

OBSERVER

Newsletter of the Denver Astronomical Society
One Mile Nearer the Stars

Collision in the Kuiper Belt

Colorado Astronomy Day sets its sights on New Horizons with extraordinary speakers and activities. Be sure to mark your calendars for October 12 and check out all the astro-activities on pages 4, 5, and 7.

Artwork ©Dan Durda, Southwest Research Institute, 2002



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OCTOBER SKIES 2002

They're baaaack! Bright planet watchers will rejoice to see the returns of **Saturn** and **Jupiter** in the late night sky. Not only will observers train optics on the gas giants, but *Astronomy* claims that with a 10-inch scope under great skies, one might be able to pick off the moons of **Uranus** and **Neptune**. **Mars** is back and climbs past **Mercury** which should be visible naked eye

6	New moon
12	First quarter moon
21	Full moon (Hunter's Moon), Orionid meteor shower peaks
27	Daylight Savings Time Ends
28	Last quarter moon

by October 10. No visual aid will be needed for the the Orionid meteor shower, although it will be washed out by this month's bright moon. This shower can dish up a few hundred meteors per hour and could certainly be worth a night out with friends and a chaise longue. And, during the first two weeks of October, look for the glow of Zodiacal light before morning twilight. As the month draws to a close, show off your love of the hobby by carving a celestial Jack-o-Lantern. You might even set up a scope to show a few celestial views to visiting ghouls and goblins. I hope your October skies are clear and dark, and happy Halloween!—*Patti Kurtz*



At last year's Colorado Astronomy Day, Stephanie Pahl (above, S&S Optika) sold astronomical goodies outside in the cold. This year the vendors will be inside Chamberlin during the star party.

PRESIDENT'S CORNER

HEY all you crazy stargazers. It's Colorado Astronomy Day. As you can see from the rest of this issue it is a major astronomical event for Denver. Not only will we have a great night at Chamberlin but we're working closely with the Denver Museum of Nature & Science — great events and speakers pack the daytime schedule. We need lots of volunteers for both the museum and at Chamberlin. If you



can't volunteer, then at least be sure to come and bring lots of friends and relatives. Many thanks to Patti Kurtz and Carla Swartz from the DAS, and Shaun Howard from the museum for doing such a fine job in putting this grand day and night together.

If you want to bring your scope for the evening at Chamberlin, then come on down! If you don't have a scope but would like to volunteer at either the museum or at Chamberlin, give me a call or email me. — Larry Brooks, LBrooks100@aol.com

DAS Schedule

OCTOBER

- 4-6 *Dark Sky Site Weekend*
- 11 *E-Board meeting, 8 P.M.*
- 12 **Colorado Astronomy Day— Takes Place of the General Meeting** (See Pages 4, 5, and 7.)
- 19 *DAS Auction (setup at 11A.M., auction begins at 1P.M. — See Page 6.)*

NOVEMBER

- 1-3 *Dark Sky Site Weekend*
- 8 *E-Board meeting, 8 P.M.*
- 9 **Clean-up Day (4:00 P.M.) and Open House** (the Open House begins at dusk.)
- 22 *General Meeting at Olin Hall, DU, 7:30 P.M.—Steve Solon (DAS), "The DAS — Us 'n Stuff."*
- 28 *Happy Thanksgiving!*

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

Costs to non-members are: \$3.00 adults, \$2.00 children. Please call (303) 281-9052 (new phone number) for reservations.

DAS Officers

President:

Larry Brooks (303) 986-5255

Email: LBrooks100@aol.com

Vice 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

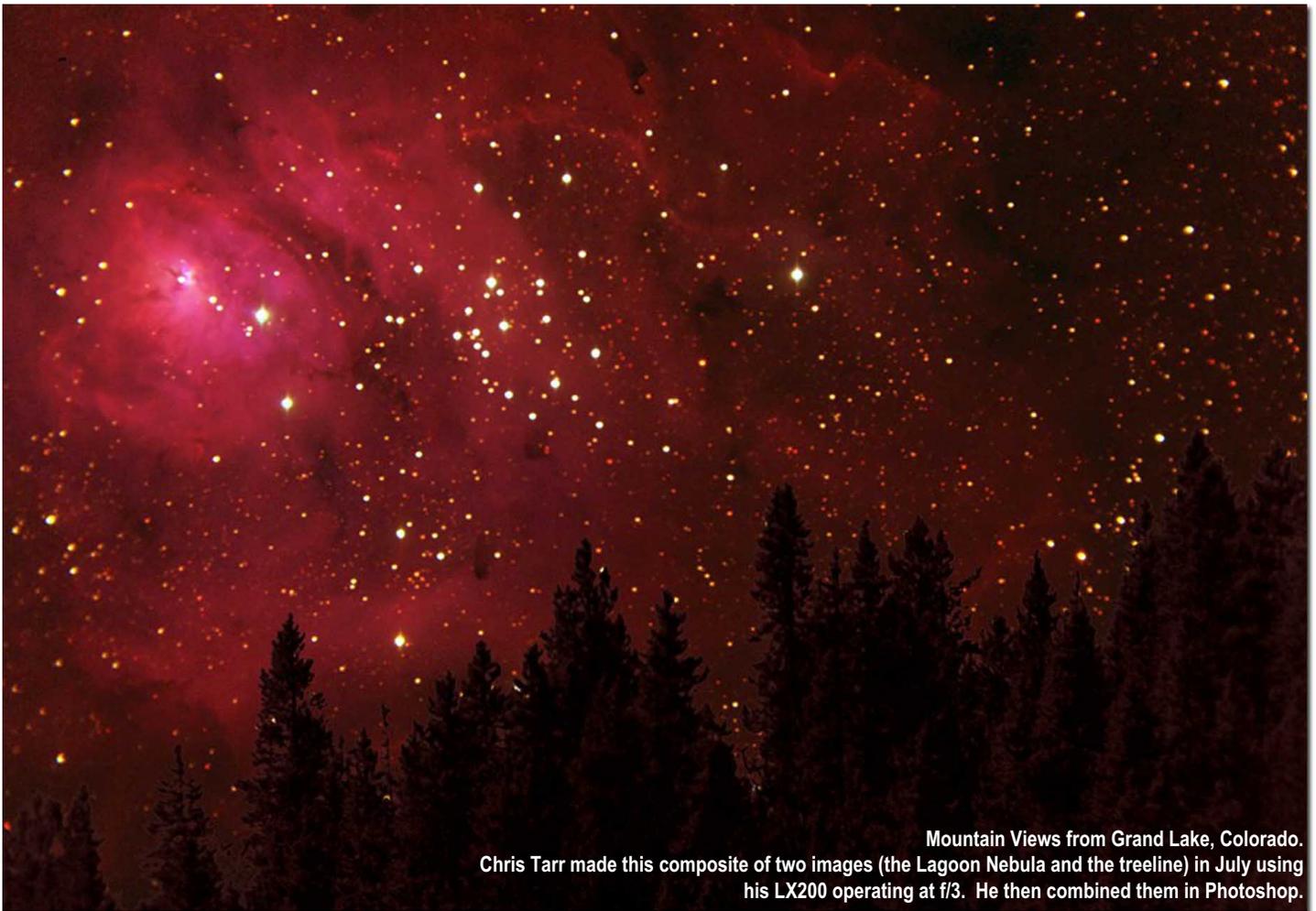
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(303) 948-5825

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 society.org



Mountain Views from Grand Lake, Colorado. Chris Tarr made this composite of two images (the Lagoon Nebula and the treeline) in July using his LX200 operating at f/3. He then combined them in Photoshop.



Seeking the Edge of the Solar System

In September and August, respectively, 2002, the Voyager 1 and 2 spacecrafts observed their 25th anniversaries in space, continuing to perform long after their original mission to visit the Jupiter and Saturn systems. After Voyager 1's encounter with the two gas giants, it was aimed upward out of the plane of the ecliptic. Voyager 2, after its visit at Jupiter and Saturn, was given two more planetary destinations, Uranus and Neptune. It completed its "grand tour" of the outer planets in 1989. It was then aimed downward out of the ecliptic plane.

Now, at about 85 AU, Voyager 1 is the most distant human-made object. Round-trip light time is 24 hours. Voyager 2 is at about 68 AU. Their mission now is to study the heliosphere, the vast bubble of space within the Sun's influence, and the heliopause, the boundary of the solar system with interstellar space. At the heliopause, the outward pressure exerted by the solar wind balances the inward pressure of the interstellar wind. The region where solar wind particles begin piling up against the heliopause is the termination shock, where the solar wind should drop from about 1,500,000 kilometers (nearly 1,000,000 miles) per hour to 400,000 kilometers (250,000 miles) per hour. Voyager 1 is already detecting a slowing of the solar wind from the pressure of inbound interstellar particles leaking through the heliopause.

No one knows exactly how much farther Voyager 1 must travel to reach the termination shock or the heliopause. Dr. Ed Stone,

Voyager Project Scientist since mission inception, estimates that the spacecraft could reach the termination shock within three years. Once there, Dr. Stone predicts it will still have about 5 billion to 8 billion kilometers (3 billion to 5 billion miles) and 10 to 15 years to go before actually crossing the heliopause into interstellar space. Because the heliosphere expands and contracts with the level of solar activity and the inward pressure of the interstellar wind is uncertain, it is very difficult for scientists to estimate the actual extent of the heliosphere.

Read more about the Voyager mission to find the heliopause at <http://voyager.jpl.nasa.gov/>. For children, go to http://spaceplace.nasa.gov/vgr_fact1.htm to read about the Voyagers' grand tour of the outer planets and find out the secret code they use to send pictures back from space.

news and updates

Colorado Astronomy Day

October 12, 2002

The Denver Astronomical Society has set its sights on New Horizons with a stellar lineup of speakers for Colorado Astronomy Day, Saturday, October 12, 2002. This year's presenters will show us the ins and outs of chasing glorious eclipses of our closest star. Together we'll observe the spectacular variety of two moons orbiting Jupiter, then explore the far-flung reaches of our solar system. Be sure to join us beginning at noon at Ricketson Auditorium at the Denver Museum of Nature & Science.

commercial pilot, he frequently flies high-performance jet aircraft equipped with instruments for astronomical research. He is probably best known to the pub-

“Pluto-Charon and the Kuiper Belt: New Horizons for NASA Exploration.”
— *Alan Stern, Ph.D.*

Dr. Alan Stern, Director of the Department of Space Studies at the Southwest Research Institute in Boulder, is one of the nation's foremost planetary scientists and astrophysicists. He is the author of numerous technical papers as well as several articles and two books directed toward a popular audience. He also has a background in aerospace engineering, having specialized in spacecraft design successively at NASA, Martin Marietta Aerospace, and the University of Colorado prior to completing his doctoral studies. Dr. Stern's research has focused on the outer reaches of the solar system — the Kuiper disk, Oort cloud, and especially the planet Pluto. He has worked on a number of NASA committees and projects involving his expertise as an instrument designer. He also has served as Principal Investigator for several important projects involving instrument payloads aboard spacecraft. A skilled com-

mercial pilot, he frequently flies high-performance jet aircraft equipped with instruments for astronomical research. He is probably best known to the pub-



Photo courtesy of the Southwest Research Institute

Dr. Alan Stern

Dr. Stern will describe the scientific motivation behind and the planning for NASA's New Horizons mission to Pluto-Charon and the Kuiper Belt. The talk will include details of the mission scenario, instrument complement, and spacecraft design.

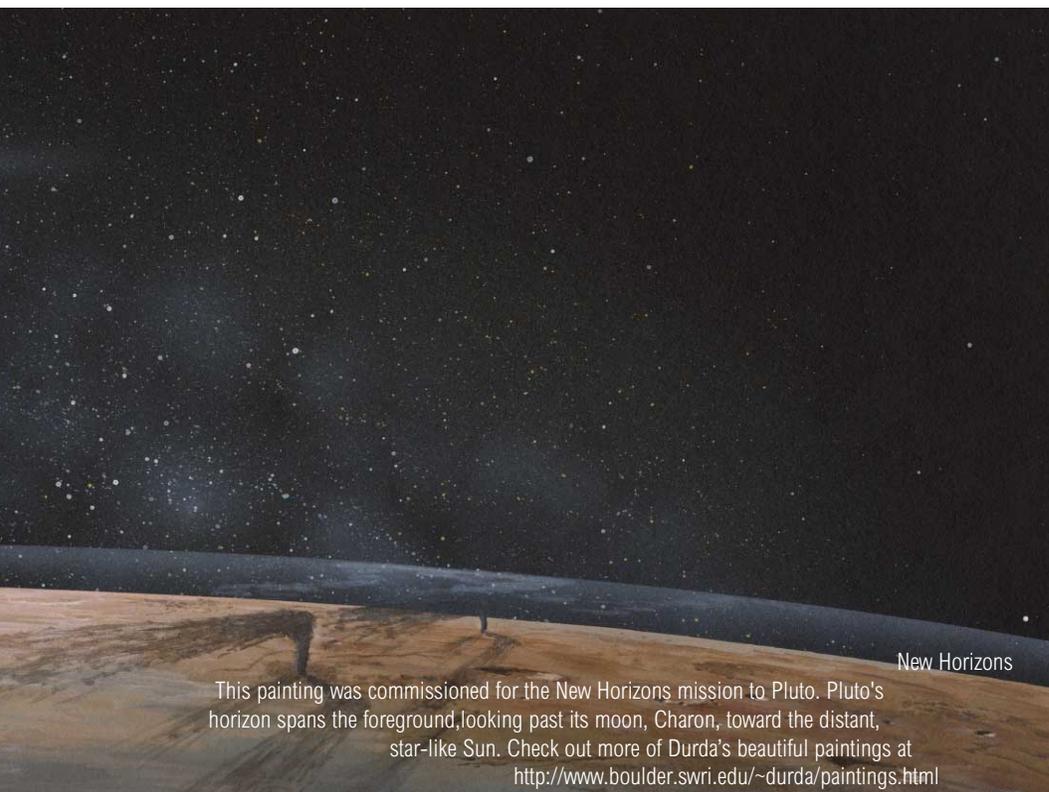
spacecraft mission to Pluto and the Kuiper Belt. This is the controversial mission that gets frequent press coverage due to the fact that it keeps getting de-funded by the Administration and re-funded by Congress. He will undoubtedly discuss the alternate joys and frustrations of his personal role as well as the scientific details of this important project. — *Charles Carlson*

“Eclipse Chasing: Seeing the World on a deadline.” — *Vic and Jennifer Winter*

It's an old saying: “There is no rest for the weary” and there are no two people more qualified to be ‘poster children’ for that saying than Vic and Jen Winter.

These two mid-western astronomers and educators have, for many years, advanced the science and appeal of astronomy through numerous programs designed to bring the universe to everyone. It is their vision to help any and all with a passion for the night sky to get as involved as they wish and to promote astronomy as a “totally reachable undertaking.”

colorado astronomy day



This painting was commissioned for the New Horizons mission to Pluto. Pluto's horizon spans the foreground, looking past its moon, Charon, toward the distant, star-like Sun. Check out more of Durda's beautiful paintings at <http://www.boulder.swri.edu/~durda/paintings.html>

“Io and Europa: Fire and Ice on the Moons of Jupiter.”— John Spencer, Ph.D.

John Spencer grew up in the north of England, and was a keen amateur astronomer as a teenager. He got his bachelor's degree in geology from Cambridge University in 1978, and crossed the Atlantic to get his Ph.D. in Planetary Sciences at the University of Arizona in 1987. After four years as a post-doc at the University of Hawaii, in 1991 he joined the staff of Lowell Observatory in Flagstaff, Arizona, where he has been ever since.

He specializes in observations of outer solar system satellites, especially the moons of Jupiter, with ground-based telescopes, the Hubble Space Telescope, and inter planetary spacecraft.

He was a member of the science team on the Galileo Jupiter Orbiter, and is now working on the Cassini Saturn Orbiter and New Horizons Pluto flyby missions. He is currently spending six months at the Southwest Research Institute in Boulder. — Ron Pearson

Through their astronomy website, ICSTARS (www.ICSTARS.com), Vic and Jen have created a place for visitors to view their photographs and explore the night sky. The couple's astrophoto-

graphic works have been published in numerous magazines and on websites all over the net.

Vic and Jen are the editors of *The Reflector*, the national quarterly publication of the Astronomical League. In their experienced hands, the astro-zine has expanded its coverage of events, with increased numbers of member - submitted astro-images. In addition, they also lead groups of enthusiasts on globe-trotting expeditions through their company, Astronomical Tours.

One of their continuing passions is chasing eclipses and they'll be bringing their expertise and valuable insights on the chase to the Denver Museum of Nature and Science on October 12 for Colorado Astronomy Day. It promises to be a fascinating journey around the world for these most prized and rare events. Join us!

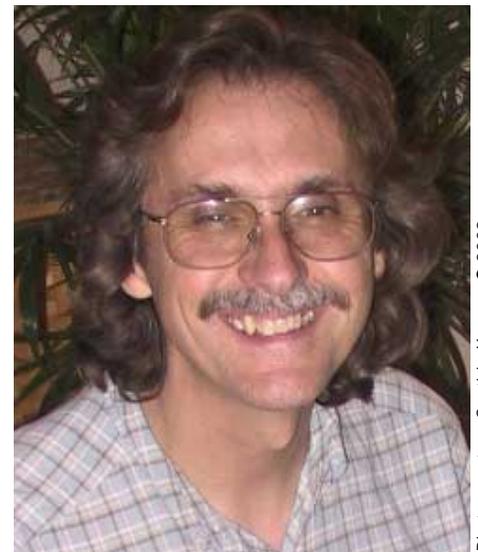
Vic and Jen can be reached by email at: webmaster@ICSTARS.com. — Steve Solon



Jennifer and Vic Winter

Eclipse chasing has led them to many corners of the globe that they never anticipated. They love working with interesting people with whom they share the completely universal interest of astronomy. They look forward to sharing some of their adventures at Colorado Astronomy Day.

Photo courtesy Kevin Anderson, © 2002



Dr. John Spencer

Dr. Spencer will present some of the latest findings about the two most spectacular of Jupiter's many moons, Io and Europa, illustrated with dramatic pictures from the Galileo mission and the Hubble Space Telescope. Io is covered in erupting volcanos, powered by Jupiter's gravity, while Europa's fractured icy crust probably conceals a vast ocean which could conceivably harbor life.

Photo courtesy Cynthia Kammer, © 2002

colorado astronomy day

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.

DAS Auction

Even if your name isn't Dave Trott, you should still mark your calendar and get out your checkbook for this year's auction slated for October 19. Setup begins at 11 A.M., the auction begins at 1 P.M. and ends about 4:00. Please bring only astronomy related items, and take home what you don't sell. Cookies, cakes and the like will also be auctioned off — as we all know, donuts and such are astronomy related items.

DAS auction telescopes include a 6-inch f/8 Criterion Dynascope Newtonian reflector (circa 1960's) with german equatorial mount and clock drive. It includes 3 eyepieces. These were great scopes with fine optics. It needs some TLC and a good cleaning.

Also for auction by the DAS is a nearly NEW! 6-inch f/5 Sovietski newtonian on a german equatorial mount, with clock drive and declination manual slow motion. This scope is in "like new" condition. Proceeds from the auction will go to the Edmund G. Kline Dark Sky fund.

observers deck

Colorado Astronomy Day
Saturday, October 12, 2002

Schedule of Events

★The Denver Museum of Nature & Science★
(City Park—Colorado Boulevard and 20th Avenue)

COST: Free to Museum members,
Non-members — (Adults) \$8.00, (children ages 3-12) \$5.50 and seniors (60+)★

All day, public spaces in the museum will be filled with space-related crafts, demonstrations, the new temporary exhibit “Liberty Bell 7,” and the new IMAX movie “Space Station.” Drop by and explore these wonderful space activities:

★SPECIAL GALLERY SHOWS★

“Nature Tales and Science Stories”

Location: South America Station
Join us for stories and learn more about space!

11:30am and 2:30pm

“South American Night Sky Myths and Legends”

Bring the whole family and participate in this interactive show and discover the myths and legends of Meso-American and South American sky lore.

12:30pm and 1:30pm

★ACTIVITIES★

“Star Lab”

Location: South East Atrium
Explore our night sky right here in the Museum!

11:00A.M., 11:30A.M., 1:00P.M., 1:30P.M.,
2:00P.M., 2:30P.M., 3:00P.M., 3:30P.M.

★ON-GOING ACTIVITIES

11AM-4PM★

“Comets!”

Location: 3rd Floor Bridge?
Discover the secrets of the origin of comets!

“Cryogenics”

Location: 3rd Floor Bridge
Watch flowers disintegrate in the freezing temperatures of space!

“Solar Viewing”

See sunspots safely through a telescope and a sun-spotter!

Location: The NEW Sky Terrace

“Astronomy Opportunity Table”

Denver Astronomical Society members will be here to talk about their programs. Also, find out about Museum star parties, space science lectures and other opportunities to get involved with space science activities in the Denver Area.

Location: 3rd Floor Bridge

“Meteorite Touch Table”

Touch real meteorites and discover their origins!

Location: 2nd Floor Bridge

★ SPEAKERS AT RICKETSON HALL (DMN&S)★

Welcome and Introduction

12:00

“Pluto-Charon and the Kuiper Belt: New Horizons for NASA Exploration.” Dr. Alan Stern, Southwest Research Institute, Principal Investigator of the New Horizons Pluto Mission, coauthor of *Pluto and Charon: Ice Worlds on the Ragged Edge of the Solar System*

1:00-1:45

“Eclipse Chasing: Seeing the World on a deadline.” Vic and Jennifer Winter, Astronomical League *Reflector* editors, and authors of *Our Spacious Skies: Stars, Sun and Storms — A journey through day and night in the heartland*

2:00-2:45

“Io and Europa: Fire and Ice on the Moons of Jupiter,” Dr. John Spencer, Lowell Observatory, part of the Galileo science team, the Cassini Mission to Saturn, and the New Horizons Pluto Mission. He coedited *The Great Comet Crash* about the Shoemaker/Levy impacts.

3:00-3:45

EVENING AT

★CHAMBERLIN OBSERVATORY BEGINS AT 7:00 P.M.★

★Star Party (Weather permitting) View the moon, planets, star clusters, galaxies, nebulae, and more!

★Explore what the various astronomical vendors have for sale.

★Stroll through the many available displays including stellar photos, meteorites, and childrens’ books.

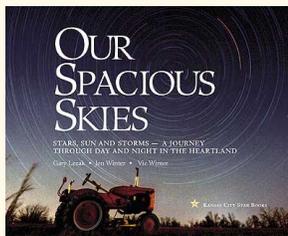
★Kids! Make your own constellation finders.

★Free star maps (while supplies last).

DAS Bookstore and More (!)

Pluto and Charon : Ice Worlds on the Ragged Edge of the Solar System was written by Astronomy Day’s keynote speaker, Dr. Alan Stern. Be sure to come to his presentation on October 12 to hear him speak about those icy worlds. A few copies of this book will be available for sale at Colorado Astronomy Day — it can also be purchased off the DAS website.

Our Spacious Skies: Stars, Sun and Storms — A Journey Through Day and Night in the Heartland shows the sky at its most dramatic. A visual feast, this book can be purchased off a link from our website, or at Colorado Astronomy Day from the authors who will sign the book for those interested, and talk about the wonders and challenges of chasing eclipses.



colorado astronomy day

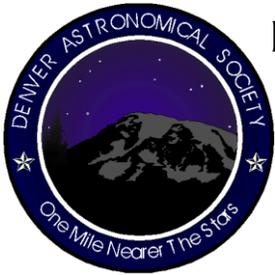
About the Denver Astronomical Society

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 <input type="checkbox"/>	Renewal <input type="checkbox"/>
Name: _____	
Address: _____	
City, State, Zip: _____	
Phone numbers: Home () _____ Work () _____	
E-mail Address: _____	
Occupation: _____	
Other Interests: _____	
(Associates Only) School: _____ Grade: _____	
Do you want to download the newsletter in PDF format from our website instead of by postal mail?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you want the above information excluded from the yearly roster? Yes <input type="checkbox"/> No <input type="checkbox"/>	
<i>Please Circle All That Apply:</i>	
Regular Membership: \$30	Associate: \$10 (Age 22 and younger) _____ \$ _____
Astronomy Magazine/\$29	_____ \$ _____
Sky & Telescope Magazine/\$29.95	_____ \$ _____
Van Nattan Scholarship Fund	_____ \$ _____
Chamberlin Restoration Fund	_____ \$ _____
Total Amount Paid	_____ \$ _____
<p><i>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</i></p>	



Denver Astronomical Society

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

OCTOBER'S MEETING:
COLORADO
ASTRONOMY DAY
Saturday,
October 12, 2002
Don't miss the fun!
See Pages 4, 5, and 7.

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join us