AN EXCITING ASTRONOMY EVENT
IN ST. PAUL, MINNESOTA

The heavens are coming to Earth in St. Paul, Minnesota, on July 13-15, and everyone is invited.

For over 100 years, the Astronomical Society of the Pacific (ASP), the nation's oldest and the world's largest general astronomy society, has worked to explain the mysteries of the Universe to students, teachers, hobbyists and the general public. Its Annual Meetings bring together professional and amateur astronomers, astronomy historians and educators, science students and the general public.

The activities begin on the evening of Friday, July 13, with a star party hosted by the Minnesota Astronomical Society and the ASP. Following that evening of observing, the weekend of July 14-15 is filled with speakers and numerous exhibits for all ages. Among a number of confirmed speakers are David H. Levy, noted amateur astronomer and comet discoverer; Claude Nicollier, Shuttle astronaut and astronomer; Virginia Trimble, astronomer from the Universities of Maryland and California, Irvine; Bob Berman, astronomy columnist for "Discover" and "Astronomy" magazines; Alex Filippenko, astronomer from the University of California, Berkeley; and William Sheehan, well-known amateur astronomer and author.

In addition to speakers addressing topics like "The Greatest Sky-Spectacles of the 21st Century", "Einstein's Biggest Blunder? The Case for Cosmic Antigravity", and "The 10 Great Tourist Wonders of the Solar System", the weekend Expo will include a large exhibit hall filled with astronomy-related merchandise and displays including books and photography supplies, telescopes and computer software, and booths for on-going and future NASA missions. In addition, there will be book signings and drawings for astronomy-related prizes. Join people from around North America in a national astronomy festival where a weekend pass is only $20.

All weekend activities will take place at the Radisson Riverfront Hotel, 11 E. Kellogg Blvd., St. Paul, MN 55101, 651-292-1900, from 9:00 a.m.-5:30 p.m., with the exception of Friday evening's star party. For information, including fees, visit http://www.asp.org/meetings.html.

Meeting cosponsors include Astronomy Magazine and Astronomy.com, the Chandra X-Ray Observatory Center, the University of Minnesota's Department of Astronomy, the Science Museum of Minnesota, and the Minnesota Astronomical Society.

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The Longmont Astronomical Society, a nonprofit educational organization, was founded in 1987 to enhance public awareness of amateur astronomy. The society's activities include lectures on various astronomical topics and related space sciences at local schools and other organizations, monthly public sky observing sessions, and monthly meetings featuring select speakers. The society serves the Boulder, Estes Park, Longmont, and Loveland, Colorado areas. Regular meetings are held on the third Thursday of every month at 7:00 PM in the Longmont Christian School basement, 550 Coffman St., Longmont. Annual dues are $20. All meetings are open to the public. Visit the LAS web page at http://lasp.stl.noaa.gov/cgl/las.cgi for timely reminders of upcoming events and maps to monthly star party sites.
MINUTES
of the
LONGMONT ASTRONOMICAL
SOCIETY’S
MONTHLY MEETING
held on
Thursday, February 15, 2001

There were thirty-six names on the roster this month, though it seems there were more folks attending than that. Visitors included Mark Poinsett, Mike and Debbie Bowden, and Canadian fellow astronomers Alister Ling and Jay Anderson.

President Dave Street reported that the club’s officers were discussing the idea of making Anderson Farms a quasi-permanent location for the annual banquet, and also forming tentative plans for a club picnic/barbecue/stars party to be held this summer around the end of July or August at a time that would not conflict with any major star parties.

Vice President Gary Garzone gave a short mention of the upcoming stars party at Sterling, and mentioned that he had met Larry Combs of the Space Environment Laboratory, who offered to host the club for a visit to the facility in the near future. Timing for the event will be announced at a later date.

Secretary/Treasurer Michael Hotka reported that the club’s accounts are in the black and in good shape.

Andrew Planck brought his astrolabes for show and tell, with an interesting description of how these simple and elegant historic instruments can be used for determining the time by simply sighting a star, and how many other ephemeric elements can be computed with them.

Stephanie Fawcett gave a great presentation on her two current astronomy projects for school, the first of which was a show and tell of the spectrograph she constructed. This included illustrated hand-outs with assembly and use instructions for anyone that wishes to make a similar instrument. Stephanie described how she took spectra of Vega and Capella, and calibration spectra of gas lamps. Then, using a chart in a book, she was able to identify the star’s spectral types and plot them against the H-R diagram. She also described how she could detect the sun’s spectrum in the light reflected from the planet Jupiter with this simple device.

The second part of her presentation was a report on her project using the ST-8 equipped 24 inch Cassegrain at Sommers-Bausch observatory, wherein she hopes to update the light curves and periods of a few known short period eclipsing binaries that currently lack modern data, and perhaps find periods for a few other suspects.

Her talk included a detailed description of the work involved in making the needed observations, including the taking of flat frames and bias frames with the CCD camera and reducing the data. We all wish her the best of success in this endeavor!

Alister Ling and Jay Anderson of the far north country (Winnipeg and Edmonton) gave a well-received presentation that showed a glimpse of the problems faced by deep-sky observers in northern Canada. This included many beautiful slides of upper latitude atmospheric phenomenon including parhelion, pillars and rings, noctilucent clouds, and some stunning pictures of the aurora borealis. Mention was also made of using a polarizing filter in conjunction with natural sky polarization to view Jupiter with the naked eye during daylight.

Thank you all!

LAS
ANNOUNCEMENTS

ROAD TRIP

The April meeting of the LAS will be held at the new Skaggs Research building on the campus of the National Institute of Standards and Technology (the National Bureau of Standards, for you old-timers) at ~325 South Broadway in Boulder. Attendees will be treated to tours of the SEC and the FSL of NOAA.

Meet in the parking lot just west of the Skaggs building; the tour of the SEC will start promptly at 7:00 pm, followed by the tour of the FSL. Each tour should take about an hour to an hour and a half.

For Longmonters that would like to arrange carpools, meet in the parking lot of Longmont Christian School promptly at 6:30 pm.

Due to the change in venue, April’s Spring Swap Meet will be postponed to the May meeting.

The LAS has a
NEW MAILING ADDRESS:
Longmont Astronomical Society
P.O. Box 806
Longmont, Colorado
80502-0806

If you are of a mind to recycle, and would like to make a small contribution to the LAS telescope making fund, bring your recycled aluminum cans to the regular meeting each month for collection. Proceeds from this activity will help fund a telescope for a local school or other worthy recipient.
Some INTERNET LINKS of Interest:

Here's a neat movie of auroras on Jupiter (follow both links when you get there):

Here's an online map of current lightning strikes all across the country:
http://www.lightningstorm.com/lightningstorm/index.htm

To download and install the National Geographic Society's free Virtual Solar System, go to:
http://www.nationalgeographic.com/solarsystem/splash.html

Thanks, Karen M.

HOW TO FLY A SPACECRAFT

"The Basics of Space Flight," a popular, longtime Internet offering that teaches the essentials of operating interplanetary spacecraft missions, has been updated and is now available, courtesy of NASA's Jet Propulsion Laboratory, Pasadena, Ca., at:

The self-teaching guide, created by JPL spacecraft operations engineer David Doody, was originally created almost a decade ago to help JPL spacecraft operators understand the concepts of and relationships between various specialized elements of a space mission, such as spacecraft engineering, mission design, launch and telecommunications. Since then, "Basics of Space Flight" has engendered broad appeal inside and outside of NASA for aerospace professionals and armchair space explorers alike. It also enjoys growing popularity among high school and college students and faculty.

"Our purpose was to cover the broad range of all subject matter that plays into robotic spaceflight," said Doody. "It covers broadly, but not deeply, all the elements of a robotic space mission. Any one of the topics we touch on could involve a lifetime of specialization." Doody said he drew upon contributions from experts in different fields at JPL and numerous other institutions.

The module, unavailable in printed form, is intended to be used online via the World Wide Web. Interactive quizzes provide users with a measurement of their progress.

"Basics of Spaceflight" was created by Doody for JPL's Telecommunications and Mission Operations Directorate under NASA's Office of Space Science. JPL is a division of the California Institute of Technology in Pasadena.

and Another:

Moon phase info for any date in 2001 and lunar features that are best visible for that phase: www.inconstantmoon.com While you're at it, check out www.moon-watch.com, and the associated links.

Thanks, Dave S.

Current LAS Membership List

If your name does not appear here, please contact Secretary/Treasurer Mike Hotka.

Steve Albers
John Axtalos
David Beery
Kimber Bertron
Dennis Billings
David Bishton
Edward Blair
Gene Brites
Kevin Brown
Ulysses & Ellen Brown
Don & Betty Bunker
Martin Buttery
John Butrito
Kathy Cary
Ted Clan
James Crane
Randy & Judy Cunningham
Melinda Diehl
Ellsworth Dutton
David Ewing
Rick, Patty, & Stephanie
Faunce
Brian & Alex Gamble
Gary Garzone
Paul Hale
Michael Hotka
Vaughn Hosie
Michael Hutchinson
Brian Kimball
David Larison
Forrest Lundberg
Dick Mallot
Cathryn Marsh
Graham McMeeking
Karen Mendenhall
Robert Michael
John & Dawn Mosher
Alan & Nancy Muth
David "Mike" Muth
Bob Noble
Bill & Maryanne Paschen
Pete Petersen
Leigh Pierson
Andrew Plancek
Andrew Robertson
Robert Ross
Jim Sapp
Kirk Schneider
Les Shaw
Brian Simpson
Michael Smith
Russell Smith
Duane Spiker
Robert Spohn
Ram Sreereangam
David Street
Archer Suly
Tom Teeters
James Totoritis
Doug Walton
Ray Warren
Pamela Wheaton
Calvin & Carol Wichern

Newsletter Operating Manual

Material submitted for publication must be received by the editor prior to midnight of the Saturday preceding the monthly meeting. Submissions can be e-mailed to jsstars@worldnet.att.net, or mailed to 1209 Vail Lane, Longmont, Colo., 80503.

Electronic submissions can be received as e-mail, or e-mail attachments as delimited DOS or ASCII text, WordPerfect 6, MSWrite, or Rich Text Format. Please save MSWord documents as Rich Text Format or as .txt before sending, lest they be sent to the great bit-bucket in the sky.

Here are two reminders that may help to reduce extra production and postage costs for the newsletter:

1) Come to the meetings! Every member that picks up their newsletter at the meetings saves the club 33 or even 55 cents in postage fees for the month. That may not sound like much, but with 80 + members, it adds up quickly!

2) Be sure to (legibly) sign the attendance roster at the meetings, for it is the tool used by the editor to determine who has already received their newsletter when mailing time comes, which will usually be the Saturday following the monthly meeting.
Another Bright Comet by LINEAR

Toward the end of this year, skywatchers should be treated to what may turn out to be the brightest comet since Hale-Bopp. The comet was first thought to be an asteroid when it was spotted Nov. 16, 2000 by researchers at the Lincoln Laboratory Near-Earth Asteroid Research project (LINEAR). It was later identified as a comet and given the official designation of 2000 WM1. Those interested in observing this comet are referred to the ephemeris provided at the back of this issue. Stay tuned for more information as it becomes available.

Clips from NASA News

Evidence for Wet Past on Ganymede

Bright, flat terrain in long swathes on the surface of Jupiter's icy moon Ganymede may testify that water or slush emerged there a billion years ago, say planetary scientists who have combined stereo images from NASA's Galileo and Voyager missions to examine provocative features on that moon.

This bright terrain, long since frozen over, lies uniformly in troughs about one kilometer (a little over a half mile) lower than Ganymede's older, darker, cratered terrain.

Ganymede is the largest moon in the solar system and larger than the planet Mercury. The roles that volcanism and various forms of tectonics have played in molding its complex topography have been hotly debated over the years. But the newly created images, taking advantage of the large quantity of Voyager images and the higher resolution of Galileo's, point to volcanism as the main impetus behind the troughs.

"What we think we're seeing is evidence of an eruption of water on the surface of Ganymede," said Dr. William B. McKinnon, professor of Earth and planetary sciences at Washington University in St. Louis and co-author of the study published in Nature on March 1, 2001. "We see these long, smooth troughs that step down up to a full kilometer. They're very much like rift valleys on the Earth and they're repaved with something pretty smooth. The material in the troughs is more like terrestrial lava in terms of its fluidity than relatively stiff glacial ice." He said the material is banked up against the edges of the walls of the trough and appears to have been more fluid than solid ice would have been, even if it were relatively warm ice. These features support the idea that they were created by volcanism.

The report's other authors are Dr. Paul Schenk of the Lunar and Planetary Institute, Houston, Texas; Dr. David Gwynn of the University of California, Los Angeles; and Dr. Jeffrey Moore of NASA's Ames Research Center, Moffett Field, Calif. Images from the report are available online from NASA's Jet Propulsion Laboratory, Pasadena, at http://www.jpl.nasa.gov/pictures/jovianmoons.

The researchers used stereo imaging -- a method where three-dimensional objects are reproduced by combining two or more images of the same subject taken from slightly different angles -- to reconstruct the physical topography of Ganymede's terrains. Maps were then generated from the stereo images. "This is a new kind of stereo topographical information over hundreds of kilometers across Ganymede," McKinnon said. The images provide new clues about what happened on Ganymede long ago and how that moon reworks its older, darker material.

One trough extends an estimated 900 kilometers (about 600 miles), the approximate distance between St. Louis and New Orleans. "The long trough is probably a billion years old, but it's actually one of the younger volcanic features," McKinnon said. "It's the last gasp of the process that made the bright terrain."

According to McKinnon, the geological explanation for such long lanes of flatness is that they occurred by the extending and opening up of Ganymede's crust. And then that portion of the crust became flooded with some sort of lava. The high-resolution Galileo images show that material that flooded the lanes is "no less liquid than a slush," said McKinnon. "But it is not glacial ice, which would have big moraines and big round edges like a flowing glacier does."

Moreover, the images reveal depressions that resemble volcanic calderas along the edges of the bright terrains. On Earth, calderas are large, more-or-less circular craters usually caused by the collapse of underground lava reservoirs. "The caldera-like features make a pretty good circumstantial case for volcanism causing this topography," McKinnon said. "We think these particularly bright terrains were formed by volcanism, which means that most or all the other bright terrains started out this way, and became fractured or grooved over time through tectonic forces."

Galileo has been orbiting Jupiter since 1995. Its 12 scientific experiments have enhanced researchers' understanding of Jupiter's atmosphere, large moons and vast magnetic field. It carried the first atmospheric probe to enter Jupiter's atmosphere. In other firsts, it was the first mission to discover a satellite of an asteroid (Ida's satellite Dactyl), the first to go into orbit around Jupiter, the first to make a close flyby of an asteroid (Gaspra), and the first to provide direct observations of a comet hitting a planet (Shoemaker-Levy 9). Galileo has also provided extensive information about active volcanism on the moon Io and the possibility of a subsurface ocean on the moon Europa. Later this year, it will make close approaches to the moons Callisto and Io.

The Voyager 1 and Voyager 2 spacecraft each passed near Jupiter in 1979 and then explored more distant parts of the solar system. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the Galileo and Voyager missions for NASA's Office of Space Science, Washington, D.C.

Twin-Telescope Sky Survey Complete

After scanning the entire sky and capturing breathtaking and scientifically important images of galaxies, stars and other celestial objects, a pair of infrared telescopes has finished its
survey work.

For the past three and a half years, the twin telescopes of the Two Micron All-Sky Survey (2MASS), located in Arizona and Chile, have conducted the first high-resolution digital survey of the complete sky. The successful completion of observations marks a milestone in modern astronomy. For the next two years, data processing will continue for the 24 terabytes of archive data, which is enough to fill more than 2,000 hard drives on an average home computer.

"These telescopes have given us the first detailed global view of our Milky Way galaxy and the galaxies that lie beyond," said Dr. Michael Skrutskie, of the University of Massachusetts, Amherst, 2MASS principal investigator. "The resulting databases and source catalogues are a treasure trove which will be mined for discovery by scientists and the public alike for decades to come." The University of Massachusetts was responsible for the development and construction of the 2MASS telescopes and cameras and managed the collection of survey data.

"The 2MASS telescopes and cameras operated with incredible efficiency and were workhorses for more than a thousand nights," said Dr. Roc Cutri, project scientist at the Infrared Processing and Analysis Center (IPAC) at the California Institute of Technology and NASA's Jet Propulsion Laboratory in Pasadena, Calif. "The facilities collected data 99.5 percent of the available time during the mission, and only a few nights were lost due to hardware failures. That's a remarkable record for any astronomical observatory on the ground or in space."

IPAC developed the software system to convert raw digital data from the telescopes into stunning images and catalogues useful to astronomers. IPAC also archives and distributes those data to the public via the Internet, in essence, turning home computers into desktop observatories.

The 2MASS survey is the most thorough census ever made of our Milky Way galaxy and the nearby universe. It detects infrared wavelengths that are longer than the red light in the rainbow of visible colors. Infrared light penetrates dust more effectively than visible light, so it is particularly useful for detecting objects obscured within the Milky Way, as well as the faint heat of very cool objects that give off very little visible light of their own.

To cover the entire sky, 2MASS used two highly automated, 1.3-meter (51-inch) diameter telescopes, one at Fred Lawrence Whipple Observatory on Mount Hopkins, Ariz., the other at the Cerro Tololo Inter-American Observatory in Chile. The Arizona telescope began operations in June of 1997, while the Chilean telescope began scanning the sky in March 1998. Both facilities completed their work on Feb. 15.

Catalogues containing more than 300 million stars and galaxies extracted from the images have begun to yield significant astronomical discoveries, and will provide an invaluable reference frame to steer NASA's Space Infrared Telescope Facility (SIRTF), scheduled for a 2002 launch, and other future infrared space missions.

The survey has:

- Uncovered numerous stars with such unique characteristics that astronomers have had to update a century-old classification system of known types of stars, and also unveiled the coolest brown dwarfs, or failed stars, known to date; Detected previously unknown galaxies seen behind the disk of our own Milky Way; Mapped new star-birth regions both in our Milky Way and in other galaxies; and Discovered many new, dust-obscured active galaxies and quasars in the distant reaches of the universe that were missed by earlier surveys that used visible and ultraviolet light.

The 2MASS project is a collaborative effort between the University of Massachusetts and IPAC. Part of NASA's Origins Program, 2MASS is primarily funded by NASA's Office of Space Science. Additional funding was provided by the National Science Foundation. In addition to enabling groundbreaking new scientific discoveries, 2MASS results will also benefit future Origins missions, including SIRTF and the Next Generation Space Telescope, and will also help scientists plan observations for the Hubble Space Telescope and the Stratospheric Observatory for Infrared Astronomy.


"There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact." —Mark Twain
You are Invited!

to the 3rd annual

Sterling Star Party

The 2001 Sterling Star Party is set for the evenings of Friday, April 20 and Saturday, April 21 at the North Sterling State Park, just outside Sterling, Colorado. The Northeastern College and its students plus local folks will be there, as they will advertise in the local newspaper and radio.

There are big camp sites with lots of room at the top of a hill above the lake for clear sky views in all directions. Showers, toilets, and other facilities will be open, and camping fees will be waived for astronomers, though it will be necessary to purchase day passes at $4/day if you don't have a current Colorado state parks pass.

Directions: From Main street in Sterling, turn north on North 7th avenue, follow the sign 12 miles to the reservoir.

North Sterling State Park
24005 County Road 330
Sterling, CO 80751
William Yang Optics' "Megrez" 80mm SD Refractor

A while back I started looking for a new scope with the objective (sorry about that) of taking it to Madagascar with me next year for the eclipse. I needed a scope that was solar capable, which leaves out my favored truss tube Dobsonians, and it needed to be small and light, considering that in this situation I could do without cleaning if my luggage were lost, but I will not check my optics! For a variety of reasons, I felt that a small refractor was going to be the choice, but which one? I had to balance cost, optical quality, mechanical quality, weight, aperture, etc...

I was starting to lean to the Televeue Ranger when I spotted an 80mm f/6 "SD" doublet refractor from William Yang Optics. This appeared to be a good candidate, in that it is somewhat photographically oriented, (reasonably) light, and with 10mm more aperture than the Ranger would do a bit better on the nights that we'll be in a country that is barely visible on the recent "Earth at Night" picture.

After a couple months of waiting, the scope arrived and it appeared to be worth the wait. Starting from the business end, and working back to the focuser:

1. The dust cap is machined aluminium with a black fabric non-marring inner surface. I expected plastic.

2. Lens & cell: non-adjustable. The legend on the focuser claims fully coated optics. Shining a light at the objective indicates coatings of some sort, but they look weird. I don't know much about coatings, so add salt as appropriate.

3. Dew shield: aluminium, retractable. There's no set screw to hold the shield in place, but it is quite stiff and I expect no problems. There is the WYO gold band around the base of the dew shield. I think that it gives the scope a "chinese restaurant decoration" feel, which is fitting as it comes from Taiwan. A bit gaudy, but distinctive, and everyone will know from miles away that it's a Yang.

4. Tube: glossy, pearlized white. Appears to be a very hard and hopefully durable finish. The baffles inside appear to be some sort of foam "stair step". Sort of like an index drill bit in reverse. Weird.

5. Focuser. Rotates without shifting collimation. The Crayford style focuser is light and precise. There is sort of a "focuser clutch" which seems to disengage the focuser knob, as well as a focus lock. The 2" focuser has a brass compression ring, and is VERY tight. I don't expect any problems with 2" accessories falling out. Focuser barrel is chrome, with the very back painted black. A 1.25" adapter is included, but it has no compression ring and is a much looser fit than the 2" focuser.

One more thing about the 1-1/4" adapter: the notch in the 2" back for the adapter retaining screw seems a little bit shallow. When the adapter is inserted all the way into the focuser, the retention screw fails to engage, which can cause whatever accessory you have to fall out. Easily worked around by pulling the adapter out a millimeter or so, but slightly annoying none the less.

One minor note: the scope failed to reach focus with a 1.25" mirror diagonal. Pulling the diagonal out 1/2" allowed it to focus on the moon. It should be fine with a 2" diagonal.

6. Focuser dust cap: machined aluminum with the WYO "swan and observatory" logo engraved in it. Some people don't seem to like the logo. I find it rather elegant and a welcome change from the rather pedestrian text-based logos of most other telescope vendors.

Accessories:

This scope came with tube rings, an erect image diagonal, a 25mm Plossl and a photo adapter.

The tube rings are quite heavy, and fit nothing except the WYO multi-mount adapter. Unfortunately, the one mount it doesn't seem to adapt to is the one GEM that I own. One problem with the rings/adapter is that the central position of the adapter puts the balance of the scope well back towards the eyepiece end. Any eyepieces, cameras, etc. will make it worse. I will probably have to fabricate an adapter (or modify this one) to allow the scope to balance better on whatever mount I use it on, though I found that if a single tube ring is used, balance can be achieved with the stock plate.

By turning the plate over I found a place where the rings could be bolted on much closer to the center, allowing the tube to be positioned for better balance. It won't fit on a Losmandy mount this way, but it will work better. A trip to the hardware store will probably let the thing fit on my old Polaris mount, at least until I can fabricate a better adapter.

The erect image diagonal is cheesy. Looks like it causes significant vignetting.

The 25mm Plossl seems cheap, but ok. It's not a Sirius, but not horrible. I might use it, or give it to my 6 year old.

The photo adapter acts as a 2" extension. The inner end is threaded for filters. Baffling seems quite good. Mine came with a small nick in the anodizing, nothing to worry about, but it isn't perfect.

Mechanically, this is more scope than I really expected for the modest price. The focuser seems especially good. Collimation was checked with a Cheshire, and found to be good (once I realized that the loose fit in the 1.25" adapter was causing me grief). This is a Good Thing because there appears to be no easy way to adjust the collimation.

Once out under the stars in seeing-challenged Boulder, I thought that the images were good. Remember that atmospheric turbulence in Boulder probably adds 1-2 waves of SA ;). When I finally got the scope out to California and some sites that have relatively stable air, a small amount of astigmatism was found. This was somewhat worrisome. Just before the 'stig was found, however, someone looked through the scope and exclaimed "optical perfection!" So the 'stig wasn't horrible.

Then a fellow with access to an interferometer and other goodies posted an analysis of his Megrez. Verdict: slight 'stig caused by an over tightened retaining ring. He also noted that the baffling was stopping down the scope to about 70mm. Not long after this the dealer announced a recall of Megrez's to have the optics checked and adjusted, and the baffling moved to provide the full 80mm aperture.

The astigmatism in my scope was slight enough that I believe that it was caused by overtightening. In focus images, particularly at low power, are very good (witnessing the remarks of an observing companion above). Since the scope came back from the dealer, I have not had a chance to take it out, and I am likely not to take it with me to California this week, as I don't expect to do a lot of observing. However, I expect the astigmatism to be gone, and the images to be somewhat brighter with a slight increase in color.

- Archer Sully
NOTES FROM THE DARK SIDE

Cactus Flats, 17 February, 2001

Driving east to the flats the haze that was blanketing the front range seemed to be dissipating. Arriving first to an observing field clear of snow the sky was nice and blue overhead from about 30° up to zenith. Steve Lynch and Mike R. arrived shortly after I did. We were joined by two fellow Greeley-ites Dave & Galin who I believe to have met before, maybe last summer.

Starting off on the three planets dominating the evening sky, Venus was as steady as I can recall, showing an excellent quarter phase. The gas giants were also giving wonderful views with the GRS coming around on Jupiter and the colors in the atmosphere were exceptionally vibrant. Saturn, now several months past opposition was casting a nice shadow on the rings. This seems to enhance the 3-D effect when using a binoviewer. Finally the skies darkened enough to begin hunting down some "deep sky" objects. Naked eye it was apparent the haze was still over us, affecting viewing up to 45° above the horizon. The surrounding glow from the Denver, Greeley, Ft. Collins and Cheyenne nebulas made Galaxy hunting futile. I did track down NGC 2261, Hubble's Variable Nebula and its neighbor the Cone Nebula NGC 2264. Nice objects that I want to try again under better conditions. Another highlight was NGC 1907, a small compact OC just north of M38. By 10:00 the temperature pleasantly rose to the upper 20°s which was followed by the tightening noose of haze overhead.

Around 10:30 the sky was completely gone and we decided to pack it in. This time we had very good seeing but lousy transparency. Last trip out it was excellent transparency but poor seeing. Sounds like were are do for a good one where everything comes together.

- David Dunn

Crow Valley, 24 February, 2001

After waiting an hour for the gale force winds to show signs of subsiding at Cactus Flats, Steve Lynch, Mike R. and I decided to head over to Crow Valley Campground. Shortly after our arrival David Ewing filled out the group for the evening.

Early views indicated the transparency to be poor. This was confirmed by the total lack of detail on the planets even at low powers. Some early highlights included the Pleiades in Dave Ewing's 8" with a 49mm Brandon eyepiece framing the cluster nicely. Thor's Helmet, NGC 2359 an emission nebulæ in CMa, also known as the "Duck Nebula", a fairly bright concentration with faint wisps flaring out to the south.

As well protected as Crow Valley is, by 11:00 there was a strong wind coming out of the north that finally blew out the muck we were trying to observe through. Stars that were fuzzy balls now became sharp points of light. The rest of the evening/morning was focused on the springtime constellations that are now beginning to dominate the sky.

Another highlight was viewing the California Nebula in Steve's Pronto using a 40mm Pentax and a H-Beta filter. The whole nebulosity was plainly obvious. Popping the binoviewer in the 17.5", I spent much time on my favorite objects, globular clusters. Two of note are M53/NGC 5024 and NGC 5053. These two GC's are about 1° apart (in COM), jumping back and forth between the two illustrates how different GC's are in structure, shape and size. We were having fun trying to identify galaxies in the Virgo/Coma Berenices area, that's always good for an hour or so.

We tracked down the comet McNaught-Hartley just off of pi Hercules. Much more faint than I had expected with little shape to it; more of a fuzzy ball than anything. Mars was still fairly low in Scorpius and would soon be obscured by the cloud bank slowly moving in from the west. Delta Scorpii appeared to be in another brightening. By 3:30 M51 and NGC 4565 were nearly at zenith and were providing stunning views; a good point to end the night.

After the morning coffee Steve vowed us with some great H-Alpha looks at the sun in his solar scope. I sure do hope it starts getting warm soon!

- David Dunn

Contributors to this month's Journal:

David Dunn: observing reports; Gary Garzone: Coma Berenices; Karen Mendenhall: Solar System Gleanings, internet links; Jim Sapp: monthly solar system stuff; Brian Simpson: monthly star chart; Dave Street: internet links; Archer Sully: Megrez review

Special thanks to MCDATA Corporation for the use of their copier. Sorry if I missed anyone!

EQUIPMENT AND BOOKS TO LEND

Don't forget about the LAS equipment that is available for members to borrow, including a 10 inch reflector, solar scope, and many books and videos.

Contact your Equipment Manager, Leigh Pierson at 303 772-4689, or leighp13@bouldernews.infi.net to use this free service!
The constellation lies between Bootes and Leo, above Virgo, below, Canes Venatici, between Arcturus and Denebola stars. Coma Berenices has no bright stars to distinguish it and is sometimes hard to find but is a remarkable piece of sky. It's a sprinkling of faint stars super imposed on a cloud of galaxies, the northern end of the Virgo clusters. There are eight Messier objects in this small constellation and some good NGC ones, like our Favorite NGC4565, great edge on galaxy. M53, great bright globular, easy to find. M64, the blackeyed galaxy with dark lane also, and small but good galaxies like, M85,88,91, 98,99,100, and actually many more galaxies, but small and pretty faint. Spring is the time to look for these objects coming up in the east early. I have done these in the yard, but dark sky place like pawnee help a whole lot. The dark lane in NGC 4565 is a must to check out, with dark lane so long it runs out to edges of 20 nagler eyepiece at pawnee on the 30. M53, globular cluster, great ones to show people at star party. Well we are lucky to have great people and scopes in club, so check out one constellation per night like this one. Hope to see some of you at pawnee to see all of these in the dark skies with the 30, happy hunting. bye gary g
Solar System Gleanings
by Karen Mendenhall

From *1001 Things Everyone Should Know About the Universe*, by William A. Gutsch, Jr., Ph.D:

from Chapter 3:

**The Moon: Our Nearest Neighbor**

163 - The tides are caused by both the Moon and the Sun. It is a common notion that the Moon causes the tides, but actually the Sun also plays a role, albeit a smaller one. Although the Sun is farther from the Earth than the Moon is, the Sun is so much more massive that it still exerts a significant gravitational influence.

165 - The tidal bulge in the direction of the Moon is pretty easy to understand, but the bulge on the side of the Earth that points away from the Moon is a bit harder.... The secret to understanding the second bulge lies in understanding what really causes the tides. Most people think the Moon's gravity causes the tides, but this isn't exactly correct. It isn't the Moon's gravity per se but rather the difference in the amount of gravitational pull the Moon exerts on the near side of the Earth vs. the far side of the Earth. The amount of gravitational force exerted by the Moon on the Earth depends on the distance between the Earth and the Moon. But the side of the Earth facing the Moon is almost 8,000 miles closer to the Moon than the opposite side. This means the Moon pulls with more force on the side of the Earth closest to it, less force on the side of the Earth farthest away, and an intermediate amount of force on the center of the Earth. The Moon pulls the water on the near side of the Earth away from the rocky core of the Earth, thereby creating the tidal bulge facing the Moon. But--and here's the tricky part--the Moon pulls harder on the Earth's core than on the opposite side of the Earth. Thus, the core of the Earth is pulled away from the water on the far side of the Earth in the direction of the Moon. This creates the second tidal bulge.

166 - Spring tides and neap tides are signs of a cosmic tug-of-war. When the Earth, Moon, and Sun all line up in space (at the times of a full and new Moon), the Moon and Sun pull on the Earth along the same line. This produces enhanced tides known as spring tides. (The name, however, is misleading, for these tides occur every few weeks through out the year....) In contrast, when the Moon and the Sun are positioned at right angles to each other as seen from the Earth (when the Moon is in its first- and third-quarter phases), they pull at cross-purposes, so the resulting tides are minimized. These are known as neap (rhymes with peap) tides.

170 - Some suggest that a higher incidence of...abnormal behavior occurs around the time of the full Moon.... It is clearly important...to differentiate between the power of the Moon and the power of the human mind. To paraphrase the great philosopher Pogo: "We have met the phenomenon and it is us."

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**HEADS UP!**

**Things to See This Month Only!**

**Mars** will double in brightness this month as we chase it toward opposition in June. By the end of this month it will appear slightly larger (14") than it did at the peak of it's last opposition two years ago!

The 70% sunlit **Moon** will traverse the northern part of the Beehive cluster for two hours centered on midnight of **April 2-3**, Longmont time.

**The Lyrid meteors** are expected to reach maximum around 10 pm local time on the **21st**. This unpredictable shower typically produces about 15 bright meteors per hour, though rates as high as 300 per hour have been seen in the past - always a surprise!

Watch the dark edge of the **Moon** snuff out Eta Geminorum at 8:23 pm on the evening of the **27th**.

---

**C/2000 WM1 LINEAR.**

Position and expected brightness is noted once per month until November, when the real action starts; then once every ten days through the end of the year. Keep your fingers crossed - this could be a good one!

<table>
<thead>
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<th>R. A.</th>
<th>Dec.</th>
<th>mag.</th>
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**Jupiter's Great Red Spot Transit Times for April, 2001**

*(Assuming Jovian system II longitude = 76 degrees)*

Only events with Jupiter above the horizon and the sun below the horizon are listed. Times shown are MDT (Longmont Daylight Time). Add or subtract 10h 55m for other events not listed.

<table>
<thead>
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<th>Time</th>
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<td>18</td>
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<tr>
<td>03</td>
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<tr>
<td>06</td>
<td>20:14</td>
<td>25</td>
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<td>08</td>
<td>21:53</td>
<td>27</td>
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<tr>
<td>13</td>
<td>21:04</td>
<td>30</td>
<td>20:14</td>
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</table>
Jovian Satellite Predictions for April, 2001

Only events with Jupiter above the horizon and the sun below the horizon are listed. Times listed are MDT (Longmont Daylight Time).

<table>
<thead>
<tr>
<th>01 Apr</th>
<th>02 Apr</th>
<th>03 Apr</th>
<th>09 Apr</th>
<th>18 Apr</th>
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<tbody>
<tr>
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<td>20:22</td>
<td>19:47</td>
<td>21:17</td>
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<td>Io</td>
<td>Io</td>
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<td>sha ing</td>
<td>sha egr</td>
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<tr>
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<td>21:42</td>
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<tr>
<td>sha ing</td>
<td>sha ing</td>
<td>sha egr</td>
<td>tra egr</td>
<td>occ dis</td>
</tr>
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</table>

Key: Cal = Callisto; dis = disappearance; ecl = eclipse; egr = egress; Eur = Europa; Gan = Ganymede; ing = ingress; Io = Io; occ = occultation; rea = reappearance; sha = shadow; tra = transit.

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**MARS**

Longitude of Central Meridian

*Longmont Daylight Time*

For different times, add 14.62 degrees for each whole hour going forward, or subtract if going backward.
For different dates, subtract 9 degrees per day going forward, or add 9 degrees per day going backward from the nearest date given.

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<th>10 PM</th>
<th>Midnight</th>
<th>2 AM</th>
<th>Sunday</th>
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<td>149</td>
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<td>14</td>
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<td>28</td>
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<td>314</td>
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<td>Sunday</td>
<td>Monday</td>
<td>Tuesday</td>
<td>Wednesday</td>
<td>Thursday</td>
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<td>--------------</td>
<td>--------</td>
<td>---------</td>
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<tr>
<td>Daylight Saving Time Begins (Yuck...)</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Passover</td>
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<td>8</td>
<td>9</td>
<td>10</td>
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<tr>
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<tr>
<td>Easter</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
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<tr>
<td>Grange Week</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
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</tbody>
</table>

**April 2001**

- **1 April**: Daylight Saving Time Begins (Yuck...)
- **8 April**: Passover
- **15 April**: Easter
  - Grange Week
- **22 April**: 09:26
- **29 April**: New Moon

**Events**
- **2 May**: Moon at perigee
- **5 April**: Good Friday
- **19 April**: LAS Meeting and Spring Swap Meet
- **20 April**: 3rd Annual Sterling Star Party at Sterling state park...
- **21 April**: Sterling Star Party...continued.
  - Lyrid meteors peak at 10 pm.
- **26 April**: Arbor Day
  - Plant a tree!
- **28 April**: ASTRONOMY DAY
  - 1st quarter Public Star Party

**Phase of the Moon**
- New Moon on 22 April
- Last Quarter on 29 April
- First Quarter on 7 May
- Full Moon on 14 May

**Moon at Apogee**
- 8 April
- 22 April

**Other Events**
- **22 April**: Look for the 2 day old Moon between Jupiter and Saturn.