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Rod Mollise's

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Great, Huge Mars Opposition Wrap-up!

Thoughts on the 2003 Mars Apparition

Pat Rochford

It is now mid October and, luckily, a major dust storm has yet to occur on Mars. I would certainly rate this up as the best Mars apparition I personally have ever witnessed. Everything seemed to fall into place – from having the right equipment, to occurring at just the right time of the year. If I should go out tonight and find the Angry Red Planet a featureless salmon colored disc, I won't lose much sleep over it. I promised myself at the beginning of spring I would observe Mars on every clear night. And for the most part I have done just that.

The 2003 apparition has been on my mind for quite a few years. After experiencing Mars' close approach in 1988, I knew there was no way I was going to miss out on this year's once in a lifetime opportunity. Although I did witness some incredible surface details that fall (I had a Celestron C8 at the time), I didn't observe Mars nearly as often

as I should have. I was going through a nasty divorce at the time and I didn't really have my heart in it. That was not the case this year. And although my eyes aren't quite as good as they were the last go around, I have seen more than enough to make up for this slight disadvantage.

I don't have the C8 any more. In 1996 I built an 8" F/7.5 Newtonian optimized for lunar and planetary viewing. And although it is in a Dobsonian mount configuration, it is motorized with a Dob Driver II system which smoothly and accurately tracks at magnifications in excess of 500X.

The C8 had very good optics, but slightly over twice the amount of central obstruction of this 8" Newtonian. The second major equipment upgrade since 1988, has been a TeleVue binocular viewer. At over \$1000 this is a rather expensive accessory, but it has been a grand very well spent. Not only is observing more comfortable, additional detail can be seen, since it is recognized by two different sources in the brain. Unfortunately these two sources each require their own eyepiece, so there is the added expense of matching sets. I decided to purchase sets of TeleVue Plossls, even though eye relief is a bit lacking in the shorter focal lengths. For the purpose of planetary viewing, an ultra-wide apparent field is not at all necessary (even though I have become spoiled with my Naglers for deep sky viewing), so the fifty-degree apparent field of the Plossl is more than adequate. With the six sets I have, the magnification ranges from 95X up to 375X (taking into account the 2X barlowing factor of the BinoVue). This has been perfect for

the typical viewing conditions we experience here on the Gulf Coast.

Now I have never been one who cared much for using colored filters on the planets. I know they enhance certain aspects of surface or atmospheric features, but in my opinion they do so at the cost of ruining the natural colors of the planet itself. I'm afraid I'm more in it for the aesthetics than the actual science. My wife on the other hand, knows only that Mars needs to be orange. Not for the enhancement of any topographical features, but because *it's just supposed to be orange!* So, being the dutiful husband, I bought a pair of #21 orange filters. With this inexpensive (\$30) investment I was able to deliver the Mars of my wife's expectations. And, though I hate to admit it, they actually came in handy during a couple of observing sessions with another scope. More about that later.

I mentioned earlier how fortunate it was for this apparition to have occurred in the summer. Well, mostly. We sort of caught up on the lack of rain we've been experiencing the last few summers. The month of June, just about the time Mars was really getting large, brought us just over *twenty* inches of rain. This averages out to 2/3's of an inch every day ... and it takes a lot of clouds to make that much rain. July was a little better, but not by much. Thankfully, as August arrived this evil weather pattern departed and things returned to near normal. By normal I refer to a late afternoon thundershower (on an almost daily basis) with clearing skies by about dark thirty. The Gulf helps to regulate the temperature, where there isn't such a drastic fluctuation between day and night. Actually it's just hot all the damn time. But that's okay because the seeing remains pretty decent for the most part. The combination of this steady atmosphere and our low latitude (30 degrees north) no doubt made for some of the better Mars observing conditions in the continental U.S.

The only real downside to August and Septembers' spectacular viewing was the presence of mosquitoes which was nearly Biblical in proportion--we are talking plague here. All the rain from June and July had produced a population of mosquitoes that easily outnumbered the local human population by at least a thousand to one. Add the threat of West Nile Virus and you had the making of an episode of Fear Factor.

Although I used the 8" Newtonian almost exclusively, I did occasionally use one of my other scopes as well. On three occasions I rolled out the 24" F/4 Dobsonian. The resolving power of this scope dwarfs that of the 8", but it is proportionately susceptible to any turbulent air up there as well. There were a couple rather incredible views with the BinoVue and a pair of 15mm Plossls (325X) but they were brief - not consistent as with the 8". And not having tracking capability, I had to continually nudge the scope to keep Mars in view. Couple this with a disc that was so bright that it nearly hurt to look at, and it doesn't take a rocket scientist to figure out why I didn't use the 24" every night. I did however, make use of the aforementioned orange filters so as not to cause permanent damage to my retinas. Going the other direction, I tried Mars out with my ETX90 on a few nights as well. Here was a case where there wasn't quite *enough* aperture. Mars appeared very sharp, but I was unable to see much in the way of any specific detail (at 180X) beyond the south polar cap and a large dark area like Mare Erythraeum. Viewing Mars with a scope this small, even with excellent optics, is not necessarily a waste of time, but certainly isn't going to give you the results of a scope six inches or larger. Finally, I also used a 10" F/5 Dob that I recently made for my son. If it were not for having to 'nudge' this scope as I did with the 24", I might well have used it exclusively instead of the 8". The

extra 2" of aperture added just enough additional resolution and brightness without encountering the seeing problem the 24" experienced. My results seem to fall in line with the statement often quoted, that eight to ten inches of aperture is perhaps best for observing planets and that some method of tracking is almost a necessity. What about 12" and greater? There is no doubt in my mind of the increased benefit from larger aperture, but at some point the seeing issue is bound to come into play. Accurate collimation of course, is an absolute necessity, regardless of the size or type of telescope used. I made it a habit to drop the autocollimator in each evening prior to observing.

What about magnification? On a few nights I was able to view a very steady Mars with the 10" at 470X (8mm Plossl with 3X barlow). At the other extreme, there was a night or two where 150X was pushing it. On most nights, Mars would tolerate around 300X. When I read internet postings of people who struggled to get up to 200X, I realize just how fortunate I am to live where short focal length eyepieces get frequent use.

I attempted a few CCD images (8" LX200 / ST237 camera at F/30) and made a sketch or two, but my primary goal was to just look and enjoy. That I certainly did and continue to do as Mars now dwindles in size. The pictures that I carry with me are only in my memory, but what incredible shots they are. Solis Lacus - the Eye of Mars - staring right back at me. The dark rift Rima Australis appearing as the south polar cap began to melt. The color of Syrtis Major, so dark with just a hint of green. Easy to imagine how it could have been mistaken for vegetation. Surface fog near the northern pole and the occasional bright spots that must have been clouds or blowing sand maybe? And of course my wife's 'orange' Mars compared to my pale, salmon Mars.

I did experience a disappointment or two as well. The elusive moons Phobos and Deimos – no sign of them. Nor the Tharsis volcanoes. No matter, I think I got to see just about everything else – several times. Several wonderful times. And even though Mars continues to diminish in size, I still find it well worth observing on these cooler (thankfully) fall evenings. By Christmas the show will pretty much be over with and I suppose I'll pack up those goofy orange filters. But only for a couple of years, as my wife will be wanting to look at 'orange' Mars again when it reaches a respectable size (about 20 arc seconds) around the first of November, 2005.

Mars Imaging with Webcams

Rod Mollise

Mars is tough. Tough to observe visually and especially tough to image. Those of you who've got a few Mars oppositions under your belts know what I'm talking about. I don't think I've ever let a Mars "season" go by without attempting to take a few pictures. But my usual results were not exactly something I wanted to show-off to my friends. More likely they've been buried in the back of a drawer somewhere, safely out of sight. Yes, that bad.

I started out in the 1970s with a 35mm camera and an eyepiece projection adapter. What torture! Mars is always relatively small, no matter how good the opposition circumstances, and that means enlarging the disk on film by projecting it with an eyepiece. Unfortunately, even with fast film, that makes Mars terribly dim and exposures relatively long. And this high magnification means that the slightest vibration of the scope is

highly exaggerated. Just tripping the shutter is often enough ruin a shot. I kept at it, though, trying everything, and occasionally would get an image "good" enough to show some evidence of a polar cap and some vague, vague hints of dark albedo markings. I didn't feel too bad, though, since even wonder-workers like planetary imager Don Parker didn't do much better. Heck, even professional Mars film photos were nearly as blurry as mine.

With the 1990s, electronic picture-taking became an option for many amateurs. By the middle of the decade quite a few of us were experimenting with video cameras for planetary imaging. I, like other amateurs working with video, was easily able to better my film results by using camcorders and black and white closed-circuit surveillance cams. But the results were still not quite there. The problems with video were twofold. First, most vidcams, both camcorders and surveillance cams, didn't offer much in the way of exposure control. Some camcorders did have limited shutter adjustments, but if you were using the more sensitive surveillance cams (and sensitivity is important for Mars, as you'll have to enlarge the image considerably to obtain high-resolution) you usually had to accept whatever came down the video cable.

The other problem was stills. Having a video of Mars to show your friends on TV was fun, but like other astrophotographers, most of us astrovideographers really wanted nice still images to pass around or post on the Internet. Frame grabbers and Snappy image capture cards provided OK results, but some quality was obviously lost in the required analog to digital conversion. And trying to make a noise-reducing stack by combining dozens or hundreds of video stills using non-astronomy programs like Photoshop was challenging to say the least.

The big news for planetary workers as the 90s wound down was, of course, the CCD revolution. The amazing results Don Parker was getting with a relatively inexpensive camera showed that the integrating CCD camera was not just for the deep sky. I myself was enthusiastic about obtaining an imager that promised better results than either film or video, and as soon as CCD prices came down to the 1000 dollar level I bought a Starlight Xpress MX516 camera. This performed relatively well, producing monochrome images that were much better than what I had been able to do previously with film or video. Jupiter, in particular, began to give up some of the belt detail I'd dreamed about but had been unable to quite capture with my vidcams.

But I still wasn't overly happy. My planetary images *were* better, but after seriously using video for five years there were some things I really missed. Mainly, live images. I had grown accustomed to focusing using a constantly updating video image on my monitor. The CCD cam, in contrast, given its parallel interface, was able to deliver a frame to my computer screen once every 5 seconds at best. I could improve on this by going to "focusing mode," but that reduced the frame size to a small spot that would not accommodate the whole disk of Jupiter or Saturn, making it hard to get the planet framed, and, once framed, focused with a moving-mirror focusing SCT. Very hard. I also missed the color that I could obtain easily with video. I really didn't have much interest in trying to learn the arcane art of tricolor CCD imaging, either, being focused on obtaining as many images as possible during times of good seeing. Since I'm not overly interested in deep sky imaging, these drawbacks of CCD cams for planetary imaging meant that I really wasn't using my camera. The last year I had the MX516, I think I used it twice.

And there things would probably have remained if an Internet buddy hadn't convinced me to try webcams. Yes, webcams, the little devices originally designed for Internet video conferencing. My friend explained that these inexpensive little things were a boon for planetary imagers. Actually better in many ways than the most expensive CCD cams. I was skeptical. How could a hundred dollar

webcam be the best a thousand dollar CCD camera? My bud patiently explained that the characteristics of a webcam which appear to make it inferior to a "real" CCD cam actually mean that it's *better* for planetary use.

Yes, webcams have small CCD chips in order to keep their prices down (some current webcams use CMOS chips—steer clear of these, as CCDs are more sensitive). But this has the effect of providing the planetary imager with a nice large image without having to resort to dreaded eyepiece projection. In addition, the small pixels of these small chips mean that you get pleasingly high resolution, too.

No, webcams (unmodified webcams) can't do exposures longer than a second or two at most, but they are sensitive enough that the planetary worker usually doesn't need longer exposures. And these short exposures come out in a

veritable flood of image frames. Five or more every second.

Those of us experimenting with video determined years ago that the way to capture the planets is collecting and stacking many frames, choosing those that were obtained during moments of best seeing. Being able to build an image out of these best frames means that the webcam user has the literal

cameras can be found on Ebay for 10 dollars or less). OK, OK, I'd try it. I started simple, using just the software that came with the Quickcam and processing single frames. I was amazed! The little sucker produced images easily as good as my best analog videos with little effort. I was able to do even better after I downloaded a freeware program for camera control, K3CCD Tools, and started stacking frames

with another freeware offering, Registax.

I was quickly convinced that webcams were superior for imaging planets, but was also convinced I didn't have the *right* webcam. The main drawback to the VC was its small image format. I wanted a camera that could deliver 640x480 frames. Also, I must admit

that my VC appeared to be on its last legs. In the course of making a 1.25" nosepiece for the camera (a 35mm film can with the bottom cut off which I glued to the front of the cam) and opening it up to remove both built-in lens and IR filter (webcams are always used at prime focus or with barlow projection), I abused the little thing. It was held together (most of the time) by a thick wrap of electrical tape. Which webcam to choose? The most widely recommended model was and still is the Phillips Toucam Pro. Unfortunately, when I got started about a year ago, this camera was very difficult to find in the U.S. These days, you can buy Toucams and professionally made 1.25"



equivalent of adaptive optics, something planetary enthusiasts have dreamed about for a long time. This choosing and stacking is made particularly easy by webcams, which deliver a fire-hose flood of images in digital form ready for processing on your computer, no frame-grabbing middleman required.

All this sounded good, but maybe a little *too* good to be true. I wasn't ready to invest a dime in a webcam to find out—I just didn't see how, explanations aside, a webcam could improve on my "real" CCD camera. I'd just stick with my CCD setup. But my pal persisted, offering to let me have a Quickcam VC he was not using (these 320x240 format

nosepieces from most astronomy dealers. But at the time I was ready to buy, your only option was to search Ebay daily.

What to do? I remembered SAC, a little company in Florida beginning to make its mark selling professionally modified webcams. A visit to their website revealed that two color models were available, the SAC4 and SAC7. The SAC 7, based on the Phillips cam, seemed to fit my needs best. It is provided in a good-looking housing with a 1.25" adapter that can be unscrewed to reveal T threads. In addition, it has been modified using the techniques developed by astro webcam guru Steve Chambers to provide long exposure capability. In this mode, the camera can expose for as long as you want, just like a normal CCD cam. I felt this would be handy for Solar System objects like planetary satellites, comets and asteroids.

A final option was the choice between an air-cooled SAC 7 (cooled via a small fan) and the Peltier cooled SAC 7B. The B was a little more than 100 dollars more expensive than the standard camera (\$499.00 vice \$389.00). If I went with the Peltier cooled cam I'd also have to purchase an external 12vdc power supply to power the cooler. In the end, I chose the B. I concluded that it was just a slightly more versatile camera. I knew that, hot as it is down here in Mobile, the Peltier would come in handy if I wanted to take the occasional deep sky shot, and that it might even reduce noise for planetary imaging on really hot nights. How to finance a SAC 7B? Simple. I sold my Starlight Xpress MX516 on Astromart. I hated to part with it, but was realistic. The MX516 is a well-made, effective camera, but I just wasn't using it. I had probably had it out about a dozen times—at most—in the two years I owned it.

I placed my order with SAC in late April, and hoped that my camera would be delivered before Mars got

much closer to opposition. It arrived in due course and I immediately gave it a quick check-out on the Moon. It performed just as advertised, remarkably well, that is, and I now consider it too have been a steal at its just under 500 bucks price, half what you'll pay for a basic integrating CCD cam from Starlight or SBIG.

If you're sure you won't want cooling and long exposure, a Toucam Pro and 1.25" adapter is a sensible choice at around \$150.00 (these cameras are now available from Adirondack Video Astronomy <http://www.astrovid.com> and Scopetronics <http://scopetronix.com>). I see that the telescope makers are even jumping on the webcam bandwagon as well, with Meade preparing to market a webcam-based "Lunar and Planetary Imager."

The camera, of course, is only half the webcam equation. You'll also need software for image acquisition and processing. The SAC cameras come with a complete package, including the COAA developed program Astrovideo for camera control, and FitsX for image processing. Both of these apps are full-featured and well done, but I found that I was happier sticking with the freeware software I'd been using with my Quickcam, K3CCD Tools and Registax. Once the SAC's drivers were loaded, K3CCD was able to operate the camera just as well as Astrovideo could. Two other items I found useful were an IR blocking filter and a flip mirror.

Webcam chips, like all CCD chips, are quite sensitive to Infrared emissions. This is not a huge problem for black and white imagers using reflecting telescopes. But if you're shooting color or shooting with a refractor or SCT, IR can be a problem. The problem for color imagers is "IR bleed." The infrared winds up being interpreted as the color magenta by your camera and the Moon, Jupiter, Mars or just

about anything else will assume a purple hue. This can be removed in image processing, but this is an extra step, and it may be hard to decide which color is "right." With an IR blocking filter in place, this magenta cast is much less noticeable. You may still have to play with the camera's "white balance" control to get color where you think it should be, but this is much easier with the filter than without.

If you use a refractor or other scope with a lens element(s), the Infrared problem becomes more serious. IR is "focused" at a different position than other "colors." This means that even a visually well-corrected refractor may have image softness problems due to the "excess color" of IR. This is less of a problem with an SCT or MCT than for a refractor, but I think it is still good practice to use an IR filter for either catadioptric scope. Luckily, Baader IR blocking filters are available for a modest price—about \$40.00 (Alpine Astro at <http://www.alpineastro.com>).

I also consider a flip mirror vital for the webcam planetary imager. Given the small size of our CCD chips and the high focal ratios we tend to use to deliver high resolution—I often shoot at f/30—it can be VERY hard to get a planet onscreen. Even a goto scope may not help much unless it can place objects dead-center in the field every single time. A flip mirror makes planet-finding easy. It's a clever device that's a little like an off-axis guider. It attaches to the scope (screws onto the back of an SCT or fits into the focuser of other designs), and the camera is either screwed onto the flip-mirror via T threads or inserted into a 1.25" adapter. The flip mirror works very simply. A knob allows you to "flip" a mirror up or down. In one position it sends light to your camera. In the other it sends it up a focus tube to an eyepiece. Flip the mirror up, find the planet in an eyepiece (use a crosshair reticle eyepiece to make

finding really easy), flip the mirror down and the planet is on your computer screen. Most flip mirrors have lockable adjustments for the mirror to allow you to fine tune it so that whatever is centered in the eyepiece is exactly in the center of the chip when you flip the mirror down.

The eyepiece focus tubes on flip mirrors are lockable, so you can focus an image sharply on your camera, adjust the focus of your eyepiece until it's sharp there too, and lock down the focuser so that the next time out you can focus for best sharpness in the eyepiece and be assured that Mars (or whatever) will be close to perfect on the screen. Flip mirrors are available from a variety of sources, but I've found the 1.25" Meade model to be effective for a very modest price. Believe you me, a flip mirror can save time and preserve your sanity.

Once you've got your gear assembled, you can start taking pictures and processing your images. How exactly do you do that? Well come with me on a typical Mars imaging run.

While I could use a larger SCT, I find my C8, a 1995 Ultima 8 very effective, and maybe a little less prone to the effects of poor seeing than larger scopes. I try to get the U8 out in the backyard and acclimatizing to outdoor temperatures at least an hour before I plan to start my imaging run. In addition to the scope, I'll setup a camping table to hold the computer.

Which is a good time to mention computers. As you may have guessed, a webcam, unlike a video cam, *must* be used with a computer. A laptop is nice, but not required. Since there's no reason to leave home for a dark site for planetary imaging, the backyard is fine. That being the case, you can use a desktop instead of a more expensive laptop. Using a desktop has other advantages in addition to

price, too. You can use a large, bright monitor which really helps with focusing, and most desktops will outdo laptops for processing power and storage capability dollar for dollar. Veteran imagers recommend putting a desktop on a microwave or other rollable cart to save the effort of lugging CPU and monitor out every night.

With scope acclimated and computer ready to go, it's time to take Mars pictures. If I haven't done so already, I mount my flip mirror onto the back of the SCT, insert a 2x or 3x barow into its 1.25" port, and insert my camera into the barlow. I usually shoot Mars at f/30 (f/10 SCT x 3x barlow = f/30) for maximum detail if seeing permits. When the camera's secure, I plug it into the computer. All modern webcams are USB devices. This provides adequate speed for image transfer, and allows you to conveniently plug-in or unplug the camera with the PC powered up without fear of damaging anything.

My next action is to start my camera control program, K3CCD Tools. When it's up and running, I select the proper driver for the camera I'm using from a menu (you can use any number of different webcams with K3CCD, since it uses the drivers supplied by the camera). I then choose a frame rate for my webcam video, usually 5 or 10 frames per second for best quality, and hit "preview". Using the flip mirror, I adjust the scope's aim until the planet is centered on the monitor and, taking my time, focus until I'm satisfied that Mars is as sharp as I can make it. I then recenter the planet if necessary before beginning the exposure. At this high magnification delivered by the combination of a high focal ratio and a small CCD chip, any polar alignment problems or periodic error will be grossly magnified, and you may find that you have to "guide" using the scope's handpaddle to keep the image centered during the exposure. If you don't want to fiddle

with exacting polar alignment, one of today's alt-az tracking SCTs can make life much simpler. If your scope features Periodic Error Correction, PEC, you may want to engage it to reduce Mars' otherwise inevitable drift back and forth across the frame.

Almost ready. Before hitting the shutter, I bring up the "video source" menu, and adjust exposure and color balance. How slow or fast an exposure? What you should aim for—using K3CCD tools, anyway—is a brightness value (displayed onscreen) of about 150. This provides a good exposure without burning out details. In addition to shutter speed, webcam drivers usually offer gain adjustment, brightness adjustment and gamma adjustment. I'll advance the brightness toward the top of its scale, and increase or decrease shutter speed to keep the image in the 150-200 range. Gain, conversely, stays close to the bottom to prevent electronic noise in the images. Gamma should also stay near minimum for best results.

It's almost time for picture taking! After adjusting the exposure, I make any final focus adjustments I deem necessary, center Mars again, and hit the "expose sequence" button. I generally shoot sequences of about 60-90 seconds at 10 frames per second. This yields .avi files (computer movie files, that is) of about 500-900 frames, giving me plenty of still images to choose among. How long you can shoot depends largely on your computer's hard drive space. Since a single 60 second exposure will consume up to 500 megabytes (that's right, MEGabytes), you'll quickly eat up disk space. In the interest of hitting good seeing, it's usually a better idea to shoot a number of 60 second .avi files over the course of the evening than to shoot one long sequence. The drive on my PC will accomodate about 20 exposures of this length before I run out of disk space.

With your .avi files in the can, it's time to either carry all the gear inside or do a little visual observing. I like to view Mars for at least a few minutes the "old way" before calling it a night.

What's next? Processing. You've only just begun, as all you have are unprocessed video files of Mars. The planet will tend to look dim and blurry in individual frames, and you'll wonder whether you're wasting your time. You're not. This is where Registax comes in. Registax, now in version 2, is a freeware program authored by Cor Berrevoets that allows you to do two things: stack the best frames from your .avi files to reduce noise and improve contrast, and process them using its innovative "wavelet" filters to bring out fine detail.

Stacking is very simple with Registax. All you have to do is choose an .avi file on the drive, select an area of the image to "track" (because of this ability to track and align images, it doesn't matter if Mars drifts around in the frame), and hit the "align and stack" button. With a planet, I select the entire disk for tracking. When imaging the Moon, I choose a small high-contrast crater or other small feature.

Your next action depends on your needs and skills. I usually just press the "align and stack button." In this mode, Registax aligns, optimizes and stacks your images, presenting you with a finished picture ready for processing in around 5 – 10 minutes (or shorter if you're using a fast PC or longer if you're stacking a large number of frames). For sophisticated users, Registax allows adjustment of a variety of parameters and settings, but I have found the "auto" mode more than sufficient to turn out excellent Mars pictures.

Once your images are aligned and stacked into one picture, the

resulting image is displayed onscreen. It will look pretty good, much better than your original frames, and I'd have been proud to obtain an image of comparable quality in the bad old days of planetary imaging. But until you run your picture through Registax's wavelet filters, you're only seeing a tiny portion of its detail. What are wavelet filters? I suspect you'd need a lot more knowledge of advanced mathematics than I have to adequately explain how they work, but, put simply, they are like a series of unsharp masking controls. When you arrive at the processing screen, Registax presents you with a series of six sliders. Each of these controls applies filtering to one "layer" of your image. In practice, moving slider one off zero sharpens smaller details, slider two works on slightly larger features, and so on. I'm still learning to use this sophisticated tool, but I can tell you that it has done more for my images than any other image enhancement technique I have used. It is positively amazing to move the wavelet controls off zero and watch your semi-fuzzy disk of Mars suddenly explode into a positive welter of detail!

Following wavelet processing with Registax, I'll usually save my shot as a .bmp file and transfer the image to a program like Paint Shop Pro or Photoshop for some final tweaking. Actually, the current version of Registax, Registax 2, offers enough image enhancement features—contrast, brightness, gamma, hue, saturation, etc.—that there's much less need for post-Registax fine-tuning than there used to be. When I'm all done, I archive the best .avi sequences onto CDs. This is very important, since imaging tools like Registax are improving all the time. Who knows how much more detail you'll be able to pull out of this opposition's videos with next year's software?

Yes, I'm turning out planetary and Lunar shots with my webcams that

are far, far better than anything I ever produced with any other media. But that doesn't mean a webcam is the *only* path to excellent planetary results. Browse through this issue's gallery section and you'll see some remarkable pictures shot with digital cameras and CCD cams too. But I think that for most amateurs the webcam is easily the most user friendly and effective tool for obtaining attractive and scientifically useful planetary imagery. If you've got further questions about getting started with planetary webcams, please feel free to email me at RMOLLISE@aol.com.

Mars Viewing Parties San Antonio Style

Becky Ramotowski

The residents of San Antonio turned out in mass numbers for two nights of Mars viewing parties hosted by the Scobee Planetarium and the San Antonio Astronomical Association.

The first night of viewing on August 27 during Mars closest approach was highlighted by ALL of the local television stations doing live coverage of the event. About 4,000 people showed up to look at the Red Planet! There were lines a block long of excited people waiting to see Mars. Most had never looked at Mars through a telescope, and were very patient while waiting in the long lines.

The second night of Mars viewing was held two days later on August 29, which happened to be a Friday. Since this was not a work or school night, the crowds were just amazing. There were almost 6,000 attendees! Talk about a "block party"! Luckily the San Antonio Astronomical Association members had almost 30 scope owners there eager to show everyone some great views of Mars.

The events did not officially start until 9:00 p.m., but people were showing up at 7:00 as scope owners were setting up their equipment.

The crowds on both nights stayed past midnight, with the Friday night Mars viewing party going on until almost 2:00 a.m. Saturday. It was probably one of the largest Mars parties on this Planet. Just incredible.

Waterfire observing

Pete Peterson

"Waterfires" are an artistic "happening" on and alongside the downtown Providence rivers. See <http://www.waterfire.com/>. The Astronomical Society of Southern New England (ASSNE) offered to run a free public viewing of Mars as a "trial run" to see if public viewing fit in with the event.



As prearranged, Daten Cohen was the first of our stalwart group of observers to arrive. At about 17:45 Daten parked his vehicle in a nearby parking lot and waited for me by my pickup truck, which had been left curbside next to the observing area earlier in the day. My son Dave is one of Waterfire's Men In Black, so I borrowed his car earlier in the day after we'd selected and roped off an observing area. We anticipated that all nearby on street parking would

be gone by 18:00, and the plan was that we'd drop our scopes off at the truck and go park the cars in the nearby lot. As it turned out there were a few curbside spaces still open. Around 18:25, after all ASSNE volunteers and some associated family had piled everything in or next to the truck, which was guarded by Daten, we loaded the scopes about 100' into the park to our site.

It immediately became obvious that the front of our rectangular area was at an angle to the area to the southeast where we anticipated viewing. The river flows south. From the river inland we were arrayed Manny Monte with his 10" GPS, myself with my 12" GPS, Bob Sikes with his 8" LX50, and Daten with his 8" Dob. Bill Lambert and his 8" was sort of squeezed out of the front row because the scopes were all at an angle instead of along the front edge of our rectangular area. So he set up his 8" Dob in the deep rear corner. Manny brought his wife and small children, and Bob brought his teenage daughter (and she proved to be very helpful).

As we setup people started to stop by to ask questions. Are those telescopes? What are you going to be doing? The answer was that this was an experimental Waterfire event, that the public would be able to view Mars, and no, we would not be charging money. There was a short line formed when I turned around from just doing the quick mechanical setup. I sent them away explaining that it was still an hour until dark.

The fires were lit off around 19:30, and we were positioned with a view of both the fires and the live Gargoyles perched on the WW1 monument. Around 19:45 Bob spotted Vega and the 3 SCT guys started their alignments. By 20:00

we were ready to rock. Except neither Mars nor the moon were yet visible – Mars having just risen and the moon being masked by a skyscraper to our south. We tried M13 and in the twilight heavily light polluted city sky it was dim and difficult to see. Not at all the gem that we're accustomed to. Bob went to Albireo, but that wasn't going to get the general public excited. We looked again and were saved. The moon was now visible. And the line of folks waiting to look through the scopes extended back 50'. Roger Forsythe and Cathy had tried to make it, but Roger's illness played him a trick and kept him home. So we had no gatekeeper. After having a couple of people wandering around within the area trying to look into more than more than one scope we quickly developed a system where the scope operator would go to the "gate", and invite the next group in line over to his scope. When everyone had viewed, the scope operator would escort them back out of the gate and pick up the next person or family group in line. This generally worked pretty well. People took the clue and waited to be invited in.

I started out with a 20 mm Meade Plossl eyepiece (152X) on the moon, but as things ran so smoothly I put in the more valuable Nagler 17mm (179X) to provide the optimum view of the rugged terminator. Through out the evening the crowd was just as polite and enthusiastic as possible. The line was usually about 50 people long (a 10 minute wait), but it did occasionally grow to as many as 100 people.

Around 21:30 Mars made its appearance. We switched our viewing from the moon to Mars. I reverted to the 20mm Meade Plossl (152X) with a #22 red filter. Mars is still approximately 23" diameter, and some major features were visible.

Daten and I were the only ones who'd been to a Waterfire, and the plan was for everyone to take a ½ hour break and walk around a bit. That never happened, as we would have been overwhelmed.

Sometime during the evening as I finished my canned spiel, I heard Bob behind me doing his professorial thing and posing questions to a viewer so that they could figure out why Mars was "dancing" a bit. Apparently the Socratic method is not dead at

People were continually pushing money at us. They couldn't believe that this great thing was FREE as they valued it greatly. I blew it here, as I should have asked them to donate the money directly to Waterfire – there were several collection sites set up to accept contributions. And with the bad

people who've been standing in line "go away, we're going home"? Once again Bob's daughter saved the day by taking a place at the end of the line and explaining to newcomers that she was the end of the line and the end of the night's viewing. It worked.

We helped each other load, guarding the viewing site until everything was gone. A woman approached me as we were packing. She'd been too late to view Mars, but had heard that ASSNE was doing this for FREE, and wanted to tell me that she thought it was wonderful that we didn't charge money or take contributions.

It was 24:00 as I pulled away from the curb.



Northeastern. I found myself wishing I could be half as spellbinding.

Dave Fox showed up with his family for a while and provided Bob with a few minutes relief. Camille Legley came by and was helping out as well. Rose Amaral and her family stopped by to say hi and check out Mars.

At one point I looked around and noticed that Bill had disappeared. His truck was still there, but he was gone and so was his scope. Daten clued me in. I got Bob's daughter to take over my scope and walked a short distance out of our area to find Bill surrounded by a small crowd as he showed them the moon. This was a real smart move on Bill's part as he really had been having space and visual path problems in the roped observing area. And there were absolutely no security problems.

economy and dearth of corporate sponsors, Waterfire needs the money.

Another part of our plan was to knock off around 22:30 or at least by 23:00 as the crowd thinned out. Now here's a strange thing... The crowd thinned out as expected, but the line for viewing Mars remained constant at around 50 people.

I didn't realize how late it had gotten until Manny shut down his 10" LX200 Classic while explaining that we were running way late and he had to get his very young children home. His poor spouse had been sitting patiently with the children for hours without complaint. At this point it was approximately 23:30

We kept at it for a while, but the line never went down. Where are they coming from? The gargoyles had long ago gone home, or wherever gargoyles go. How do you tell

Conclusions and lessons learned:

* We were all overwhelmed by the warm and enthusiastic response from the Waterfire attendees. I was repeatedly asked whether they could come back and see us again at the next Waterfire 2 weeks hence.

* For a last minute arrangement the club members responded wonderfully. The volunteers that brought their scopes were all hugely hyped by the volume of people who appreciated their efforts. Several said that if we do repeat this viewing, to count them in.

* Scope volunteers were disappointed that they couldn't break free to experience the Waterfire experience. Should we be invited to run another observing event we'll have more notice, and

hopefully will be able to bring some backup people.

* There were no security threats or problems beyond my having to refuse a couple of men who wanted to view through multiple scopes when we had a long line waiting.

* Viewing conditions were excellent. But the fires on the river disturbed the atmosphere we were viewing through so that we had to limit magnification to approximately 150X. Just about everyone who viewed Mars through my scope was able to identify one or more major features shown on my mini-map. When I got home to Barrington I was amazed at the hundreds of stars that had become visible in a 15-minute drive. My attempt to view M13 might or might not have been successful had I waited a little longer into the twilight.

* Based upon an average "processing time" of a little less than 1 minute per viewer, given 5 active scopes running continuously for 4 hours we probably had somewhere around 1,200 to 1,500 public viewings.

"Your description is right on. I had a great time, it was exhausting but I loved it when people exclaimed, "I see it!!". Before they looked through the scope I was showing people an image from Sky and Telescope of the view they might see and many did see some surface detail and the polar cap." Daten

postscript: The artist in charge was thrilled with the success of the Mars viewing. ASSNE ran a second viewing at the Waterfire event of Sept 20th (see <http://assne.org/board/viewtopic.php?t=51>). A third and final viewing for this year is scheduled on Oct 18th.

Lessons Learned from Mars

Jack Kramer

The close approach of Mars in August 2003 fired up the public's interest in the Red Planet. And some amateur astronomers were also turned on to our Solar System, often referred to as the "shallow sky". Of course, there are many who still feel that observing the planets is sort of like dancing with your sister – not unpleasant but not as interesting as all those faint galaxies waiting to be found in deep space.

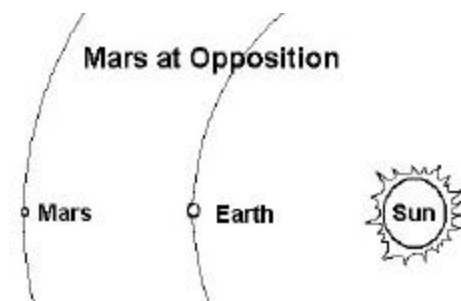
With deep sky objects, there are so many faint fuzzies that the quest is to see as many different ones as possible, and we tend not to re-visit many of those we've already seen. But except for the most distant members of our Solar System, the planets are easy to spot and we look upon them again and again. Their unique appeal is that most are rich in dynamics; it's not just a matter of picking out details, but also seeing what has changed from night to night. For those who are relatively new to observing, the latest Mars encounter has provided a learning experience applicable to other planets, as well.

Gaining Altitude

Altitude of the object in the sky is important – the higher the better. Everyone wanted to see Mars near its close approach on August 27, and all of us were excited to see that bright orange-colored beacon rising in the east. Except that in a telescope it was a quivering out-of-focus blob. Many newcomers wondered why they couldn't even make out the polar cap. If you did

acquire an in-focus image, it quickly drifted out of focus. The frustrating thing was that you had to patiently wait for it to climb higher in the sky so as not to be looking through so much of the Earth's atmosphere. Earlier in the summer that meant waiting until the wee hours of the morning.

Experienced observers usually note that until a planet reaches an altitude of at least 25° to 30° up in the sky, it will appear unsteady in the telescope and that there will be some false color (chromatic aberration) caused by the Earth's atmosphere. It's best to observe a planet near the time when it culminates – reaches its highest point in the sky. An outer planet at opposition (opposite the sun in our sky) is also about as near as it gets to Earth. On the date of opposition it rises at sunset and sets at dawn, so it culminates at midnight, and is about as large as it will appear. However, contrary to what the public was led to believe by many media reports on Mars, the difference in a planet's apparent size through a telescope isn't really that significant for about a month before and after opposition.



Telescope Characteristics

The naked-eye planets are bright and easy to see, so they don't need a lot of light gathering ability. A large telescope will indeed provide better resolution (the ability to distinguish fine detail), but high quality optics generally give a more pleasing, high-contrast view regardless of size. Design is important too – the smaller the diameter of the central obstruction,

the better the image tends to be. In wandering around the star parties, I noted a “cleaner”, more contrasty image in a Meade ETX125 than in many larger 8 and 10-inch Schmidt-Cassegrains. In some cases, more light gathering made the image so bright that filtering was needed in order to cut the glare. And while my 4” achromatic refractor provides a sharp image, the chromatic aberration typical of this design scatters the blue component of light, making images too yellow. In the case of Mars, the polar cap appeared yellow, rather than white. The very best images were in apochromatic refractors and Newtonians with superior quality mirrors, regardless of size. Biggest wasn’t always best.

Filter Factor

The use of filters depends largely on the planet being observed, the telescope, and the observer’s preference. To my way of thinking, Mars is one of the few planets on which colored filters can make a positive contribution. The two most popular ones that seem to have emerged in the latest Mars apparition are the #21 orange and #80A light blue. Orange provided a more naturally-colored view, accentuated the darker details, and cut the glare on larger scopes. The light blue seemed to diminish the effects of Earth’s atmosphere and made the polar cap stand out, while not dimming the planet too much on smaller telescopes.

A less conventional approach to filtering is to use a nebula filter. Yes, that’s a *nebula* filter used on a planet. I heard about this on an Internet discussion group and subsequently tried each of my nebula filters on Mars with my 6-inch APO. A broadband “light pollution” filter didn’t really enhance any features and gave an unnatural electric blue color. The OIII line filter colored the planet a deep red without improving the contrast of

features. (Perhaps in a larger scope the greater light gathering would overcome the darkening effect of the filter.) But a UHC filter made the polar cap and dark features stand out better, while causing a milder reddening of the image. It’ll be interesting to try these filters on other planets.

Some of the latest items on the market are planetary filters for discrete wavelengths. The Baader Moon and Skyglow Filter, available from Astro Physics, is one such product. Sirius Optics has a whole range of “light manipulation” filters, such as the Planetary Contrast (PC1), Variable Filter System (VFS), and the Contrast Enhancement Mars 2003 (CE1) filter. These filters employ peaks of high transmission with the regions in between being heavily rejected, a sort of filtration that is impossible with dye-in-glass filters. Reports indicate that they bring out details surprisingly well on the objects for which they are intended, while giving a more natural coloration. Some have also reported that they are useful for cutting light pollution. Others will argue that a telescope with high quality optics provides the greatest possible contrast without help from filters, plus it will display all the natural coloration of the planet.

So the lesson for observing planets in general is to try different filters to see which works well for your own telescope and to see which, if any, you like best.

Preparation

A unique aspect of the planets is that something is always different, be it the dance of their satellites or the surface features currently facing our direction. Just as you check a reference source when setting out to find deep sky objects, so it should be for planetary observing. Because the planets are always changing, the most useful reference is a computer program that provides a plot of the current position of surface features and/or satellites. This is a

great help in knowing where and when to look. I rely heavily on two freeware programs:

- Meridian
<http://pages.infinet.net/merid/index.html>
- Mars Previewer
http://skyandtelescope.com/resources/software/article_328_1.asp

Many of the feature-rich planetarium programs also include ephemerides for the various planets. For example, a member of our club used the Starry Night software to confirm the position of the Martian satellite Deimos, which he spotted in his 24-inch scope. Another source is the detailed tables printed monthly in *Sky & Telescope* magazine and info on their web site. The August 2003 edition of *S&T* had included info on finding and identifying Deimos and Phobos.

Expectations

Newspaper articles about an astronomical event are usually written by people who have little understanding of astronomy. So at public star parties we encountered guests who thought that Mars would appear the size of the moon, and that it was only on August 27th that it would be so large. Obviously, before a member of the public looks through our telescopes, we should carefully explain how the object will appear and what to look for.

We amateur astronomers also should not approach the eyepiece with a lot of preconceptions. Planets sometimes surprise us with the unexpected – like a dust storm on Mars, a change in Jupiter’s Red Spot, or the mysterious white cloud on Saturn. And consider the routine events such as seasonal changes in the Martian polar cap, the transit of a Jovian satellite, or Saturn casting a shadow on its rings. This reminds us that despite their distance and inhospitable nature, these are other

worlds that just happen to circle the same star as we do.

The Apogee Wide-Scan Seventies

Tom Trusock

have five elements and are a design that is neither an erfle or plossl but something in the middle. They are listed as MultiCoated but between you, me and the wall I do wonder about just how multi – their multicoated is (and how effectively it's been applied). They are available in 10, 15, and 20mm in 1.25 inch format, and 32mm in the 2 inch format.

For those of you not familiar with the typical coating terminology, here is a quick primer;

may only pass 70% of the light it receives. While this is certainly noticeable, it's not quite as conspicuous as you might think if you are primarily a visual observer. For example, Meade's UTHC improves transmission by around 18%, but the difference between UTHC and Non-UTHC can be fairly subtle at the eyepiece.

I ordered a set of the 20mm's for my binoviewer a while back ago, and recently decided I liked what I saw enough to order the 10's and 15's as well.



I spent several nights with these in my TV102, 15" f5 StarSplitter and my 10" f7.5 Planet Killer, in both mono and binoview modes. When in binoview mode, I used a Denkmeier FMC with the OCS at low and high power modes (yielding Barlow factors of 1.25 and 2.5 respectively). I compared the Celestron Ultima 30's (I was mainly interested in field size) the Apogee 20's, 15's, 10's, Nagler 13mm t6's,

Lately there seems to be a plethora of Chinese manufactured astronomy equipment on the market, but despite the many different labels they bear it seems like most of it rolls of the same assembly line and just gets marketed under different names.

The Apogee Wide-Scans look to be something a little different.

While it's true they do come out of China, and the name bears a great resemblance to a well regarded Japanese line of eyepieces, I haven't seen these particular eyepieces for sale anywhere else.

When Apogee dropped the price from \$80 to \$40 on their Wide-scans, it bumped them to the top of my price/performance radar. Please note: as I stated above, these are NOT the same as the Japanese Widescans. Apogee tells me they

- **Coated:** Air to glass surfaces receive one layer of coating (usually MgF₂), Fully Coated: All surfaces receive one layer of coating,
- **MultiCoated:** All surfaces are fully coated with the air to glass interfaces receiving several coats
- **Fully MultiCoated** where each lens surface receives several layers of coatings.

How do coatings affect performance? Well let's say a poorly coated surface reflects 5% of the light that hits it – that means only 95% of the light actually reaches your eye. Most observers won't be able to tell the difference between 100% and 95%, but it's not quite that simple. Given all the different lenses in the eyepiece, a complex eyepiece with poor transmission

9mm UO Classic Ortho, 9mm Hd Ortho, 9mm Nagler t1, 22 Panopic, the 9mm Synta Ultrawides, and probably tossed various and sundry other eyepieces into the mix as well. My test subjects included various DSO's and all the planetary targets up at the time - Mars, Luna, Mars, Neptune, Uranus, Mars, and oh – did I mention Mars?

So, I'm sure you're asking by now, how's the performance? Well, the field is sharp and fairly flat on all on them, and what aberrations there are tend to be progressive but fairly subtle – at least at longer focal lengths. They do suffer rather badly from internal reflections on bright objects and I would not use them as budget planetary eyepieces. Even though they are sharp, I found the views of Mars quite distracting from the multiple reflections in the field. They don't have the blackout problem I found with the 9mm

Synta's, and the 10's are at least as sharp. I noted that there is hardly any eye relief on the 10mm's, and my eyelashes brush the lens - I'd estimate maybe 6-8mm or so of eye relief - Less eye relief than my Nagler 3-6 has in any case. This makes perfect sense, as I suspect the eye relief for the line is probably something like a little less than the FL. They do perform better at longer focal lengths, but I find them to be acceptable for deep sky work at f5.

For sharpness, I had the distinct impression the wide-scans were on the order of a standard Chinese plossl.

Comparing the 15's to the Nagler 13mm t6's was a little surprising. Aside from the not so minor internal reflections, the small amount of lateral chromatic aberration, and the minor flatness of field issues they actually compared surprisingly well to the 13mm t6 Naglers. If you want to get picky, well sure - the Naglers were sharper, had higher throughput and completely lacked internal reflections (so ok, yeah, they trounced them) - but they are also around 8 times the price.

Comparing field size in the 30mm Ultimas and 20mm Apogee's, the Ultimas win (but not by a whole lot - certainly enough to keep) - they also win in lack of reflections, quality control, as well as possessing fewer aberrations.

On the Apogee's, I found the coatings weren't all that great, and aside from this contributing to lower light transmission and internal reflections, it allows you to easily spot the light reflecting off any little imperfections in the lenses.

As far as the quality control is concerned: some are excellent, and some are awful. I wound up returning one of the 10mm's because of what appeared to be a rough optical surface. The replacement was just fine, but the

fact that I had to replace it at all said something. While the exterior fit and finish appears good (they resemble the Meade Super Plossls in exterior appearance) I've also noticed dust on the interior elements, and had one with a loose lens element. All these things are easy enough to fix - if you are so inclined. But the question is should you really have to fix them?

Now that I've torn them apart, made them sound truly awful, let me say this: for the price - I must admit I like them. No, they aren't Naglers or Panoptics or even Wide Fields. I will say that I would have been terribly upset with the quality if I had paid \$80 for them - for that type of money, unless you really want the wide fields, just get an Ultima and be done with it. The bottom line is, for \$40, they are a pretty good deal, if you get decent ones.

Although the 10mm Wide-scans lack the eye relief, I think they are a bit better than the Synta Expanse/Ultrawide (probably their main competitor in this price range). They certainly are more comfortable to use. But if you are thinking about purchasing a set, I'd be aware of quality control issues, realize they lack eye relief in the 10mm's, and be ready for the internal reflections on bright objects.

A final note: The \$40 price tag does reflect close out pricing so if you think you might want some, now's the time.

In Search of Alien Oceans

Patrick L. Barry and Dr. Tony Phillips

A robotic submarine plunges into the dark ocean of a distant world, beaming back humanity's first views from an alien ocean. The craft's

floodlights pierce the silty water, searching for the first, historic sign of extraterrestrial life.

Such a scenario may not be as fantastic as it sounds. Many scientists believe that Jupiter's moon Europa conceals a vast ocean under its icy crust. If so, heat from the moon's interior-which would keep the ocean from freezing solid-may also drive subaquatic volcanoes and hydrothermal vents. On Earth, such deep-sea vents provide chemical energy for ecosystems that thrive without sunlight, and some scientists even suggest that Earthly life first got started around these vents.

So a warm European ocean spotted with thermal vents could be a natural incubator for life. That's why some scientists hope that someday we will send a probe to Europa that could bore through the ice and explore the ocean below like a submarine.

To plan for such a mission, scientists would first need to put a camera in orbit around Europa. By looking for places where water has welled up to fill the spindly cracks that riddle Europa's surface, scientists can estimate where the ice is thinnest-and thus easiest to bore through.

That mission scenario presents a problem, though. Europa orbits Jupiter inside the giant planet's punishing radiation belts. Continuous exposure to such high radiation would damage today's scientific cameras, making the information they gather less reliable and perhaps ruining them completely.

That's why NASA is designing a more radiation-tolerant CCD that could be used on a mapping mission to Europa. A CCD (short for "charge-coupled device") is a digital camera's chip-like core, which converts light into electric signals.

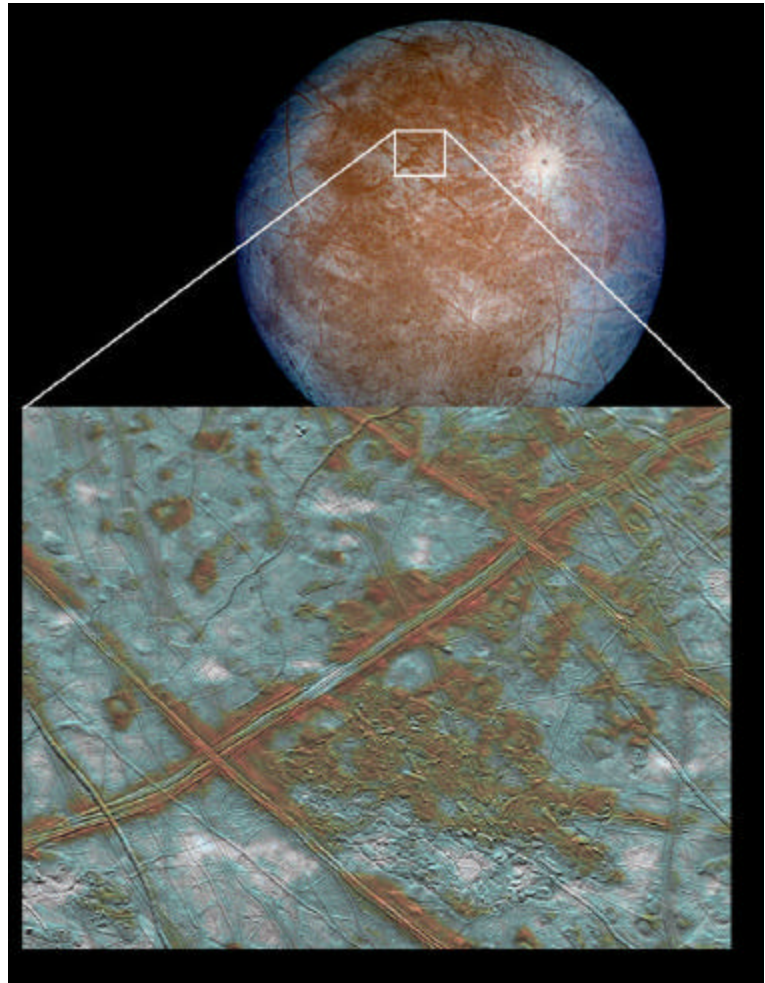
"We've seen the effects of this radiation during the Galileo mission to Jupiter," says JPL's Andy Collins, principal investigator for the Planetary Imager Project. "Galileo has orbited Jupiter for many years, dipping inside the radiation belts only for brief intervals. Even so," he says, "we've seen clear signs of damage to its instruments."

By using the hardier CCD's developed by the Planetary Imager Project, a future probe could remain in Jupiter's radiation belts for many months, gathering the maps scientists will need to finally get a peek behind Europa's icy veil. And who knows, maybe there will be something peeking back!

To learn more about the Galileo mission to the Jupiter system, visit <http://www.jpl.nasa.gov/galileo/>. For children, a fun, interactive "Pixel This!" game at http://spaceplace.nasa.gov/p_image_r/pixel_this.htm introduces CCDs and how a really tough one will be needed for a future mission to Europa.

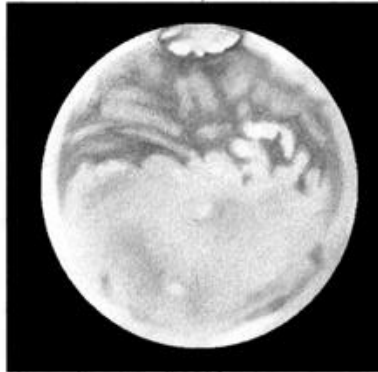
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

(Image Caption:
Cracks on the icy surface of Jupiter's moon Europa give evidence of a liquid ocean below.



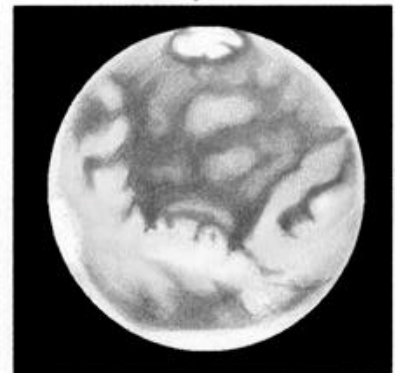
Tom Campbell

SEEING 7-8/10 ⚡



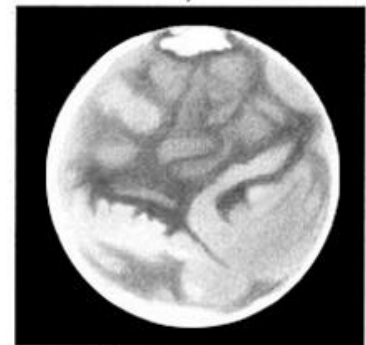
© SOL ROBBINS N
6" SKYWATCHER REFRACTOR
CHROMALOR II
SIRIUS OPTIC VFS
SETTINGS 0,30
375X + 400X

12:00 A.M. - 12:20 AM ET ⚡



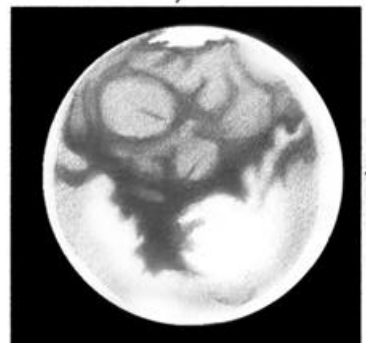
© SOL ROBBINS N
6" SKYWATCHER REFRACTOR
CHROMALOR II
SIRIUS OPTICS VARIABLE
FILTER SET 0,30
375X

AUGUST 28, 2003 SEEING 8
11:00 PM - 11:25 PM ET ⚡



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6" SKYWATCHER REFRACTOR
CHROMALOR II
SIRIUS OPTICS VARIABLE
FILTER-SETTING 210
375X

SEPT. 5, 2003 10:15-10:35 PM ET
SEEING 8 ⚡



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6" SKYWATCHER REFRACTOR
CHROMALOR II
SIRIUS OPTICS VARIABLE
FILTER-SET 0 + 30
375X

Mars 2003



22.9"
Alt 32.7°

August 4th, 2003



25"
Alt 26°

August 23rd, 2003

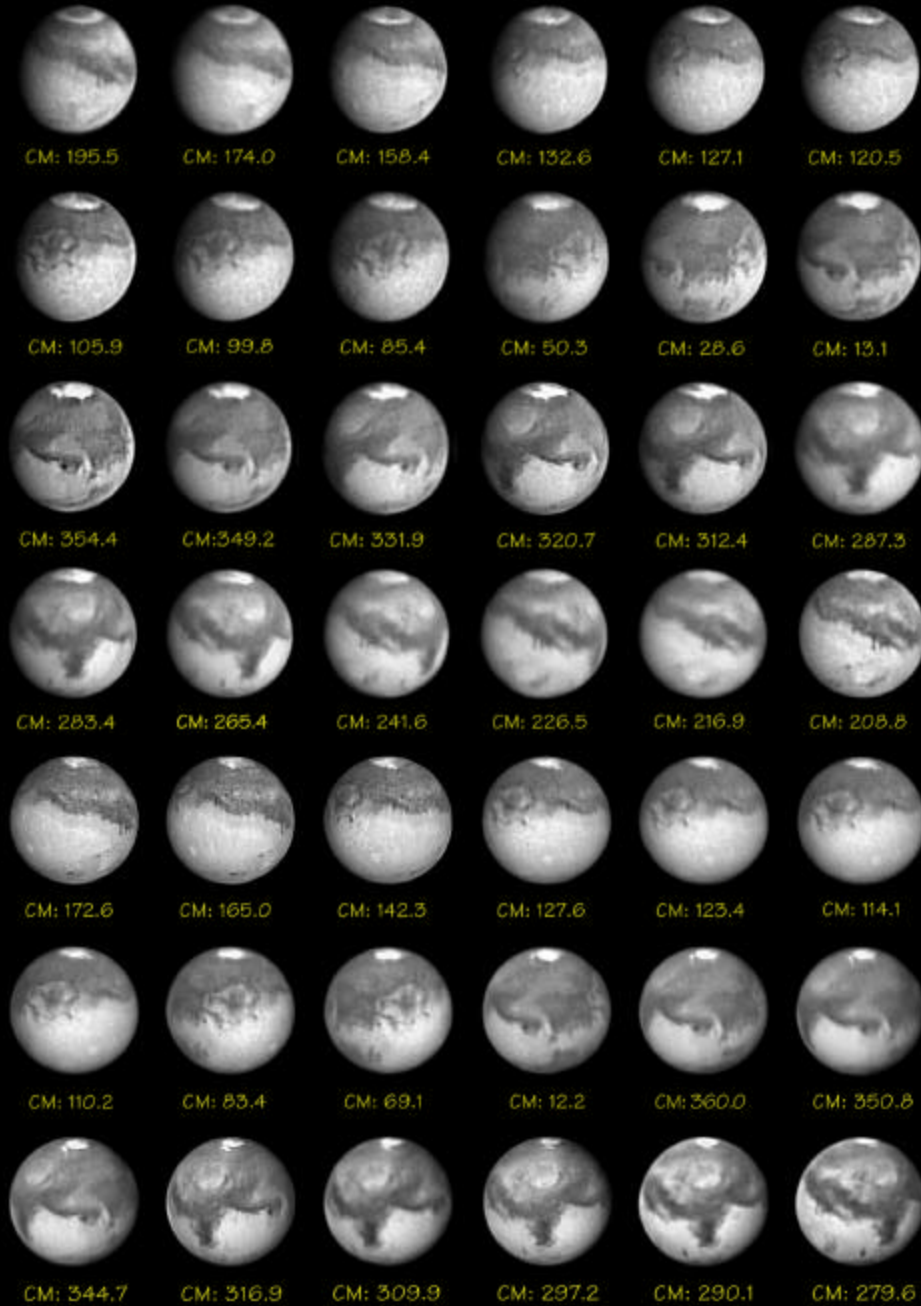


25"
Alt 30°

August 31st, 2003

2003 PERIHELIC APPARITION OF MARS

The Closest Approach Of Mars to Earth In Over 60,000 Years

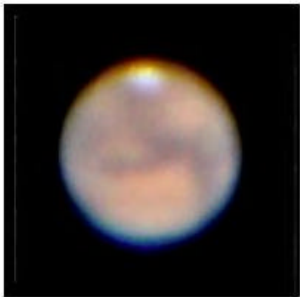


Images By: Mark Schmidt

Mars - 9/3/03 - 23:30 CDT

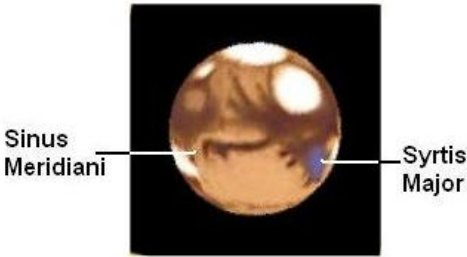


152mm refractor @ 300x
Sony DSC-70 camera
eight images stacked
and processed to bring
out clouds in Martian
atmosphere

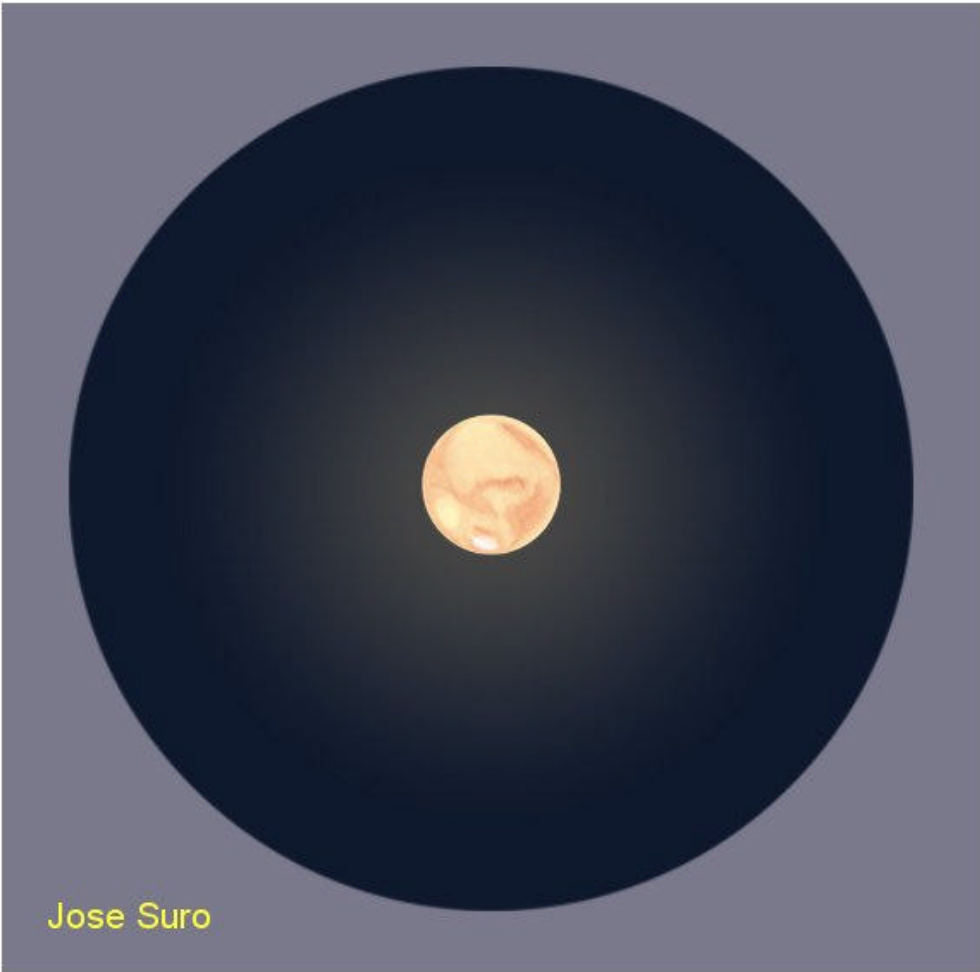


152mm refractor @ 300x
Sony DSC-70 camera
three images stacked

by Jack Kramer

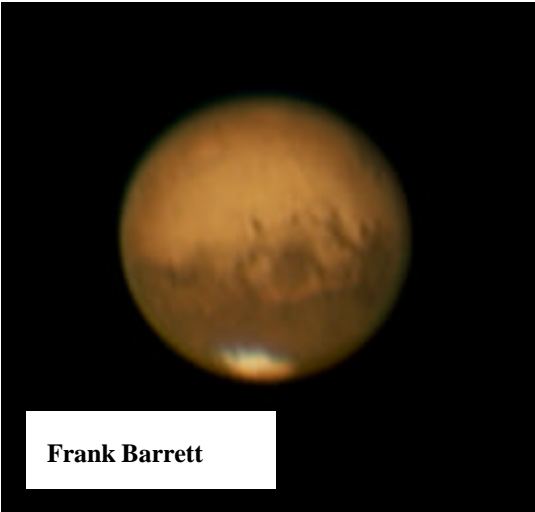


Comparison chart
from Mars Previewer
program

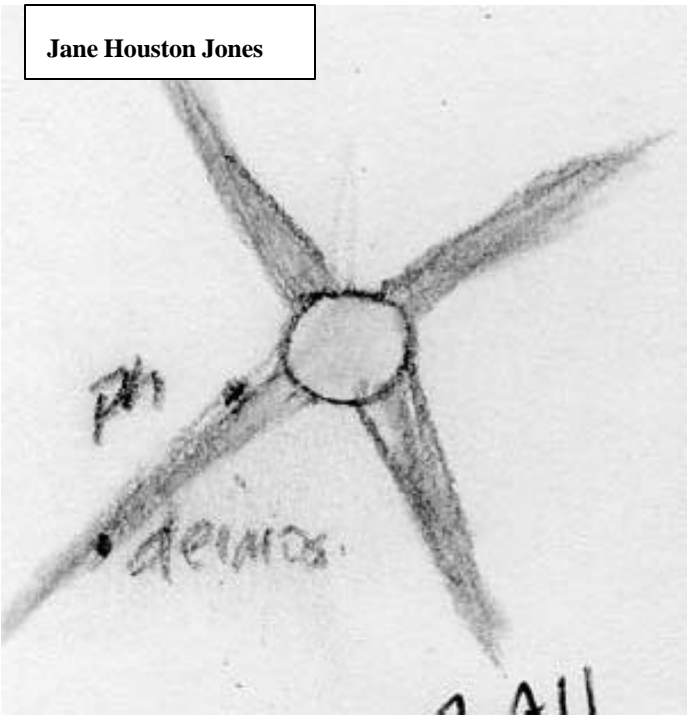




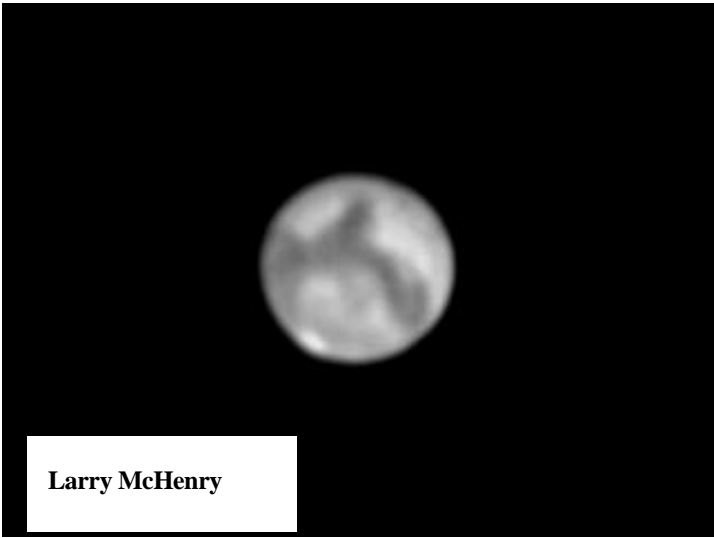
Anthony A



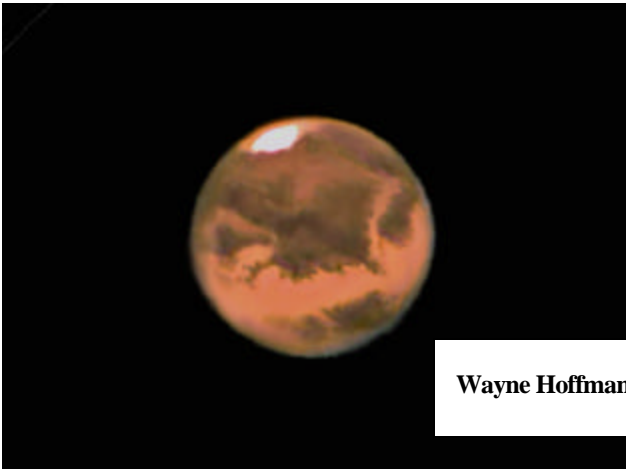
Frank Barrett



Jane Houston Jones



Larry McHenry



Wayne Hoffman



Rob Adkins

My Back Pages

"Crimson flames tied through my ears
Rollin' high and mighty traps
Pounced with fire on flaming roads
Using ideas as my maps
"We'll meet on edges, soon," said I
Proud 'neath heated brow.
Ah, but I was so much older then,
I'm younger than that now."



Mars Poems

Real Mars

Real Mars
is not blood red,
but the sharp ochre of
dry dust-swept plains and cold deserts
waiting.

--Rod Mollise

There once was a planet called Mars
Observed by a young man named Lars.
His scope? A refractor,
with nary a detractor.

--Len Philpot

Oppositions of Mars

The ember eye of Mars watches,
an opposition of my personal clock Mars.

No god of war, my confidant and calendar,
I record steps and turns in light of bright Mars.

Every two years I look to the sky,

pricking memory with dim Mars

I see the passage of a young man
by scintillated light of unsteady Mars.

Married a girl green as myself
back fifteen passes of red mars.

A shining girl was gone too soon,
absent by next light of dusty Mars.

What I did in short sectors of Martian orbit
had nothing to do with war-god Mars.

Falls of a still-hot heart only
reflected without bale in loved Mars.

--Rod Mollise

"Poetry?"
"Poetry SUCKS! We can read in school!"
"Heh-heh, yeah, yeah."
"What a dillweed, Beavis!"

So spoke our moronic minions. The only reading matter they favor, of course is the very latest...

Rumours

Well, the Mars mania is winding down, and what a ride it has been. Not just for us observers, but for the telescope

manufacturers and vendors, too. We heard many cases of items being out of stock, backordered, and just plain gone. And Celestron and Meade's customer service desks appeared to be overwhelmed. Celestron, especially, is normally very good at answering the phone. But during the past couple of months customers seeking support have encountered the dreaded, "we will call you back" voicemail. Honestly, I'm surprised. I just didn't expect Mars to be as big as it was—in the minds of the public, that is. It was almost a slight reprise of something many of you old-timers recall with dread, HALLEYMANIA! Yes, if you were an amateur during Halley-time, I now rate you as an "old timer." Sorry!

Meade followed the phase-out of their line of CCD cameras with the introduction of something called the "LPI," the "Lunar and Planetary Imager." This is, you won't be surprised to hear, a webcam. Yes, webcams are INCREDIBLY hot in astronomy now, especially after showing what they could do during the nights of Mars. They easily blew away anything done on film, ever, and often equaled or more often bettered expensive integrating CCD cameras. There is one small hitch where Meade's camera is concerned—it uses a CMOS sensor. My experience has been that webcams with "real" CCDs are more sensitive and noise free. But early images from the LPI are impressive and on a par with what you see from Toucams. The software Meade includes with the camera, a camera-control and processing program and a planetarium program (a replacement for their HEH-HEH, SUCKY Epoch software) that offers an onscreen Autostar analog, looks interesting. It can even use the LPI to autoguide Autostar equipped scopes. Unfortunately, some early adopters have reported bad CDs and problems installing the software on Windows 98 computers. There is, as you won't be surprised to hear, a Yahoo group for this camera/software, the Autostar Suite (that's what Meade calls the package) Group. We'll be watching this group to see how this interesting webcam does.

Meade also has introduced something called "Smart Mount Technology" for the LX200 GPS series. The main feature of this upgrade is software that works a lot like Software Bisque's renowned T-Point. Will Smart Mount prove as useful for refining goto pointing accuracy as Tpoint? Too soon to say, I'd say, but it *sounds* good.

Not too much new to report out of Celestron. They've apparently been devoting their time to fine-tuning their newly introduced CGE and AS scopes, as well as continuing to improve the GPS Nexstars. The Advanced Series scopes, a variety of OTAs on computerized CG5 GEMs, got off to a rocky start QA/documentation-wise, but we hear they are getting better in a hurry.

As many had been predicting, the Chinese, Synta, that is, have introduced an APO, if a modest one. The OTA, currently being sold by Orion as the "80mm ED" is an

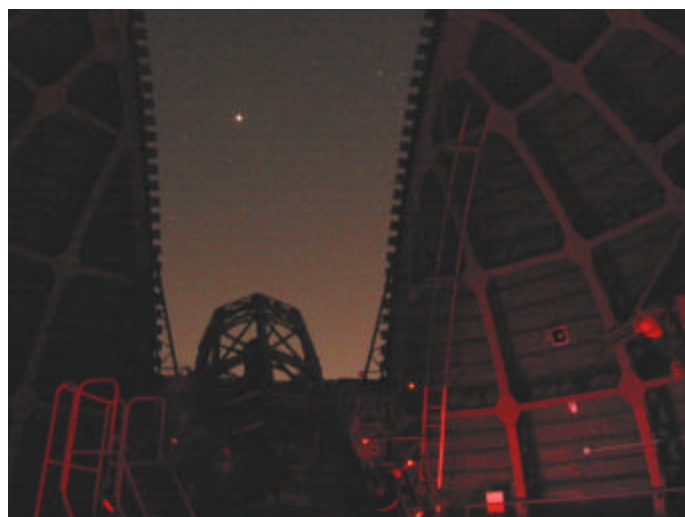
80mm refractor that features a fluorite ED element in its objective (a two element objective). The scope also sports a decent—if not fancy--Crayford focuser. The mechanics are a far cry from what you'd expect from TV, TAK or AP, but for the price, less than 500 bucks, this little scope is amazing. Many folks are reporting that this simple little thing nearly equals the famous TV85 optically. The TV85, as you know, costs <ahem> "a lot more" than 500 bucks. Question is, can the Chinese produce a good 4 inch APO now? That would be harder—you can't just scale up the 80's design and expect comparable performance.

The Anonymous Astronomer.

The Wrap-up...

I hate to end on a downer, but with a slightly heavy heart I must announce that this will be the **last bimonthly issue of Skywatch** for the foreseeable future. As many of you know, I've returned to graduate school to FINALLY earn my PhD. At my advanced age, that's proving to be, well, a "CHALLENGE!" All is well in that regard, but in order to be able to give *Skywatch* the attention I think it deserves and not let Y'ALL down, I'm cutting back to a quarterly schedule. Look for the next issue in January, but that will be "Winter 2004" rather than "January-February 2004" Let me know what you think.

Rod RMOLLISE@aol.com



NOW THAT'S A VIEW OF MARS! A BEAUTIFUL image of Mars taken through the slit of Mt. Wilson's historic 60" by Barry Megdal!