies. You will be impressed with its moderately bright core and its arms splicing into several smaller arms.

In Canes Venatici, straight overhead, you will have the perfect opportunity to observe M106, 12h 19.0m, 47.18 degrees,9.0 magnitude, 18.2x7.9', this Spiral Galaxy has two arms protruding to the north and south. Under dark skies and good to excellent conditions, you could associate M106 to look like a paper clip.

Finally, back in Coma Berenices, M99 will be the hardest to see a large amount of detail in. If you are relaxed and have good to excellent skies, you may see chunks of brighter material in the arms of this Spiral Galaxy. You will find M99 located at 12h 18.8min., 14.25 degrees, 10.4 mag., 5.4x4.8'. You will mainly see a soft glowing fuzz around the core, with some chunky areas where the arms are.

Don't forget your BUG spray, and something refreshing to drink. Happy Observing!

Computer Buying Guide Update Part II

by Rick Johnson

Since I wrote the first half of this article the 100 Mhz 486 has come out and is called the DX4 even though it is a clock tripler chip running at 33 Mhz. Is it really running at 99 Mhz? Intel doesn't say and you can't get inside the chip to tell. Anyway it runs at 3.3 volts so runs cooler than the DX2 chips. Of course they sell at a premium but if you just must have the fastest 486 around or are looking to upgrade your 33 Mhz 486SX this would be an option. Even though it runs at 3.3 volts it can interface with 5 volt chips as long as your motherboard has provision for 3.3 volt 486 upgrade chips. But if you really want speed at any cost there is the Pentium.

Forget all about the 60 and 66 Mhz versions. They run very hot and were intended by Intel to be a stop-gap measure anyway until the "good" Pentiums came on line. The first ones now are out. They run at 3.3 volts and use .6 micron technology. To you this means they run far cooler and will last longer than the old versions. To Intel it means the chip can be made in far higher quantities, runs faster and costs half as much to produce (about $175 per chip compared to $350 for a 60 Mhz Pentium.) Since it runs faster they can (and do) charge more for a cheaper product. Just thought you should know this. Right now the only Pentium using the new technology runs at 90 Mhz on a 60 Mhz bus. By June the 100 Mhz Pentium running on a 66 Mhz bus should be out. Followed by even faster Pentiums. Other chip manufacturers promise to be making clones of the Pentium by then which should spawn more lawsuits and drive the prices down. The Pentium gets its speed not only from a faster clock speed (right now the 486DX4 has a faster clock) but from how data travels into, through and out of it. First of all it uses a 64 bit data path rather than 32 like the 486. Next, it has one internal 64 bit bus and 8K cache for instructions and another 64bit bus and 8K cache for data. This allows it to load instruction and related data in one clock cycle instead of two as the 486 requires. Next it can be doing this with two instructions and data sets at one time. Thus, it can process more than one instruction per clock cycle IF the compiler the software manufacturer used takes advantage of this. Unless the program is Pentium specific this is won't be happening and much of the Pentium's speed will be thrown away.

When the 486 replaced the 386 little change in the computer's architecture was needed. Then meant manufacturers could quickly and cheaply retool for the 486. This isn't the case with the Pentium. It is a 64 bit wide chip not 32 meaning twice as much data can be handled at once but this means completely redesigning the computer's motherboard. Also the new Pentium's require 3.3 volt support chips as well as memory cache. Also the Cache should be 512K to 1M for full speed operation but this is rarely found in base machines. Most manufacturers offer this at added cost however. It's money well spent.

When running these fast machines, either Pentium or the DX4 chips, be sure you are getting a top quality motherboard and that the hard disk system and video system are up to the task. If they aren't you end up with a computer little faster than a 486DX2 computer. In fact there are some DX2 machines out there that outperform the 66MHz Pentiums just because of this quality of these components. If you need (or must have) top performance you won't get it buying a cheap DX4 or Pentium. Since I wrote the first half the PCI local bus has been outperforming the VESA local bus on Pentiums and DX4 machines and the V-LB has been the faster on 486 and DX2 machines. Though there are exceptions both ways and tomorrow may be a whole new ball game.

When shopping for a hard drive for a "super" machine be sure to get one with an access time of less than 10ms and a spin rate of 7200 RPM or better. Otherwise the hard disk will really slow you down, especially in Windows. Also a good Local Bus video system is a must. If you run only windows there are several good ones out there such as the Diamond Viper and Matrox MGA Ultima. But if you need video speed in DOS the super fast Windows systems are real dogs. Often they are slower than cheap "frame buffers" you can get for $35 instead of the $300 and up you paid for your super board. The ATI Ultra Pro does fairly well in Windows and fair in DOS. Those using the Tseng ET4000 frame buffer and related windows accelerator the W32P are probably the best compromise if you run both systems. One such board is the Hercules Dynamite PCI Pro. If you plan to run Windows using full 24 bit graphics the Matrox MGA Ultima is about the only solution I know of that is affordable (barely) but you pay a very steep price in DOS performance.

Most of todays 486 machines claim to be Pentium compatible, implying you can put a Pentium chip into them. Well maybe Intel will come out with one but it sure won't perform like one. The Pentium needs a redesigned motherboard which you won't have. You will still be running a 32 bit bus to a 64 bit CPU. You will be feeding it with a cache that can't provide instructions and data at the same time and you will still be using your old (slow) video and hard disk systems. You will see little gain for the bucks spent. Also going with the DX4 chips won't help much if your other systems aren't up to its speed.

A friend (not in the club) recently bought a Packard Bell 25 Mhz 486SX and wanted a copy of my sky program for it. I put it on and found it took 1 minute 47 seconds to calculate a sky my 20 Mhz 386 with co-processor does in 2 seconds! Even the kids game computer, a 25 Mhz 386 without co-processor or

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cache, takes only 37 seconds. Why the difference? I don't know but since the 486SX on paper is twice as fast as the kids 386 it should only take it 20 seconds or so. Obviously internal timing in this particular Packard Bell machine is very poor. The BIOS is not mating with the hardware worth a darn. He may have installed something the BIOS can't handle well or set a jumper wrong or the particular model is the worst designed I've ever seen. I've seen BIOS problems slow a machine but not to this extent. Machines with poor internal design run half the speed of a similar well designed one but this difference is ridiculous.

Why am I bringing this up? Just because the parts look great on paper doesn't mean a thing if they don't work well together. Try before you buy or buy with a no cost 30 day return guarantee. Check the literature to see what various benchmark test results are for your class of machine then run the benchmarks on your machine. If they don't measure up return it and try someplace else. One source of such benchmark programs is Ziff-Davis publishing Co. They have PC-Bench 8.0 for testing DOS and Winstone 94 and WinBench 4.0 for testing Windows. I have copies of all of these and you can get them free by writing Ziff-Davis Benchmark Operation, One Copley Pkwy., Suite 510, Morrisville, NC 27560, Attn.: Distribution Coordinator. Ask for which test or tests you want. Winstone 94 is huge and available only on CD-ROM. If ordering it you get the others included on the CD-ROM. To run they require more than 30MB of free contiguous space on C: drive.

One thing Winstone 94 really shows up is the effect of adding more memory. It uses actual Windows programs just as you would so makes the best possible test. I find my 20 Mhz 386 with 8MB of memory is as fast as a 486 33Mhz machine with 4 MB of memory. **IF YOU RUN WINDOWS WITH 4MB OF MEMORY, YOUR BEST AND CHEAPEST UPGRADE IS TO BUY ANOTHER 4MB OF MEMORY.** You will see some additional gain up to 16MB but it won't be nearly as great. Configure the memory so that 2MB are used for SmartDrive (or other Windows cache) and the rest free for Windows to grab as needed. If you have 4Mb use a 1Mb cache. Use a 4MB cache with 12MB and up of memeory. After upgrading memory reset your permanent hard disk file size. Its under Enhanced Memory in the Control Panel Icon. Select the Change Virtual Memory option and do what Windows recommends

In the last year the size of a hard drive needed to run Windows has increased. Windows is larger than ever (version 3.11) and the average Windows program is also larger. Documents with pictures eat memory rapidly. For Windows I'd now recommend at least 350MB before any disk compression is used. 500MB would be even better if you can afford it. If your kids will be running educational games and software under DOS they can be huge too. Go with at least a 250MB hard drive in this case and larger if you can afford it. I have a 1000MB hard disk and am always running out of space! Hard disk space is like closet space, no matter how much you have, it is never enough.

Both Apple and IBM have now come out with their PowerPC RISC based computers. Prior to their release both used CISC chips in their computers. (RISC: Reduced Instruction Set Computer; CISC: Complex Instruction Set Computer) They can run current Apple and PC software only by emulation. This step greatly hinders their performance. Mac software will emulate quite well but PC software often uses undocumented calls the emulators don't emulate. Program crashes are the result. Until a lot more software is available in the PowerPC's native language they are a poor buy. It is highly doubtful that much of the current PC software will ever be due to the high cost of conversion. Lotus just announced it won't support PowerPC platforms put out by Apple. Mac software will convert much more easily as it is far more "standardized." With the huge base of PC's out there new PC software will nearly always appear much later in the PowerPC format. Because a RISC processor is far simpler than a CISC one (Complex is the definitive word here) the cost is much less for equivalent speed. But the CPU must use more instructions to do the same job. Right now it is nearly a dead heat between the two but only if the PowerPC is not emulating a Mac or PC. If it is, it is no faster than the very bottom line machines. The RISC computer does shine in its handling of floating point numbers. There it beats the socks off the Pentium which does the same to the 486 machines. But here you will probably have to write your own stuff to see this gain until such programs are ported over to the RISC chip. Due to the small installed base of such software don't hold your breath. But those wishing to model galaxy formation may find the PowerPC useful. Otherwise, check back in a few years.

After all this I must report that I am still using my old, ISA based, power hungry, Dell 386, 20 Mhz computer with co-processor as it is still fast enough for most everything I do. The only thing I have found I can't do with it is run Flight Simulator 5.0. Some math modeling does require several overnight runs to complete while a Pentium could do it in 30 minutes. But as I sleep away the time it is of little importance but a bit annoying as the computer is in the bedroom.

An Encounter with the Northern Lights

by John Lortz

I'm not one who normally watches the local nightly television news, especially on the weekend. I've grown addicted to National Public Radio and have found that it's a lot easier and lot more informative to switch the radio on while I'm shaving or driving in my car.

But, as luck would have it, on Saturday night, April 16th at about 10 p.m. I DID have the t.v. on, hoping to catch the baseball scores that I had missed on ESPN. Well, the scores had just rolled off the screen, and I was getting ready to switch over to Start Trek, The Next Generation, when I heard the weather guy mention something about auroral activity. Someone over in Council Bluffs had called into the station and said that the sky to the north was ablaze with activity.

It had been years since I seen the northern lights. I had been about 17 then, living in a tiny Northeast Nebraska town, and was more interested in girls and cars than in the sky. So I couldn't really remember what I had seen.

Here was my chance to fling-off my arm chair astronomer hat and do some (sort of) real observing out in the field! My wife, Sue, is a 5th grade teacher and is always interested in science things, so I had no problem in talking her into driving out into the country north of Omaha with me, our dog and my camera.

We drove north up I-29 to Missouri Valley, and then northeast into the quiet and fertiel farmland of Iowa. The entire way we kept peering out the car window, watching a strange hazy glow that had settled in to the north.

When we finally found a nice dark hill with a good vantage point, I stopped the car, turned off the engine, and we got out. Neither of us expected what we saw.

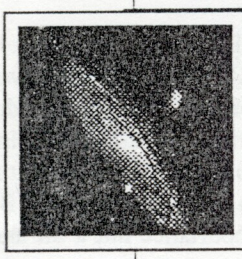
There, across the northern sky from horizon to horizon was sheet of greenish light that magically moved and undulated before our eyes. It was amazing. As our eyes adjusted to the dark we could actually see the sky pulse and huge streamers of light reach up from the horizon, and then disappear in the next minute. It was like a sea, ebbing and flowing against a shore of stars.

We watched for about 45 minutes, and were getting ready to leave when suddenly I noticed a dim flash in my peripheral vision. At first I thought it was the arc of an airport beacon light, moving along the sky. But then the flashes became more frequent and pronounced, and we realized we were viewing another part of the aurorae show. I had never seen this before. It looked almost like summer heat lightening, but was more subtle and soft. Most of the flashes appeared above the brighter portions of the aurorae sheets and almost looked as though they were emanating from the tops of those sheets.

It was somewhat errie to see all this sky activity with no sound other than the slight rustling of grass, the occasional bellow of a cow, and the 'click-whrrr' of my camera.. It was almost as if we were witnessing a battle between the ancient gods, not close enough to see the combatants, but able to see and feel the wrath of their power.

We stayed for another hour before deciding to head back to town. Neither of us said much on the way back, other than muttering the occasional 'wow' or 'wasn't that great'. Mostly, we were lost in thoughts about what we had seen and how we would describe it to our friends. The funny thing is, neither one of us has really talked much about the experience. Not because it wasn't incredible, (it really was!) It's just that neither one of us knows how to describe something that you just have to see with your own eyes.

And you know what? The three rolls of film I shot are still sitting here on my desk. Maybe I'd just hate to ruin the lingering picture in my mind with something I know my camera could never see.



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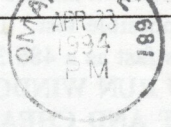

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