

# *The Denver Observer*

January, 2003



Aurora in Cygnus. See "Caption" on page 2 for an explanation of this photo.

### Front Page Photo Caption

I took this Thursday night, 11/20/03, at the Chief Hosa offramp of I70 at about 11:30. I thought I was photographing aurora over a hill to the NE, when I noticed this cloud on the Milky Way. As it increased in brightness I thought; "Wow what a bright cloud."

As I watched it became obviously green, and I started to shoot it. The red was first visible in the pictures, but then I could see it naked eye. I shot until midnight when my batteries died. I decided to go home to get Carol out of bed and get more batteries. We could see the aurora from our driveway in Lakewood. We went out 5 minutes from home to Green Mountain, and took pictures for another hour before it started to subside. It was almost due west. The photo was shot with an Olympus C2020 at 200 ASA and 10 second exposures. I stacked 5 for this picture.

David Shouldice

### January President's Corner

*You never really leave a place you love. Part of it you take with you leaving part of yourself behind.*  
Unknown



It has been my honor to serve as President over the past year. However, due to increased professional obligations, I will not be able to run for office in 2004. I feel a great pride in our accomplishments during the last year and hope I have sustained Larry's vision as past President while expanding our club through my own approach and ideas. I look forward to continuing as an active member of the DAS and focusing my efforts on new challenges. I would like to sincerely thank the officers, e-board, public night team and club members for their tireless support and encouragement, and commend them for their dedication to our club. The election for our next President will take place at the February general meeting and I am confident that with the club behind them, they will succeed in sustaining our traditions as well as defining our future.

Carla Swartz

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### Adopting A Resolution

By Steve Solon

In the early days of CCD imaging, the cameras proved their weight in gold as far as sensitivity, but fell short in the detail department; the images were often "blocky" and lacked any real resolution. A great benefit, however, was the camera's ability to autoguide for film imaging -- the neck and shoulder muscles of astrophotographers everywhere breathed a

*(Continued on page 4)*

### DAS Participation Prize Winner

Congratulations to Rich Loper, 4th quarter DAS Participation Prize Winner.

Rich Loper has been an amateur astronomer since childhood, a time period that spans 40 years. He moved to Denver in 1997, and joined the DAS 4 years ago. An active member from that time forward, he has attended meetings, worked DAS Open Houses, and helped out on clean up days at Chamberlin. Earlier this year he became a Certified Operator of the 20" Alvan Clark Telescope at the Historic Chamberlin Observatory after completing an extensive training program and passing his final examination administered by Chamberlin Deputy Director Dave Trott. Rich works "Public Nights" and has filled out Participation Slips on those nights and at other DAS events.

Two prizes were awarded to Rich at the December Holiday Pot Luck held at Chamberlin. A pair of 10 X 50 Bausch & Lomb Legacy Binoculars and a one year extension to his DAS Membership. You can become eligible for a participation prize by volunteering for Public Nights, Open Houses, school star parties, clean up days at Chamberlin, or work days at the Edmond G Kline Dark Site. Just ask an E-Board Member for a participation slip and their signature, and you could be the winner at the next quarterly drawing.

Frank T Mancini

### AstroQuiz

Q. How did the element helium get its name?

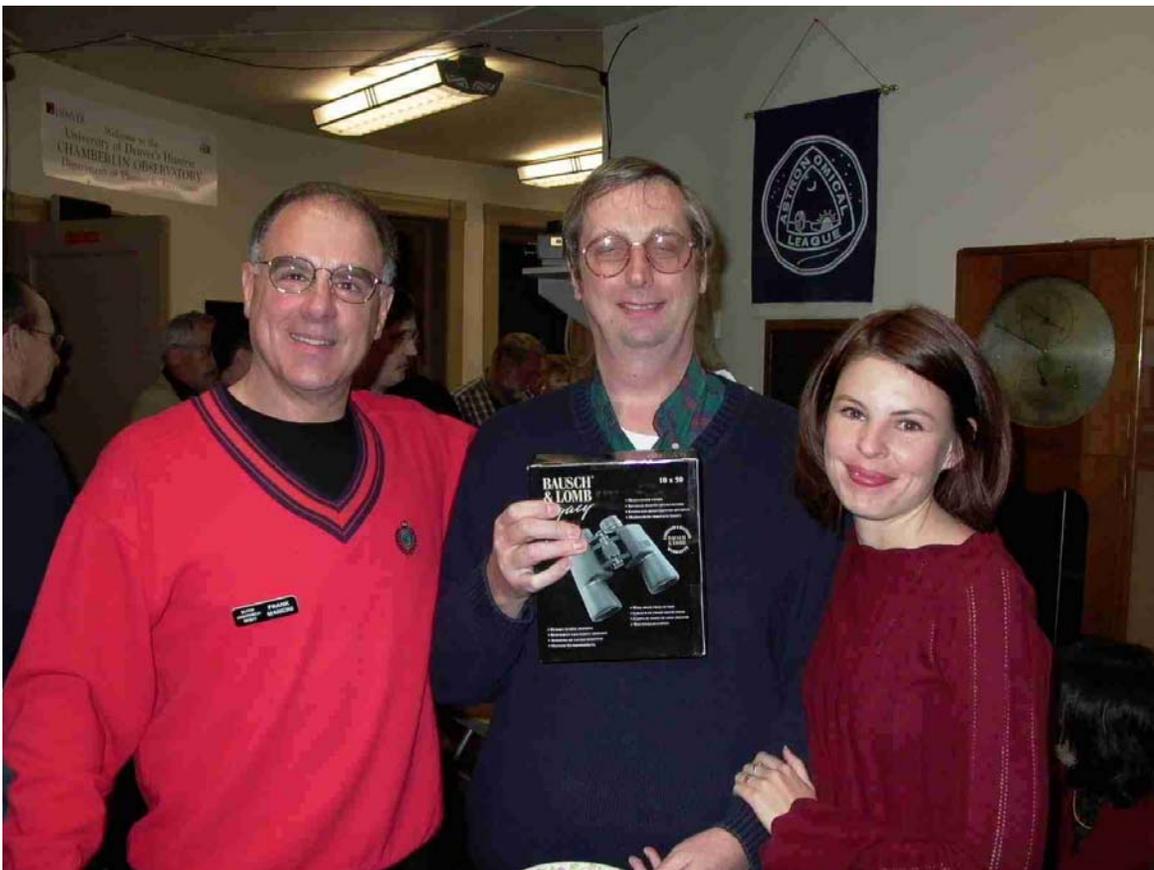
-Answer on page 7-

## Fun & Fellowship & Fotos at the Holiday Potluck

Despite the rather cramped quarters of Chamberlin Observatory, the Holiday Potluck of December 6th offered a wonderful time for all those who attended. The food brought by DAS members was satisfying, and the company and conversation was stimulating. The added benefit being that despite all of my careful preparation, no one got ill from my stew.



Above: Steve Solon realizes that he is the only one wearing a tie.



Left: Rich Loper being awarded a pair of binoculars at the holiday potluck. The drawing was held for the 4th quarter participation prize. See the "DAS Participation Prize Winner" article on page 2 to find out how YOU CAN BE THE NEXT WINNER! Pictured left to right: Frank Mancini-DAS VP; Rich Loper, 4th quarter DAS participation prize winner; and Carla Swartz, DAS President.

*(Continued from page 2)*

collective sigh of relief.

Technology to the rescue! The current crop of CCD cameras have chips with pixel sizes that allow imaging that meets and exceeds the resolution of even fine-grained films such as Tech Pan 2415. The question most beginning imagers ask is, "What's right for my setup?" Given a few conditions and limitations, the decision of what to buy is actually fairly easy to make.

First to understand is that Earth's atmosphere will allow only so much resolution to be captured, based on moisture content, the jet stream and other winds. Here in Colorado, we have wonderfully clear skies, but relatively poor stability. Our 'seeing' is somewhere between 2 and 4 arc-seconds per pixel on the CCD chip. This means that a star whose actual image is 1 arc-second across will actually appear to be 2 to 4 arc-seconds across in the CCD image due to the above annoyances. Your telescope/camera combination allows you to capture resolution to a certain degree. Here's the formula:

$$\frac{205 \times \text{pixel size in microns}}{\text{focal length of the telescope in millimeters}}$$

For an 8 inch Schmidt Cassegrain using an SBIG ST-6, the numbers yield this result:

$$\frac{205 \times 13}{2000} = 1.33 \text{ arc-seconds per pixel}$$

This means that this system will "see" resolution better than what the sky allows -- typically, a waste of camera power. CCD software, however, offers a solution to this slight dilemma by including "binning" in its list of options. Binning is a way of telling the camera that you want a group of pixels to act as 1 pixel; for example, binning the camera at 2x2 means that 2 pixels square (4 pixels) will read out as 1 unit pixel -- the resolution, in most cases will be more in line with what the sky offers, download time decreases, while sensitivity increases:

$$\frac{205 \times 26 \text{ (double the 13 for 2x2 or triple for 3x3)}}{2000} = 2.66 \text{ arc-seconds per pixel}$$

Now you're imaging capabilities more closely match what the sky will allow.

*(Continued on page 5)*



Copyright Steve Solon

M-1, the Crab Nebula. A sample of Steve's fine imaging.

(Continued from page 4)

If you're using a focal reducer, this changes the focal length of your scope, so don't forget to plug that corrected figure into your formula to determine effective resolution. For example, if you employ an f/6.3 reducer, your focal length changes from 2000 to 1260. The new result for arc-seconds per pixel at 1x1 resolution is 2.11. For 2x2 binning, the result is 4.2, which means the sky is giving better resolution than you can capture. In this case, stick to shooting at full resolution of 1x1.

A final note -- Dr. Robert Gendler has produced what is arguably the most beautiful image of M-31 to date and he acquired it from some of the most astrophotographically horrible conditions on Earth -- 10 miles west of Hartford, Connecticut. How, you might ask? Dr. Gendler's sky transparency is, indeed, lousy. His stability, on the other hand, is remarkable (humidity will do that.) To make up for horrid transparency, he simply shoots dozens of light frames and combines them to yield tremendous data, then works reduction and processing magic for the final outcome.

Voila. Technology to the rescue again.

Any questions, just e-mail me at "galaxyshots@compuserve.com" Please put "CCD Question" in the subject line so I'll know you're not offering a deal on Viagra.

Happy shooting,

### **Star Talks at Fiske Planetarium.**

- \* Thursday & Friday, January 15 & 16; Black Holes by Professor Andrew Hamilton
- \* Thursday, January 22<sup>nd</sup>: History of the Space Shuttle; given by Fiske Staff Members; Rob Morris and Sanlyn Buxner
- \* Thursday, January 29; History & Future of Mars by Professor Steven Lee
- \* Friday, January 30; Memories of Columbia by Fiske Staff Members; Rob Morris and Sanlyn Buxner

Contact info for Fiske Planetarium; 303-492-5002  
for more information or contact our web site at  
[www.colorado.edu/fiske](http://www.colorado.edu/fiske)

### **2004 Texas Star Party - Sign up Now!**

The great tradition of dark sky observing continues with the 26th Annual TEXAS STAR PARTY, May 16 - 23, 2004!

TSP WILL NOT BE MAILING A FLYER this year!

1. You should submit a Registration/Reservation Request Form to ENTER THE TSP DRAWING before January 19, 2004. This will provide you the highest possible chance of being selected as one of the 700 people who will be able to attend TSP this year. Go to:

<http://www.texasstarparty.org/draw.html>

...or fill out the Request Form immediately at:

<http://www.alphadata.net/cgi-bin/forms/forms.cgi?form=3>

READ THE REST OF THIS ARTICLE BEFORE SUBMITTING YOUR REQUEST.

2. Participants at the TEXAS STAR PARTY can select from a variety of accommodations on the Prude Ranch, including bunkhouses, private cabins, trailer hookups, and campsites with convenient bathhouses. All accommodations include access to a TV lounge, a western-style dining room, and an indoor swimming pool. And of course the convenience of the observing fields! For rates and more information on ranch and nearby accommodations, please visit:

<http://www.texasstarparty.org/travel.html>

3. The TSP Registration Fee (DOES NOT INCLUDE your accommodations) is \$50/person if you preregister before April 15, 2004. (Each additional family member is just \$30 more.) For more information about TSP Registration rates and policies, visit:

<http://www.texasstarparty.org/tspreg.html>

The drawing for names is in late January, and if your name is drawn you will get a TSP Registration Form (and optional Prude Ranch Reservation Form) to send in with your payments in February/March.

**SIGN UP NOW!**

Questions? Visit our website for the latest and complete details!

<http://www.texasstarparty.org/>

We look forward to seeing you next May!

Sincerely,

*The volunteers for Texas Star Party*

### **January Speaker**

Our speaker for the January meeting will be:

Dr. David Grinspoon: Principal Scientist-Dept of Space Studies-Southwest Research Institute

Topic: A presentation on his new book:

LONELY PLANETS: The Natural Philosophy of Alien Life

*Frank Mancini, Vice President*

## 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.

### 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.

### *SCHEDULE*

#### *JANUARY*

- 1** New Years, No Public Open House  
**9** General Meeting at Olin Hall, rm 105, DU, beginning at 7:30. **E-BOARD NOMINATIONS**  
Speaker and topic; see page 5

- 17-18** Dark Sky Site Weekend.  
**23** 8:00 PM E- Board meeting, Chamberlin Observatory  
**24** Open House, 5:00 pm, Chamberlin Observatory

**February**

- 6** General Meeting at Olin Hall, rm 105, DU, beginning at 7:30. **E-BOARD ELECTIONS**  
**13** 8:00 PM E- Board meeting, Chamberlin Observatory  
**21-22** Dark Sky Site Weekend  
**28** Open House, 5:30 pm, Chamberlin Observatory

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**Denver Astronomical Society Website:**  
**WWW.DENVERASTROSOCIETY.ORG**

OFFICERS AND E-BOARD of  
THE DENVER ASTRONOMICAL  
SOCIETY

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

**OFFICERS**

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**AstroQuiz Answers**

**A.** During the total solar eclipse of August 1868, the first eclipse studied with a spectroscope, observers saw a bright yellow line in the spectrum of a prominence. At first the bold line was thought to be the D line of sodium, but subsequent independent observations by Pierre Janssen and J. Norman Lockyer proved that the line did not come from sodium but from an unknown substance. Because the new element was first seen in the solar atmosphere, it was named helium from the Greek word "helios" for the Sun. Janssen and Lockyer were awarded gold medals by the French government for their work. Although scientists made extensive searches for the new element on Earth, it was almost twenty-seven years later that the final piece of the puzzle was discovered - and by accident. In March 1895 English chemist William Ramsey was searching for a substance that would combine chemically with argon, a recently discovered element. Strongly suspecting that the uranium-bearing mineral cleveite contained argon, he heated the mineral and analyzed the spectrum of the liberated gases. The spectrum showed not only the lines of argon, but also the bright yellow line of helium first seen during the 1868 eclipse. In 1904 Sir William Ramsey was awarded the Nobel Prize in Chemistry, in part for isolating helium, the "long sought for element hitherto undiscovered on Earth".

*AstroQuiz is contributed by Sandy Shaw.*

## 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*.

### 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 web-site 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/\$32.95  
 \*\*\*\*\*\$ \_\_\_\_\_  
 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**



**Denver Astronomical Society**  
 C/o Chamberlin Observatory  
 2930 East Warren Avenue  
 Denver, CO 80208