

HORIZON



Newsletter of the Wilderness Center Astronomy Club
Winter Solstice, 2003/2004

AT PRIME FOCUS

BY BILL CASTRO

After more than 20 years, we have a new Horizon editor, Phil Hoyle. Of course we all would like to thank Dave Gill for his more than 20 years as the previous editor. When Phil asked me to write something for the Prime Focus article, he suggested using something from The Wilderness Center Newsletter with public viewing night attendance and other items of what has happened in the club over the past few months. I decided to expand this to the whole year. Here is what I wrote for The Wilderness Center's Annual Report:

Astronomy is up! Our club membership has increased from 70 to 96 in 2003. This was mainly due to our increased attendance at our monthly star watches. The favorable viewings of Saturn and Mars really brought out the crowds in February, October and September. We canceled the July star watch due to the 4th holiday and December's due to a winter storm. Overall, we had 731 guests for

ten nights. We average two planetarium shows per night. We typically fill the parking lot! (Not bad considering half of the nights were cloudy.) Press releases to local radio and newspapers by Vicki Capps and Jim Quinn really helped get the word out.



Observatory Coordinator John Waechter coordinates Star Watches and other observatory events. We start with a Planetarium Show. If it is cloudy, we show video images taken with members' CCD cameras. If it is clear, we set up the Centers' telescopes and Club members set up our own. We often have ten or more! For daytime events, we observe the Sun with solar filters. With the video monitor and members' cameras, we show objects to large groups and those who can't reach the eyepiece. Regular volunteers for Observatory events are Rick, Norma and Josh Breehl, Jeff Brest, Bill Castro, Phil Creed, Ralph Geschwind, Dave and Robin Gill, Brian Gray, Carl and Jordan Fritter, Fred Grosse, Br. Albert Heinrich, Philip Hoyle, Fred Jarka, Brian Klinehoffer, Tom and Sandra Kolar, Russ Meyers, Paul Piotrowski, Jim Quinn, Gene Rickenbrode, Dave Ross, Ken Schneller, Barb Vaughn, John Waechter, John Weiss, and others.

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And MORE!

Fred F. Silk Planetarium Coordinator Dave Ross organizes Planetarium Shows, maintains the equipment, and trains other Club members to give shows. Rick and Norma Breehl, Dave Gill, Dave Ross, Mike Rossetti, Barb Vaughn, John Waechter, and others gave public Planetarium Shows. Dave Ross has volunteered a considerable amount of time to get the Planetarium to the first class building that it is today.

John Waechter is also the Club's Outreach Coordinator. We showed the nighttime sky to over 900 adults and students of all ages at schools, camps, and parks. Outreach volunteers included Joann Ballbach, Rick, Norma and Josh Breehl, Jeff Brest, Bill Castro, Phil Creed, Ralph Geschwind, Dave and Robin Gill, Brian Gray, Carl and Jordan Fritter, Fred Grosse, Br. Albert Heinrich, Philip Hoyle, Fred Jarka, Brian Klinehoffer, Tom and Sandra Kolar, Russ Meyers, Paul Piotrowski, Jim Quinn, Gene Rickenbrode, Dave Ross, Ken Schneller, Barb Vaughn, John Waechter, John Weiss, and others. We worked with the Hoover-Price Planetarium and held a Mars watch at the McKinley Monument with over 480 guests. We are also working with Hoover-Price Planetarium and the National Inventors Hall of Fame in NASA's Cassini Program to do public observations of Saturn. Bill Castro is a merit badge counselor for the Astronomy merit badge with the local Boy Scout troops.

We helped in other TWC activities. During Club's Day, we held three planetarium shows, led sunspot and solar flare observing, displayed a live video of the Sun and ran a video of stellar objects taken through the Center's scopes. We had a stellar turnout!

We received several wonderful donations this year. Ken Schneller donated star charts for the Club's library. Chris Emler donated an IBM ThinkPad to help run the Planetarium. Other donations from Club members include stereo components for the Planetarium and observing aides in the Observatory.

We have activities of various levels for Club members. Our Membership Achievement Program helps members master skills at different levels. Roving astronomers Phil Hoyle and Phil Creed led trips to dark sky sites in Ohio, Pennsylvania, West Virginia and Arizona.

Our club newsletter, The HORIZON, has a new editor this year. Phil Hoyle will take up where Dave Gill has left off. Thanks Dave for your years

HORIZON is the quarterly newsletter of The Wilderness Center Astronomy Club.

Editor: Phil Hoyle

Contributors: Bill Castro, Phill Creed,
Dave Gill

Layout & Printing John Waechter

WCAC Officers:

President: Bill Castro

Vice President: Gene Rickenbrode

Secretary: Norma Breehl

Treasurer: Dave Gill

Program Director: Dave Ross

Planetarium Coordinator: Dave Ross

Observatory Coordinator: .John Waechter

Education Outreach: John Waechter

WCAC Address:

P.O. Box 202

Wilmot, Ohio 44689-0202

Web Site: <http://www.twcac.org>

of work. It is published by John Waechter and consists of articles by members. Webmaster Bill Castro keeps our web site full of up-to-date information about the Club, a photo gallery, and tutorials.

This year Tammy Seikel is our new club liaison. Our previous liaison, Joann Ballbach, was reassigned, but not lost, as she is still an active club member. Thanks Joann for all of your years of hard work. Our officers this year are President Bill Castro, Vice President Gene Rickenbrode, Secretary Norma Breehl, and Treasurer Dave Gill. Planning Committee members are John Waechter, Dave Ross, Tammy Seikel, and others.

We meet on the last Friday of the month at 7:30 PM at TWC for a program, refreshments, business meeting, and observing (if it's clear). Public Star Watches are the first Friday of each month at 7:30 PM (8:30 in the summer). Please come and visit us!



PORTLANDIA: My FIRST ASTEROID OCCULTATION

BY PHIL HOYLE

Those of you who were at the November Astronomy Club meeting may remember that Dave Gill announced that there would be a good opportunity to do an asteroid occultation observation on Sunday, December 7, 2003. This sounded very enticing to me for a few reasons:

First, the star being occulted was a relatively bright 8th magnitude. Since I hadn't done this before, having a relatively bright target star would make it easier to do. The second reason it sounded enticing was that I had recently gotten a new video camera and was anxious to put it to good use. The third reason this was particularly enticing was that the town of Wooster, where I live, was just about in the middle of the projected path of the occultation.

At this point, a little background on occultation timings and what they are used for may be of help. An asteroid occultation occurs when an asteroid in our Solar system passes in front of a distant star. Because distant stars are essentially point sources of light, the passing of the asteroid in front of the star completely blocks the light from the star. The only light remaining is light from the Sun reflected off of the asteroid. Because asteroids are relatively small and somewhat distant, the shadow of the asteroid passes across the Earth in a very narrow band. People who are really into this sort of thing make predictions about when and where these occultations will be visible. Probably the most well known website containing these predictions is Steve Preston's website <http://www.asteroidoccultation.com/>. This website not only lists the predictions, but after a few clicks will give maps and other information about where and when the occultation will be visible.

An accurate timing observation, along with the known orbital mechanics of the asteroid, can be used to determine the size of the asteroid. If enough observations are made in different points along the path, estimates can also be made about the shape of the asteroid. This is one area of astronomy research where amateurs can, and have, played a more important role than professional astronomers. One of the reasons for this is because the amateur astronomer is often mobile and can move his or her telescope into the pre-

dicted path. The other main reason is that there are simply more amateurs that can perform this type of observation. It does take multiple observations to get information on the shape of the asteroid. Since the crash of comet Shoemaker-Levy 9 into Jupiter and the ensuing realization that solar system objects can and have crashed into planets, research into the nature of asteroids has taken on a new importance.

Now, there were some obstacles that had to be overcome for me to make this kind of observation. The first is that I have a lot of trees in my yard. The only good direction for observing, other than straight up, is toward the southwest. This occultation event was going to take place in the southeast, the worst direction in my yard for trees. This meant I would have to travel somewhere, though not necessarily far. A second obstacle is that I do not have a radio that can tune into the WWV short wave signal that broadcasts the ping-pong of the atomic clock in Fort Collins, Colorado. This is a necessity to get an accurate timing of the event. This meant that I would need help from someone who does have such a radio. A third obstacle is, of course, the notoriously cloudy weather of Ohio in December.

By mid-week, the weather forecast looked surprisingly good for Sunday night even though there was a snowstorm forecast for Friday. I phoned Phil Creed. (He has a ham radio that can pick up the atomic clock signal.) He agreed to meet at a "halfway" point at one of the public parks in Medina County. The area where route 3 crosses I76 in southern Medina County was very close to the centerline of the predicted path. I did some Internet research on parks in Medina County, since neither of us had done any observing from this area before. It turns out that there are four county parks in southern Medina County that were close to the center of the predicted path. Which one should we use? I decided I'd better do a daytime road trip. I'm glad I did.

On Saturday the 6th, when everyone else was Christmas shopping, the day after the snowstorm, I did my road trip. It wasn't very far for me, but it ended up taking the whole afternoon. It turns out that our "first choice" of these parks closes at sunset and it was gated. Rats! The second park also closes at sunset and was also gated. Things weren't looking very good. The third park really wasn't



Sunset at the observing site

much of a park; it was a trailhead. It did have a small parking lot, but there were residential houses nearby in the direction of the southeast. I might have some explaining to do if someone saw my telescope pointed toward their house! The fourth park was Buckeye Woods Park. It is everything the other three parks aren't. It has very large open fields for baseball and soccer. And at this point, most important, it wasn't gated.

Phil Creed and I agreed that we would meet at Buckeye Woods Park at about 5 PM. The occultation was forecast to occur between 5:48 and 6:05 PM EST and last just a few seconds. It was still light when I got there and started setting up my LX200. Phil Creed arrived with a friend of his about 10 minutes later. I had plenty of time to set up the telescope, but since this was going to be during the later portion of evening twilight, things were going to get rushed in a hurry.

By about 5:30, I had all the mechanical portions of the setup completed. I still needed to do the two-star alignment and it wasn't quite dark enough to see two stars to align on. I decided to get the video camera setup with the projecting eyepiece. When that was finished, we could only wait until the stars came out. Once the stars did come out, we had to do things pretty quick. I got my two-star alignment done at about 5:45 and still had to key-in the coordinates and slew to the target star. Once that was done, I wanted to confirm that we were looking at the correct star with the finder charts that I had printed from Steve Preston's web page. There were supposed to be two fainter stars in the field of view and because of the mirror image through the scope and the rush I was trying to do

things in, I just couldn't confirm that I was looking at the right star. I tried slowly slewing the scope back and forth, but it only got me more confused and we were running out of time. We should have started the tape already. I decided we would just have to trust the pointing capabilities of the LX200 and go with the star that was in the field of view after keying in the Declination and Right Ascension. Time to start the video camera. Problem. Though the star was visible in the eyepiece, it wasn't visible in the view screen of the camera. I had the camera in night shot mode. We lost a few minutes more before I realized that I could turn on the slow shutter in addition to using the night shot mode. (This allows a $\frac{1}{4}$ second exposure for each video frame and can take video in extremely low light levels.) I turned on the slow shutter and the star appeared. Just to check, I turned it off again and it disappeared. I turned it back on again and started the videotape. The time was about 5:57. At this point, I was justifiably concerned that we had missed the occultation. I was also concerned that we might not be pointed at the right star. Phil Creed had setup his radio with the atomic clock signal while I was fussing with the camera and all we could do now was record and wait. I began to relax a little and briefly stepped a short distance away from the telescope. Then I realized that if I didn't watch the view screen of the camera, we could record the event and I wouldn't know it. As I watched the view screen of the camera, I was afraid to blink. Then a minute or two later, the star disappeared! I practically shouted, "There it is!" Even though I should have said there it isn't, because it had just disappeared. Phil Creed looked just in time to see it reappear and the radio



View toward the southeast

broadcast the louder time signaling that it had just turned 23:00 hours UT (6:00 PM EST). His friend had been watching with me and also saw the disappearance as well as the reappearance.

Wow! What an unbelievable rush! It was just a tiny dot on the camera view screen, but the predictions went just as they were supposed to. With all the possible things that could have and did go wrong, we still managed to get the disappearance and the reappearance on tape with the WWV signal on the audio track. I hadn't expected it to be this much fun. Both Phil Creed and his friend also agreed that it was definitely worth the trouble and bearing up to the cold. Most of all, the experience produced a tremendous feeling of accomplishment.

Afterward, we observed Mars and the Moon for a very short while. It was getting colder. We got something to eat at a nearby Wendy's. Later that night, I e-mailed David Dunham of the International Occultation Timing Association because I knew that a rate of 30 frames per second

is preferable for the best timing accuracy and I was concerned that our observation might not have value since I had to do it at 4 frames per second. The next day I got a reply and he assured me that I should send in my observation because it would still be much better than visual timings, which often have greater errors.

I e-mailed my results and copied Dave Gill and Phil Creed. A few days later I US mailed a VHS copy of the tape to David Dunham. Dave Gill also forwarded me a copy of a bulletin board discussion about the occultation. It seems we were the only people to get the observation in Ohio. In fact, it seems we had the only observation outside of Ontario!

As I write this, I can only think of something a high school teacher of mine said a long time ago: The worst thing that can happen at someone's first visit to the horse racetrack is winning on their first bet...



HORIZON Bookshelf

THREE NEW BOOKS ILLUMINATE THE MOON AND MARS

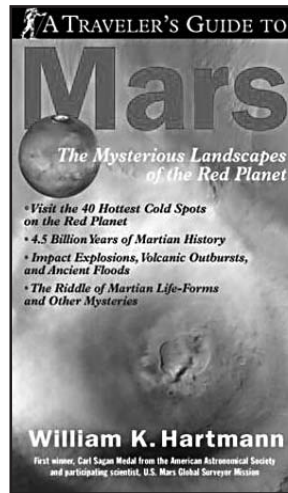
BY DAVE GILL

In case you slept through it, 2003 was a big year for Mars. The perihelic opposition of Mars in 2003 was the closest in recorded history. New missions were on the way to Mars. Public exposure to Mars was high. And a number of new books about Mars were published. I've read two of them, and want to discuss them here. Also, in late 2003, a new book came out that helps the amateur place his lunar observations in geological context. I will review that book as well.

A Traveler's Guide to Mars by William K.

Hartmann - Workman Publishing, 2003 \$18.95

If I were to take a guided trip to Mars, there are a handful of people that I'd like to choose my guide from – people who have spent their careers trying to understand Mars from the Mariner, Viking and Mars Global Surveyor missions. Bill Hartmann is certainly one of the members of that pool. He cut his geological teeth on the Moon with Gerard Kuiper in the early 60's, and made wonderful, major contributions to our understanding of the



Moon. Then he has been involved in all the major Mars missions since the start. He is an artist as well as a scientist, so he informs this book with the soul of an artist as well as the mind of a scientist.

When I first saw the promotional literature for this book, I was struck by the beauty of the images in it. The book itself did not disappoint. It is a paperback, in the format of a field guide, but it is richly illustrated with color and black and white images. The book has two large fold-out maps – one of the best pre-space probe maps showing the Mars that can be seen with a telescope, and a topographic map from the Mars Global Surveyor mission.

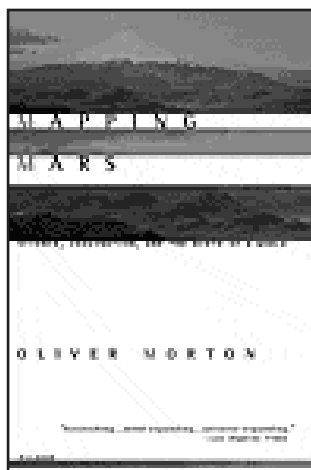
Hartmann uses his "Traveler's Guide" format to take us on a tour of Mars. The organization of the tour is based on the geological history of the Red Planet. So along the way, in addition to seeing the

most fascinating places on Mars, we learn their geological context in chronological sequence.

Although it would be easy to bury the reader in geological jargon, Hartmann succeeds in making the study of Mars accessible and exciting. It is clear from reading the text that Mars is a world that still harbors many surprises for us. He is not afraid to share his thoughts with the reader – but he is careful to point out where they depart from the main stream. But given Hartmann's track record, one has to give his speculations more weight than most. He also enlivens the book with a thread of his personal journey as a Mars scientist in a series of stories from his career labeled, "My Martian Chronicle" that are interwoven with the main text. These help illuminate the human side of the scientist. Highly recommended!

Mapping Mars by Oliver Morton Picador,
2002 - \$16.00 in paperback

When I first saw this book I was fascinated, but I held off 'till it came out in paperback. Mapping Mars is a very different book than Hartmann's Traveler's Guide. Morton is concerned with helping us understand the process we have gone through in the understanding of the face of Mars. As such, he interviewed many key players in the space-age study of Mars and paints his portrait of Mars through their work.



Mapping Mars is concerned more with the "big picture" of Mars than the Traveler's Guide. As such, its illustrations are more concerned with showing the evolution of our maps and our mental images of Mars. Part of that "big picture" is our cultural view of Mars through our science fiction, art and exploration plans. He spends quite a bit of time on these topics – but does not sacrifice the science content.

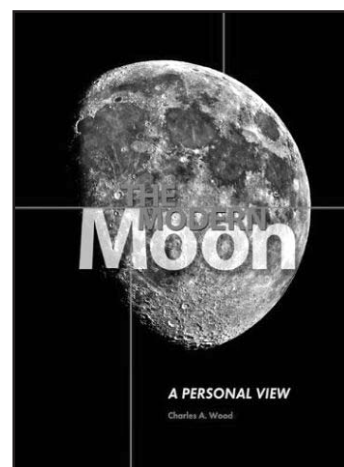
The book reads like a series of personal vignettes of the people involved in the illumination of Mars – people like Hartmann, Michael Carr, Michael Malin and Bob Zubrin.

Mapping Mars reads well and draws the reader into the personal and scientific journey of understanding Mars. Highly recommended.

The Modern Moon: A Personal View by Charles A. Wood - Sky Publishing, 2003 \$45.00

Where have you been all my life, oh Modern Moon?

As many of you know, I started getting interested in the Moon in the early '90's. It was all Tom Dobbins's fault. He somehow transmitted the virus to me. I've collected a lot of lunar books since then – many of them out of print and out of date. But still fas-



inating books. One weakness in many of the Moon books I have – they do not illuminate a coherent picture of the Moon as seen by the amateur astronomer with the light of post-Apollo geology.

In The Modern Moon, Wood fills that gap. He organized the book regionally – choosing various areas of the Moon to discuss as a unit. But he does them in an order that builds the story of the Moon, and our understanding. For instance, he first discusses impact craters and lava flows – the two phenomena that explain 99% of the geology of the Moon. He then uses the Imbrium Basin and the Imbrium lava plain to illustrate these phenomena as seen through the telescope. He then builds on this knowledge in discussing the specifics of other areas. But just as Imbrium was the Rosetta Stone for science's understanding of the Moon, Wood uses it that way for us.

Chuck Wood has been writing a monthly column on lunar features for SKY & TELESCOPE for several years. But this book is much more than a compilation of his columns – there may be some common material (I don't know) but Modern Moon's organization presents the geological facts in the context of the way the Moon is observed.

Modern Moon is richly illustrated with photos of the Moon, illustrative historical sketches, pictures of characters in Wood's narrative, interpretive maps and scientific drawings. It is a lovely book to behold. Wood's text is lively, interesting and infused with the author's sense of humor.

I can safely say that Modern Moon will be a frequently used reference in my lunar library – both at the desk and at the telescope. Taken along with the long-awaited new edition of Rukl's Atlas of the Moon rumored to be coming out in the spring of 2004, this will be a staple for a long time.

CHAOTIC MARS

BY DAVE GILL

In studying Mars, scientists are faced with the task of explaining how the planet has changed over time. There is plentiful evidence of a warmer, wetter past despite the cold, arid present. For the most part, this is supposed to have happened long, long ago when Mars was still warmed by its internal heat and the bulk of its atmosphere had not yet escaped. But there are pesky signs that Mars still alternates between warmer and colder cycles. The most interesting of these can be seen at the polar regions, where the terrain is layered and terraced. The best explanation for these is periodic deposition and dissipation of the ices leaving behind tell-tale layers like tree rings.

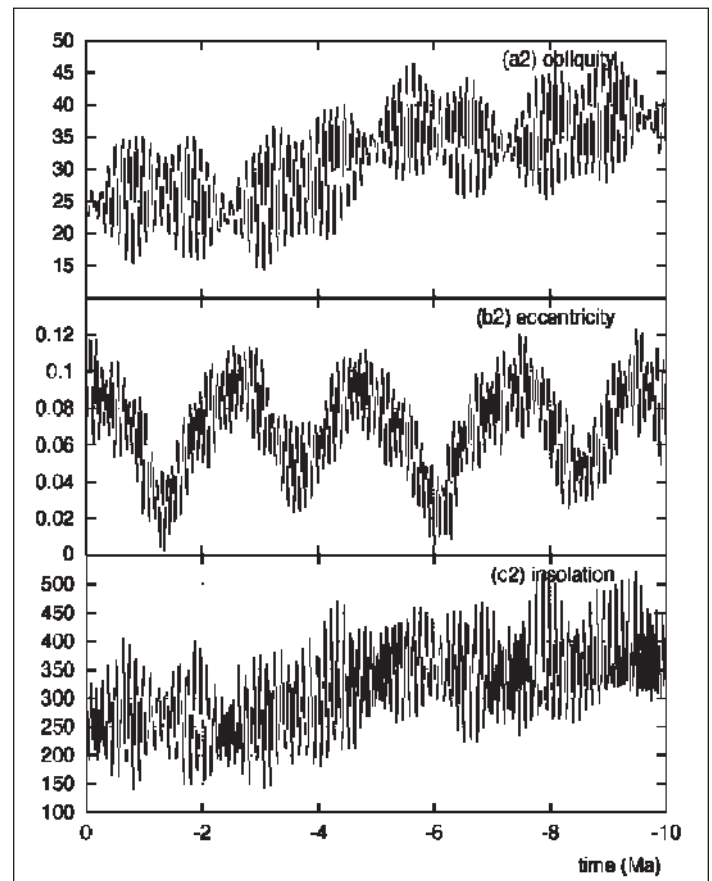
We often note when talking about Mars that its axis tilts at 25 degrees – comfortably close to Earth’s 23.5 degrees. We can relate to its seasons on that level because the cycle is similar to ours – just longer. Earth’s seasons are, of course, driven by changes in the face of the Earth receiving the most direct sunlight at any particular time of year. Earth’s orbit is nearly circular with an eccentricity of only about 1.5% (the ratio of the difference of the major and minor axes – meaning that we are about 3% closer at perihelion than aphelion). This makes little difference in our seasonal changes compared to the differences in tilt. But Mars’s eccentricity is much larger – nearly 10%. So this has a significant effect – especially when coupled with the tilt. In particular, Mars has “hot” summers in its southern hemisphere, which occur when Mars is at perihelion. One manifestation of this is the tendency for Mars to experience global dust storms when it is at perihelion – much to the chagrin of earthly Mars observers who get their best views of Mars at perihelic opposition.

But the Earth’s orbit and axial rotation are not constant. In particular, our axial tilt varies over a range of about 2.4 degrees. This is not a huge amount, but it is enough to drive periodic ice ages. The period of this change in Earth’s “obliquity” is about 41,000 years. The eccentricity of our orbit varies from nearly 0 to nearly 5% on the order of 100,000 years. Also the earth wobbles, called precession, with a period of 26,000 years. This causes the seasons to migrate through the year, and will cause the juxtaposition of perihelion and a partic-

ular orientation of our axis to change. In 13,000 years, we will be at perihelion in July rather than in January. We might expect this to enhance northern hemisphere seasonal variations. You can see that this is all quite complex – and the interaction between all these cycles and climate is not well understood.

But our neighbor Mars has even wilder swings in its orbital and axial behavior. Mars’s orbit shows changes in eccentricity from 0 to 13% over a period of 2 million years (recall that it is currently about 9%). Mars’s precession cycle is about 173,000 years and its poles alternate which point toward the sun at perihelion with a cycle of about 25,000 years. But it is in the obliquity or tilt of its axis that Mars has the largest variation. Mars has periodic variations in its tilt of from 15 to 35 degrees with a period of about 120,000 years. But that is not all – it shows chaotic swings from 0 to as much as 60 degrees on a time scale of several million years.

Why does Mars show such huge swings in its axis compared to the Earth – (recall that Earth has



about a total 2.4 degree variation while Mars has as high as 60 degrees)? That answer is largely due to our moon. The Earth has a sizable moon – especially compared to Mars’s two tiny captured asteroids, Phobos and Deimos. So what does that have to do with it? A planet and its moons form a dynamic system. All matter has the property that we call inertia – the tendency to resist changes in its state of motion (change in speed or direction of motion or change from rest). For linear motion, this is proportional to the mass of an object. Rotating objects also have inertia related to their rotation. This is called “moment of inertia” and is related to the resistance a body has to changes in its speed or direction of rotation about an axis. The moment of inertia of a body is related not only to its mass, but also to how that mass is distributed. Think of a barbell. Grip it in the middle of the bar. Try to rotate it perpendicular to the bar. Now move the weights in toward the center and try the same thing. Easier, isn’t it? You didn’t change the mass, but you changed the moment of inertia by changing the distribution of the weights.

The Earth-Moon system has a larger moment of inertia because of the presence of the moon. It acts as a stabilizing agent. Why do tightrope walkers use a large, heavy pole? It gives them a larger moment of inertia and helps them resist small variations that could throw them off the rope. It stabilizes them. Well, the Moon helps the Earth in the same fashion. But poor Mars doesn’t have that same kind of stabilizer.

So, what is doing the forcing? The solar system is a complex place. If it were just Mars and the Sun, and if Mars was perfectly uniform, there would be much less cause for variability. But according to Mr. Newton’s universal law of gravitation, every body in the universe attracts every other body. In the case of the solar system, Jupiter is the primary perturber of orbits since it is the largest planet. Mars, being farther from the Sun, is a little less strongly bound by the Sun, and being closer to Jupiter than we are, is more strongly perturbed by it. Mars also has an interesting asymmetry called the Tharsis bulge. It is a huge plateau upon which the Tharsis volcanic mountains reside. This tends to make Mars wobble a bit as it rotates – like an unbalanced tire. The heavy side is slightly more strongly attracted to the Sun or Jupiter than the lighter side. Over time, these little nudges add up and can drive the variations.

Above, I called these variations “chaotic”. This is not a pejorative term – to scientists it has a specific meaning. Most systems in our daily lives are pretty predictable and well behaved. We can predict changes in behavior with changes in input. We nudge something and it moves. We nudge it a little harder, and it moves a little faster. These are called linear systems. Some dynamic systems don’t behave this way – at least not over a wide range of conditions. For instance, Mars may respond linearly to changes in gravitational inputs – but once the changes have built up so far, small changes to inputs can produce large changes in behavior. This makes long-term prediction difficult. We call these kinds of sensitive systems chaotic. And chaos is relatively common in the solar system since there are so many little influences perturbing planetary motions. Chaos in systems limits how far we can calculate back in the past or into the future with any confidence of accuracy. That is what we mean by Mars having chaotic variations.

So what does this mean for the climate of Mars? Obviously if Mars’s poles are straight up and down the planet will see a far different climate than if the poles are at 60 degrees! A Mars with 0 degree obliquity will be cold – and most of its CO₂ atmosphere will freeze out and gather as dry ice at the poles. A 60-degree obliquity moon will have both poles fully illuminated by rather direct sunlight (same angle as at, say, Miami – but less intense because of the greater distance). The dry ice will sublime into the atmosphere. Much of the water ice will melt. Whether conditions will be such that there can actually be precipitation, or whether the water will soak into the porous rocks is unknown. Even with less dramatic episodes of obliquity, the climate will change.

If there is one thing we have learned about life, it is that it is tenuous. Once it can get established, it seems to find a way to keep going. It can adapt, or go dormant. But it seems to be persistent. So if life did indeed get a start in the earlier warm, wet Mars days, it may have been able to survive through periods of dormancy in cold climates and activity in warmer ones. Some authors have suggested that the poles are a great place to look for signs of life since that is where the water is.

Here is hoping that the new batch of Mars exploring missions are able to learn more about the long-term climatic history of the intriguing red planet next door.

COMETS—MONSTER SPRING, OR HO-HUM?

BY PHILLIP J. CREED

Of all the more transient phenomena of the heavens it is the comets that have fascinated me with an awe that few other wonders can illicit. Not that there isn't plenty of beauty to be found in deep-sky objects, but the sight of seeing a bright comet filling up a sizable portion of a binocular field with its gossamer-thin tail is one of those welcome aberrations from the static.

In the wake of Comets Hyakutake in 1996 and Hale-Bopp in 1997, it seemed easy to get spoiled with having two bright comets visible in such a short period of time. Waiting for another bright comet was like waiting for the other shoe to drop. Comet Ikeya-Zhang of 2002 was a welcome sight, sporting an 8-deg tail and shining at 3rd magnitude, but it has been almost a decade without a monster comet. And, truth be told, the odds would be in favor of there not being another monster comet. Nevertheless, the spring months of 2004 hold out an interesting twist—with a little luck and a little sacrifice (okay, you got it out of me; an insatiable appetite for bright comets that can only be quelled by long travel; happy?!), it may be possible to see TWO monster comets in the span of WEEKS.

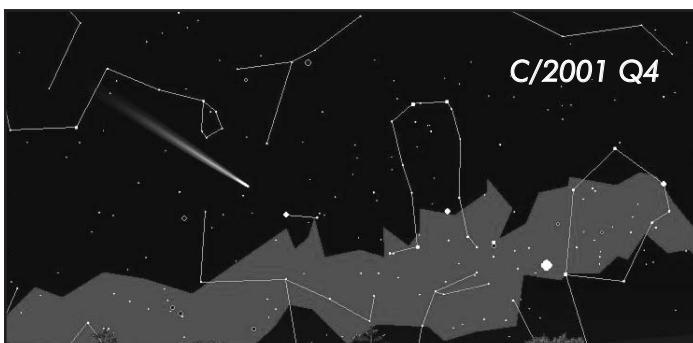
Our contestants are Comets C/2002 T7 (LINEAR) and C/2001 Q4 (NEAT). Both comets are currently inbound at this time, and for the most part, they are each holding close to their respective ephemeris. C/2002 T7 is currently visible in the northern sky just south of Andromeda, shining around 8th magnitude. It should disappear below the western horizon in late February around 5th or 6th magnitude.

Where C/2002 T7 gets interesting is at perihelion in May. It's scheduled to peak around magnitude 0 or 1, when it is strictly a southern-hemisphere object. However, there is a moonless window in the predawn sky in the last week of April

where the comet should be around magnitude 1 or 1.5. To have any decent altitude, one must be south of 30N latitude, or about the Florida/Georgia line. At our latitude, the comet will rise at the start of twilight and will probably be too low to look spectacular. Key West, at latitude 25N, would offer many a fine view off to the east for this comet in the last week in April; the simulation provided is c/o Starry Night Pro, and is for the morning of April 28, 2004, at the start of astronomical twilight. The comet's altitude is about 9 degrees. Some other sites, like Fort Davis, TX, could be used, as well. They are further north, but they would offer a drier environment with more altitude, thus the lesser amounts of atmospheric extinction may make up for the lost altitude.

OK, maybe this sounds like a little too far to travel. Well, there's this option—you could hang around town and hope for C/2001 Q4 to put on a fine show. Unlike C/2002 T7, the latter comet is strictly a southern-hemisphere object on the inbound leg. When it reaches perihelion, however, the comet is well-placed around the world, and a moonless period between the evenings of May 6 and May 20 should have this comet well-placed for observation, at perhaps 1st-magnitude. Here is another Starry Night-generated map, this time for May 10, 2004, for Canton, OH. In addition to the comet, Saturn, Mars, and Venus will form a close trio, with Mars nearly superimposed on the cluster M35.

As always, forecasting the arrival of a bright comet is trepidacious at best. There are no "lead-pipe locks". Allowing even a meager brightening rate by C/2001 Q4 means the comet should at least hit 3rd-magnitude, and a series of Ikeya-Zhang-type comets is better than the miserable drought we had from about Comet West seemingly all the way through Hyakutake. So keep your fingers crossed for some cosmic snowballs heading our way, and maybe allot a little extra time for your galaxy-hunting this spring.



The Event Horizon

February 2004

6th: Planetarium show & Public Viewing Night
7:30 at TWC - Clear or Cloudy!

27th: WCAC Meeting - 7:30pm at TWC IB

March 2004

5th: Planetarium show & Public Viewing Night
7:30 at TWC - Clear or Cloudy!

10th: Planning Committee Meeting - 7:00pm
at John Waechter's house

19th: Club Observing Night - Kensington
Cloud date, Saturday 3/20

26th: WCAC Meeting - 7:30pm at TWC IB
Election of Officers

April 2004

2nd: Planetarium show & Public Viewing Night
- 7:30 at TWC - Clear or Cloudy!

30th: WCAC Meeting - 7:30pm at TWC IB

Club Observing Night

Friday, March 19th
cloud date - Saturday, March 20th

At the new Kensington observing site
Contact John Waechter for details & map

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