

DENVER OBSERVER

Newsletter of the Denver Astronomical Society

One Mile Nearer the Stars



Image: ©Joe Gafford

December 25, 2000

Eclipse Begins: 8:29 a.m.
Reaches Maximum: 9:44 a.m.
Partial Eclipse: 40%

Christmas morning presents a delightful holiday gift for North American astronomers – a partial solar eclipse. You don't even have to risk your eyesight to view the eclipse, because both *Astronomy* and *Sky & Telescope* magazines will include eclipse glasses in their January issues (See Page 4 for more tips from Jack Eastman).

Times are Mountain Standard.

The Christmas Eclipse

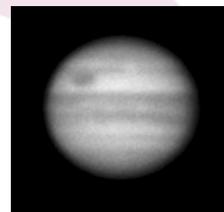
Inside The Observer

<i>President's Corner</i>	2
<i>Schedule of Events</i>	2
<i>Officers</i>	2
<i>Observers Deck</i>	3, 4
<i>Updates</i>	5
<i>Directions</i>	6
<i>For Sale</i>	7
<i>Membership Info</i>	8

DECEMBER SKIES 2000

The last of couple months you've undoubtedly noticed Jupiter and Saturn creating a lovely trio with Aldebaran in Taurus. This dance continues throughout December — if you're a photographer, a great photo opportunity can be had. Venus is back and showing off for a few hours in the evenings. You might reassure your non-astronomy friends that the bright light in the west after sunset is *not a UFO!* Uranus and Neptune are available in the early evening, but you'll have to wait until the wee hours for Mars.

- 3 First quarter moon
- 11 Full moon
- 13 Peak of Geminid Meteor Shower
- 17 Last quarter moon
- 21 Winter solstice
- 25 New moon,
Partial solar eclipse



Jupiter:
The fifth planet from the sun and the largest in our solar system.

Image: ©Roger N. Clark, 2000

PRESIDENT'S CORNER

I would like to take this opportunity to thank all the people who contribute so much to making this organization one of the most active in the country.

A hardy congratulations to the E-board, public events crews, open house volunteers, teachers, the Dark Sky Site Committee, and all of those who have donated so generously in terms of time, money, and equipment. You have made this club so very successful. We encourage all members to become involved in any way that fits their needs the best. If you



Pat Ryan holds the "thank you" plaque he received at the November E-board meeting.
Image: ©Patti Kurtz

wish to volunteer or have suggestions, contact myself or any member of the E-Board.

Additionally, we made about \$1,700 in the Auction — an all-time high. The success was due to the many 100 percent donations from individual members, S & S Optika, the Museum of Nature and Science, and JMI. We thank them all for their support. Happy holidays and best wishes for a terrific New Year. — *Larry Brooks*

D.A. S. Officers

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The Observer is available in color or b&w PDF format from the D.A.S. website.

The Executive Board conducts the business of the D.A.S. at 8 p.m. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.

D.A.S. Schedule

DECEMBER

- 1 E-Board meeting, 8 P.M.
- 2 Open House (How to buy a scope)
- 9 Christmas Party (pg. 5)
Replaces the General Meeting - NEW PLACE
- 23 Dark Sky Site star party

JANUARY

- 5 E-Board meeting, 8 P.M.
- 6 Open House (How to use your scope)
- 19 General Meeting at Olin Hall,
D.U. 7:30 P.M. - Nominations meeting
- 26 - 28 Dark Sky Site Weekend

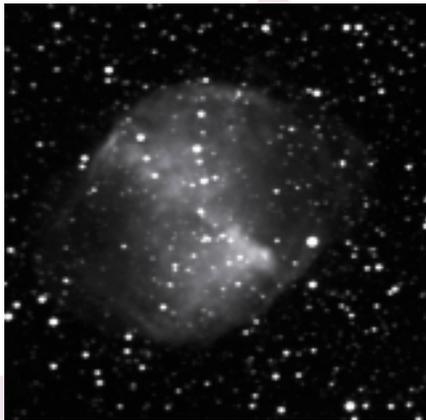
Public Nights are held every Tuesday and Thursday from 7:00-9:00 P.M.

at Chamberlin Observatory

Costs to non-members are: \$2.00 adults, \$1.00 children

Please call (303) 871-3222 for reservations.

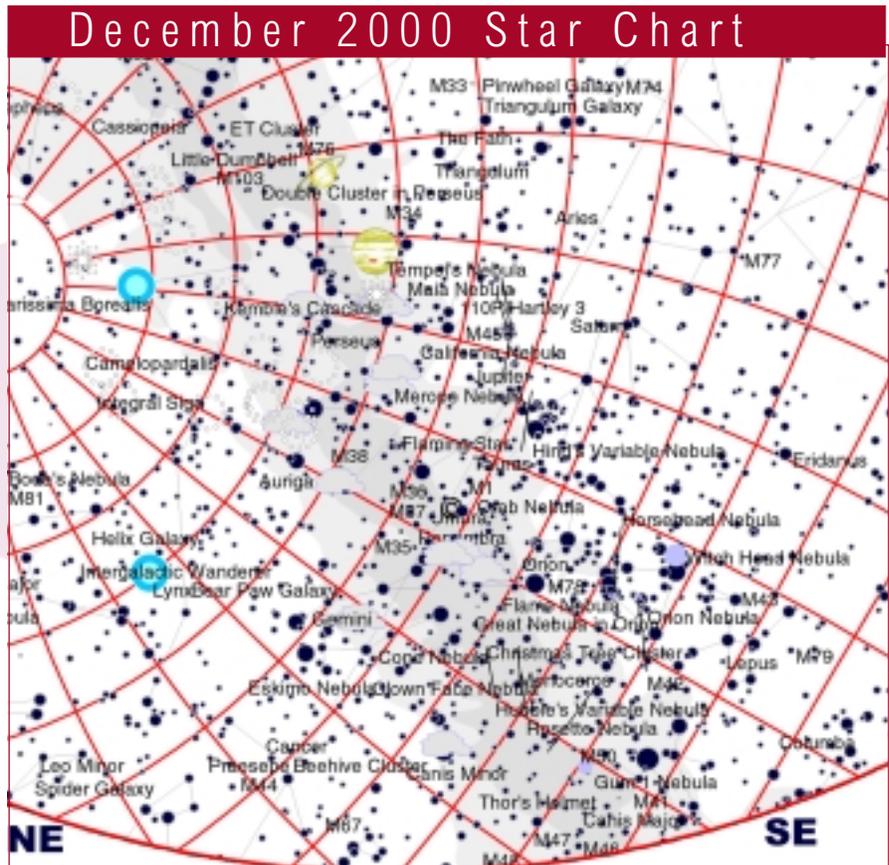
www.denverastro.org



M27 (Dumbbell Nebula) in Vulpecula
Image: ©Kiowa Observatory, 2000

Sky & Telescope sends only one notice before subscriptions end. The D.A.S. sends only one issue of The Denver Observer after dues expire. The cost of magazines (Astronomy and Sky & Telescope) is in addition to the annual dues. For questions concerning memberships, please contact D.A.S. Treasurer, Chuck Carlson (chcarlso@du.edu). See the back page of this newsletter for more information.

M 45 (The Pleiades)
Image: ©Joe Gafford, 2000



Star chart from TheSky,
Software Bisque (www.bisque.com)

Note from the editor:

Newsletter contributions (ccd and film images, short observing anecdotes, observing and imaging tips, etc.) are welcome and encouraged. This is your chance to strut your stuff! **Please submit by the 15th of each month as follows:**
Film: Glossy prints by mail** or scanned and uploaded (high res.) to the listserve upload area.
CCD: Uploaded to the listserve upload area (as high res. as possible).
Text: Paste into an email and email to me at: pkurtz@starfirecreations.com.
 If you don't receive a confirmation email from me, I didn't get your email. Also, be sure to let me know if you've uploaded a file. Thank you!

**Patti Kurtz
12086 W. Cross Ave., #203
Littleton, CO 80127

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observers deck

Here Comes the Sun

Methods for observing our great ball of fire

by Jack F. Eastman

The following article is presented as a two-part series and will be completed in the January, 2001 Observer — PK.

WARNING!! Always use adequate eye protection when looking at the sun. This means using certified solar filters or shade 14 welders glass in front of the unaided eye, and NEVER place a welder's glass or filter of any other kind behind your eyepiece! The little filters sold with cheap telescopes should never be within throwing distance of a telescope. The projection method is recommended, because one can obtain a fairly large image that can be measured with a ruler. This is much cheaper than a filar micrometer at the telescope!

With the sunspot maximum upon us, and the visibility of a few notable spots in the recent past, I thought I'd share some my observing methods. I suggested that perhaps the preferred method is eyepiece projection, as it is eye safe, allows several people to observe at once, and allows for measurements relatively easy. A shade can be fashioned to fit over the telescope, shading the projection screen from



An Annular Solar Eclipse taken on May 10, 1994 from Pecos, Texas

Image: ©Bill Ormsby, 2000

direct light, thereby improving the contrast of the image. However, there are possible dangers with this method to the equipment. First, use a "cheap" eyepiece, preferably a Ramsden or Huygens, with a metal barrel.

The glass in these eyepieces is most likely a crown and is relatively insensitive to thermal effects. Therefore, there



The core of the Andromeda Galaxy (M31)

Image: ©Kiowa Observatory, 2000



First quarter moon. Notice Alphonsus with its central peak.

Image: ©Gordon Teall, 2000

observers deck

are no cemented elements to come unglued or crack from unequal expansion, and no exotic glasses which are highly temperature-sensitive. Loosen the retaining rings so the lenses rattle to allow for expansion differences between the glass and metal.

The best telescope to use is a refractor — 60- to 100-mm or so in aperture, and $f/12$ - $f/16$. With such a scope the simple eyepieces work surprisingly well. There may be a bit of color fringing with the Ramsden, but that's a small price to pay to avoid tears shed over a ruined Nagler or a well-loved eyepiece. Unfortunately the recent breed of cheap, and even not-so-cheap telescopes contain a lot of plastic parts. A misdirected solar image onto the inside of a plastic focuser is not good! Ditto for inexpensive eyepieces — plastic barrels and field stops and even sometimes (choke) plastic lenses! In the past I used a 20cm (8") Schmidt Cassegrain (SC) for this type of solar observing, but this was my own make (perhaps a story in itself for future telling) — it was all metal and held together with threaded rings and screws. It gave a wonderfully large and bright image. The production SCs that are on the market today may contain plastic parts that are cemented, and this bonding material could fail at high temperatures. I don't recommend using the SCs for these reasons.

It seems that keeping all the heat out of the telescope is the right answer. Enter the full aperture solar filter. Personally, I've never met one I liked. All the various Mylar and, yes, even the glass ones, seem to compromise the telescope performance, which is no surprise. If you have slaved over a piece of glass to obtain perfection, you want a filter (and this goes for optical windows as well) at least as good as the telescope. Have you priced an 8" window of grade A BK7, parallel to a few arc seconds, and flat to an honest $1/15$ wave on each surface? The exception may very well be the new Bader filter material. I have yet to see it

(Continued on 7.)

Christmas Potluck

It's time to rustle up your favorite holiday recipe (or make up a new one) and get it ready for the Christmas Party. Come one, come all and get in the holiday spirit! **Directions:** Take 6th Ave. west towards Golden. The first light beyond C-470 should be Heritage Rd., turn left. Go to the first light and turn left into the Golden Ridge Condominiums. We'll be in the clubhouse which is straight ahead. If you have difficulties, call 1 (800) 716-2694 (pager).

Date: Sat., Dec. 9
Time: 7p.m. to 10:00 p.m.
Place: 1350 Golden Circle

The D.A. S. Listserve (For Members Only)

The D.A.S. Listserve is available to club members with an Internet connection. It's operated by the E-board and can be accessed from a link provided at the D.A.S. website. Members are encouraged to join up and share anecdotes, observing and imaging tips, or whatever moves you *astronomically*.

Upcoming Chats (8 P.M.):

- | | |
|-------------|--|
| December 6 | Jack Eastman (<i>tips for observing the Christmas eclipse.</i>) |
| December 20 | Al Kelly (<i>CCD imaging and cookbook cameras.</i>)
Tentative, check website. |
| December 27 | Terry Chatterton and Steve Solon (<i>Building a private observatory.</i>) |

Dark Sky Site Update

I bring great news from your Dark Sky Site Committee — we have purchased the warming shed for the Dark Sky Site.

It is an 8 x 24-foot building on skids. We are hoping it will be delivered to the Dark Sky Site within a month — just in time for the really cold nights!

We still need to level some ground and select the final site to place the shed.

We hope to continue the plans for getting a vault toilet and a few more concrete pads this spring.

If you have any questions or suggestions, contact either me or any member of the committee. The Dark Sky Site Committee members are Larry Brooks, Steve Solon, Ed Kline, Ted Cox, Wayne Kazz, and Greg Marino.

Enjoy, and remember that your generous contributions to the Dark Sky Site are making all these improvements possible. Thank you very much. — *Larry Brooks*

Classes

UNIVERSITY OF DENVER

ASTRONOMY CLASSES:

All levels of instruction are available at Chamberlin and Mt. Evans Observatories. Contact Dr. Bob Stencel (303) 871-2135, rstencel@du.edu, www.du.edu/~rstencel, and/or the D.U. Registrar's Office at (303) 871-2284.

CHAMBERLIN OBSERVATORY

MIRROR-GRINDING CLASSES:

December 9 and 23 - 10:30 A.M. Please call Terry Chatterton for details at (303) 621-2442.

updates



Waiting for nightfall and dark skies, club members stake out the three concrete pads at the Dark Sky Site. From left to right: Michael Brown, Alan Baxter, Fred Wilkins, Brad Gilman, Bill Eareckson, and John Flemming. Image: ©Leroy Guatney, 2000

S & S OPTIKA

Colorado's Premier Astronomical Supply Store
5174 So. Broadway; Englewood, CO 80110
(303) 789-1089

Hours: Tues., Wed., Friday: 10 a.m. - 8 p.m.
Saturday: 10 a.m. - 4 p.m.

Don't miss S&S Optika's Holiday Open House
December 2

10a.m. - 6 p.m., and meet Victor from Celestron

Directions to the D.S.S.

The D.A.S. Deer Trail Dark Sky Site is about 60 miles east of the "mousetrap" in downtown Denver.

Take I-70 east to the Deer Trail exit (exit 328), turn left at the end of the exit ramp, and turn left again on CR 217 (after the Texaco station). Take CR 217 just over 1/2 mile, and turn right (east) onto CR 34. Stay on CR 34 about 6 miles until you get to CR 241. Turn left (north) onto CR 241 and continue about 1.5 miles – you'll see a culvert with a wide gate on the right (east) side of the road.

Directions to D.S.S. from Denver, arrival from the North (for after-dark arrivals):

Take I-25 eastbound to exit 316 (Byers). Turn left at end of ramp which puts you on eastbound US-36. Take US-36 east 17.2 miles to CR 241. Turn right (south) onto CR 241 and continue for 6.2 miles. The D.S.S. entrance is on the left between two tall posts.

Note: Travel distance from Denver using the North route is actually 3.9 miles shorter than the traditional route. The first 5 miles of CR 241 going south from US-36 is narrow and somewhat rough. Be careful.

Dark Sky Site Guidelines

The Dark Sky Site is for the use of D.A.S. members and their guests. If you are neither, please contact an officer of the D.A.S. for a "guest pass." Please remember that white light disrupts your eye's dark adaptation and can ruin astrophotography. Most members (astrophotographers may be the exception) are happy to share views from their telescopes, however, please introduce yourself and ask permission upon approaching a telescope owner. Please follow these simple guidelines to maintain a positive experience for everyone:

- ★ Try to arrive before dark. If you must arrive after dark, please turn off headlights when turning into the site, and try to arrive from the north.
 - ★ Don't park on the graded graveled roads.
 - ★ Turn off all dome and trunk lights in your car (or cover with layered red tape or duct tape)
 - ★ Use only dull RED FLASHLIGHTS.
 - ★ If you leave before everyone else, ask for assistance in getting out of the site without headlights.
 - ★ NO OPEN FIRES. NEVER.
 - ★ If you're the last person to leave, close the gate.
- Other suggestions:**
- ★ Wear warm clothing.
 - ★ Bring your own toilet paper in case that in the porta-pottie has run out.

how to get there

Here Comes the Sun

firsthand, but from what I hear, it holds promise.

Filters near the eyepiece are not usually recommended, as they will be near the focus, and can get very hot. By far the worst filter is that which fits behind the eyepiece. I had one of these with my 60mm Polarex (Unitron). It worked okay, and in my then-childish-ignorance, I assumed it was safe. After I finished building my 15-cm (6") Newtonian, I tried this filter on it and *pop(!)*, it cracked. Fortunately I was not looking through it at the time: I'd have gotten an eyeful of photons *and* little shards of hot glass as well! At least with the filters that fit in front of the eyepiece, the eyepiece stops the flying glass!

For my visual solar work I use a Herschel Wedge: this is essentially a "star" diagonal with a bare glass reflection. The glass is wedge-shaped to toss out the reflection from the second surface, and avoids a double image. About 4% of the light (and heat) are directed to the eyepiece. A shade 12 welder's glass filter between the reflector and the eyepiece seems to do just fine. The total attenuation of this setup is approximately 1.3 million, making the solar disk about 40% as bright as the full moon. With most of the light and heat removed from the beam, the welder's glass does not heat up to dangerous (of breaking) levels. The light that continues through is blocked by a small metal flap that prevents setting one's tie (does anybody still wear ties these days?) or beard on fire. Using a similar setup many years ago on the venerable 6" refractor at Mt. Wilson, I discovered that the little flap gets really hot! Don't grab the thing to move the telescope or pull it out right after observing! Yowtch!

The best magnifications I have found for general viewing with the



While it's true that weather for the Sky Show didn't cooperate, members of the D.A.S. and surrounding clubs sure did. Watch for a similar photo of volunteers and *Astronomy* staff members in *Astronomy's* January issue. Image: ©Raleigh Souther, 2000

12-cm is a 32mm Brandon (56X), a 20mm Erfle (90X), and if the seeing will allow it, a 12mm (150X) Erfle. The 20mm Erfle has a 2/3° field, and the full solar image fits quite nicely. This setup provides a wealth of detail and when the seeing is good, the granulation and fine structure of the sunspots can be seen, with high contrast, down to the limit of resolution of the telescope.

Be sure to read the conclusion of this article in the January 2001 Observer.

For Sale

Telescopes

★ **Meade 7" APO Refractor**, 1996 model with all standard accessories; Mount upgraded to 750 with current 1697 Computer firmware. Asking \$6,800.

- Heavy duty tripod
- Eyepieces: Meade Super Wide angle 40mm, TeleVue 27mm Panoptic, TeleVue 12mm Nagler 4, TeleVue 7mm Nagler, TeleVue 2X Big Barlow, TeleVue 2" to
- 1.25" Brass Equalizer
- Thousand Oaks Solar Filter
- ND-5 Meade 7" Type 2 Full Aperture
- Extra 25-lb. counterweight
- DC Power adaptor

Contact: Sam Andrews (303) 688-4429, email: sandrews@lasertech.com

★ **Meade 6" ED 152 Refractor** with computer drive any heavy mount, 2" & 1.25" Barlows, 2" & 1.25" eyepieces, filters, camera adapter, extras. Located in Longmont. \$6500. **Respond to jmwsnw@msn.com**
Provides exceptional viewing for the planets and moon.

Miscellaneous

Sky & Telescope, 1990-1998, missing maybe 1 or 2 issues. Free if you come to pickup, \$50.00 if you want me to ship. If you pick up, then an optional contribution to DAS Chamberlain Observatory or the Deer Trail Site might be appropriate. **Call Joe Kraus, 303-933-4399.**

odds 'n ends

About the Denver Astronomical Society

The D. A. S. is a group of amateur and professional astronomers that share a mutual interest in the heavens. The D.A.S. operates the University of Denver's Chamberlin Observatory, along with its prized 1894 Alvan Clark 20-inch refracting telescope. Our members have been involved with the first public planetarium at the Denver Museum of Science and Nature and the Smithsonian Astrophysics Observatory's "Moon Watch" program. The D.A.S. successfully petitioned to have the Chamberlin Observatory listed on the National Register of Historic Places.

Our Credo is to provide members a forum for increasing and sharing their knowledge, to promote and educate the public about astronomy, and to preserve the historic telescope and observatory in cooperation with the University of Denver. To these ends we have established three tax deductible funds: the Van Nattan Scholarship Fund, the Chamberlin Restoration Fund, and the D.A.S. Dark Sky Site Fund. This last fund was established in order to construct and maintain observing facilities near Deer Trail in eastern Colorado.

Please call our Info Line at (303) 871-5172 and drop by the General Membership meetings. Become a member and enjoy speakers, facilities, events, and our monthly newsletter, *The Denver Observer*.

APPLICATION FOR MEMBERSHIP TO THE DENVER ASTRONOMICAL SOCIETY	
New <input type="checkbox"/>	Renewal <input type="checkbox"/>
Name: _____	
Address: _____	
City, State, Zip: _____	
Phone numbers: Home () _____ Work () _____	
E-mail Address: _____	
Occupation: _____	
Other Interests: _____	
(Associates Only) School: _____ Grade: _____	
Do you want to download the newsletter in PDF format from our website instead of by postal mail?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you want the above information excluded from the yearly roster?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Please Circle All That Apply:</i>	
Regular Membership: \$30 Associate: \$10 (Age 22 and younger)	
..... \$ _____	
Astronomy Magazine/\$29	
Sky & Telescope Magazine/\$29.95	
..... \$ _____	
Dark Sky Site Fund Donation \$ _____	
Van Nattan Scholarship Fund \$ _____	
Chamberlin Restoration Fund \$ _____	
Total Amount Paid \$ _____	
Complete this form, or a copy, and mail it with your check or money order payable to The Denver Astronomical Society; D.A.S. Treasurer, Chuck Carlson; 1521 So. Vine St.; Denver, CO 80210	



Denver Astronomical Society

c/o Chamberlin Observatory
 2930 East Warren Avenue
 Denver, Colorado 80208

join us