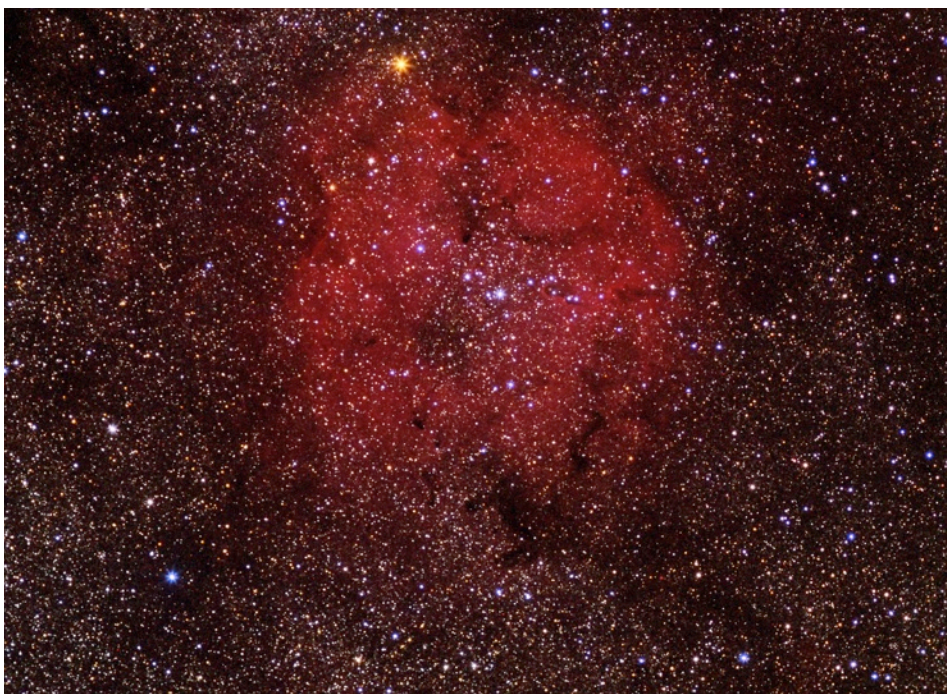


OBSERVER

The Chill's a-Comin'



BUT NOWHERE NEAR THE TEMPERATURE INSIDE THE MU CEPHEI NEBULA CLOUD, IC 1396 IN CEPHEUS, WHERE A FRIGID -290° AWAITS A STELLAR ADVENTURER

Joe used an SBIG ST-2000XM ccd camera with a 110mm Mamiya RZ lens at f/5.6. Please contact Joe for more technical details. The bright orange star is Mu Cephei, the Garnet Star; the Elephant Trunk nebula portion is right of center.

Image copyright 2009 Joe Gafford

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Calendar

- 4..... Full moon
- 11..... Last quarter moon
- 17..... New moon
- 24..... Colorado Astronomy Day
- 25..... First quarter moon

OCTOBER SKIES *by Dennis Cochran*

Jupiter is already up in the south when darkness descends, situated along the top left of Capricornus' goat-ee jester grin. Above Jupiter and the Goat is the water jug of Aquarius, in case you've ever wondered where this elusive constellation lies. Wasn't there an Age of Aquarius? Perhaps that was when the New Age movement was born.

The Saturn planetary nebula, NGC 7009, one of the Milky Way's brightest, lies along the bottom of the faint scrunched oval of the water jug; look for it northwest of Jupiter. By the way, the water jug asterism that makes up the west end of Aquarius shows up on Astronomy's sky map, but not on *Sky & Telescope's*, nor in the *Peterson Guide*.

Open cluster M73 is just southwest of the Saturn Nebula and next to M72, a faint globular a bit farther west. From the water jug, you can go east to

Alpha Aquarius, the star at the top of the arc of that constellation. Above it a short way and a bit west is the slightly brighter red star, Enif, at the end of one of Pegasus' legs. Just northwest of Enif is M15, one of the best globulars on the list. If you then drop from Enif or M15, straight south about 2/3 of the way back towards Aquarius, you'll find another good globular, M2.

Cute little Delphinus the Dolphin is west of the Enif-M15 area. If you're a faint fuzzy person (ffp), look for distant globular cluster NGC 7006 while contemplating that it's 185,000 light years from us, the same distance as the Magellanic Clouds. If you draw a line from Enif to M15 and continue in the same direction on to Delphinus, you'll bump into 7006 shortly before you

Continued on Page 3

PRESIDENT'S CORNER

The October issue of the *Observer* opens by welcoming our newest members, listed on Page 5. We are pleased to have you join us!

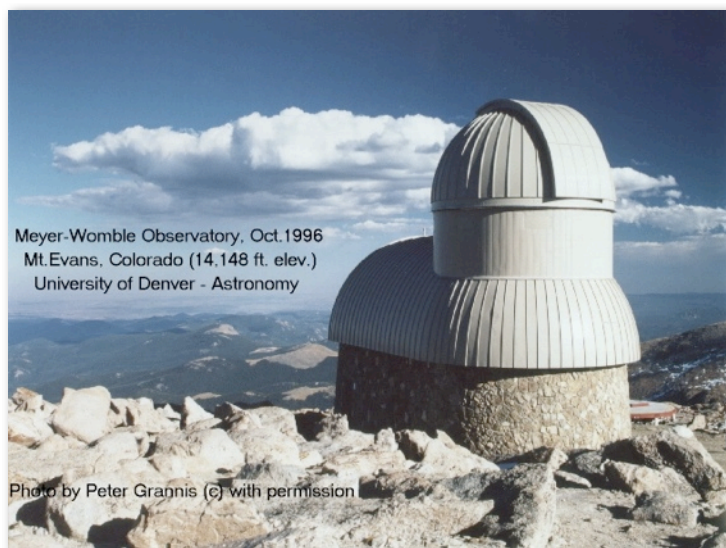
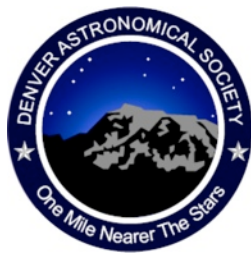
This is my "What I Did Over Summer Vacation" report. For most of us, vacations mean trips with family to fun places, no setting the alarm, and generally kicking back and relaxing. This is certainly true for me, most of the time. However, "most of the time" does not include the week I schedule for Denver University's Meyer-Womble Observatory (MWO) atop Mt. Evans, working with Dr. Robert Stencel, aka Dr. Bob.

During the week of August 17, I spent my days and nights either at DU's Echo Lake Lab or in the MWO. The observatory atop Mt. Evans is one of three observatories operated by DU, the other two being Historic Chamberlin Observatory and the Glenn E. Montgomery Student Astronomy Lab. At an elevation of 14,148 feet, the MWO is one of the highest observatories in the world. According to a *National Geographic* article published in 2002, "The Indian Astronomical Observatory, sitting [at] 14,800 feet ... is located 660 feet higher than the Meyer-Womble Observatory, operated by the University of Denver deep in the Rocky Mountains, which until now held the distinction of being the world's highest observatory."

The MWO houses binocular mounted, dual-aperture 0.7m, f/21 Ritchey-Chretien telescopes on an equatorial English yoke-design mount, with an overall mass of 9,000

kg and a moving mass of 4,100 kg. Pointing and slewing the telescopes is done either from the control room on the second level of the observatory or from the dome room.

The University of Denver's Echo Lake Laboratory and High Altitude Research Station, or High Altitude Lab, has a long history in the field of physics, dating back to the 1880s (<http://mysite.du.edu/~rstencel/MtEvans/echolab.htm>). In particular, during the early years of the 20th century, following Einstein's postulates of relativity, scientists conducted a number of experiments to test both special and general relativity. Einstein's thought experiments have generated numerous books, papers, and articles; I will admit to having only a very basic understanding of special relativity. Moving on, the locations of Echo Lake Lab and Denver were used in the early 1940's by Bruno Rossi and D.B. Hall to conduct time dilation experiments using the decay of muons as their subject. According to Galilean relativity, the half-life of muons in motion, 1.5 microseconds (accepted period in 1940), should have no effect on the probability of decay. That is, muons in motion should have the same half-life as muons at rest (rest frame), 1.5 microseconds. Some of you will recognize the association of time dilation with the relativistic effect.



Meyer-Womble Observatory, Oct.1996
Mt.Evans, Colorado (14,148 ft. elev.)
University of Denver - Astronomy

Photo by Peter Grannis (c) with permission

Special relativity places the muons in their own reference frame, while we observe from our rest frame. Rossi and Hall knew the cosmic ray muons traveled close to the speed of light (0.992c) and should advance 450 meters before half the muons had decayed. According to special relativity, the time dilation equation

Continued on Page 4

Society Directory

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- Jack Eastman
Joe Gafford
Ginny Kramer
Frank Mancini
- David Shouldice
Tim Pimentel
Steve Solon
Dan Wray
Wayne Green, Past President
President Emeritus, Larry Brooks

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- IDA Representative:**
Dr. Robert Stencel
Email: coloida@hotmail.com
- Public Outreach Committee:**
Ron Mickle (Chair)
Student Astronomy Chair:
Naomi Pequette (Chair)
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- Librarian:**
Phil Klos
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- DAS Correspondence:**
Denver Astronomical Society
Chamberlin Observatory c/o Ron Mickle
2930 East Warren Avenue
Denver, Colorado 80210

The Executive Board conducts the business of the DAS at 7:30 p.m. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.

www.denverastro.org

SALE OF *PRELUDE LAKE*

I am in the process of speaking to a couple of national book chains about purchasing the balance of my 3-D Aurora Borealis book, *Prelude Lake*. They feel that it will be an excellent book to sell in their stores over the holiday season at the retail price of \$64.95. However, I would like to give local astronomy club members a first chance to purchase signed copies of the book at a deep discount price of \$15 if you purchase 10 or more books. Imagine, getting all your holiday shopping done in advance for only \$150!!!

You can see the book at my web site at www.preludelake.com.

You need to contact me directly for this special order either through my email (nbryanwhite@netscape.net) or by phone. Mail charges outside of Denver will be around \$30.

Thanks!

Bryan White

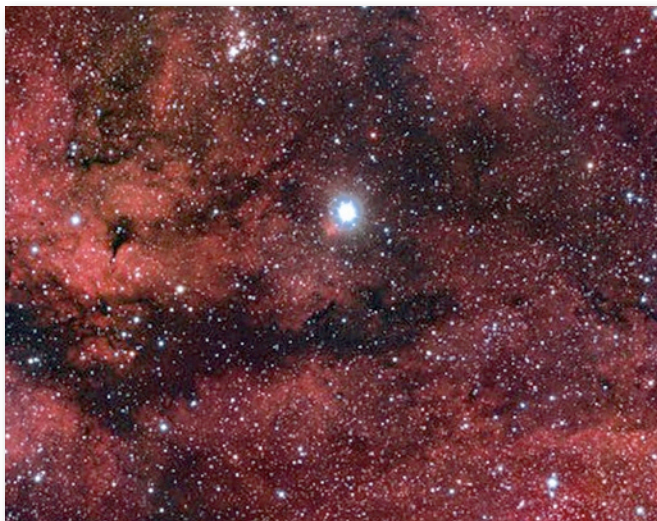
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OCTOBER SKIES (CONTINUED FROM PAGE 1)

get there. *S&T's* Sue French tells us to look for globular NGC 6934 below the tail of the dolphin and that it's "the brightest globular cluster north of the celestial equator that's not in the Messier catalog."

If you're truly an ffp, go down to Capricornus and look west of its western tip about one dolphin length for NGC 6822, an irregular galaxy that is "one of the few members of the Local Group that is readily visible." (Peterson's)



OF STAR LANES AFAR

Riding along the Cygnus starfields at the very center of the Northern Cross lies the Gamma Cygni nebular region, with the aptly-named Butterfly Nebula (IC 1318) at left. Blue supergiant Gamma dominates the area, but lies much closer than the hydrogen clouds, at 760 light-years distance. The amber-red hues of the surrounding nebula cover an area of three full moons and glow from 4200 light-years away.

Minolta 400mm lens, SBIG ST8e camera, HaRGB image totaling 3.2 hours.

Photo copyright Steve Solon

Tired of looking south? Switch around to Cassiopeia, in the region east of Polaris. Find the Alpha-to-Beta line at the right side of the W; Alpha is at the bottom of the right-hand V and Beta at the upper right. Continue up past Beta an 'Alpha-Beta distance' to find rich open star cluster M52. Just west of it in this busy part of the sky is the Bubble Nebula, NGC 7635, large and faint, a star-puff planetary. Back at Beta Cass, go southwest, perpendicular to the Alpha-Beta line and almost its distance, to find the large cluster NGC 7789, a binocular object made up of a thousand stars. Finally, scoot over on the W to the Delta star at the bottom of the shallow V

and go below it a short distance to encounter the bright cluster, NGC 457 and its faint companion, 436.

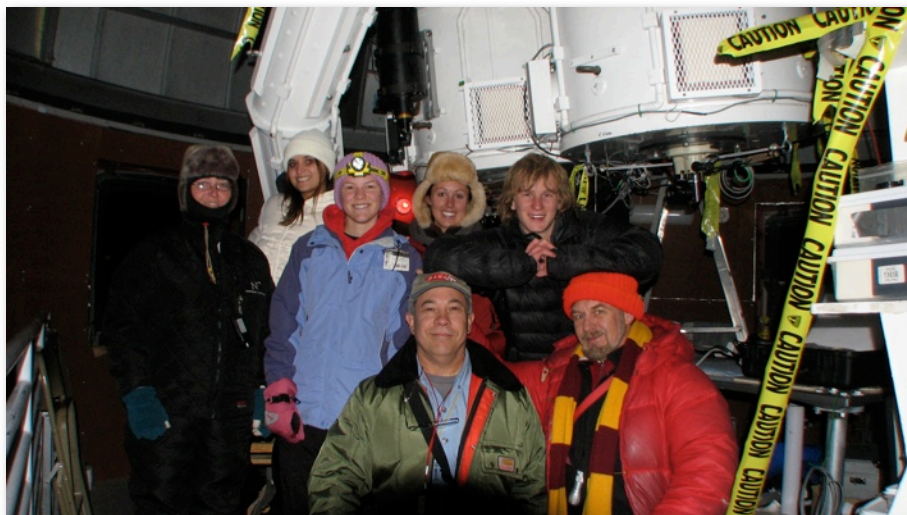
This month you can see pieces of Comet Halley, which make up the Orionid meteor shower. Look before dawn on the morning of Wednesday, 10/21. The Moon will be down and you may see as many as 30 meteors per hour, one every two minutes. They may look better than Halley itself did in the middle 80s.

Next month we'll explore some of Pegasus. Meanwhile remember that Saturday the 3rd is our yearly auction, so bring your castoff equipment and your checkbook! This is the day after the General Meeting on Friday the 2nd. Then on Saturday, October 24th, we have our Colorado Astronomy Day Open House.

AND FINALLY—NASA 'LCROSS' SPACECRAFT TO DESTROY MOON!

"Today the Moon, tomorrow the Universe!" chortled NASA spokesperson Tottal D. Struction. No, wait, LCROSS is just gonna crash into the moon, creating a large crater. No, wait, it's just gonna crash into an existing crater called Cabeus A. This is down in the region of the Moon's South Pole. If you point a 10-inch scope or larger at the South Pole region at 5:30 A.M. on 10/9 you may see some debris blasted downward (upward, whatever) into space. In fact, if you're out under the stars at that moment you may get some of the debris on you! Wear a helmet. Good luck. I'll be in my survival cave.

PRESIDENT'S CORNER (CONTINUED FROM PAGE 2)

**GROUP PHOTO**

L-R: Amy Heard, Kathy Arcumanova, Stasia Erickson, Tiffany Lunney, Nick Long. Kneeling L-R: Ron Mickle and Dr. Robert Stencel. (Not pictured, but taking the photo is David Heard)

Photo by David Heard

showed the distance to be greater. Using their muon detector, Rossi and Hall were able to determine that muons traveling at nearly the speed of light needed 5.33 microseconds to traverse the 1,600 meters difference in elevation from Echo Lake and Denver, more than three times the half-life of the muon!

The daily routine at Mt. Evans involves sleeping in until around 11 A.M., mid-afternoon preparing for the upcoming nights observing run, class and analysis, then one-half hour before sunset heading up the mountain. Six other observers joined Dr. Bob and me. They were David and Amy Heard from Panhandle, Texas, and DU students Kathy Arcumanova, Stasia Erickson, Nick Long and Tiffany Lunney. I wish I had more space and time to discuss the observatory David and Amy built adjacent to their home in Panhandle. They gave a presentation one afternoon to the group explaining the concept, planning, construction and costs associated of the observatory. Even for those of us with years of experience in astronomy, this was an eye opener. Congratulations to David and Amy for a job well done!

The observing runs were based on two team assignments. The Red team collected data on the satellites of Jupiter, binary star separations, the cluster NGC 7006 and supernovae. The Blue team collected

corresponding data for the satellites of Uranus and Neptune, spectra of bright stars, nebulae and galaxy colors. A spectrograph and photometer with J and H-band filters were used during the week for data collection.

My goal was to assist Dr. Bob in collecting as much data on the eclipsing binary star system epsilon Aurigae. The best observing run for us occurred Wednesday night/Thursday morning. The weather the previous two nights had been good with clear skies until 2a-3a, when high thin clouds would start developing. The drive down the mountain Monday night was particularly slow going since we were literally in the clouds. On Wednesday night, the clouds started forming earlier than normal and it appeared that we were in for another short night. The teams were sent down to the Echo Lake lab around midnight before the clouds

enveloped the mountaintop. Dr. Bob and I decided to postpone our departure, gambling on Colorado weather – wait 15 minutes and the weather will change. By 1a, the skies opened. It was, as we say in aviation, clear blue and 102 (miles visibility). Collection of photometric data started as soon as the clouds cleared. The first targets were the AAVSO near-IR primary standard stars, which will be used as comparison stars for epsilon Aurigae. There are 53 primary standards for the AAVSO, so having six to 10 standard stars available is relatively easy. Data collection continued until around 6 A.M. when the sun started to rise.

The Optec SSP-4 photometer was used for all photometric data. The SSP-4 was developed by Optec, in conjunction with the AAVSO, for variable star observations, making it ideal for observations of epsilon Aurigae. The SSP-4 utilizes the J and H-band filters, which have a band pass of 1.250 microns and 1.650 microns respectively, which is in the near I-R.

Even during periods of inclement weather, the teams stayed busy utilizing the Tzec Maun observatory's robotic telescopes in Cloudcroft, New Mexico. Users of the Tzec Maun observatory must reserve telescope time, so the teams alternated between reserved blocks of time on the Tzec Maun Observatory and those teams using the 0.7 m of the MWO. Using several telescopes available at Tzec Maun, teams were able to continue collecting data needed for their projects even during inclement weather.

**DR. ROBERT STENCEL**

Dr. Bob outside the University of Denver's Meyer-Womble Observatory, atop Mt. Evans, shortly after sunrise.

Photo courtesy R. Mickle

The Mt. Evans MWO is a working observatory and, while not readily accessible to the public, small pre-arranged group tours are possible. There are other ways to gain access, such as submitting a research proposal to the Observatory Director, being enrolled at DU in an astronomy course or participating as a volunteer in support of an astronomy program within the American Association of Variable Star Observers, International Dark Sky Association or the Astronomical League (<http://mysite.du.edu/~rstencel/MtEvans/access.html>).

There is much more I would like to talk about, but it will have to wait until after my next visit to the top of the mountain. This was truly a great vacation.—*Ronald E. Mickle, President.*



SUNRISE

Sunrise as seen from DU's Meyer-Womble Observatory, Mt Evans, Colorado.

Photo courtesy R. Mickle

CONGRATULATIONS!

Joel Allen of the Denver Astronomical Society joined the ranks of a select few by becoming a certified telescope operator of the Clark 20-inch at the University of Denver's Historic Chamberlin Observatory. Joel is one of thirty-one DAS members who volunteer in outreach education programs and are assigned to the Public Night staff.

To become certified, Joel completed the written exam, a minimum of six apprenticeship sessions under the guidance of a current certified operator and a final preparation review, followed by the final "check ride" from Dr. Stencel, Director of DU Observatories.

The Denver Astronomical Society's

certified telescope operators are volunteers who staff the Public Nights at Chamberlin Observatory on Tuesday and Thursday nights, every week of the year, taking off only on Thanksgiving and Christmas. In addition, they staff the monthly Open House and special viewing events. Our public night volunteers reach

over 6,000 guests annually, carrying on since 1949, a 60-year-old tradition of which we are very proud. Thanks to all the volunteers for their service and for making 2009 accident free at Chamberlin Observatory.

If you are interested in joining one of the teams, please contact Ron Mickle at slingwing@comcast.net. Apprentices receive training by selecting one or more of the seven public night teams.

2010 Astronomy Calendars Available

- \$10.00 for members
- \$12.00 for non members

Get them while they last!

WELCOME August and September New Members

Michael Eiser
Robert Field
Eric J. Houby
Alexandria MacGregor
Jerry MacGregor
McKinley MacGregor
Jennifer MacGregor
Gwen Raftery Proctor
Diane Rogers
David W. Steele
Glenn B. "Burt" Watson
David R. Whitcomb

For Sale: Meade 2080 Schmidt-Cassegrain Telescope

Meade 8-inch SCT, Model 2080, with Meade #9068 Digital Readout System and case. System also includes Orion Blue Bag with tripod, wedge, assorted eyepieces and Meade solar filters—one Mylar & one glass. Asking \$1,500.

—Contact Wayne Kaaz via email: kaazmos@msn.com

NEW OBSERVING CLUB PROPOSAL

from the website of the Astronomical League:

<http://www.astroleague.org>

So, you have an idea for an observing club that the Astronomical League should offer to its members? And, you are willing to develop and maybe even act as coordinator? You have come to the right place.

The first thing you should do is check out the list to see if someone is already working on a club on that topic. The easiest way to do that is to contact one of the National Observing Program Coordinators: Aaron Clevenson or Mike Benson.

Then understand how the process works . . .

New clubs are reviewed and approved by the AL Council at an annual convention (ALCON), typically held in July or August. Submissions should be made to the AL officers and the AL National Observing Program Coordinators at least a month before the convention. This gives time for the AL Secretary to add your proposal to the agenda for the meeting of the Executive Council and gives time for members of the Council to review your proposal and to be prepared for the meeting. It also gives them time to ask questions and it gives you time to make any changes that they recommend. A proposed club must be a complete package when it is submitted.

New clubs must add to the existing observing program. This might be a club that explores a new class of objects or one that investigates a new feature of the universe. More advanced forms of existing clubs are also an option (Lunar II, Herschel II, etc.). Some overlap with objects in existing clubs is acceptable, but it should be as small as possible. The new club must also be of interest to a large group of the membership. It should be comprised of objects that would be accessible to members using their backyard telescopes.

The AL National Observing Program Coordinators are available to help you throughout the process. Please contact one of them through email, and they will work with you towards successful adoption of your new club.

Here are the steps involved:

1. Identify your idea for a new AL observing club.

2. Check with a National Observing Program Coordinator to see if that club is already under development.

3. Submit your topic to one of the AL National Observing Program Coordinators. They will add it to the list on the website and will communicate it to the AL Officers.

4. Develop your list of objects. This list varies from club to club, but the typical club has about 100 observations. You should note the object's designation, common name (if it has one), constellation, rights ascension, declination, object type (whatever is appropriate for your list), magnitude, and any other pertinent information about the object (class, classification, color, etc.).

5. Fill in the Observing Club Proposal form. This form will provide all of the information that is required by the AL Council to make a decision on the new club.

6. Develop the manual if you plan to have one. See the information on AL Manual Publication. Manuals are a benefit to the participants, the observing club, and the Astronomical League.

7. Work with the AL National Observing Program Coordinators as needed and desired.

8. Create the content for your club's page on the AL website.

9. Submit your proposal to the AL Officers and the AL National Observing Program Coordinators at least a month before the annual convention. This submission should include:

- The Observing Club Proposal form
- Your list of objects
- The proposed pin design
- The proposed web page contents.

This can be submitted through one of the AL National Observing Program Coordinators.

1. The proposal will be reviewed and the AL Council will make a decision at the annual convention. You are encouraged to attend and present the case for the new club at their meeting. If you do not attend, we will try to represent you as best as possible. If you plan to attend, please contact the AL Secretary to coordinate. There are three possible outcomes: They will accept the proposal, they will defer the decision pending additional information or changes, or they will decline to add the new club. Their decision will be given to the AL National Observing Program Coordinators who will forward it on to you. Normally, if additional information or changes are required, the club will be reconsidered at the following annual convention.

2. After the club is approved, additional information will be provided regarding the ordering of pins and manuals. These are ordered through the Astronomical League's National Office to take advantage of quantity discounts.

We look forward to your submission. Please contact one of us if you have any questions.

Aaron Clevenson, National Observing Program Coordinator:

aaron@clevenson.org

Mike Benson, National Observing Program Coordinator:

ocentaurus@aol.com



NASA'S SPACE PLACE

SPITZER, THE SEQUEL

A Space Place Partner Article

The Spitzer Space Telescope is getting a second chance at life. The liquid helium “lifeblood” that flows through the telescope has finally run out, bringing Spitzer’s primary mission to an end. But a new phase of this infrared telescope’s exploration of the universe is just beginning.

Even without liquid helium, which cooled the telescope to about 2 degrees above absolute zero (-271°C), Spitzer will continue to do important research—some of which couldn’t easily be done during its primary mission. For example, scientists will use Spitzer’s “second life” to explore the rate of expansion of the universe, study variable stars, and search for near-Earth asteroids that could pose a threat to our planet.

“We always knew that a ‘warm phase’ of the mission was a possibility, but it became ever more exciting scientifically as we started to plan for it seriously,” says JPL’s Michael Werner, Project Scientist for Spitzer. “Spitzer is just going on and on like the Energizer bunny.”

Launched in August 2003 as the last of NASA’s four Great Observatories, Spitzer specializes in observing infrared light, which is invisible to normal, optical telescopes.

That gives Spitzer the power to see relatively dark, cool objects such as planet-forming discs or nearby asteroids. These objects are too cold to emit light at visible wavelengths, but they’re still warm enough to emit infrared light.

In fact, all warm objects “glow” with infrared light—even telescopes. That’s why Spitzer had to be cooled with liquid helium to such a low temperature. Otherwise, it would be blinded by its own infrared glow.

As the helium expires, Spitzer will warm to about 30 degrees above absolute zero (-243°C). At that temperature, the telescope will begin emitting long-wavelength infrared light, but two of its short-wavelength sensors will still work perfectly.

And with more telescope time available for the remaining sensors, mission managers can more easily schedule new research proposals designed for those

sensors. For example, scientists have recently realized how to use infrared observations to improve our measurements of the rate of expansion of the universe. And interest in tracking near-Earth objects has grown in recent years—a task for which Spitzer is well suited.

“Science has progressed, and people always have new ideas,” Werner says. In its second life, Spitzer will help turn those ideas into new discoveries.

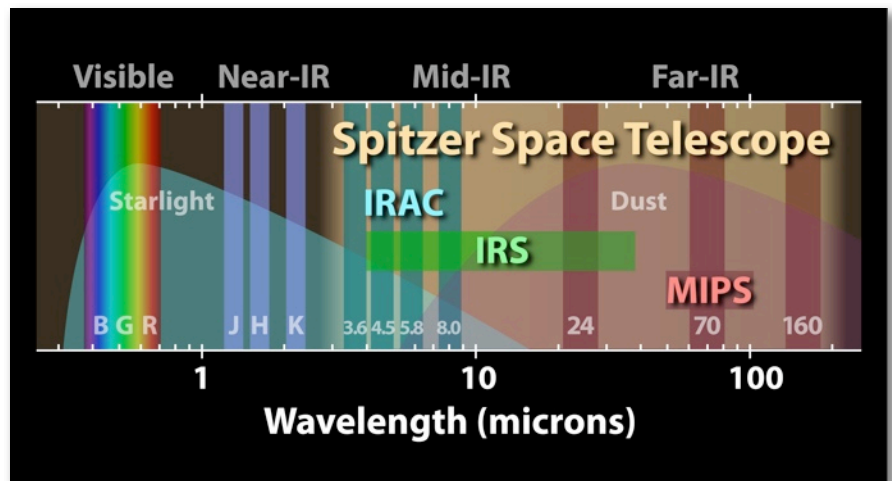
For kids, The Space Place Web site has a fun typing game using Spitzer and infrared astronomy words. Check it out at spaceplace.nasa.gov/en/kids/spitzer/signs.

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

SPITZER SPACE TELESCOPE

The “warm mission” of the Spitzer Space Telescope will still be able to use two sensors in its Infrared Array Camera (IRAC) to continue its observations of the infrared universe.

Illustration courtesy of JPL/NASA



ABOUT THE DAS

Membership in the Denver Astronomical Society is open to anyone wishing to join. The DAS provides trained volunteers who host educational and public outreach events at the **University of Denver’s**

Historic Chamberlin Observatory, which the DAS helped place on the National Register of Historic Places. First light at Chamberlin in 1894 was a public

night of viewing, a tradition the DAS has helped maintain since its founding in 1952.

The DAS is a long-time member in good standing of the **Astronomical League** and the **International Dark Sky Association**. The DAS’ mission is to provide its members a forum for increasing and sharing their knowledge of astronomy, to promote astronomical education to the public, and to preserve Historic Chamberlin Observatory and its telescope in cooperation with the University of Denver.

The DAS is 501 (c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the Public Outreach Fund and the Edmund G. Kline Dark Site Fund. To contribute, please see the bottom of the membership form for details (found on the DAS website: thedas.org).

More information about the DAS, its activities and the special tax-deductible funds is available on the DAS website at www.denverastro.org.



S&S OPTIKA HAS MOVED TO:

6579 SO. BROADWAY
LITTLETON, CO. 80121
(~1 1/2 blocks NORTH of
Arapahoe Road on the
WEST side of South
Broadway)

(303) 789-1089
www.sandsoptika.com

DAS SCHEDULE

OCTOBER

- 2 General Meeting at D.U.'s Olin Hall (Begins at 7:30 P.M.)
- 3 Annual DAS Auction (Setup begins at 11:00 A.M. and Bidding begins at 1:00 P.M.)
- 9 E-Board meeting at Chamberlin Observatory (Begins at 7:30 P.M.)
- 16-17 EGK Dark Sky weekend
- 24 Colorado Astronomy Day Open House (Begins at 5:00 P.M.)

NOVEMBER

- 6 General Meeting at D.U.'s Olin Hall (Begins at 7:30 P.M.)
- 13 E-Board meeting at Chamberlin Observatory (Begins at 7:30 P.M.)
- 13-14 EGK Dark Sky weekend
- 21 Open House at Chamberlin Observatory (Begins at 5:00 P.M.)

Public nights are held at Chamberlin Observatory every Tuesday and Thursday evenings

beginning at the following times:

March 9 - April 14 at 8:00 p.m.

April 15 - September 1 at 8:30 p.m.

September 2 - March 8 at 7:00 p.m.

Costs to non-members are: \$3.00 adults, \$2.00 children.

Please make reservations via our website (www.denverastro.org) or call (303) 871-5172.



The Denver Astronomical Society
c/o Chamberlin Observatory
2930 E. Warren Ave.
Denver, Colorado 80210