

OBSERVER

Newsletter of the Denver Astronomical Society
One Mile Nearer the Stars

NATURE'S FIREWORKS

While it didn't hold a candle to last year's storm, last month's Leonids event definitely managed to produce more meteors than the average shower. In spite of a

Continued on page 6

© Roger N. Clark

Inside The Observer

<i>President's Corner</i>	2
<i>Schedule of Events</i>	2
<i>Officers</i>	2
<i>NASA'S Space Place</i>	3
<i>Astro Trivia</i>	3
<i>A Visit From St. Celestia</i>	4,5
<i>Annual Holiday Potluck</i>	7
<i>DSS Information</i>	6,7
<i>Membership Info.</i>	back

DECEMBER SKIES 2002

The holiday season serves up a number of celestial treats for stargazers. Every six years we are treated to hundreds of eclipses and occultations from the system of our gas giant neighbor, **Jupiter**. Read more about how and why in December's *Astronomy*, but be prepared for an extravaganza of such Galilean events (between October 3, 2002 and September 22, 2003 expect 578!). Some of the best of these events occurring during the next four to five weeks are: the 19th

4	New moon, Total solar eclipse (S. Africa, Indian Ocean, some Australia)
11	First quarter moon,
13	Geminid meteor shower peaks
19	Full moon
21	Winter Solstice (6:14 P.M.)
26	Last quarter moon

when Europa eclipses Io and on the 22nd, Io occults Europa. On the 27th and then again on January 3, 7, and 14, Europa eclipses Io. While these events don't quite rival the total solar eclipse of December 4, perhaps those of us unable to witness nature's grandest spectacle will find solace in an eclipse or two much farther away. At opposition all month and rising ahead of Jupiter in the night sky, **Saturn** is well placed and glorious, showing off its rings at maximum tilt. Early morning **Venus** has a celestial dance partner this month as **Mars** glides alongside it in the same binocular field, and **Mercury** is relatively bright in the evening sky if you know where to look. Meteor shower lovers who just can't get enough of those bright and flashy streaks across the dark are in for a treat—the **Geminids** peak during the morning of the 13/14 (about 4 A.M.). Enjoy your holidays and may your stars be bright!—*Patti Kurtz*

PRESIDENT'S CORNER

As the winter sky begins to reveal itself, I'm inspired to reflect on the past year and compelled to realize what the hobby of astronomy really means to me. Not only have I gazed at mind-blowing objects in the distant universe, but I've also come to know truly extraordinary people. Astronomy transcends our humanness, challenging us to look beyond day-to-day tasks, and connecting us to something greater, something beyond ourselves. It's in those moments we are able to realize, if only for a fleeting second, how interconnected we are with the universe that surrounds us. Sharing a common understanding and passion with others is an immeasurable blessing.

I know those of you who donate your time and energy to the DAS understand the joy of giving of yourself, but it is my hope you also realize the impact you have on others. Through this club and our



DAS Schedule

DECEMBER

- 6-8 Dark Sky Site Weekend
- 13 E-Board meeting, 8 P.M.
- 14 **Clean-up Day** (4:00 P.M.) and **Open House** (the Open House begins at dusk.)
- 21 Holiday Party (takes the place of the general meeting. See Page 7.)
- 25 Christmas Day

JANUARY

- 1 New Year's Day
- 4-5 Dark Sky Site Weekend
- 10 E-Board meeting, 8 P.M.
- 11 **Clean-up Day** (4:00 P.M.) and **Open House** (the Open House begins at dusk.)
- 17 General Meeting at Olin Hall, DU, 7:30 P.M.—Speaker: Wayne Kaaz (DAS), "Senior Observatories — How They Are Coping." and Officer/E-Board Nominations

Public nights are held every Tuesday and Thursday evenings beginning at the following times: October 1 - March 31 at 7:00 P.M.
 April 1 - September 30 at 8:30 P.M. at Chamberlin Observatory
 Costs to non-members are: \$3.00 adults, \$2.00 children.
 Please call (303) 281-9052 for reservations.



Ron Pearson had his hands full while he used a changing bag to load film into his 4" X 5" camera for Leonid meteor photographing in South Park, Colorado.

Image: © Roger Clark 2002

passion for astronomy, we are changing the world. Yes, maybe it is only in the Denver area, but the fever of astronomy can be quite contagious. Volunteering at public nights, open houses and star parties has given me the opportunity to see the joy and awe spread across the face of a child or an adult the first time they see the red spot of Jupiter or a globular cluster. Not in the pages of a book or as an assembly of pixels on a computer screen, but with their own eyes, as if they could reach out and take it in their hand.

Continued on page 6

DAS Officers

President:

Larry Brooks

Vice President and Acting President:

Carla Swartz (303) 246-6926

Email: CSastrogirl@aol.com

Secretary:

Ron Pearson (303) 670-1299

Email: rpearson@ecentral.com

Treasurer:

Chuck Carlson (303) 744-7331

Email: chcarlo@du.edu

ALCor:

Jerry Sherlin (303) 680-6894

Email: SHERLINJ@aol.com

Chief Observer:

Jack Eastman

Executive Board Members

Ted Cox	Sandy Shaw
Jack Eastman	David Shouldice
Joe Gafford	Steve Solon
Patti Kurtz	Dan Wray
George Jones, Past President	

DAS Information Line:

(303) 986-5255

DAS Correspondence:

Denver Astronomical Society
 c/o Larry Brooks
 3686 South Depew, #8
 Denver, Colorado 80235

Van Nattan Scholarship Fund

P.O. Box 150743
 Lakewood, Colorado 80215-0743

Webmistress:

Patti Kurtz
 Email: pkurtz@starfirecreations.com

Newsletter:

Denver Observer editor, Patti Kurtz
 StarFire Creations Unlimited
 (303) 948-5825

The Observer is available in color PDF format from the DAS website.

The Executive Board conducts the business of the DAS at 8 P.M. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.

www.denverastrosociety.org

Enlightened by the Darkness

by Diane K. Fisher

On the clearest of nights, I may see a dozen stars from my suburban backyard near Los Angeles. Unfortunately, my studies of space and astronomy have been confined to books and the pictures taken by others. Seldom have I experienced for myself a truly dark, clear, moonless sky.

One of those rare times was a summer camping trip in Bryce Canyon, Utah. I lay on my sleeping bag in an open area away from trees. I saw millions of stars (so it seemed) and the cloud of the Milky Way streaking across the sky. Nothing of planet Earth was in my view. It was then I glimpsed my true situation in the universe, a speck of dust clinging to a tiny stone hurtling through the darkness of a cold, infinite universe. I was awe-struck by the beauty of the stars and the darkness-and terrified!

In the light of day and a more "down-to-Earth" state of mind, I wondered: With around 100 billion galaxies out there, why is it still so dark out there?

Until the 20th century, astronomers thought the universe was infinite. They were perplexed though, because in an infinite universe, no matter where you look

in the night sky, you should see a star. Stars should overlap each other and the sky should be blazing with light and hot as the sun. This problem became known as "Olber's Paradox."

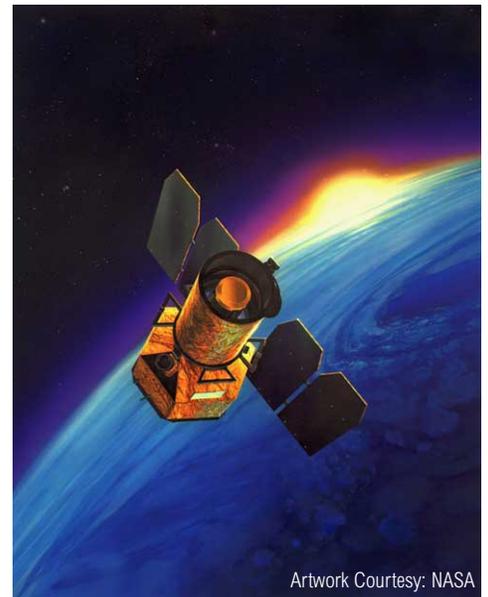
Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although a finite universe is enough to explain the darkness, the expansion of the universe also contributes. As light travels from a distant galaxy to us, the space through which the light is traveling is expanding. Therefore, the amount of energy reaching us dwindles all the time, thus causing the color of the radiation to be "redshifted." (The wavelength is stretched out due to cosmic expansion.) The more distant the galaxy, the more redshifted the light. The largest redshift astronomers have measured comes from radiation that was emitted when the Universe was only 300,000 years old. This radiation has taken over 12 billion years to reach us and although it began as infrared radiation, it is now seen as the microwave background radiation.

GALEX (Galaxy Evolution Explorer) is a NASA space telescope that will survey the universe, including galaxies with redshifts that indicate their light has been traveling for up to 10 billion years (or 80% of the history of the universe). Read about GALEX at www.galex.caltech.edu/. For budding astronomers, print out **The Space Place New Millennium Program Calendar** at spaceplace.nasa.gov/calendar.htm to identify great sky watching opportunities.

Diane K. Fisher is the developer and writer for The Space Place web site.

This article was provided by the Jet Propulsion Laboratory, California In-



Artwork Courtesy: NASA

The GALEX (Galaxy Evolution Explorer) mission will do a broad survey of galaxies in various stages of evolution and identify interesting objects for further study by the Hubble Space Telescope.

stitute of Technology, under a contract with the National Aeronautics and Space Administration.

AstroTrivia

(Look for the answer in this issue.)

Q. What is Coon Butte?

AstroTrivia is contributed by Sandy Shaw.

Note from the editor:

Many thanks to **Sandra Shaw** for sharing St. Celestia with us on pages 4 and 5.

Thanks also to **Carla Swartz** who wrote this month's President's Corner. Carla is the DAS acting President while Larry Brooks recovers from his illness.

Newsletter contributions (ccd and film astrophotos, members with telescopes, star party candid photos, short observing anecdotes, observing and imaging tips, etc.) are welcome and encouraged. This is your chance to strut your stuff! **Please call me for submission instructions.**

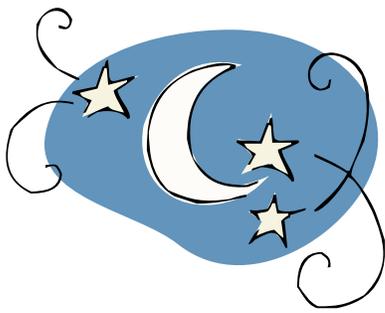
****Patti Kurtz**

(303) 948-5825

All articles and images are © the author or photographer, and may not be reproduced without their written permission—Ed.

Sky & Telescope sends only one notice before subscriptions end. The DAS 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 DAS Treasurer, Chuck Carlson (cbcarlso@du.edu). See the back page of this newsletter for more information.

u p d a t e s



A Visit From St. Celestia

by Sandra J. Shaw

with a handful of stardust to Clement Clark Moore

Twas the night of the New Moon and all through the camp,

Not a soul was observing, all dew caps were damp.
Some menacing clouds dropped a few blops of rain
And the seeing was bad, like a wavy glass pane.
Jane in her jumpsuit and I in my sweats
Were swamped with malaise and a case of the frets.
The neighbors had erected new mega-watt lights
And we were exhausted from six sleepless nights.
My Telrad refused with the tube to align,
Making faint objects quite tricky to find.
A squad of mosquitoes had sampled Jane's blood
And my new starry charts had been squished in the mud.
Gusts of chill wind caused my Dob tube to rattle,
'Til observing became a most difficult battle.
Then I heard from the next site a curse and a shout
"This photo is ruined 'cause my dec drive is out!"
We were set to postpone astronomical missions
And wait for more pleasant observing conditions.
When what should appear to our wondering eyes
But a beautiful fairy from out of the skies.
Her sleigh was a comet, her coursers live stars
That gleamed iridescent with light from afar.
More graceful than meteors the horse-stars did land
And she smiled and she laughed as she called to her band.
"On Betelgeuse, Sirius, Mira, and Rigel,
Capella, Arcturus, Canopus, and Nigel!"
Seven star-horses were rosy in hue
But Nigel, we saw, was a bright shade of blue.
Red stars are older and wiser, you see
But Nigel, much younger, was naughty with glee.
"Oh Nigel, behave, my young turquoise beauty
Now follow my lead and commit to your duty."
Giving her steed an affectionate pat,
She emerged from her sleigh with the grace of a cat.
Her gown trailed behind her, a nebulous wisp
As she walked to us, striding with steps bold and crisp.
Her eyes - how they twinkled, like sparkling twin stars;

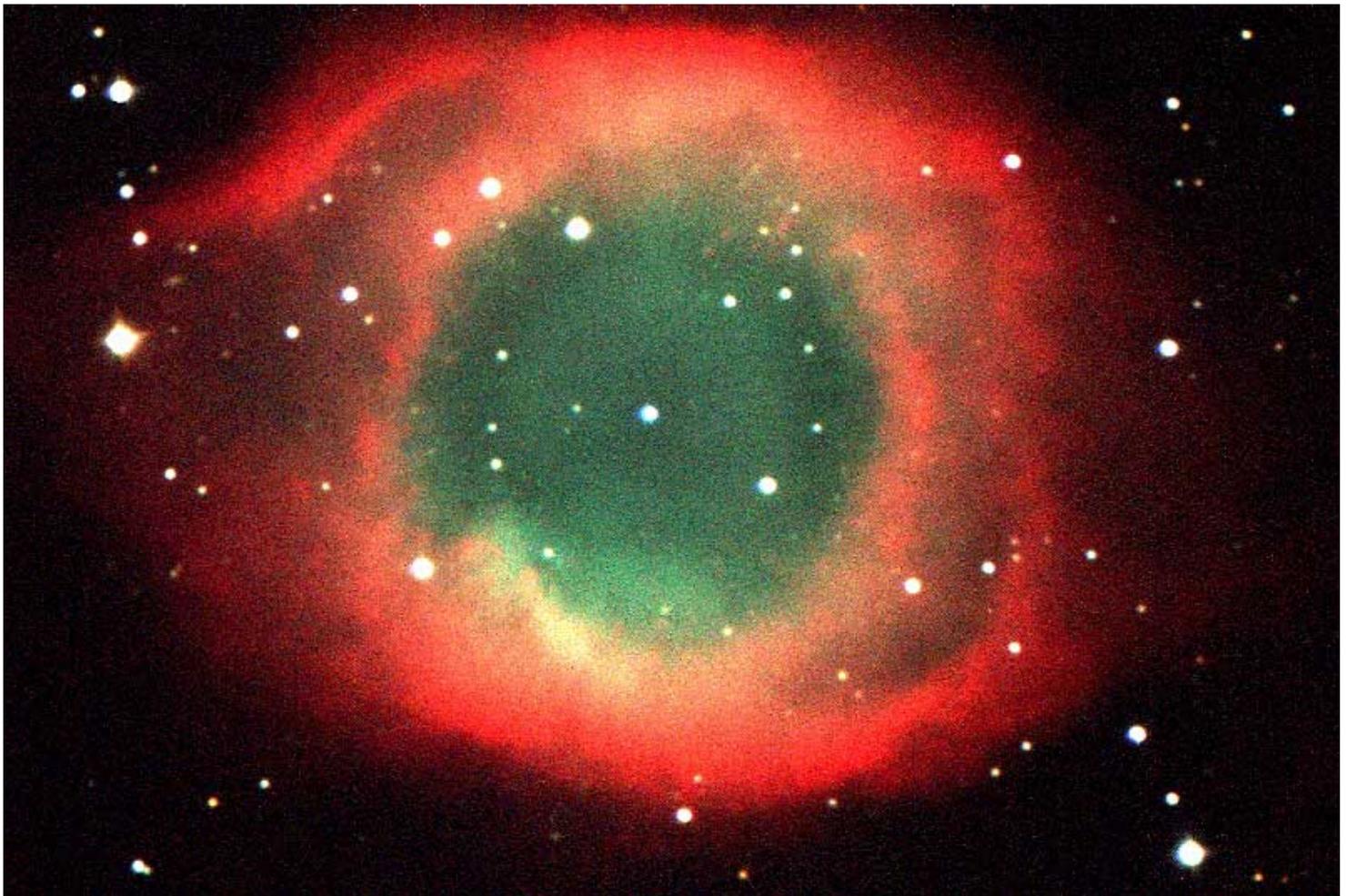
Her cheeks were so rosy, like red planet Mars.
Her blonde wavy hair like a waterfall's mist
Flowed down to her shoulders in tendrils of bliss.
A star-tipped pink scepter she held in her hand
Hinted that magic was hers to command.
A heavenly smile quite enlivened her face
As she brought us enchantment from far out in space.
The musical tones of her most welcome speech
Promised assistance and help to us each.
"My stargazing friends shall no longer despair
Right after I make some strategic repairs."
"These dark sky site hazards will ne'er more molest ya
I'll fix all these problems, for I'm St. Celestia."

"Just look all around, there's no mud on the field
And Jane's itchy bites have been skillfully healed."
"It's chilly no longer, the weather is balmy
The seeing is excellent — atmosphere's calm-y."



“The wind, so annoying, has been finally banished
And the clouds and the rain now have totally vanished.”
“Your lenses are dry for the dew is all gone
And your Telrad alignment’s exactly spot on.”
“Your star charts, once muddy, look new and pristine
And your sleepiness left without use of caffeine.”
“Astrophotographer, here’s your delight —
Your dec drive’s been fixed and it’s working just right.”
Only one thing remained to encumber our session
So we asked St. Celestia to answer our question:
The seeing is perfect, transparency’s fine
But what of the mega-watt lights down the line?
Surveying the lights’ rather horrible show
She carefully pointed her wand at the glow.
The lights disappeared with a pop! satisfying
And darkness returned, which was most gratifying.
With a wink and a nod she returned to her sleigh;
The star-horses whinnied while flying away.

Nigel gave out an undignified snort
Which our good St. Celestia made haste to stop short.
And I heard her exclaim as she drove out of sight
“*Good seeing to all — dark skies and clear nights!*”



On a windy night at the Okie-Tex star party, Joe Gafford set up his 18-inch f/4.5 scope with a CCD camera and made this tri-color composite of the Helix Nebula (NGC 2685).



Directions to the E.G. Kline Dark Site

The DAS Edmund G. Kline Dark 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 the site from Denver, arrival from the North (for after-dark arrivals):

Take I-70 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 DSS 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.

Warming Hut Rules

- The last people on the site must turn off the lights and the heat.
- A microwave will be provided for warming food. Please clean up after yourself.
- No pots and pans, appliances, or other supplies are to be left in the shed.
- No personal supplies are to be left in the shed overnight.
- Do not donate furniture or other things unless you clear it with the D.S.S. committee first.
- No food left overnight in the shed.
- No sleeping overnight in the shed.
- Quick naps are permitted if you feel you might fall asleep on the way home. We would prefer you get your nap rather than falling asleep on the road. However, we don't want it to become a tent for camping.
- Clean up after yourself before you leave the site.
- Please clean up all food that drops or is spilled, otherwise it will attract mice and insects.

The President's Corner

Continued from page 2

I remember the first time I came to an open house and Larry shared his time with me, asking me what my favorite astronomical object was. I wasn't very familiar with the night sky, but I loved looking at M57 in photos. He proceeded to walk out to the south lawn and asked Greg Marino if he would mind putting his scope on M57. While looking through the scope, I realized I had never truly seen the beauty of the object. The photographs were amazing, but actually seeing the object with my own eyes was a very visceral event. As a child my Dad, RJ, took me on many camping trips, he shared his knowledge

Welcome New Members!

The following folks joined the Denver Astronomical Society during the last few months. Welcome new members!

- James Dobbs
- Timothy M. Fullager
- Michael P. Murray
- Sharon Sander
- Greg & Heather Thorwald

Nature's Fireworks

Continued from page 1

moon-washed sky, meteors were clearly visible as can be seen by Roger Clark's composite photo of 57 meteors.

Under frigid conditions (18°F) in South Park, Colorado, Roger shot a series of 30-second exposures throughout the early morning hours of November 19th. The image is a composite of 35 frames from 3:16 to 4:54 A.M. MST. He used a Canon D60 6-megapixel digital camera set at ISO 800 with a 24mm f/2.8 lens on a stationary tripod.

with me about the constellations and the lore that made them seem so magical. From that instant I was smitten. How is it that objects so far away can warm your heart and become friends?

I'd like to sincerely thank everyone who has pitched in over the past year and I look forward to seeing new faces participating in the year to come. I would also like to thank the University of Denver for providing such a beautiful observatory for us to call home. Most importantly, I'd like to thank Larry Brooks, our beloved President, for everything he has shared with us; he has lead us through a journey and provided a vision for us to see through. He has been an immensely influential person in my life and has inspired my passion for astronomy. For his friendship and generosity, I will be forever in his debt.

Acquiring knowledge and possessing the ability to comprehend the world around us is a great gift indeed. However, the greater gift is in the ability and desire to share those things which inspire us. Best wishes to all for a joyous new year and many clear skies. —Carla Swartz

Astro-Trivia Answer

A. In the 1880s, geologists became interested in a huge steep-walled Arizona pit, then known as Coon Butte, because of odd iron fragments found nearby. By 1891, mineralogist A. E. Foote had identified the fragments as meteorites, although within a few years the foremost geologist of the time concluded that a steam explosion caused the pit itself. In 1905, mining engineer D. M. Barringer and physicist B. C. Tilghman published separate papers establishing evidence that a meteor had formed the pit. In 1960, E. M. Shoemaker's discovery of coesite - a high-pressure form of silica - in the pit now known as Meteor Crater provided a powerful new tool with which to identify impact craters.

o b s e r v e r s d e c k

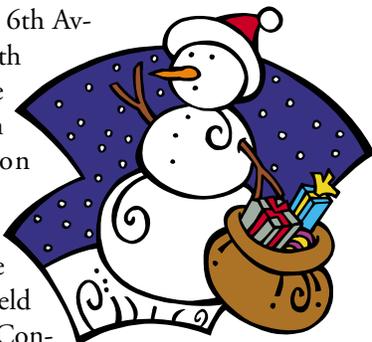
Annual Holiday Potluck

Saturday, December 21st at 5 p.m.

Cook up your favorite dish and join us for lots of holiday cheer at the Green Mountain II Clubhouse. The Holiday Potluck party will take place of the monthly general meeting. If you have some slides of your travels over the past year or great astro photos you would like to share, please bring them along. Thanks to Ron and Marilyn Pearson for arranging the accommodations.

Address: Green Mountain II Clubhouse: 650 South Youngfield Court, Lakewood, CO 80228

Directions: Take I-70 west to 6th Avenue and turn left (east) onto 6th Avenue. Continue east to the Union and Simms intersection and turn right onto Union (south). Continue south on Union and turn right onto Alameda Parkway and continue south until you reach Youngfield Court and turn right (west). Continue west on Youngfield Court approximately 1/3 mile and turn right into the clubhouse parking lot, if you reach West Virginia Avenue you have gone too far.



Great food, photos, and friends are the hallmarks of the Annual Holiday Potluck. If you have some slides you think others will enjoy, bring them along. Above photo (left to right) shows partiers around the Christmas tree: David Shouldice, Ron Pearson, Dan Wray, and Ivan Geisler. Inset: Carla Swartz delights in the great food.

Dark Sky Site Courtesy

Please remember that white light disrupts the eye's dark adaptation and can ruin astrophotography. Following these simple guidelines will improve the experience for all:

- ★ Upon arrival at the site, check to see if sign in has been instituted at the warming hut. We hope this will help alleviate problems members may be experiencing in trying to find a place to set up.
- ★ Drive carefully on the road, there are blind spots in the low area and you will find cattle on the road at times.
- ★ Try to arrive before dark.
- ★ If you have to arrive after dark, turn off headlights when turning into site.
- ★ Turn off all dome and trunk lights. If a light can't be turned off, pull the fuse, use layered red brake light tape or just duct tape over it.
- ★ When you drive in, position your car so you can drive out directly instead of using your back up lights.
- ★ Use only dim red flashlights. Never shine a flashlight in someone's face or on their scope.
- ★ Please wipe your feet carefully before using the warming hut.
- ★ Please chip in and do some cleaning up in the hut or at the observing sites. It is the responsibility of all users to keep the place nice.
- ★ Serious astrophotographers may wish to use the South field since it is somewhat isolated from the rest of the area.
- ★ If you are the last person to leave the site, turn off the lights and the heaters in the warming hut. Then, lock the warming hut and

close the gate to the site.

- ★ Members are responsible for educating their guests as to the rules.
- ★ Prospective members, out of town astronomers, and others may be guests one time.
- ★ Members can bring family any time and personal friends on a limited basis, but should not abuse the privilege.
- ★ Groups of five or more guests must be cleared through the President or Vice President prior to visiting the Dark Sky Site.
- ★ There is no sleeping in the warming shed overnight. However if you need to nap for a short period, you can use the shed. We would rather you fall asleep there rather than at the wheel on the way home.
- ★ You may warm drinks in the microwave—it is not there for warming food and cooking since we have no water to clean up. If you spill, please clean up after yourself

OTHER SUGGESTIONS:

- ★ Wear warm clothing. The nights can be extremely cold in the winter and surprisingly cold in the summer.
- ★ Bring your own power such as a battery and/or an inverter since the power sites are limited. Also bring extension chords.
- ★ Hot drinks can help you survive the night!
- ★ When approaching the telescope of someone who does not know you, introduce yourself and ask before looking through the scope. Most members (with the exception of astrophotographers when they are taking pictures) will be happy to share their scopes.
- ★ Bring your own toilet paper in case that in the porta-potty runs out.

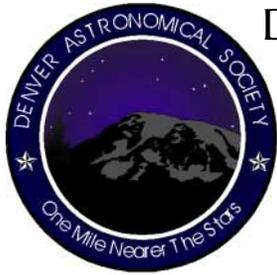
edmund g. kline dark site

About the Denver Astronomical Society

The DAS is a group of amateur and professional astronomers that share a mutual interest in the heavens. The DAS 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 DAS 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 DAS 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*.



Denver Astronomical Society

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

DECEMBERS'S MEETING

DECEMBER 21:

Holiday Potluck/Party takes the place of the December's General Meeting. See page 7.

S & S OPTIKA

Colorado's Premier Astronomical Supply Store
(303) 789-1089
www.sandsoptika.com

join us

APPLICATION FOR MEMBERSHIP TO THE DENVER ASTRONOMICAL SOCIETY

New Renewal

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 No

Do you want the above information excluded from the yearly roster?

Yes No

Please Circle All That Apply:

Regular Membership: \$30 Associate: \$10 (Age 22 and younger) \$

Astronomy Magazine/\$29 \$

Sky & Telescope Magazine/\$29.95 \$

Van Nattan Scholarship Fund \$

Chamberlin Restoration Fund \$

Total Amount Paid \$

Please mail Dark Sky Site donations to: DAS Treasurer, Chuck Carlson, at the address below. (Make checks payable to the Dark Sky Site Fund).

Please complete this form, or a copy, and mail it with your check or money order payable to The Denver Astronomical Society:

DAS Treasurer, Chuck Carlson; 1521 So. Vine St.; Denver, CO 80210