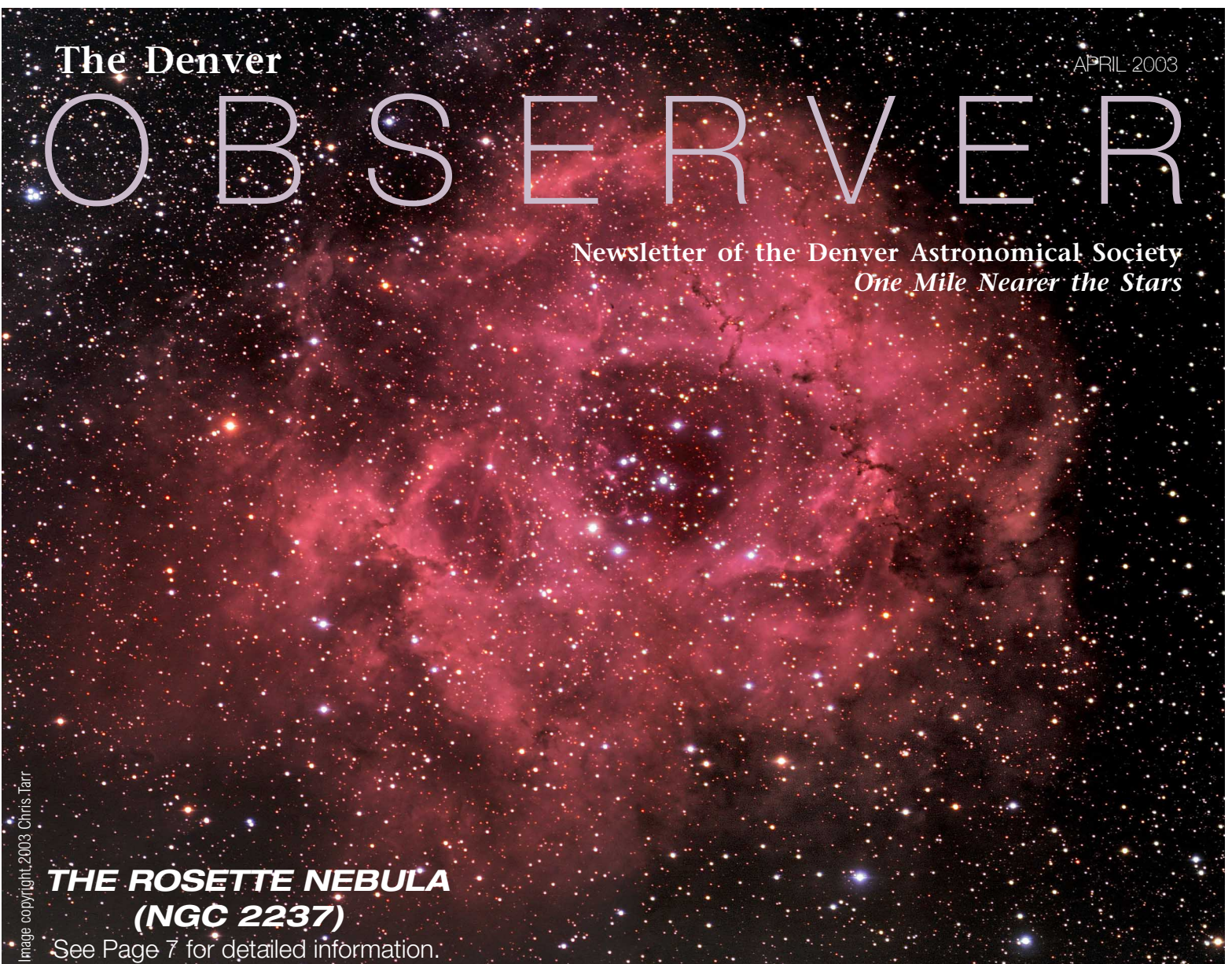


# OBSERVER

Newsletter of the Denver Astronomical Society  
*One Mile Nearer the Stars*



## THE ROSETTE NEBULA (NGC 2237)

See Page 7 for detailed information.

Image copyright, 2003 Chris Tarr

# Finally—Springtime in the Rockies

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## APRIL SKIES 2003

The first three weeks of April give us this year's best views of fleet-footed **Mercury**. While it pales in comparison to the brightness of **Jupiter** (-2.2 in Cancer) and Saturn, in the deepening twilight of evening, it's worth aiming binoculars in its direction as it wanes from gibbous to a thin crescent. On the flip side of day, You'll need to rise early to glimpse the 5th-magnitude **Comet Juels-Holvorcem (C/2002Y1)** discovered on December 28, 2002. As it approaches perihelion on the 13th, this inter-

1 .....	New moon
9 .....	First quarter moon
13 .....	Perihelion, Comet Juels-Holvorcem
16 .....	Full moon,
.....	Mercury at greatest eastern elongation
22 .....	Lyrid meteor shower peaks
23 .....	Last quarter moon

loper in Andromeda should be an easy target but act quickly—we'll lose it to the Southern Hemisphere afterwards. Jupiter's moons continue to dance circles around themselves and the giant planet. Check out *S&T's* website ([www.skyandtelescope.com](http://www.skyandtelescope.com)) for a complete listing of the 39 mutual events this month. Setting at 11:30 P.M. by month's end, glorious **Saturn** has found a dance partner as it glides to 20' of the Crab Nebula (M1). Unlike dawn's **Venus** which will gradually become harder to follow as it gets closer to the sun, **Mars** is approaching its best opposition "in our lifetimes," according to *Astronomy*. See Page 7 of this month's *Observer* to get involved with "**Mars Madness**." Happy Spring and send me your images of this month's celestial events!—*Patti Kurtz*



# PRESIDENT'S CORNER

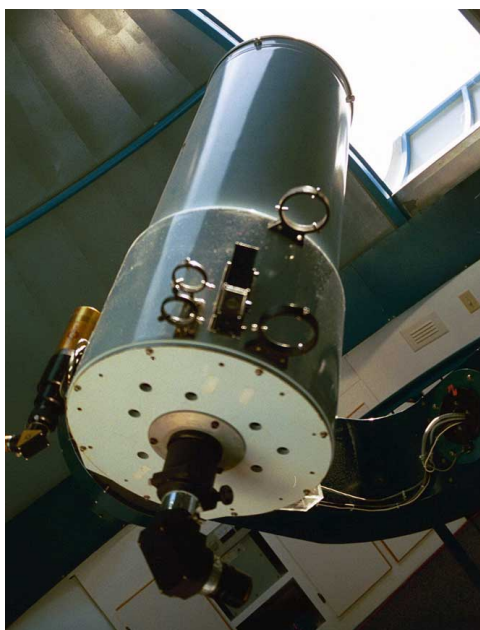
Join us on a field trip! We will be heading north for a wonderful evening of observing at the Little Thompson Observatory in Berthoud on February 22nd and April 12th. You will be able to look through the 18" Tinsley Cassegrain telescope and visit with Greg Marino, long-time DAS member, who is now volunteering at the observatory.

In 1996, the Little Thompson Science Foundation (LTSF) was founded to promote math and science education at the Thompson and Saint Vrain schools. In 1968, the telescope was built for Mr. C.F. Rehnborg. After owning the telescope for almost thirty years, it was donated by his estate to the Mt. Wilson Telescopes in Education project, in turn donated to the LTSF. The telescope, originally built for \$24,000 is now appraised at three times that amount.



The observatory will be open to DAS members on April 12th from 6:30 P.M. – 10:00 P.M.

Don't let the drive detour you; the trip will be well worth it. The main telescope will be open with smaller scopes outside. Also,



The 18-inch Tinsley Cassegrain telescope at the Little Thompson Observatory in Berthoud, Colorado.

Image copyright 2003 Brad Gilman

don't miss the constellation wall: by utilizing red and black light, various celestial objects fade into the background as the Milky Way reveals itself. Excluding a major blizzard, the observatory will be open and there will be plenty to entertain you even if the weather doesn't cooperate. Special thanks to Greg Marino, DAS member and telescope operator at LTO; Meinte Veldhuis, President of The Little Thompson Science Foundation; and Dr. Chet Rideout, Ecology, Astronomy, Educational Supervisor;

## DAS Schedule

### APRIL

- 29-30 (March) *Dark Sky Site Weekend*
- 4 *E-Board meeting, 8 P.M.*
- 5 **Clean-up Day** (4:00 P.M.) and **Open House** (the Open House begins at dusk.)
- 11 *General Meeting at Olin Hall, DU, 7:30 P.M.*—Speaker: Patrick S. McIntosh (Helio Synoptics), "Solar Cartography and Long-Range Predictions."
- 27-May 3 *Texas Star Party*

### MAY

- 3-4 *Dark Sky Site Weekend*
- 9 *E-Board meeting, 8 P.M.*
- 15 **Open House—Total Lunar Eclipse**  
★**Special Alternate Night**★  
(the Open House begins at 7:30.)
- 16 *General Meeting at Olin Hall, DU, 7:30 P.M.*—Speaker: TBD
- 23-26 *Riverside Telescope Makers Conference*

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.

## DAS Officers

### President:

Carla Swartz (303) 246-6926  
Email: CSastrogirl@aol.com

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Larry Brooks

### Vice President:

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### Chief Observer:

Jack Eastman

## Executive Board Members

Jack Eastman	Bill Ormsby
Joe Gafford	Sandy Shaw
Ivan Geisler	David Shouldice
Ron Mickle	Steve Solon
George Jones, Past President	

### DAS Information Line:

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### 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.denverastro.org

# Musical Satellites

by Tony Phillips

If light were sound, then chemicals would play chords.

Water: C major. Cyanide: A minor. Chlorophyll: G diminished 7th. (Please note that the choice of chords here is only for the sake of illustration, and not meant to reflect the actual spectra of these chemicals.)

It's a loose metaphor, but an apt one. Musical chords are combinations of frequencies of sound (notes), while chemicals leave unique combinations of dips in the frequency spectrum of reflected light, like keys pressed on a piano. Spectrographs, machines that recognize chemicals from their "chords of light,"

for making the field trips possible. Visit [www.starkids.org/](http://www.starkids.org/) for more information. Hope to see you all there!

**DIRECTIONS:** Take I-25 north to exit 250 (Highway 56). Exit west onto highway 56 and continue for several miles until you reach a "Y" in the road at highway 287. Turn left onto southbound 287 (it actually heads east-west for a few miles, so you will be going west bound). Follow 287 west to 8th street. Turn left (south) on 8th street and follow it around until it ends at Spartan Drive. Turn right (west) on Spartan drive and the high school will be on your right with the blue and white LTO building off beyond the parking lot. Park in the high school lot and walk through the gate to the observatory.—Carla Swartz

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](mailto:cbcarlso@du.edu)). See the back page of this newsletter for more information.

are among the most powerful tools of modern chemistry.

Most earth-watching satellites, like the highly successful Landsat series, carry spectrographs onboard. These sensors measure the spectra of light reflected from forests, crops, cities, and lakes, yielding valuable information about our natural environment. Current satellites do this in a fairly limited way; their sensors can "hear" only a few meager notes amid the symphony of information emanating from the planet below.

EO-1 could change that. Short for "Earth Observing 1," EO-1 is an experimental NASA satellite in orbit since 2000. It's testing out a more advanced "spectrometer in the sky"—the Hyperion hyperspectral imager. How good is it? If Landsat were "chopsticks," EO-1 would be Gershwin's "Rhapsody in Blue."

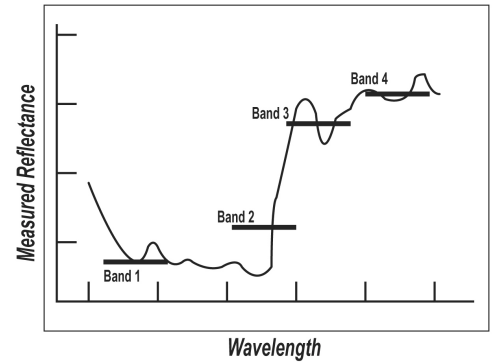
The Hyperion sensor looks at 220 frequencies in the spectrum of visible and infrared light (0.4 to 2.5 microns) reflecting off Earth's surface. Landsat, in contrast, measures only 10. Bryant Cramer, who manages the EO-1 project at the Goddard Space Flight Center, puts these numbers in perspective. "If we flew Landsat over the northeastern United States, it could readily identify a hardwood forest. But using hyperspectral techniques, you probably can . . . tell the oak trees from the maple trees."

Future earth-watching satellites may use Hyperion-like instruments to vastly improve the environmental data they provide. EO-1 is paving the way for these future missions by taking on the risk of flight-testing the sensor for the first time.

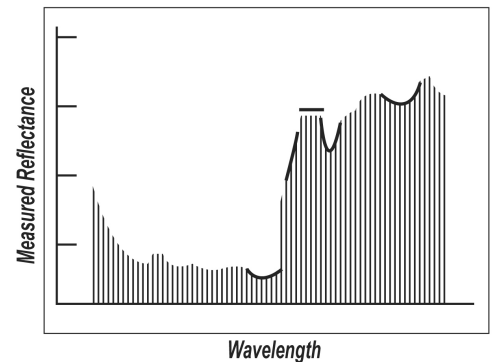
For farmers, foresters, and many others, this new remote sensing technology will surely be music to the ears.

Read about EO1 at <http://eo1.gsfc.nasa.gov>. Budding young astronomers can learn more at [http://spaceplace.nasa.gov/eo1\\_1.htm](http://spaceplace.nasa.gov/eo1_1.htm).

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Multispectral Imaging (few bands)



Hyperspectral Imaging (hundreds of bands)

Hyperion instrument distinguishes hundreds of wavelength bands, while current Landsat instrument images only a few. Charts Courtesy: NASA

### Note from the editor:

Thanks to **Ron Pearson** who generously shared his experiences while on the team that searched for debris from the space shuttle Columbia.

Newsletter contributions (ccd and film astrophotos, members with telescopes, star party candid, 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

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updates



# Searching for Columbia

by Ron Pearson

*Towards the end of February, DAS member Ron Pearson became part of the Columbia Recovery Team in Texas. Following are two excerpts from e-mail messages he sent to the DAS listserve. All photos are from the Corsicana Recovery Team website at: <http://www.pnw-team2.com>.*

Greetings y'all from Corsicana TX., Columbia Recovery Team field station.

I was expecting sunny warm weather here in the Lone Star State, but it's anything but that now. Drove up from Houston to Lufkin to Corsicana last Friday. They were getting over 3 inches of rain then. We had two days of field searching for Columbia 'material' Sun. and Mon. Fields very wet to overflowing. Yesterday it was 30°, with 20 mph winds. If you can picture teams totaling about 700 forest fire fighters spread out over thousand acres of Texas pastures, fields, briar covered streams and creeks in crews of 20 spaced 20 ft. apart walking slowly in lines followed by teams of NASA, EPA and others to pick up samples, that's what is going on. The operation is run by the forest service like a major forest fire operation from a central camp, where hundreds of forest service crew from all over US are holed up in tents set up in warehouses, with logistics and support of about 10 govt. agencies from the Coast Guard to EPA. This 'station' is repeated at 4 or 5 other towns in Texas all dedicated to recovery of the Columbia and her crew. I was surprised to learn at the check in point in Lufkin, that the operation comes

under National Emergency contingency plan—which is why the Coast guard and FEMA are involved—they are now part of Homeland Security. This is truly a national effort. Fire crews from Puget Sound to Florida are here. We heard Navajo spoken by some the other day. Some worked the Hayman fire last summer. I tell them, I hope not to see them at my house next summer!

I have met and worked with a number of folks from NASA, who are here to guide us and locate areas for searching. They are great and they are hurt. One guy named John works at KSC on the shuttle for 24 years.

in the first half hour of a search. The fire crew on the line all high-fived the person that got the first find. We all doubted whether we'd actually find anything before going out. Unfortunately they are not allowing us to take any photos other than the 'official' sample photos, so can't send any. But evidence of burning and scoring of the tiles is obvious. The search areas in eastern Texas are apparently finding the heavier parts as you've heard on the news, but the searching in the thickets and swamps and pine forests are incredibly difficult. We'll be getting into more creeks and woods the next few days, as we've covered the 'easy' areas of open pastures in the search area for now. A NASA engineer told us they hope to find where the 'lug-nuts' came off the wheel—



Search crews fan out and look carefully for debris in the soggy fields.

He told me this was the best thing they could do for them, to let them go out and help. After Challenger, they were not allowed to do anything.

Talked to another guy that knows Scott Merkle in JSC in Houston, and he works on the X-38 vehicle project. These guys know what the shuttle materials are and what they look like. Its important because there is alot of 'junk', farm stuff and white foam that looks like tile material all over the place. The Texan's like those styrofoam take home boxes for BBQ and coffee cups! But it's easy to tell apart once you get close. We have found many tile fragments, some whole tiles and other materials.

My first day out, we found tile fragments

not literal shuttle wheel I hope—in this area. The 'wheel' went on down the road—so to speak. And so far we are finding 'external' material that was coming off.

Well today was a 'down day' with freezing rain, and sleet covering everything. Otherwise its been 12-14 hour days. Tomorrow doesn't look good either. Give time for my boots to dry out and get this laptop hooked up to the local ISP number, so we had some coordination meetings and tried to catch up on logistic coordinating of all these groups that there wasn't time to do before heading out in the fields last weekend.

Not many prepared for this type of weather, so the crews and us have cleaned out the local wall mart! Last night they were



The sleeping quarters of the search crews.

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



**Boots drying out.**

telling us the only thermal type clothes left were in womens wear. Had to buy a hooded sweatshirt over there. A polar fleece store could make a killing now! The FS supplies most of the field crews needs, but its going to be a bit like the German army marching on Moscow for the next few days.

Well, better go, this is way too long for e-mail chat. If the weather cooperates, we'll be back out in fields and hopefully the astronauts and space program will not be grounded for too long.

Clear skies and send us some dry Colorado weather!—*Ron Pearson*

3/3/03

Hi all,

I lost Internet access for several days but am back on tonight. The recovery here in Corsicana continues at a very hard pace. 12 hrs p/day, 7 days a week, fielding several hundred fire team crews, and those of us behind them, picking up the samples and documenting them with evidence tracking procedures. The weather continues to slow the teams.

Today we had rain delays for 3 hrs or so,



**Search crews sign the banners.**

but still got in alot of slogging through swamps, briars and brush. Pastures are still mud. We went out east to an area we had an incredible day last week, when we recovered over 400 pieces. They now predict weather by 70 later in the week. But today they predicted 20% chance of rain. That was 20% for 80% of the day where we were!

Last night the field crews were driven to Corsicana High for a presentation by 2 NASA astronauts. They packed the auditorium. They showed a mission summary video of STS 107 all the crew showing and explaining what there were going to do on the flight, plus the lift-off and some inflight video. Its hard to see those smiling faces in spacesuits that met such an end over this part of Texas. Astronaut John Harrington showed video of his mission to the ISS last Dec., the flight before Columbia. There are alot of the crews that are from various Native American tribes, and Harrington is the first NA to fly in space—a Chickasaw. So he drew much applause, cheers and warwhoops from the NA crews. Their pride in his accomplishments is impressive. But it was a late night for them and back out starting at 7 a.m. Afterward they signed autographs. There were also Columbia flags laid out for people to sign as a sort of condolence for Columbia and the crew. I signed for myself and also signed the DAS on a flag for all of you.

We've found many tiles, many many fragments of tiles and other materials. Sunday a fairly large piece—bout 2 ft. of left wing leading edge structure was found with a couple tiles still attached. The NASA folks are very interested to get that one to KSC. Today the crew I was out with found a piece of the composite material the payload bay doors are made of. Its amazingly thin and lightweight material. Those huge doors are very thin and light. The piece we found was about a foot long. One of biggest I've seen. One of the NASA guys was telling me some of the details of how the doors and wings are made and some of the differences between Columbia and the other 3 orbiters. I never knew the wings are covered by a very thin composite material, not tiles, on the

top. The construction is not much different than old fabric covered airplane wings, just high tech materials and construction methods. But very light and tough.

Gotta go, time to hit the sack for another 5 A.M. start to the center. Be back in Denver late Friday—by then the sun will be out in Texas I bet!—*Ron Pearson*



**Folks wait their turn in the breakfast line.**

## *AstroTrivia*

*(Look for the answer in this issue.)*

**Q. What are Hirayama familiee?**

*AstroTrivia is contributed by Sandy Shaw.*

**A Total Solar Eclipse  
at Midnight?  
How weird is that?**

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



## 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):*

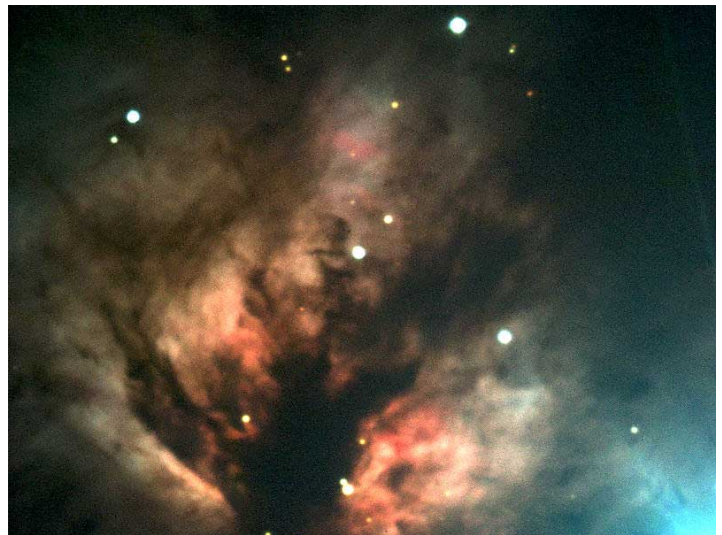
Take I-70 eastbound to exit 316 (Byers). Turn left at end of ramp which puts you on eastbound US-36. Take US-36 east 17.2 miles to CR 241. Turn right (south) onto CR 241 and continue for 6.2 miles. The DSS entrance is on the left between two tall posts.

*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.

During November, 2002, Joe Gafford pointed his camera at Orion, and photographed The Flame Nebula (NGC 2024)—part of a complex star-forming region that includes the Horsehead Nebula (Barnard 33).



## 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

## Committee Campaign

### *Do you need a creative outlet?*

If so, we are forming committees to develop ideas and activities for our larger public outreach events throughout the year. If you are interested in working on a committee and haven't signed up yet, please contact the team leaders listed below to join in the fun. Thanks to everyone who is helping make this a successful year of public outreach for the DAS.—*Carla Swartz*

### ★May 15th (6-10pm)

#### **Total Lunar Eclipse: 9:13 P.M.**

Open house has been moved to this evening.

Present your plan to E-board at meeting on April 4th.

Team Leader—Steve Solon,  
*galaxyshots@compuserve.com*,  
303.932.7613

### ★August 27th (8 P.M.-12 A.M.)

#### **Midnight Mars Madnes: Peak 11:30 P.M.**

Present your plan to E-board at meeting on July 11th.

Team Leader—John Flemming,  
*johncflemming@yahoo.com*,  
303.978.0635

### ★October 4th all day activities

#### **Colorado Astronomy Day**

Present your plan to E-board at meeting on August 8th.

Team Leader—Patti Kurtz,  
*pkurtz@att.net*,  
303.948.5825

### ★November 8th (6-10 P.M.)

#### **Total Lunar Eclipse: 6:06 P.M.**

Present your plan E-board at meeting on October 3rd.

Team Leader—Steve Solon,  
*galaxyshots@compuserve.com*,  
303.932.7613

## From the Cover:

### The Rosette Nebula (NGC 2237)

Spectacular and flow-er like, the Rosette Nebula (NGC 2237) in Monoceros appears to swallow the open cluster NGC 2244 and its approximate 24 member stars. While this cluster is observable naked eye, the nebula around it is not. At low power the Rosette looks like a halo surrounding the stars: photographed, its true beauty is revealed. This region of the sky is not devoid of celestial delights—the Rosette lies only about 17° degrees north-east of the Great Orion Nebula (M42).

DAS member Chris Tarr continues to dazzle us with his photography. The Rosette is a composite of two images shot at his site in Grand Lake during February and March, 2003. It's his first project using a Hydrogen Alpha filter. Aggregate exposure times are (100+70) 15, 15, and 22 minutes, respectively. Thanks, Chris.—*PK*



## CCD CLASSES

“How do they do it?”—Come find out on Saturday, June 7, when the DAS will present, “CCD Imaging—Just for Starters,” an introduction to the basics of CCD photography hosted by the DAS's Steve Solon.

The class will be held at DU's historic Chamberlin Observatory from noon to 3 P.M. with a break for refreshments. Class size is limited to 30 persons and pre-registration is required. The cost

for the class is \$5.00 for DAS members and \$10.00 for non-members.

Checks may be made payable to: “The DSSF” and mailed to:

Steve Solon, 9774 West Elmhurst Place, Littleton, Colorado 80128.

Come join us for an informative session on the basic tools and workings of the art of CCD imaging. See you there. *Image (M42) by Steve Solon.*

### Astro-Trivia Answer

A. In the late 1800s, astronomers speculated that asteroids with almost identical orbital elements could have resulted from the breakup of a large parent body in the distant past. Kiyotsugu Hirayama searched for such asteroid families using three orbital elements—semimajor axis, eccentricity, and inclination. By 1918 he had identified three asteroid families with a grand total of 56 members; by 1923 he had found 2 more families. By 1988 more than 100 asteroid families, called Hirayama families, had been found. They included almost half of the known asteroids.—*Sandy Shaw*

### Welcome New Members!

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

- Rod Champney
- Les Feka
- Peter Gillette
- Robert Heintz
- Scott Hendrickson
- Kelsey Jensen
- Deb Ostergaard
- Lucy Wolboldt

# updates

## 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**

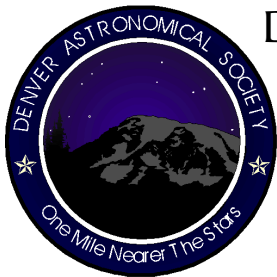
New  Renewal

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 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



## Denver Astronomical Society

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

### APRIL'S MEETING

#### APRIL 11:

*General Meeting at Olin Hall, DU, 7:30 P.M.—Speaker: Patrick S. McIntosh (Helio Synoptics), "Solar Cartography and Long-Range Predictions."*

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