

# Valley Skies

The Monthly Newsletter of the Stockton Astronomical Society  
and the San Joaquin Delta College Clever Planetarium

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Issue No. 8

Stockton Astronomical Society: founded November 1950 by Clarence P. Custer, M.D., 1906-1998  
(Meetings of the Stockton Astronomical Society are held on the second Thursday of each month, and are open to the public.)

## IN THIS ISSUE:

Stockton Astronomical Society

### Editors' Corner

Astronomy Day Oct. 1 .....	2
Back to our old Stomping Ground.....	2

Aug/Sept Star Parties.....	3
Report - Hwy 4, July 23 .....	3
Directions to Star Party sites .....	3
Pardee Reservoir Star Party.....	3

### Space.com

Largest Mass of Water in Universe.....	4
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### NASA Space Place

GOES-R More Tornado Warning.....	6
----------------------------------	---

### Public Astronomy

Astronomy in Park – July 9 report.....	7
ATM Report .....	7
Through the Looking Glass (cont.).....	7

Clever Planetarium Shows .....	8
Sky Tours .....	8
Astronomy in Park, Aug. 6 .....	8
Next ATM Session .....	8

August Sky Calendar .....	9
---------------------------	---

Stockton Evening Sky Chart .....	10
----------------------------------	----

Membership Application.....	11
Sky Tours Aug. 5.....	11
Astronomy in the Park Aug. 6.....	11
Scope City .....	11
“What’s Up?” Podcast.....	11



General Meeting:

**Thursday, August 11, 2011 – 7:30 p.m.**

**Stockton Astronomical Society**

returns for a one-night stand to the

**Clever Planetarium at Delta College**

This will be our regular monthly meeting with all the usual preamble of announcements and discussion of upcoming activities, plus a presentation by Kyle Wilson of this month's public show:

## "Oasis in Space"

Oasis In Space will transport you on a startling and beautiful voyage through our universe, galaxy and solar system in search of liquid water - a key ingredient for life on Earth. We start by exploring Earth, with its vast oceans that make life possible. One by one, we fly by the other planets and moons, and look at their atmospheres, temperature and composition.

## "Australian Skies"

For this months tour of the sky we will be taking a trip Down Under to see the sky from the Southern Hemisphere. We will show the differences in their sky compared to ours, as well as taking a look at some objects that can never be seen from Stockton. The show will feature Alpha Centauri, The Southern Cross, Omega Centauri, and the Eta Carina Nebula.

...Dennis LeClert, Program Director

Visit the SAS Web Site at: [www.stocktonastro.org](http://www.stocktonastro.org)

**STOCKTON ASTRONOMICAL SOCIETY**

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[Lukaszewski@prodigy.net](mailto:Lukaszewski@prodigy.net)**SAS Web Site:** [www.stocktonastro.org](http://www.stocktonastro.org)*(All numbers are area code 209 except as noted)*

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Non-commercial advertising of astronomy-related products or services will be printed free of charge for members, for up to three months if necessary. Submission deadline is the 15<sup>th</sup> of each month.

Unless identified by a byline or other credit, all text is by the editor and does not necessarily reflect the opinions of the Stockton Astronomical Society.

## EDITOR'S CORNER...

***Change is in the air...*****Astronomy Day: Saturday, October 1**

We thought we had reserved the Historical Museum at Micke Grove for October 1, but there apparently was a misunderstanding. That venue will not be available.

Time to punt!

Since the monthly Astronomy in the Park sessions have been so successful at Oak Grove Regional Park, (*see Doug Christensen's report on the July 9 event on page 7*), Doug has checked into the possibility of using the park for our big Astronomy Day bash. Based on discussions so far with the park personnel it looks like it will be feasible. That is the tentative plan we're moving ahead with.

Dave Jacobi has volunteered to be the coordinator for the event this year, since Becky Greider, who has served so diligently in that role for all of the previous events at Micke Grove, will be unavailable for this one.

The format will undoubtedly be different this year. Oak Grove Regional Park doesn't have the building space we've had previously that enabled us to have indoor activities and displays, including the Star Labs which *have* to be indoors. So plans will have to be adapted to the facilities available to us.

There is much detail to be worked out yet.

One constant that remains, however, is the need for telescopes. If indoor activities are limited, there will be greater emphasis on telescope viewing. There is ample space for all the telescopes we can muster, so we ask that ***all members with telescopes please plan to be available on October 1.***

That's only two months away! Assuming it all comes together, we'll have full details in the September newsletter.

**Back to our old stomping ground...**

Remember the **Clever Planetarium**? ...where we held our meetings for about three decades? ... Where we had night skies to play with regardless of the weather? ... Yeah...that place!

**Well, we'll be back there for our August 11 meeting.**

Don't forget! If you turn up at Olson 120 just out of habit, and find the door locked...well, it's not far to drive over to Delta College, though it will take a few minutes to walk from the Shima 1 parking lot to the Planetarium.

Better to avoid the UOP detour and go direct to Delta.

**SAS Meeting: August 11 (7:30 p.m.):  
Clever Planetarium  
Delta College**



## Stars R Us...

SAS Star Party News

### August:

*New Moon: Sun., August 28, 8:04 p.m. PDT*

#### Saturday, Aug. 20 **Pardee Reservoir**

Sunset: 7:52 p.m. PDT

Moonrise: 11:11 p.m. PDT

#### Saturday, Aug. 27 **Hi-Alt**

Sunset: 7:42 p.m. PDT

Moonrise (Sun.): 6:05 a.m. PDT

### September:

*New Moon: Tues., Sept. 27, 4:09 a.m. PDT*

#### Saturday, Sept. 24 **Hwy 4 or Hi-Alt**

Sunset: 6:59 p.m. PDT

Moonrise (Sunday): 4:51 a.m. PDT

## Report on Hwy 4 - July 23

Missed seeing a few folks last night. Those of us that did go enjoyed the best transparency so far this year. Seven people showed up bringing 4 reflectors from 4.5" to 14", 2 Schmidts, 10 and 14" and 2 refractors 80mm and 120mm. There were more than enough telescopes and targets to keep us busy.

The Lagoon Nebula looked almost electric, the Milky Way made a great showing, and a huge meteor left a trail for about 60 degrees, finally glowing green and disappearing.

Paul and I stayed until Jupiter and the Moon came over the hill at about 2:00 a.m. ...*Greg Seibold*

## Directions to SAS Star Party Sites

### Highway 4/Shirley Road:

Drive 30 miles east on Hwy 4 from Hwy 99. At the sign for Shirley Road/Telegraph Road, turn right off Hwy 4, then **left at the stop sign**. You will be heading east, parallel to Hwy 4. Drive to the setup area at the end of the road.

### 4000' Heliport on Highway 88:

Drive 21.8 miles east from Jackson on Hwy 88 till you pass the "Elevation 4,000 ft." sign, (0.4 miles past Amador Station). Turn left at the "Emergency Heliport" sign and double back parallel to the road about 400 feet to the helipad. Set up on the north side.

Please park on N side of road only at both the Hwy 4 and 4000 ft. site.

### Peddler Hill:

Drive east from Jackson on Highway 88 to Ham's Station. Continue 6.2 miles east to the junction sign-posted for Bear River Reservoir Resort on the right. Directly opposite the Resort road there is a service road, on the left, with a small "Zone 7" sign. Turn left onto the service road and go 0.8 miles to the site.

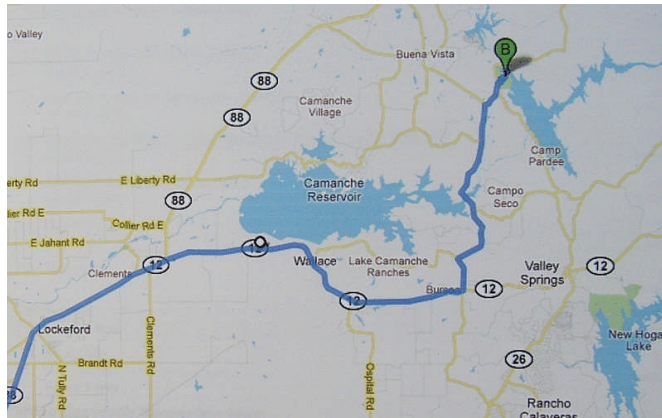


## Pardee Reservoir Star Party – Saturday, August 20

SAS member Bill Cook, who works for East Bay MUD at Pardee Reservoir, has arranged for us to hold a star party in the parking lot at the Pardee Reservoir Recreation Area, at the northern end of the reservoir.

According to Bill, the SAS will have exclusive use of the parking lot after sunset. It will be *dark* – no lights in the area to interfere with telescope viewing.

This will be instead of the monthly Highway 4 star party, usually held at Highway 4/Shirley Road. Driving distance to the site from Highway 99, though more



circuitous, is approximately the same as the drive to Shirley Road on Highway 4.

Take Hwy 12 toward Valley Springs; turn north at Burson on Burson Road then right on Camanche Parkway S. After you cross the eastern arm of Lake Camanche, the road becomes Lancha Plana Buena Vista Rd. After 3.3 miles, turn right on Stoney Creek Road, then approximately 1¼ mile to the recreation area.

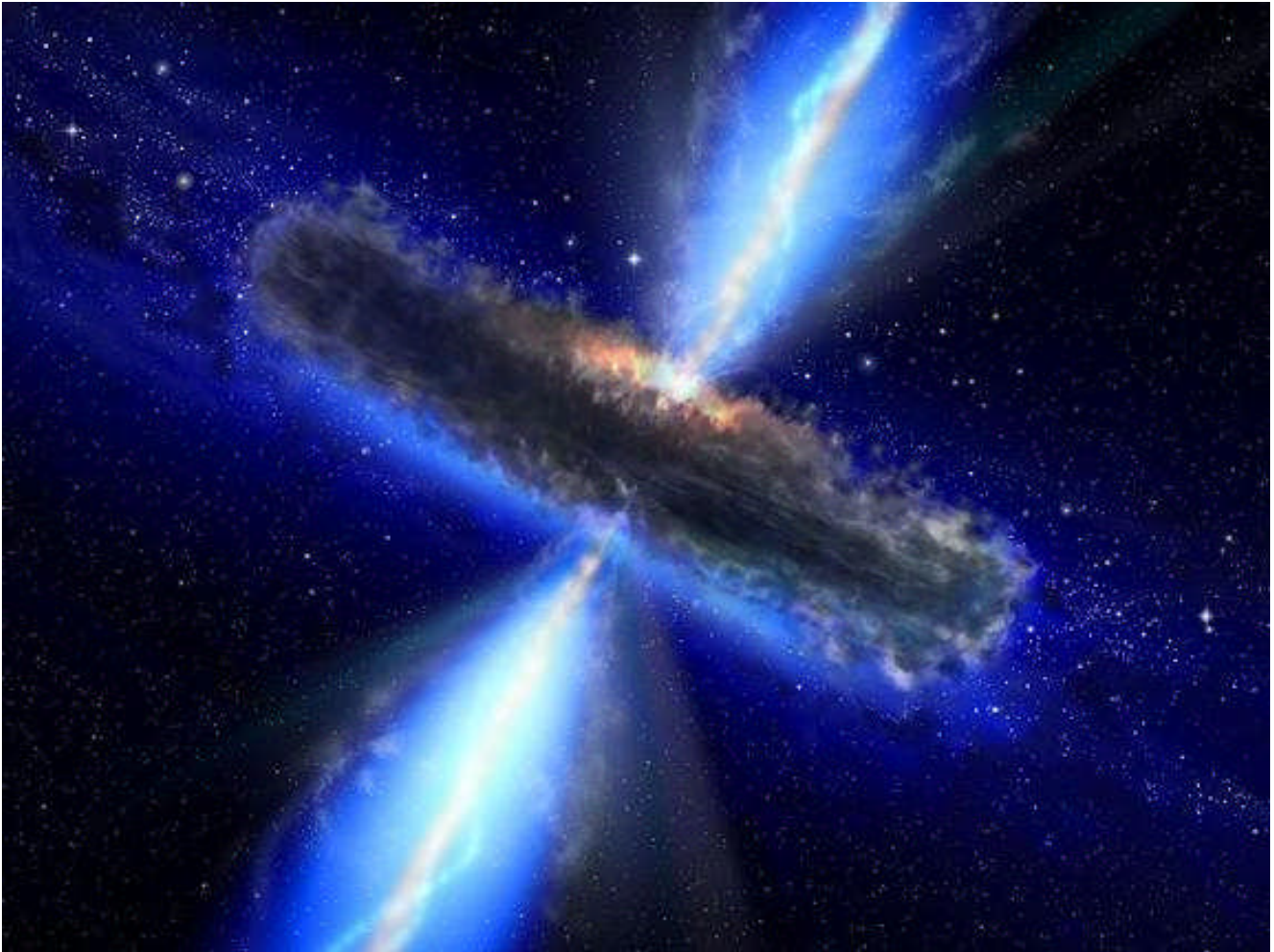
[See larger map to Pardee Reservoir on the SAS web site at

<http://stocktonastro.org/DirectionsPardee.html>

SPACE.com

## Astronomers Find Largest, Oldest Mass of Water in Universe

SPACE.com Staff



This artist's concept illustrates a quasar, or feeding black hole, similar to APM 08279+5255, where astronomers discovered huge amounts of water vapor. Gas and dust likely form a torus around the central black hole, with clouds of charged gas above and below. CREDIT: NASA/ESA

Astronomers have discovered the largest and oldest mass of water ever detected in the universe — a gigantic, 12-billion-year-old cloud harboring 140 trillion times more water than all of Earth's oceans combined.

The cloud of water vapor surrounds a supermassive black hole called a quasar located 12 billion light-years from Earth. The discovery shows that water has been prevalent in the universe for nearly its entire existence, researchers said.

"Because the light we are seeing left this quasar more than 12 billion years ago, we are seeing water that was present only some 1.6 billion years after the beginning of the universe," said [study](#) co-author Alberto Bolatto, of the University of Maryland, in a statement. "This discovery pushes the detection of water one billion years closer to the Big Bang than any previous find."

## Studying a distant quasar

[Quasars](#) are the most luminous, most powerful and most energetic objects in the universe. They are powered by enormous black holes that suck in surrounding gas and dust and spew out huge amounts of energy.

The research team studied a particular quasar called APM 08279+5255, which harbors a black hole 20 billion times more massive than the sun and produces as much energy as one quadrillion suns

The astronomers used two different telescopes, one in Hawaii and one in California, to detect and confirm the water vapor surrounding the quasar.

Scientists think water vapor was present even in the early universe. So finding this old cloud of the stuff doesn't come as a shock.

"It's another demonstration that water is pervasive throughout the universe, even at the very earliest times," said study lead author Matt Bradford of NASA's Jet Propulsion Laboratory in Pasadena, Calif.

However, the sheer size of the vapor cloud may surprise some scientists. APM 08279+5255 contains 4,000 times more water vapor than our own Milky Way galaxy, researchers said. That may be because much of the Milky Way's water is locked up in ice rather than vapor.

## Learning about the quasar

The water vapor in the quasar is distributed around the massive black hole in a region spanning hundreds of light-years. The cloud has a temperature of minus 63 degrees Fahrenheit (minus 53 degrees Celsius), and it's 300 trillion times less dense than Earth's atmosphere.

That may sound chilly and tenuous, but it means the cloud is five times hotter and 10 to 100 times denser than what's typical in galaxies like the Milky Way, researchers said.

In addition to shedding light on the early universe, the huge vapor cloud also reveals some important information about the quasar, researchers said.

Measurements of the water vapor and of other molecules, such as carbon monoxide, suggest that there is enough gas to feed the black hole until it grows to about six times its size. Whether or not this will happen is unclear, researchers said, since some of the gas may end up condensing into stars or may be ejected from the quasar.

The study has been accepted for publication in the *Astrophysical Journal Letters*.



## New GOES-R to Give More Tornado Warning Time

by Dauna Coulter and Dr. Tony Phillips

So far this spring, more than 1,400 tornadoes have struck the U.S. Some of them have cut jaw-dropping trails of destruction across the countryside and, tragically, across inhabited communities, too. Hundreds of lives have been lost in the onslaught.

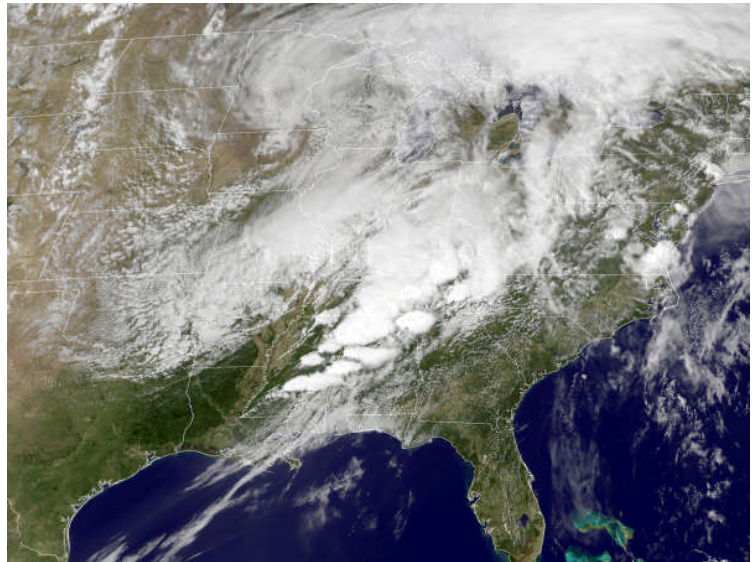
Throughout the season, the National Weather Service has routinely issued tornado alerts. In the case of the Alabama tornadoes of April 27<sup>th</sup>, forecasters warned of severe weather five full days before the twisters struck. Because they couldn't say precisely *where* the twisters would strike, however, many of their warnings went unheeded.

"If people get a hurricane warning, they often evacuate the area," notes NOAA's Steve Goodman. "But we react differently to tornado warnings."

Perhaps it's because tornadoes are smaller than hurricanes, and the odds of a direct hit seem so remote. Recent pictures from Tuscaloosa, Alabama, and Joplin, Missouri, however, show the perils of playing those odds. Goodman believes that more precise warnings could save lives.

To fine-tune tornado warnings, NOAA will soon launch the first in a series of next-generation weather satellites – GOES-R (Geostationary Operational Environmental Satellites-R series). The spacecraft is brimming with advanced sensors for measuring key ingredients of severe weather including winds, cloud growth, and lightning.

*This GOES image shows the storms that spurred the intense April 27 tornado outbreak in the southern U.S. Animation showing the development of weather can be seen at <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=50347>.*



"GOES-R will be the first geostationary spacecraft to carry a lightning sensor," says Goodman, the GOES-R Program Senior Scientist. "Studies show that sudden changes in the total lightning activity correlate with storm intensity—and with tornadoes."

The lightning mapper will detect and map not only cloud-to-ground lightning, but also bolts within and between clouds. The kind of cloud-to-ground lightning we see from our front yards accounts for only 15-20 percent of total lightning. To get a clear idea of a storm's intensity, meteorologists need to know about *all* the lightning—a view GOES-R can provide.

All by itself, the lightning mapper will provide 7 minutes more lead time in tornado warnings, according to Goodman. GOES-R's state-of-the-art instruments will also improve long-range forecasts.

"The satellite's Advanced Baseline Imager (ABI), for instance, will provide a much clearer picture of clouds," says NOAA research meteorologist Tim Schmit. Compared to lesser instruments already in orbit, ABI can better detect super-cold "overshooting tops," evidence of enormous energy and upward velocity that correlate with subsequent severe weather.

"Accurate advanced notice of high-risk tornadic conditions can cue officials to close schools and businesses even before tornadoes are actually detected," says Schmit.

Forecasters doubt tornadoes can ever be predicted with 100% accuracy. The twisters are just too capricious. GOES-R, however, is a step in the right direction.

Find out more about GOES-R's unprecedented capabilities at <http://www.goes-r.gov>.

Young people can learn more about tornadoes and all kinds of other weather at <http://scijinks.gov>.

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

## Astronomy in the Park, July 9

The weather did not cooperate in May or June so we hoped that “*the third time would be the charm.*” Jeff Baldwin got to the park an hour before sunset and set out the club’s new solar scope. He said he had a few gawkers before the Sun dropped below I-5. As I was setting up my C-8, which Sam @ Scope City had repaired for me, the first of the evening’s viewing public started to gather.

Jeff & I were soon joined by David Parker and the ever present Wheelers with their scopes. As I waited for darkness to reveal the first of my guide stars to set my computer driven scope, Jeff, Dave & Frank were already showing the gathering crowd our First Quarter Moon.

As I was able to get my scope zeroed onto Saturn I noticed that the lines at the telescopes were getting longer. After an hour or so there was no ebb to the tide of people waiting their turn at the 4 scopes. At about 10 pm the crowds started to thin down to about 6 to 12 people per scope, I turned my scope to M13 and ended up with about a dozen or more wanting to see and most of them stayed as I then turned to the Ring Nebula.

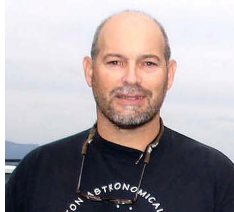
It was after 10:30 before the last of the public wandered on home and James Rexroth (our host at this monthly party) came out to tell us that we had drawn a record crowd that night. He counted almost 200 inside the Nature Center and I bet we had an additional 100 outside that never made it in to be counted.

Every time we bring our scopes to Oak Grove the public comes out to enjoy the views. Make sure you come out next month and join the party.

...Thanks, Doug

## ATM Report

We had a good ATM session on July 9<sup>th</sup>. We worked on Dan Collins’ 10” f/6, Jeff Baldwin’s 24” f/3.6. Dan and Jeff are



having a difficult time mating schedules, but Dan is nearly polished out and will have a very short parabolization session.

Greg Wilhite’s 12” f/3 mirror is nearly parabolized, only about ½ wave from a paraboloid. He had a successful astigmatism test the night of July 11<sup>th</sup>, so he can progress as a surface of revolution. Greg is about ¼ parabolized, and hopes to have it nearly parabolized at the next session.

We also worked on secondary mirror holders and spiders and discussed our future with polishing machines. All in all it was a busy and productive day.

It would be nice to have many of these telescopes ready for our annual Show and Tell session at the December meeting.

...Jeff

## Through the Looking Glass (continued)

By Jeff Baldwin

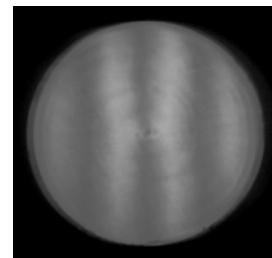
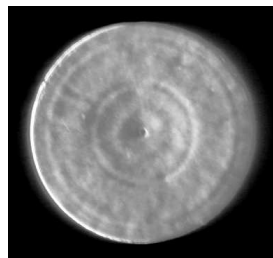
Last month, I reported on my preliminary inspection of the mirror salvaged from Dr. Clarence Custer’s Springfield telescope. Here is a summary of my findings from a more complete testing of the mirror:

Diameter:	12.5”	Thickness:	2.125”
Weight:	21 lb.	Radius of Curvature:	201.13”
Focal length:	100.6”	Focal Ratio:	f/8.045lt

Knife-edge examination shows a zoned, rough, non-corrected mirror. It appears as though Dr. Custer polished the mirror to what he thought was a sphere and left it that way. For photography purposes with wide fields, this would have been just fine. But for examining astronomical objects using anything more powerful than the least magnifying eyepiece would leave much to be desired.

There are many rings of zonal damage, much roughness, known as “dog biscuit” or micro-ripple. There is a severe turned-down edge. An astigmatism test showed some first order astigmatism, but much second order astigmatism.

Zones are shown in the Foucaultgram below, left.. They can even be seen in the Ronchigram.



The zonal errors, surface roughness, turned-down edge, and 2<sup>nd</sup> order astigmatism, all combine to make a mirror that, while serviceable for wide-angle, low-power observing or astrophotography, is not acceptable for medium or high power use. It can be readily improved using current ATM mirror-making techniques.

Based on the examination of this mirror, it needs to be smoothed, the turned-down edge repaired or eliminated, the figure corrected to a paraboloid, then aluminized.

This is in no way a condemnation of Dr. Custer. Kudos to him for making a mirror when local tutors didn’t exist, only ATM books by Russell Porter existed, and he took on this project single handedly. His telescope construction and photographs made on home-made glass plates are a testimonial to his resourcefulness and initiative. Not that many years ago this would be an acceptable mirror in an astronomy club’s ATM shop. Dr. Custer is still our hero and seeing this mirror quality should not detract from that.

**NOTE:** At the July 7 Executive Committee meeting, the committee gave Jeff the go-ahead to refinish the mirror, keeping the existing focal length. It will eventually be assembled into a truss-mounted Dobsonian club telescope, to be designated the Clarence P. Custer Commemorative Telescope.



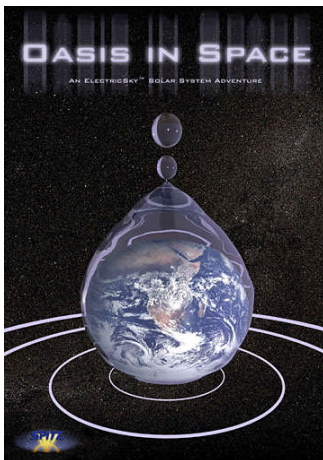
See the new digital planetarium in action! Public Shows will be presented one weekend every month on Friday and Saturday. The shows will be approximately 1 hour long. All public shows will include a full dome video and a live presentation of the current nighttime sky. The cost for public shows is \$8 for adults and \$6 for children, seniors, and students. Reserve your tickets at the Delta College box office or purchase them before the show at the planetarium.

... Kyle Wilson, Planetarium Technician



## Public Shows

August 5 and 6 at 7:30 P.M.



### "Oasis in Space"

Oasis In Space will transport you on a startling and beautiful voyage through our universe, galaxy and solar system in search of liquid water - a key ingredient for life on Earth. We start by exploring Earth, with its vast oceans that make life possible. One by one, we fly by the other planets and moons, and look at their atmospheres, temperature and composition.

### "Australian Skies"

For this months tour of the sky we will be taking a trip Down Under to see the sky from the Southern Hemisphere. We will show the differences in their sky compared to ours, as well as taking a look at some objects that can never be seen from Stockton. The show will feature Alpha Centauri, The Southern Cross, Omega Centauri, and the Eta Carina Nebula.

## Field Trips

The planetarium is taking bookings for field trips. If you would like to bring your school group, scout group, youth group or would like to book the planetarium for any special event call Kyle at the planetarium at 954-5313 or visit our website at [www.deltacollege.edu/dept/planetarium](http://www.deltacollege.edu/dept/planetarium).

*Following the Friday Planetarium show:*

**Sky Tours: Friday, August 5, 8:30 – 10:30 p.m. in Shima 2 parking lot, Delta College.**

*Next evening:*






**Astronomy in the Park: Saturday, August 6. Oak Grove Regional Park near the Nature Center. (Sunset 8:09 p.m. Come early and picnic before telescope setup).**



## Next ATM Session

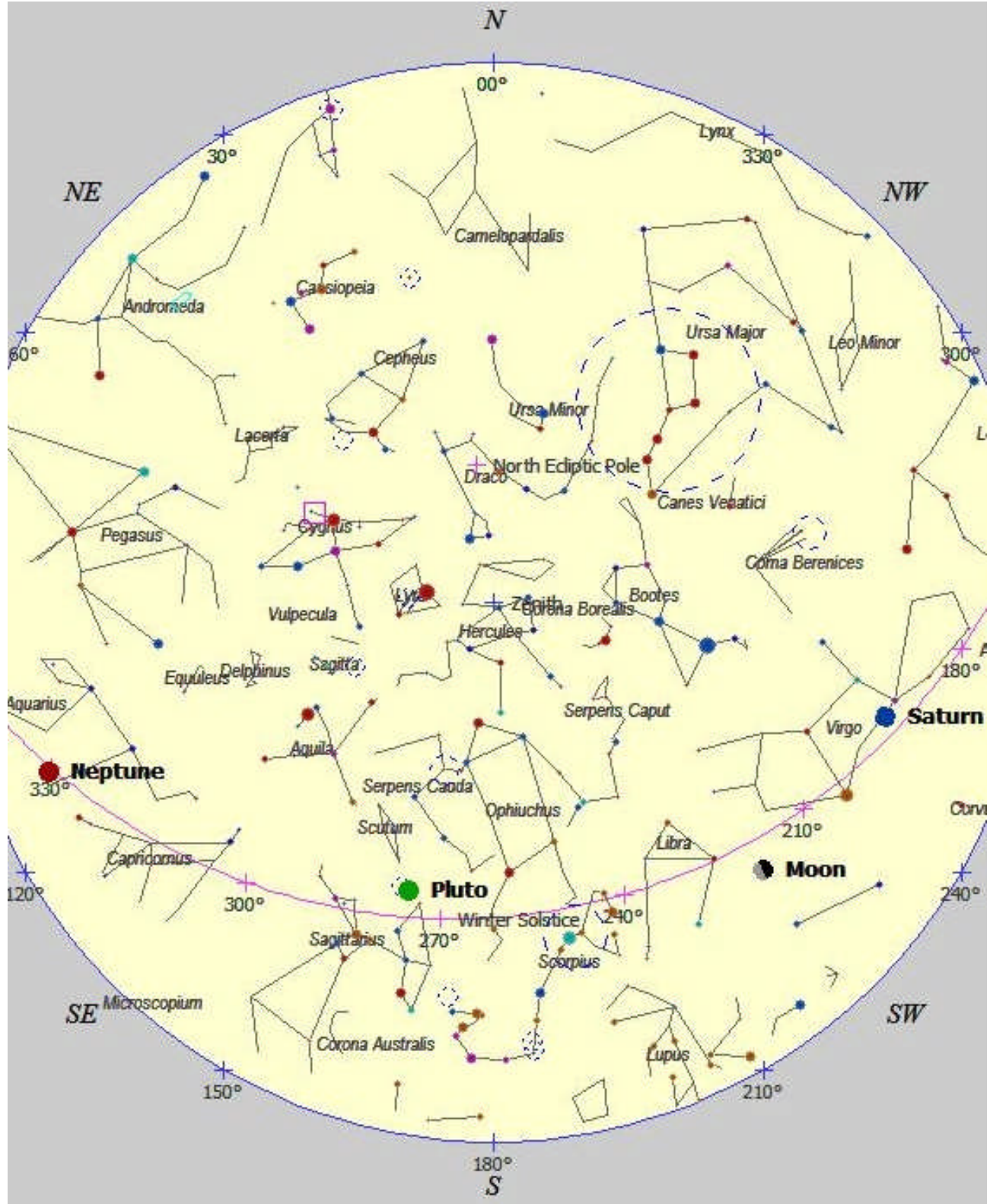
Our next ATM session will be on Saturday, August 20<sup>th</sup>, 10 AM to 3 PM. We meet at Baldwin's Optical Shop at 684 Pioneer Ave in Lathrop. Call Jeff at 594-1894 to make sure there is no cancellation.

# August 2011 Sky Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	<p><b>1</b></p> <p>PM: Mercury 1.5° N of Moon.</p>	<p><b>2</b></p> <p>Moon at perigee.</p>	<p><b>3</b></p>	<p><b>4</b></p> <p>PM: Saturn 8° N. of Moon.</p>	<p><b>5</b></p> <p>Planetarium Show (Details on page 8)</p> <p>Sky Tours at Delta College 8:30 – 10:30 p.m.</p>	<p><b>6</b></p> <p>First Quarter 4:09 a.m. PDT </p> <p>Planetarium Show (Details on page 8)</p> <p>Astronomy in the Park Oak Grove Reg. Park (Sunset 8:09 p.m.)</p>
<p><b>7</b></p>	<p><b>8</b></p>	<p><b>9</b></p>	<p><b>10</b></p>	<p><b>11</b></p> <p>SAS Meeting 7:30 p.m. Delta College Clever Planetarium</p>	<p><b>12</b></p> <p>PM: Perseid meteor shower peak.</p>	<p><b>13</b></p> <p>Full Moon 11:58 a.m. PDT </p> <p>Perseid meteor shower</p>
<p><b>14</b></p> <p>PM: Neptune 6° S. of Moon.</p>	<p><b>15</b></p>	<p><b>16</b></p> <p>Venus in superior conjunction. Mercury in inferior conjunction.</p>	<p><b>17</b></p> <p>PM: Uranus rises late evening, 6° S. of Moon.</p>	<p><b>18</b></p> <p>Moon at apogee.</p>	<p><b>19</b></p>	<p><b>20</b></p> <p>SAS Star Party at Pardee Reservoir (See page 3)</p> <p>AM: Jupiter 5° S. of Moon.</p>
<p><b>21</b></p> <p>Last Quarter 2:57 p.m. PDT </p>	<p><b>22</b></p> <p>Neptune at opposition.</p>	<p><b>23</b></p>	<p><b>24</b></p>	<p><b>25</b></p> <p>AM: Mars 3° N of Moon.</p>	<p><b>26</b></p>	<p><b>27</b></p> <p>SAS Hi-altitude Star Party</p> <p>AM: Mercury 3° N. of Moon.</p>
<p><b>28</b></p> <p>New Moon 8:04 p.m. PDT </p>	<p><b>29</b></p>	<p><b>30</b></p> <p>Moon at perigee. Jupiter appears stationary.</p>	<p><b>31</b></p> <p>PM: Saturn 7° N. of Moon.</p>	<p><b>1</b></p>	<p><b>EVENING PLANETS</b>  <b>Saturn:</b> Low in western evening sky; sets late evening.  <b>Jupiter:</b> Rises N of E near midnight in Aries.  <b>Uranus:</b> Rises late evening in Pisces.  <b>Neptune:</b> Visible all night.</p>	<p><b>MORNING PLANETS</b>  <b>Mercury:</b> Vanishes in evening twilight early in month; reappears in dawn sky by month end.  <b>Venus:</b> Not visible this month.  <b>Mars:</b> In eastern morning sky in Gemini.</p>

# Stockton Evening Sky for Sky Tours

Friday, August 5, 2011 – 9:30 p.m. PDT  
(Chart by CyberSky 4.0.7)



### Membership Application

Mark the selected category  
and mail check  
(payable to SAS)  
to:  
SAS  
P.O. Box 243  
Stockton, CA 95201  
or bring to the  
next meeting.

SAS Membership:  Renewal  New

Student Rate: \$10/yr (Full-time student, no age restrictions)

General/Family Rate: \$20/yr (Covers all members of immediate family)

Name(s) \_\_\_\_\_

Address \_\_\_\_\_

City/State/ZIP \_\_\_\_\_

Home Phone \_\_\_\_\_ Bus. Phone \_\_\_\_\_

Cell Phone \_\_\_\_\_

**E-mail** \_\_\_\_\_ \*

(\* Valley Skies newsletter will be delivered by E-mail in pdf format.)

√ Opt Out:  I am not able to receive E-mail. Please deliver Valley Skies newsletter by mail.

- \_\_\_\_\_ I am willing to help with public outreach activities such as Sky Tours or school star parties.
- \_\_\_\_\_ I will help any way I can with Society activities.
- \_\_\_\_\_ I would be willing to serve as an appointed or elected officer of the club.

✂-----

For new membership or renewal, complete the form above and bring it with your check to the next meeting or mail it to:  
**SAS, P.O. Box 243, Stockton, CA 95201**

### Astronomy in the Park

**Saturday, August 6. Sunset 8:09 p.m.**

(Come before sunset and bring food to picnic before the observing session.)

### Next Sky Tours:

**Friday, August 5, 8:30 – 10:30 p.m.**  
Shima 2 parking lot at Delta College



#### SAS MEMBER DISCOUNTS

Scope City at 350 Bay Street, San Francisco, offers a huge selection of telescopes, accessories and more. Manager Sam Sweiss is offering discounted prices and free shipping to all SAS members and, for new members, an additional \$25 merchandise discount. (Obtain a receipt from Jerry Hyatt, SAS Treasurer, showing you have paid the \$20 SAS membership dues.)

To arrange for your merchandise discount, contact Sam personally at 415/421-8800 or at <http://www.scopecity.com>

#### “What’s Up?”

Don’t forget to check the “What’s Up” Podcast by Jane Houston Jones each month.

Using a combination of NASA images, beautifully clear graphics and her own narration, Jane does an outstanding job of explaining what you can expect to see in the night sky each month.

Bookmark the site:

<http://solarsystem.nasa.gov/news/whatsup.cf>

**Stockton Astronomical Society**

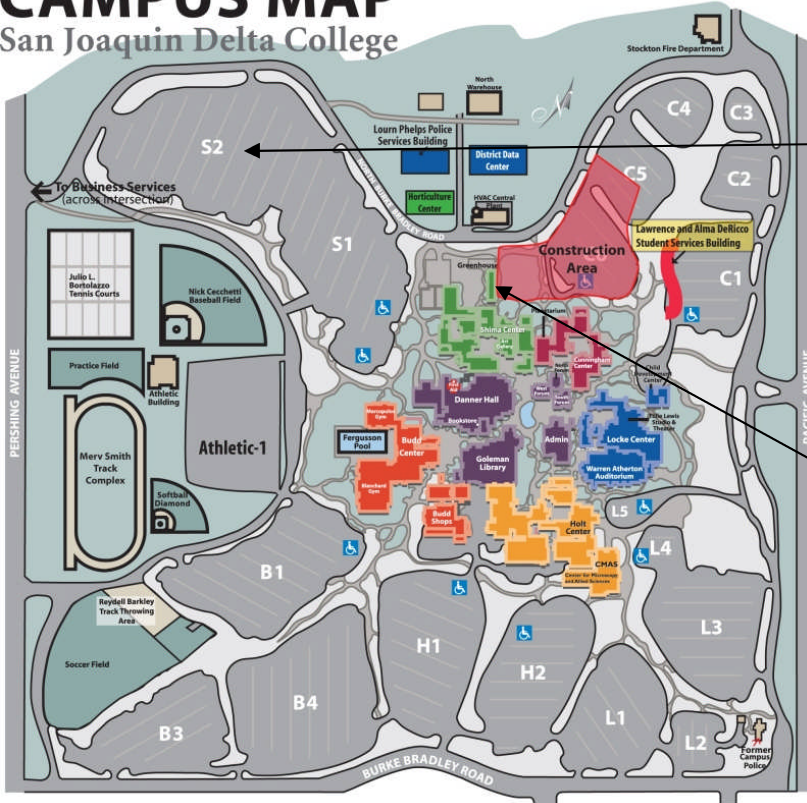
P.O. Box 243  
Stockton, CA 95201



**Date Sensitive Material  
Please Deliver Promptly**



**CAMPUS MAP**  
San Joaquin Delta College



**Sky Tours on August 5**  
will be in the  
**Shima S2 parking lot**  
at Delta College  
(8:30 – 10:30 p.m.)

**Picnic and  
Astronomy in the Park**  
**Saturday, August 6**  
**Oak Grove Regional Park**  
**Nature Center**

**Stockton Astronomical Society**  
**August 11 Meeting**  
**Clever Planetarium**  
**Delta College**