

# OBSERVER

## A STABLE OF STARS



**FLYING HORSE NEBULA A.K.A. THE WIZARD NEBULA (NGC 7380)**

This rather young cluster contains about 125 bright type O and B stars and the red emission nebula Sh2-142 in Cepheus. It lies nearly 9,700 light-years away. Alan used his QSI540wsg CCD camera on a 7-inch Mak-Newtonian.

*Image copyright 2010 Alan Erickson*

**Inside the  
Observer**

*President's Corner*..... 2

*Society Directory*..... 2

*Student Telescope*.....4-5

*Colorado/National Astronomy Days*.. 6-7

*NASA's Space Place*..... 8

*New Astronomer's Den Chart*..... 9

*California Reunion (Part 2)*..... 10-11

*Schedule of Events*..... *back page*

**Calendar**

7..... New moon

14..... First quarter moon

21..... Orionid meteor shower

22..... Full moon

30..... Last quarter moon

## OCTOBER SKIES *by Dennis Cochran*

A year-old source of astro-info says that Comet Hartley will still be big this month. I am writing this before seeing any recent writing, so I hope it's true. And next month's column will be even worse! Augh! This is because I'll be on the road, slithy, like a toad.

Jupiter will still be big, I'm sure. And it may even be visible. Will the South Equatorial Belt be back? You'll have to look to find out. Meanwhile its aesthetic comrade, Saturn, should finally be gone.

Scorpius will have dipped down into the southern horizon while Sagittarius and all of its nebulae and star clusters will be riding high, as if on a seesaw with the scorpion. Capricorn will be up east of Sagittarius, no doubt with slow-moving Neptune still findable at the upper

left of Cap's left corner. Capricorn, you will remember, looks like an extremely fat V, a Cheshire Cat's grin. The globular cluster M30 is down-left of the grin, just left of the ζ (zeta) star, or one could drop south from the δ (delta) star at Cap's left corner. On the other side of the grin is M75, a small glob, south and a bit west of the right corner.

Above the grin is a trio of objects, north and a smidgen west of the θ (theta) star at the bend-point of the top of the grin. The three include the small globular M72 and the open cluster M73, and little higher and directly north of θ (theta) is the "Saturn Nebula," NGC 7009. It's a planetary nebula, a semi-exploded star like the one in the middle of the "Ring

*Continued on Page 3*

# PRESIDENT'S CORNER

I hope you have your telescope or binoculars dusted off and optics aligned because October brings us many opportunities for pointing them up at the night sky. We are so busy with outreach and observing that we don't even have a regular meeting indoors to hear a speaker.

Our Colorado Astronomy Day, October 16th and 17th, coincides with National Astronomy Day, and this year we have two days of solar observing and talks planned at the Denver Museum of Nature and Science (DMNS). We are helping DMNS celebrate the opening of its new 3-D IMAX theatre with the premier of the Hubble 3-D IMAX movie. If you haven't seen this spectacular film in 2-D, or even if you have, it should be even more incredible to fly through the Orion Nebula Trapezium cluster or relive the launch of the upgraded Hubble from space shuttle Discovery in 3-D! Four DAS members will present "How To..." programs on topics for amateur astronomy, and DMNS astronomers will provide talks during the day, as well.

On Saturday evening, join us at Chamberlin Observatory for viewing of the night sky with your telescope or binoculars. Viewing of the Moon and Jupiter should be great, as well as double stars and star clusters. A special visitor this year will (hopefully) be a relatively bright comet, Hartley 2 (103P), which will be passing our planet and rising late in the evening in Perseus. If you've never observed a comet before, Comet Hartley 2 will provide a great opportunity to watch a comet approach Earth and increase in brightness; who knows—maybe

a tail will develop. This is the comet's first passage through the inner solar system, and these intruding dusty ice balls can be unpredictable as they warm up from the Sun's energy. Even NASA is asking for your help in making and reporting observations, because on November 4th a spacecraft will intercept the comet for imaging and study.

In addition to all the CAD activities, if you are astronomically "under-stuffed" or just need to exchange your "stuff," the annual DAS Auction is coming up October 23rd, too. More details about all our activities are in this edition of the newsletter.

All of our Astronomy Day and other activities depend on DAS members who volunteer their time and telescopes. Our troupe of volunteers makes us one of the most active societies in the U.S. Sharing astronomy between members is the primary purpose of organizations like the DAS. Most of us find out early-on that we learn more about astronomy and have more fun doing it by sharing what we know with each other and, particularly, those not "in-the-know." There is nothing like hearing a small kid and even older adults look through your telescope and go, "WHOA!" or "WOW! I never knew..." when they get their first view of Saturn, Jupiter, M13 or M42, the Moon or Sun; that always brings us back to that same moment



### THE BIG GUY

The king of planets, Jupiter, still shines brightly in the night sky. It should be a great target for Colorado/National Astronomy Day.

*Photo copyright 2010 Ron Pearson*



that got us started. Astronomy is more than just science, and that's exactly why DAS members have been around for more than 60 years and the University of Denver's historic Chamberlin Observatory's 20-inch Alvan Clark-Saegmuller refractor for 116 years now. I hope to hear your WOWs! out in the dark soon.

Clear, steady skies. —  
*Ron Pearson*

### Society Directory

- President:**  
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### Executive Board Members

- |                                  |                 |
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| Jack Eastman                     | Tim Pimentel    |
| Joe Gafford                      | David Shouldice |
| Frank Mancini                    | Steve Solon     |
| Keith Pool                       | Dan Wray        |
| Ron Mickle, Past President       |                 |
| President Emeritus, Larry Brooks |                 |

### Committees

- Van Nattan-Hansen Scholarship Fund:**  
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Darrell Dodge, Interim Chair  
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Chamberlin Observatory c/o Ron Pearson  
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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](http://www.denverastro.org)

## OCTOBER SKIES (CONTINUED FROM PAGE 1)

Nebula,” but with a more complicated shape. Of these Capricorn objects only M30 is on the *S&T* sky map. But M2 is there, a bigger glob farther up in Aquarius north of its  $\beta$  (beta) star, diagonally up-left from the Saturn Nebula. Another big glob, M15, is directly north of M2. If going north from M2 doesn't work for you or you've had trouble finding any of the above-Capricorn objects, go to Delphinus, the cute Little Dolphin and drift left over Equuleus, a small acute-triangle constellation, towards the reddish  $\epsilon$  (epsilon) star of Pegasus to find M15. Then drop south to get to M2, and from there go southwest for the Saturn Nebula, M72 and 73.

Back to the dolphin: find nearby Albireo— $\beta$  (beta) Cygni—the head of Cygnus the Swan (bottom of the Northern Cross) and go from Delphinus halfway to Albireo (maybe 60% of the way), to run into the big old “Dumbbell Nebula,” another planetary (Photo at right). If one thinks of the “Ring Nebula” in Lyra, the “Saturn Nebula” above Capricorn and the “Dumbbell,” one realizes how differently each aging star manages to puff off its outer layers. Despite their simple dot-like appearance, stars are individuals after all.

Remember “Bad Things That Can Happen To You Whilst Observing?” We haven't spoken yet of vampire bats. Vamp bats are nocturnal and so are astronomers, so it's logical that the latter are the natural food of the former. (It could be the other way around, but have you ever tried eating a vampire bat?—Ick!) And with vampires so popular in the media these days one might welcome being attacked by these night creatures from Heck. If they're not flying around your head, they're probably creeping towards you on the ground, making icky little scratching sounds. They used to live in Central America, but with global warming they'll get to your neighborhood any day now. A bite from an animal-type vampire won't turn you into a vampire but it may make you inexplicably want to observe later than usual. One poor vampire bat victim was known to occasionally flap his arms as if they were bat wings; people thought he was doing the chicken dance.

Meetings: Not a meeting, but an increasingly popular dark-sky camp out, the nine-day Okie-Tex Star Party is Saturday the 2nd through Sunday the 10th. Its location is in the extreme western end of the Oklahoma Panhandle near the southeast corner of



## A WEIGHTY CONTENDER

The night sky is full of examples of our sun's future, but few are as mesmerizing as M27, the Dumbbell Nebula in Vulpecula the Fox. The large white dwarf star at its heart has shed its outer layers to form the distinct pattern that gives the nebula its name. At a distance of 1,360 light years, NGC 6853 reigns as one of late summer's nebular showpieces.

Data: Celestron C-11, ST-8e camera on a Paramount ME. LRGB exposures totaling 6.5 hours.

*Image copyright 2010 Brad Gilman and Steve Solon*

Colorado. The next weekend (the 16th and 17th) is Colorado/National Astronomy Day at DMNS and the historic Chamberlin Observatory (See pages 6 and 7). The General Meeting is replaced by a Saturday afternoon event, also at Chamberlin—the annual

DAS auction on the 23rd. Pre-auction milling around starts at 11 A.M., the auction at 1 P.M. Bring your junk—whole telescopes are especially welcome—and wads of cash and books of checks.

# REBUILDING THE DAS STUDENT TELESCOPE

*Presented by Neil Pearson and Ariel Sandberg*

The DAS Student Telescope has been disassembled and sitting in Stuart Hutchin's garage. The telescope was last worked on over 10 years ago. Recently DAS President Ron Pearson asked me to look into making the parts a working telescope. These parts include a secondary mirror, mirror and mirror cell, and 2-inch focuser. This was inspired by the fact that Dave Shouldice recently completed remaking his telescope, which has a mirror similar to the Student Telescope. The Shouldice Design is lightweight, portable and easy to set up making it the ideal design for students learning how to operate their own telescope. Currently two students, Ariel Sandberg, and myself, Neil Pearson, have been in contact and discussing the rebuilding. It has been decided that a workshop located near I-25 and 6th Ave. called club workshop will be used to construct the telescope. Both student participants are prepared to start on the project immediately if funds are allocated to an amount requested of \$280.00.

### DESIGN

The design of the Telescope will be a Newtonian on a truss tube Dobsonian mount. The truss tube design and base of the telescope will be based off of Dave Shouldice's design. This design is meant to be lightweight and portable, as well as easy to set up. To accomplish this Aluminum was used in almost the complete design. One unique feature of the design was the use of an aluminum surveyors tripod for the trusses. This feature allows the scope to be collapsed and the size halved in a matter of a minute or so.

There will have to be several modifications made to the



Photo at left, the mirror in the mirror cell and below left, the 2-inch focuser. The above right photo shows the secondary mirror in a spider mount.

Shouldice Design to accommodate the mirror of the Student Scope. One such modification will have to be the addition of a fiberglass or aluminum tube as the nose of the telescope. This is due to the fact that the student scope has a larger focal length than in the original design. This will also add stability to the design, as well as allow for the easier mounting of finder scopes and the focuser. The base of the telescope will also have to be modified because of a different Center of Gravity. Thus the base and the tube itself will have to be made first and then the pivot axis specifically design based on size and weight dimensions.

### CONSTRUCTION



Construction will take place over the period of several months at The Club Workshop located by 6th Ave and I-25 in Denver. This location was chosen because of its central location, and its large amount of space and availability of

machine tools. Membership at the Club Workshop is \$129 a month for three months, however Ariel Sandberg is already a member and can therefore provide access.



The Construction process will take place in three Phases.

**Phase One:** Construction of the tube assembly

**Phase Two:** Construction of the Base.

**Phase Three:** Mounting of the tube assembly on the base and rings.

Phase One and Phase Two can be started simultaneously, but will be started at different times for organization and possible storage requirements.

### COSTS

An estimate for costs were developed from a recent trip to Home Depot as well as talking to Dave Shouldice about how much material costs were for his telescope:

90 deg aluminum 1/16"X3/4"X4'	\$4.98
Square Stock Aluminum 3/4"X4'	\$14.66
Estimated Cost for Aluminum Stock*	\$100.00
Lazy Susan.....	\$30.00
Surveyor's Tripod.....	\$69.00
Telrad Finder.....	\$35.00
Total Estimated Cost.....	\$233.00
Total Requested Funds.....	\$280.00

Any funds that remain at the conclusion of the project will be returned to the DAS.

### CONCLUSION

A new DAS Student Scope would be an excellent addition to club resources. Possible uses for such a scope would be to use it in Chamberlin Observatory Open Houses, to be loaned out to school programs like the University of Denver Society of Physics Students or the Colorado School of Mines Astronomy Club and general use by DAS student members for years to come.

\* Price Estimate from Dave Shouldice



Photo at top left shows connection points for the mirror cell, and below it the base and rocker box in more detail.



The center photo shows the complete Dave Shouldice Design with tube and base connected and Trusses fully extended. The above photo shows the Truss tube that represents Phase One of the proposed Student Scope.



**COMET  
103P/HARTLEY 2**

During the morning hours of September 12, 2010, Joe plucked this image of the latest comet. The EPOXI spacecraft (See page 7) will rendezvous with it on November 4. Joe used a ST-2000XM CCD camera on his 18-inch f/4.5 Newtonian telescope. He made 10-minute LRGB exposures in 1-minute sub-exposures in twos, repeated four more times.

*Photo copyright 2010 Joe Gafford*

# COLORADO/NATIONAL ASTRONOMY

**D**AS members will celebrate Colorado and National Astronomy Day with two days of amateur astronomy activities at the Denver Museum of Nature & Science (DMNS) and Denver University's (DU) Historic Chamberlin Observatory.

Starting at 10 A.M. on both Saturday and Sunday, there will be, literally, a whole spectrum (pun intended!) of DAS solar astronomers set up on the west patio of DMNS where you can safely view the Sun in white, hydrogen-alpha (deep-red) and calcium-K (deep purple) spectral colors of the Sun. If the Sun and weather cooperate, we should be able to show you sunspots, huge prominences—many times the size of Earth—and other changing features of our nearest star. John and Judy Anderson will have their always-popular solar spectroscope set up for viewing the entire spectrum of light and elements in the Sun. DAS members will be inside DMNS's Space Odyssey to answer questions about astronomy, telescopes and the DAS, and will be presenting a series of "How To" talks in the Space Odyssey theater on four topics of amateur astronomy, which will include:

- "How To Buy A Telescope" with Norm Rosling
- "How To Find What's Up in the Sky Tonight" with Steve Solon
- "How To Star Hop—Deep Sky Observing Unplugged" with Jim Holder
- "How To Safely Observe the Sun" with Tim Pimental

On the evening of Oct. 16th (only), DAS members will set up their telescopes for public observing of the night sky on the south lawn at Historic Chamberlin Observatory in Observatory Park. They will also be operating DU's 116-year-old Clark-Saegmuller telescope for public observing of the Moon and the King of the

Planets, Jupiter, as well as other stars, star clusters and nebulae. Later in the evening, periodic comet Hartley 2 will be rising in the northeast, and we hope to have views of that comet with our telescopes, as it will be near Earth at that time. DAS amateur astronomers will be supporting a NASA teacher-and-educators workshop to view Comet Hartley 2, which will be the next comet visited by NASA's EPOXI (formerly Deep Impact) spacecraft in just three weeks, on November 4th.—Ron.

*Pearson*



## A TASTE OF OUR STAR

Barring cloudy skies, folks attending Astronomy Day will be treated to views of the sun as in Ron's image above. He used a 40mm Ha Coronado filter on an Orion ED 80mm telescope +2x shorty barlow, Sweeeeeet.

*Photo copyright 2010 Ron Pearson*

## DMNS: "EXPLORING SMALL WORLDS IN THE SOLAR SYSTEM" OCTOBER 16, 2010, DENVER, COLORADO



**JPL'S DR. DON YEOMANS**

*Image credit: NASA/JPL-Caltech*

NASA and DMNS are offering a one day science educator workshop right out of this world! McREL is teaming with NASA's Discovery Program missions, Denver Mu-

seum of Nature and Science (DMNS) and the Space Science Institute's National Center of Interactive Learning (NCIL) to herald the Dawn, Stardust-NExT and EPOXI missions' arrival at their respective comets and asteroids in the next twelve months.

Don Yeomans, Manager of NASA's Near-Earth Object Program Office, will speak to participants. Scientists and engineers from the Jet Propulsion Laboratory, Lockheed Martin, and Ball Aerospace will join educators sharing mission activities to give unique, real-life perspective on the science concepts. SSI/NCIL will introduce their new asteroids and comets exhibition, **Great Balls of Fire**, and participants will have a chance to explore DMNS's Space Odyssey! Optional credit is available through the Colorado School of Mines.

The workshop "is open to educators . . . we define this as those who work with kids . . . while we are focusing mostly on formal education, many of our materials have been or could be adapted for those who work in informal settings."

For information and registration: <http://www.dmns.org/?DN=71cc4977-be0e-45e1-8729-15bdd0ae2bbc>

—From Elizabeth Warner: *NASA Amateur Observer Liaison for EPOXI*

## TELESCOPE WARRIORS

Photos on the next page show dedicated DAS members John Anderson (bottom left) and Tim Pimental (bottom right) showing off the sun to past Colorado Astronomy Day attendees.

*Photos courtesy Ron Pearson*

# DAYS – OCTOBER 16TH-17TH, 2010

## NASA WANTS YOU! AMATEUR OBSERVERS WANTED FOR SOLAR SYSTEM MISSIONS

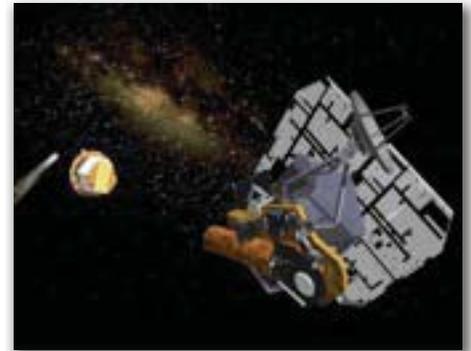
NASA now has three spacecraft “cruising the inner solar system” on long duration missions to explore several comets and asteroids. The spacecraft are EPOXI (formerly known as Deep Impact), Dawn and Stardust-NExT. And NASA science teams want your help—NOW! You can join the Amateur Observer’s Program.

NASA’s Amateur Observer’s Program requests observations now for incoming Comet 103P Hartley 2 and other comets and asteroids to support the upcoming spacecraft rendezvous with Hartley 2 and asteroids Ceres and Vesta. The Deep Impact spacecraft, renamed EPOXI, has been ‘cruising’ the solar system since

successfully launching its impactor into comet Temple 2, and will be flying by and imaging Comet Hartley 2 on Nov. 4th. In 2011, the Dawn mission is continuing its explorations by going into orbit about dwarf planet Ceres, then leaving Ceres and heading for Vesta in 2015. Using an advanced ion propulsion engine, Dawn will be the first spacecraft to leave Earth and visit two other bodies. Early in 2011, the Stardust spacecraft (first mission to return samples of a comet’s coma to Earth) will revisit Comet Temple 1 to image the site of Deep Impact’s impactor crater, created in 2005, and image and map changes in the comet after it has completed an orbit of the Sun.

The AOP has a lot of great “How To” information, written at different levels, on how we amateurs can contribute to these programs. EPOXI has its own Facebook page for submitting images and reports, and the spacecraft will be sending ‘comments’ from deep-space as the mission progresses.

As noted in the Colorado Astronomy Day article, the DAS will be supporting the NASA educators’ EPOXI workshop at DMNS, which will be held on Colorado Astronomy Day. There is nothing like a targeted observing program with clear

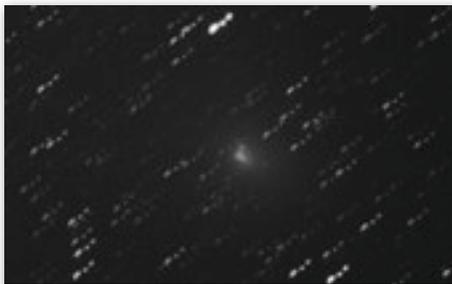


**EPOXI**

Artist's concept of Epoxi spacecraft.  
 Courtesy NASA/JPL

science goals to test your equipment and build your knowledge and skills. If you are new to the DAS and amateur astronomy, this is a great way to learn about more than star hopping to the next pretty bauble in the sky and about what amateurs can contribute by actually doing. If you are an “old-timer,” this is a great way to learn even more and contribute to the exploration of the solar system.

To enlist in this campaign go to: <http://dawn-aop.astro.umd.edu/>  
<http://www.sciencedaily.com/releases/2010/02/100218151152.htm>.



**COMET  
 103P/HARTLEY 2**

Photo copyright 2010 Ron Pearson

## PHOTOS FROM COLORADO ASTRONOMY DAYS PAST



## NASA'S SPACE PLACE

**THE HUNT IS ON!**

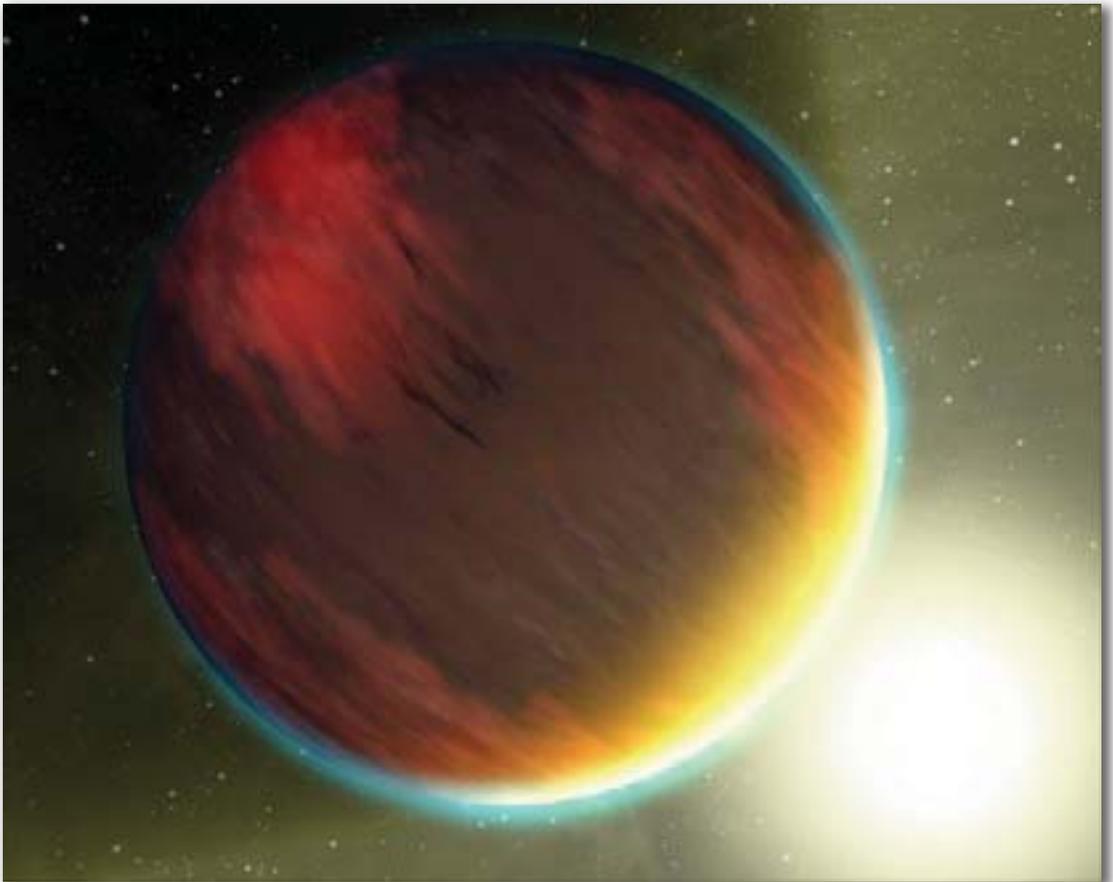
*A Space Place Partner Article  
by Carolyn Brinkworth*

The world of astronomy was given new direction on August 13, 2010, with the publication of the Astro2010 Decadal Survey. Astro2010 is the latest in a series of surveys produced every 10 years by the National Research Council (NRC) of the National Academy of Sciences. This council is a team of senior astronomers who recommend priorities for the most important topics and missions for the next decade.

Up near the top of their list this decade is the search for Earth-like planets around other stars—called “extrasolar planets” or “exoplanets”—which has become one of the hottest topics in astronomy.

The first planet to be found orbiting a star like our Sun was discovered in 1995. The planet, called “51 Peg b,” is a “Hot Jupiter.” It is about 160 times the mass of Earth and orbits so close to its parent star that its gaseous “surface” is seared by its blazing sun. With no solid surface, and temperatures of about 1000 degrees Celsius (1700 Fahrenheit), there was no chance of finding life on this distant world. Since that discovery, astronomers have been on the hunt for smaller and more Earth-like planets, and today we know of around 470 extrasolar planets, ranging from about 4 times to 8000 times the mass of Earth.

This explosion in extrasolar planet discoveries is only set to get bigger, with a NASA mission called Kepler that was launched last year. After staring at a single small patch of sky for 43 days, Kepler has detected the definite signatures of seven new exoplanets, plus 706 “planetary candidates” that are unconfirmed and in need of further investigation.

**ALIEN WORLD**

Artist's rendering of hot gas planet HD209458b. Both the Hubble and Spitzer Space Telescopes have detected carbon dioxide, methane, and water vapor—in other words, the basic chemistry for life—in the atmosphere of this planet, although since it is a hot ball of gas, it would be unlikely to harbor life.

Kepler is likely to revolutionize our understanding of Earth's place in the Universe.

We don't yet have the technology to search for life on exoplanets. However, the infrared Spitzer Space Telescope has detected molecules that are the basic building blocks of life in two exoplanet atmospheres. Most extrasolar planets appear unsuitable for supporting life, but at least two lie within the “habitable zone” of their stars, where conditions are theoretically right for life to gain a foothold.

We are still a long way from detecting life on other worlds, but in the last 20 years, the number of known planets in our Universe has gone from the 8 in our own Solar System

to almost 500. It's clear to everyone, including the Astro2010 decadal survey team, that the hunt for exoplanets is only just beginning, and the search for life is finally underway in earnest.

Explore Spitzer's latest findings at <http://www.spitzer.caltech.edu>. Kids can dream about finding other Earths as they read “Lucy's Planet Hunt” at <http://spaceplace.nasa.gov/en/kids/storybooks/#lucy>.

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

**NEW ASTRONOMER'S DEN**

October, 2010

*Parade of the Giants in the Realm of Servants and Goats*

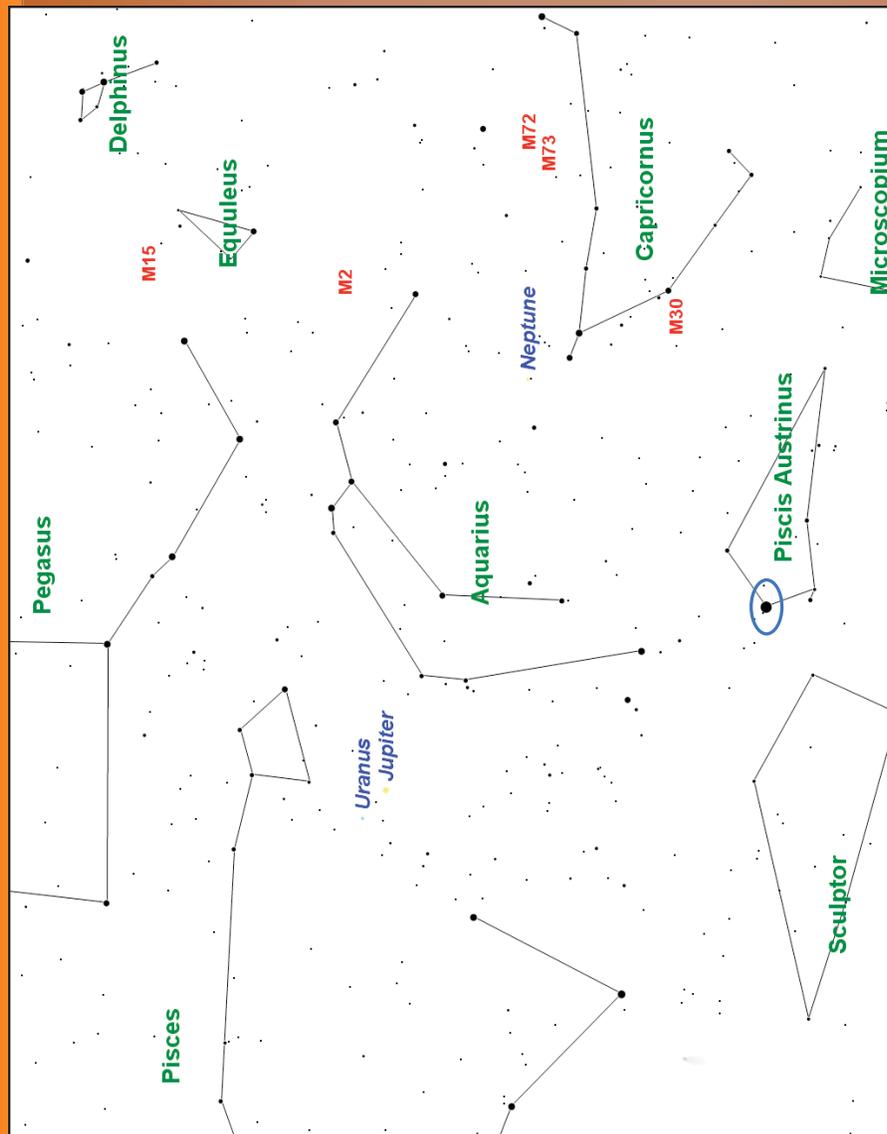


Although it is one of the densest globular clusters of the Milky Way, M15 appears fairly small (about 1/6th Jupiter's width) in amateur scopes. As with all its relatives, NGC 7078 resides in the Milky Way's outer halo.

With the disappearance of its famed South Equatorial Belt, Jupiter is the astro-news-maker to watch, aside from it being the visibly-largest and brightest planet in the current night sky.



One of the truly hypnotizing images from Voyager 2 was this revealing portrait of Neptune, named for the mythical god of the sea. 1200-mph winds and ammonia vapor clouds torment our solar system's azure giant.



South-southeast sky — 9 p.m.

**Aquarius the Water Bearer** and **Capricornus the Sea Goat** define a relatively star-dim area of the southern sky, with exception of bright-blue Fomalhaut in Piscis Austrinus at the bottom of the chart. The special guests in this area, however, are not stellar, but planetary in nature — three of the largest bodies in the Terran solar system. Jupiter dominates the scene, striking a 46 arc-second pose, with pale-green Uranus occupying the same binocular view. Pastel-blue Neptune rides the sea goat to the west, while a host of beautiful globular clusters, M2, 15, 30, and 72, along with open cluster M73, rounds out the field.



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star chart courtesy  
TheSky6 astronomy software suite.  
© 2010 Software Bisque

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# REUNITED IN CALIFORNIA

by Jack Eastman

Part Two (continued from the Denver Observer September 2010 issue)

Last time I talked about the historic Mt. Wilson Observatory and the truly wonderful experience we all had, thanks largely to Carla Johns (Swartz) being able to take off her day job to host our group to a truly wonderful tour of this historic observatory. The next morning, Tuesday, dawned gray and cool, as had every other day. Another huge breakfast at the hotel, they had a really great continental breakfast, waffle iron, toast, eggs—you name it. I checked out, as the plan was to head back to Colorado right after we were done at Griffith. It was a weekday so the observatory should be relatively uncrowded allowing for leisurely exploration.

What a surprise! I got there (after a miserable traffic clogged trip from Hermosa (average 12mph!)) and the place was as crowded as I could recall for any Summer Saturday. I had to park more than a half mile below the parking lot! As I saw 3 years ago (my 50th class reunion that time) the building looked the same from the front, but huge changes inside. Many new exhibits but still some of the old. The Solar telescopes at the West end of the original Hall of Science were working, and although the seeing was somewhat marginal there seemed to be a tiny sunspot or two. The presentations on the Sun were excellent with lots of videos from the Solar Heliospheric Observatory (SOHO) showing, in particular, a video of a huge Coronal Mass Ejection (CME) and flood particles shortly afterward looking like someone poured salt all over the detector! In the main rotunda the Foucault Pendulum still was knocking over the pegs, proving the rotation of the Earth. Up on the ceiling above the pendulum are the



GRIFFITH OBSERVATORY

Photo courtesy of Carla Johns

beautifully restored murals of Hugo Ballin showing the history of our views of the universe. Down the East Hall was a great deal about the eye, telescopes and the science of optics, along with a nice exhibit on how astronomers go about getting their information, eyeball, micrometer, (the beautiful Gaertner filar micrometer from the Zeiss telescope was prominently displayed) photography and electronic imaging. There was a series of panels showing how the universe looks from X-rays all the way to Radio. Prominently displayed at the end of the hall is a scale model of the Palomar 200" dome. Buttons open its shutters, rotate the dome and reveal the detailed model of the telescope. Switches allow the visitor to move the model, showing its motions. The actual 40" plug from the 200" in place during the grinding and figuring of the mirror, is displayed with half the coating removed to reveal the thick pyrex glass, full of striations and veins and bubbles. It sure doesn't look like optical

glass! Nearby, now in a Farady cage, was the million-volt Tesla coil, still in operation by the staff, but no more drawing sparks on the outside or holding up fluorescent tubes and watching them light up. Part of the excuse for this is probably modern medicine... pacemakers and the like might be adversely affected by loose electrical fields. New to the museum is the underground exhibit hall which at least tripled the space for exhibits. Downstairs is a small theater, the Leonard Nimoy Event Horizon, where a free movie of the building's restoration, narrated by Leonard Nimoy, is presented every hour or so. A large model of the solar system dominates much of this new exhibit space, and yes, unlike their counterpart in New York, Pluto is still there! A huge Murial of the nearby Virgo cluster of galaxies fills a very impressive 3040 square feet of the wall opposite the planet models. Truly impressive. A large gift shop and cafe are new, although the gift shop seems more into trinkets and souvenirs than the more

meaty books and the like that we used to have in past years. After combing through the building I grabbed my camera stuff and climbed most of the way to the top of Mt. Hollywood took some photos, working up a healthy appetite. I bit the bullet and tried “the Cafe at the End of the Universe” and it wasn’t bad. It did fill me up and eliminated a trip “down the hill”.

About 6:30 or so Carla arrived to fire up the 12-inch Zeiss refractor. First, Venus then Saturn. I looked at the planetarium show schedule and wow! they must have known I was coming. One of my favorite shows was “The Northern Lights and Other Sky Colors”. It explained the rainbow, blue skies and red sunsets but the very best was the aurorae. After explaining how the Northern Lights work, their causes and all they’d talk about the Vikings, their belief system, that these lights were the magic fire as the valkyries, handmaidens of the god Oden, (Wotan) would ride their fiery steeds across the sky carrying the fallen warriors up to Valhalla. Of course that would invoke the music of Richard Wagner, in particular the opening and closing scenes of the third act of his opera *Die Walkurie*, the Ride of the Valkyries and the Magic Fire Music. That show is what sealed my lifelong love and appreciation of fine music. Well, the 7:30 show was titled “Light of the Valkyries”! Yes, I had to see it. It was mostly the story of Wagner’s operatic masterpiece “*Der Ring des Nibelung*”, the Ring of the Dwarfs, complete with all the dragons, dwarfs, giants and gods with copious use of the music from the Ring. Very impressive, indeed. There was a lot of use of the Zeiss mark IX projector, a truly impressive night sky, indeed! There was injected into this fanciful tale a fair bit of hard science, how the aurorae work, how the sun works, solar effects on the earth, flares, coronal mass ejections and all. Although a great presentation, I’d have to vote for the old show of 40 years ago when it comes to the realism of those aurorae, the old ones were, in my humble opinion, far more realistic. Show over, and back up to the telescope. Carla dragged out the huge 120mm “comet” eyepiece. Truly a monster, over 6 inches in diameter, about 9” in length with a field lens 6” in diameter! It gives a field the order of a degree and a half on the 30-cm F/16 refractor at 42X. After they closed up, we played around with the refractor for a bit, split Antares even in spite of marginal seeing. A truly wonderful telescope.

All too soon, it was time to head out. Wisdom suggested getting a room, a good nights sleep and starting out the next morning. However, a different wisdom said “run for it.” It’s late at

night (promise of less clogged freeways, (lesson taught from the return from Mt. Wilson, the freeways seem to actually move late at night.) and I’d get through most of the hot desert at night, a definite plus. So it was, head out, get a couple of catnaps along the way and out of most of the hot country by early morning. Second hot part, Green River area, Utah, I was blessed by clouds and thundershowers, making for a cool and pleasant trip.

A seriously enjoyable trip in all, many memories both at the reunion and at the observatories I used to frequent in my younger years. Still it’s great to be back!!



Carla Johns and Jack Eastman at the Zeiss Refractor at Griffith Observatory.

*Photo courtesy of Jim Mahon*

## 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 DAS-General 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](http://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](http://www.denverastro.org).

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## DAS SCHEDULE

### OCTOBER

- 1 E-Board meeting at Chamberlin  
(Begins at 7:30 P.M.)
- 2 Chamberlin Public Night Operators  
Recertification meeting
- 2-10 Okie-Tex Star Party
- 8-10 EGK Dark Sky weekend
- 16 and 17 **Colorado Astronomy Day**  
(See Pages 6-7)
- 23 DAS Auction at Chamberlin (Begins  
at 11:00 A.M.)
- 31 Hallowe'en

### NOVEMBER

- 6-8 EGK Dark Sky weekend
- 7 Daylight Saving Time ends
- 13 Open House at Chamberlin (Begins  
at 5:30 P.M.)
- 19 DAS General Membership Meeting  
and "Show 'n Tell" at Olin Hall at  
DU (Begins at 7:30 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](http://www.denverastro.org)) or call (303) 871-5172.*



The Denver Astronomical Society  
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