

# OBSERVER

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

Image copyright 2003 Chris Tarr

## Celebrate Luna

This creative composite was combined in Photoshop after shooting the trees and moon through an LX200 at f/3. The starfield was made with a Cannon 35mm camera.

# This Month's Star is the Moon

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## MAY SKIES 2003

Now that we are well into spring, the nights are getting shorter but that doesn't mean there is less to observe during this May. This month you will have a chance to really improve your observing skills and enjoy just about all the night sky can offer. If you ever thought you didn't need

to know your constellations or need a goal or incentive to learn your way around the sky, this is it. Starting with constellations and moving to stars, planets, meteor showers, eclipses, and those most challenging of all "faint fuzzies" billions and billions of galaxies—or maybe just few hundred visible in most of our telescopes. Warm up those star hopping skills and let's cruise some galaxies.

But first, starting in the west, point that scope toward those bright stars up

1 .....	New moon
9 .....	First quarter moon
15 .....	Full moon,
.....	Total lunar eclipse
23 .....	Last quarter moon
27 .....	Mercury passes 2° south of Venus
30 .....	New moon

*Continued on page 4*

# PRESIDENT'S CORNER

Arcturus is again rising in the evening sky, reminding me that a new summer has arrived, and with it a hope for less smoke and greener landscapes than last year.

With new beginnings on my mind, I'd like to take the opportunity to introduce six new public night telescope operator trainees, Darrell Dodge, Phil Klos, Robert Spaulding, Stuart Hutchins, Todd Hitch and Wayne Green. Not only have these industrious souls decided to join our team, but in doing so, they have become part of the history of Chamberlin. We welcome our newest trainees and support their endeavor as they continue through their training and testing. Our public night team possesses a tremendous amount of expertise, and a willingness to share that knowledge and their time with the newest members of their circle. I would like to extend a special thanks to Bill Ormsby, Brad Gilman, Dave Tondreau, David



Shouldice, Doug Dreher, John Doran, Norm Rosling, Rich Lane, Ron Mickle, Steve Solon and Ted Cox as they continue to help novices and experts alike view the night sky.

In addition, Ron Mickle, has been ap-



Thousands of people received their first views of the stars through the historic 20-inch Alvan Clark at Chamberlin.

Image copyright 2003 Carla Swartz

pointed our new Public Night Team Leader. I'm certain that his expertise, excitement and ability to deliver superb training will help us all as we continue to provide a great service to the community.

It is my hope, that along the way, we have inspired a few of our visitors to join the DAS. Perhaps, if we are fortunate, we have even opened the eyes of children to the skies, providing them the motivation to pursue a future of their own in astronomy.—Carla Swartz

## DAS Officers

### President:

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Larry Brooks

### Vice President:

### Secretary:

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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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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.

## DAS Schedule

### 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: Dr. Doug Duncan (Director, Fiske Planetarium), "Pluto, Quaoar, and an African Eclipse Safari with a real lion expert."

### JUNE

- May 31-June 1 Dark Sky Site Weekend
- 6 E-Board meeting, 8 P.M.
- 7 **Open House** (the Open House begins at dusk.)
- 13 General Meeting at Olin Hall, DU, 7:30 P.M.—Speaker: TBD.
- 26-29 Star Stare
- 28-29 Dark Sky Site Weekend

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.

www.denverastrosoociety.org

# In Search of Alien Oceans

by Patrick L. Barry and Dr. Tony Phillips

A robotic submarine plunges into the dark ocean of a distant world, beaming back humanity's first views from an alien ocean. The craft's floodlights pierce the silty water, searching for the first, historic sign of extraterrestrial life.

Such a scenario may not be as fantastic as it sounds. Many scientists believe that Jupiter's moon Europa conceals a vast ocean under its icy crust. If so, heat from the moon's interior—which would keep the ocean from freezing solid—may also drive subaquatic volcanoes and hydrothermal vents.

On Earth, such deep-sea vents provide chemical energy for ecosystems that thrive without sunlight, and some scientists even suggest that Earthly life first got started around these vents.

So a warm European ocean spotted with thermal vents could be a natural incubator for life. That's why some scientists hope that someday we will send a probe to Europa that could bore through the ice and explore the ocean below like a submarine.

To plan for such a mission, scientists would first need to put a camera in orbit around Europa. By looking for places where water has welled up to fill

*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.*

the spindly cracks that riddle Europa's surface, scientists can estimate where the ice is thinnest—and thus easiest to bore through.

That mission scenario presents a problem, though. Europa orbits Jupiter inside the giant planet's punishing radiation belts. Continuous exposure to such high radiation would damage today's scientific cameras, making the information they gather less reliable and perhaps ruining them completely.

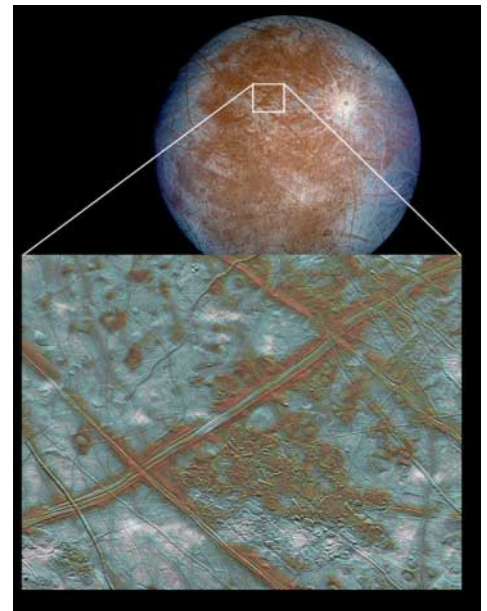
That's why NASA is designing a more radiation-tolerant CCD that could be used on a mapping mission to Europa. A CCD (short for "charge-coupled device") is a digital camera's chip-like core, which converts light into electric signals.

"We've seen the effects of this radiation during the Galileo mission to Jupiter," says JPL's Andy Collins, principal investigator for the Planetary Imager Project. "Galileo has orbited Jupiter for many years, dipping inside the radiation belts only for brief intervals. Even so," he says, "we've seen clear signs of damage to its instruments."

By using the hardier CCD's developed by the Planetary Imager Project, a future probe could remain in Jupiter's radiation belts for many months, gathering the maps scientists will need to finally get a peek behind Europa's icy veil. And who knows, maybe there will be something peeking back!

To learn more about the Galileo mission to the Jupiter system, visit <http://www.jpl.nasa.gov/galileo/>. For children, a fun, interactive "Pixel This!" game at [http://spaceplace.nasa.gov/p\\_imager/pixel\\_this.htm](http://spaceplace.nasa.gov/p_imager/pixel_this.htm) introduces CCDs and how a really tough one will be needed for a future mission to Europa.

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract*



Cracks on the icy surface of Jupiter's moon Europa give evidence of a liquid ocean below.

Charts Courtesy: NASA

*with the National Aeronautics and Space Administration.*

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

**Q. What are the Kirkwood gaps?**  
*AstroTrivia is contributed by Sandy Shaw.*

**Note from the editor:**

Thanks to **Ron Pearson** who wrote "May Skies" so thoroughly it expanded into a feature! Also thanks to **Sandy Shaw** for this month's "AstroTrivia."

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

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# May Skies

## *Continued from page 1*

about 1/3 to 1/2 to overhead. Those aren't stars are they? Those are Saturn and Jupiter. Put in a higher power eyepiece and enjoy the perfection of the rings of Saturn and the cloud belts and moons of Jupiter. Been there done that enough this winter? Say farewell to Saturn 'till next year. Put in a low power, wide field eyepiece and swing a little way up from Jupiter. You should find a beautiful cluster of stars known as M44 or "The Beehive," a honey of a cluster!

From the Beehive move a bit east. The nights are full of galaxies high overhead in the constellations Virgo and Leo. Start in Leo since its next to M44 and setting earlier. Look for that backwards question mark in the sky — the head of the Lion, then find that large right triangle of stars to the east of the Lions head. Swing your telescope



The Virgo Cluster in . . . well, Virgo.

Image copyright 2003 Joe Gafford

down to the star at the bottom of the leg of triangle, and then down a bit further, about a finder field of view or so. Start looking for two or maybe three small faint fuzzies. They're kinda elliptical in shape or elongated smudges of light in a small telescope. You're on the prowl for M66 and M65. If you find those two you should see a third galaxy in the same field or nearby to the



M66, M65, and NGC 3628 in Leo make a lovely trio in a small telescope.

Image copyright 2003 Steve Bell

west. NGC 3628. Whoa partner, you've got three galaxies in one view, shining their light from billions of miles away in your eyeball! If you sweep back up to that star and then about 7 degrees -about a fist width, to the east you can pick up 3 more bright galaxies; M105, M95 and M96 in one field. If you can do that, you're on to star hopping and hopping galaxies.

By now you've dug out your constellation maps and maybe that chart that shows all the Messier and NGC objects in Virgo. You're geared up and ready to cruise the galaxies of the Virgo Super Cluster. Even with small scopes you can find quite a few. The bigger the scope and further away from lights you are the more you'll see. If you can't tell one from another, no problemo, enjoy the views and sweep around at low power. Find a brighter one, increase the power to see what details might pop out at you. Use averted vision. Some place up in the midst of the galaxies is something much closer and moving slowly amongst the stars. Its a big space rock or very small planet known as Vesta. Look it up, check it out. It was bright enough to see with unaided eye just a few weeks ago. Now a small scope or binocs will do.

You've been out all night by now enjoying the galaxies, planets and maybe the moon before it set. If it's the morning of May 5-6th you should start seeing meteors flying out of the eastern sky. Is that meteor shower or not? You wont be overwhelmed but you may notice a pattern of bright, very fast meteors coming from the neighborhood of Aquarius. Oh, there's one of those weird Greek constellations again. The neat thing about this meteor shower is that those bits of space debris come from the famous Comet Halley.

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



## Get Ready to be Eclipsed

Plan to join us on Thursday, May 15 for what promises to be the first of two spectacular lunar eclipses. The evening coincides with our monthly Open House at Chamberlin Observatory, so there will be plenty of looking to do—and not just at the Moon!

We'll have a demonstration of why eclipses happen only part of the time and a presentation on eclipse histories — some folks actually died because of them!

So bundle up the kids, the scope, the dog and yourself and come mingle under the mystical spell of the shadowed Moon on Thursday May 15, beginning at 7:30 p.m. Heathens beware !!

Using a 4-inch Celestron refractor and Kodak Royal film, Bill Ormsby shot this total lunar eclipse at an eclipse party on March 23, 1997 at Chamberlin.


Image copyright 2003 Bill Ormsby

While you're up at that time, check out Mars, that bright orange-red star in the east. Its about 10 arc seconds across, pretty small, but you may be able to see some makings by now. You'll appreciate even more in August when its 24 arc seconds across.

In mid-month you're back observing in the city and burbs under the moon. On the night of May 15th pack up your scope or just bring your eyes for a special evening on the lawn at Chamberlin. We'll be there for the first of two lunar eclipses this year. Its been awhile since we've enjoyed the spectacle of a blood-red moon slowly disappearing into Earth's shadow. Come out in the evening, the eclipse starts at 8:03 p.m.

MDT. Mid-eclipse will be 9:40 p.m. You won't need a filter to protect your eyes or telescope! If you've wanted to try astrophotography with film or pixels, now's a great opportunity. If not, share your views with the neighbors, kids, friends of Chamberlin and fellow DASers. If you've seen lunar eclipses before, how does the color or darkness compare with previous ones? The bright, full moon returns by 11:17 p.m. Just in time to hit the sack for another day at work, unless by now you've quit your day-job so you can observe all the more!

Clear skies to all from the Cosmic Rock Observatory, Evergreen.—*Ron Pearson*



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

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## 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.



A springtime favorite, the Sombrero Galaxy (M104) in Virgo shows off its dark dust lane to those with telescopes.

Image copyright 2003 Steve Solon

## 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

## Prize Participation Winner!

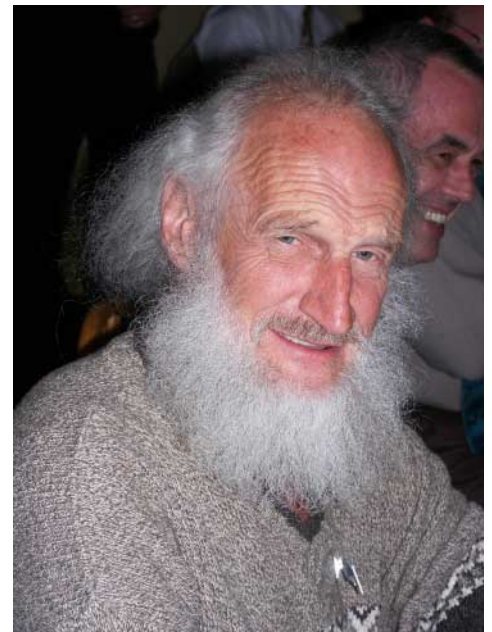
Congratulations to Jack Eastman, 1st Quarter DAS Participation Prize Recipient.

Once again, Jack has been recognized for his commitment and dedication to amateur astronomy. Jack is a long time member of the DAS and LAAS (Los Angeles Astronomical Society), and has served each club as both President and board member. He was recently awarded The G. Bruce Blair award for 2003 by the Western Amateur Astronomers (see March Observer). Owning a 6-inch Clark himself, he has been an active advisor for the preservation and restoration work on the 20-inch Clark. In addition, Jack is an avid solar and planetary observer and has held the position of Chief Observer of the DAS for many years. His wit, warmth and willingness to share his vast knowledge

of astronomy, only serve to represent why he is so special to us. Thank you Jack, for your dedication to the DAS. Your enthusiasm inspires us and your guidance awakens new possibilities for all of us.

A complimentary year of DAS membership dues will keep Jack with us for yet another year. The next DAS participation prize drawing will be held in June at the general meeting. The recipient will be given a pre-paid year of DAS membership dues, or a subscription to Sky & Telescope or Astronomy. You can also 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.

Please see an e-board member for a slip and their signature to become eligible for the next drawing. Remember, the more you volunteer, the more opportunities you have for winning a prize.—*Carla Swartz*



Jack Eastman has received the DAS Prize Participation Award for the quarter.

Image copyright 2003 Joe Gafford

### Astro-Trivia Answer

A. In 1866 astronomer and math professor Daniel Kirkwood announced that the main asteroid belt between Mars and Jupiter contained gaps where there were no asteroids. Realizing that the gaps were due to the influence of Jupiter's gravity, he analyzed the orbits of 97 asteroids and determined that the gaps occurred at resonance points — certain places where Jupiter and an asteroid would come into conjunction at the same location in the asteroid's orbit. He described the 1:3 resonance as a point where the asteroid "would make precisely three revolutions while Jupiter completes one." Meeting the asteroid at an even ratio in its orbit, Jupiter would repeatedly tug the minor planet until it was no longer at that even ratio thus creating a gap in the asteroid belt. Kirkwood gaps, as they are now called, have been found at the 1:3, 2:5, 3:7, 1:2, and 3:5 resonances.—*Sandy Shaw*

### Welcome New Members!

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

- Joseph Bomgaars • Jeremy Simons
- Xachary Bomgaars • Jim Toohey
- Robert J. Schwartz • Jennifer Wilson

## CCD CLASS

"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.*

# 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

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 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

### MAY'S MEETING MAY 16:

*General Meeting at Olin Hall, DU, 7:30 P.M.—Speaker: Dr. Doug Duncan (Director, Fiske Planetarium), "Pluto, Quaoar, and an African Eclipse Safari with a real lion expert."*

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