

# SDAA

## San Diego Astronomy Association

*Promising the Sun, the Moon, and the Stars...and Delivering!*



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P.O. Box 23215, San Diego, CA 92193-3215

### SDAA Business Meeting

Will be held at:

**SKF Condition Monitoring**  
4141 Ruffin Road  
San Diego, CA 92123-1841  
October 8th at 7:00 pm

## Don't Be Locked Out!

The combination to the lock on the gate at Tierra del Sol has been changed.  
See The Back Page for details.

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### News and Notes

October 2002

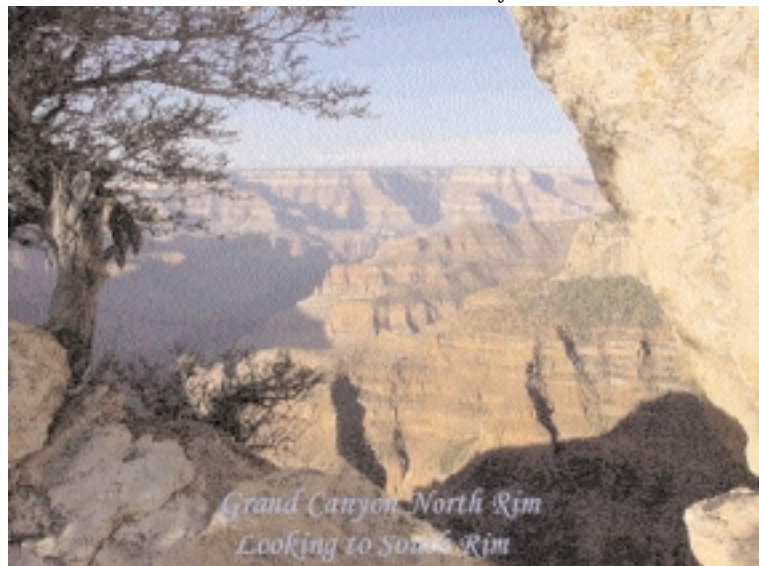
#### Arizona Skies and Scholars by Dennis Ritz

The Grand Canyon Star Party (GCSP) was held June 8-15, 2002, for the first time on the north rim. A magnificent location for a star party, John Dobson started the GCSP in the 1970s, and the event was resumed by Dean Ketelsen and the Tucson Amateur Astronomy Association. We took advantage of the situation by attending the GCSP, then traveling south to visit the University of Arizona Lucas Award recipients. Bill Lucas was a founding member of the San Diego Astronomy Association who taught the ATM telescope making class for years. It was then fitting I met Dean at the UA Steward Observatory Large Mirror Lab as he was polishing the first of two 8.4 meter mirrors for the Large Binocular Telescope. Bill and Betty passed away in the late 1970's, but their awards to the University of Arizona and San Diego State University Astronomy Departments

have since supported many students and researchers. I met with UA Steward Observatory Director Dr. Peter A. Strittmatter and several of the Lucas Award recipients for a gracious campus tour and lunch, but first things first, the GRAND Canyon Star Party report!

**Grand Canyon Star Party**  
<http://www.tucsonastronomy.org/gcsp.html>

The GCSP has been held on the south rim since the 1991 wedding anniversary of Dean and Vicki Ketelsen. However those familiar with the crowds of the south rim were pleasantly surprised by this year's expansion to the north rim, a cooler and less visited location. At about 8,000 feet, the north rim is far from any city and has truly clear, dark skies. We stayed in the Pioneer cabins for 4 nights and enjoyed the weather and forests of the north rim during the day while awaiting evenings spent with fellow astronomy enthusiasts.



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# San Diego Astronomy Association

## Arizona Skies & Scholars

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The north rim star party is held on the Lodge 'Sun Porch,' which presents some difficulty in getting larger scopes to/from the porch. My 18" Dob was a bit much, so several of us ventured to a large parking lot at Point Imperial for great viewing. We had so much fun, we are already reserved for 2003. Following a week of views, sun, fun, and clear nights, we traveled to Tucson to visit the University of Arizona Steward Observatory and Lucas Award recipients.

## University of Arizona Steward Observatory and Lucas Awards

<http://sdaa.org/SDAACContacts/lucas.htm>

June in Tucson was HOT, temperatures in excess of 110°F, adding to the warm welcome I received from Dr. Peter A. Strittmatter, Director of the Steward Observatory and the faculty and staff at the University of Arizona Astronomy Department. They showed me around the Steward Observatory building on the U of A campus and introduced me to Dr. John M. Hill, Director of the Large Binocular Telescope (LBT) Project being built on Mt. Graham. Dr. Hill gave me a fascinating tour of the famous Mirror Lab under the U of A stadium grandstands. Everything here is BIG! Here's a picture of

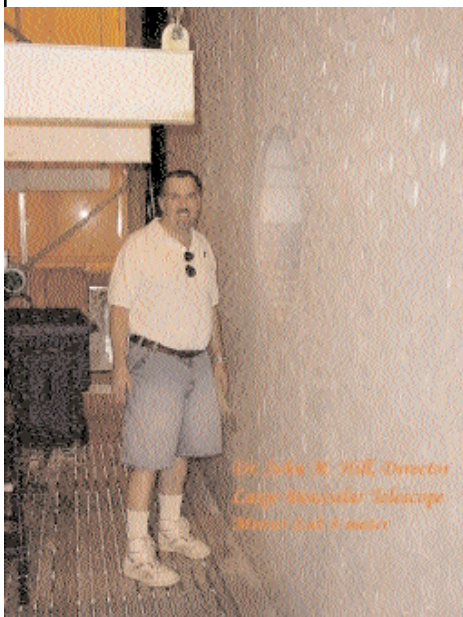
Dr. Hill next to the second LBT 8.4 meter mirror back. You can follow the progress of the twin 8.4 meter Large Binocular Telescope Project on their web site at:

<http://medusa.as.arizona.edu/lbtwww/>.

The LBT project will cost over \$ 110 million dollars and will be a crown jewel of the famous optical telescopes of Arizona.

The following pictures show the computer controlled polishing pitch tool using cerium oxide.

committee Dr. Edward Olszewski, and undergraduate astronomy associate professor Dr. John Beiging. The Lucas Awards are endowed through the University of Arizona Foundation and provide approximately two \$5,000 awards annually for post doctoral research. Unlike many grants or awards, it is 'no-strings' and can be used as the recipient needs. Dr. Smith used it for various components and supplies to support the Steward Observatory CCD Spectropolarimeter (SPOL) developed by Drs. Gary Schmidt and H.S. Stockman, and his own research



*Dr. John M. Hill, Director  
Large Binocular Telescope  
Mirror Lab & more*

After the Mirror Lab tour, I met with several Lucas Award recipients, including Drs. Paul Smith, Mike Meyer, and Grant Williams, the chair of the Lucas Awards

on "Polarimetry of Active Galactic Nuclei." SPOL is one of the most sensitive astronomical instruments in the

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# San Diego Astronomy Association

## Arizona Skies & Scholars

(continued from page 2)

world for the study of polarized light, and has recently been used at the 6.5 m MMT on Mt. Hopkins, Arizona, to study very faint and red quasars. Information on this unique instrument can be found at <http://chinadoll.as.arizona.edu/~schmidt/spol/spol.html> and links to research publications resulting from the use SPOL by Dr. Smith and others can be found at <http://chinadoll.as.arizona.edu/~schmidt/spol/spolpub.html>.

Dr. Mike Meyer, a 1998 and 2000 Lucas Award fellow studied "Near IR Monitoring of the Young Stellar Objects- Angular Momentum Evolution and Disk Accretion" and "A Sub-Stellar Search for the Coolest Young Stars: A Multi-Object Infrared Spectroscopic Approach." Dr. Meyer joined us at lunch following an all-night flight from the Inter-American Observatory at Cerro-Tololo in Chile. Dr. Meyer's research can be reviewed at the following web sites:

<http://feps.as.arizona.edu/team.html>

[http://nai.arc.nasa.gov/news\\_stories/news\\_detail.cfm?ID=20](http://nai.arc.nasa.gov/news_stories/news_detail.cfm?ID=20)

[http://www.space.com/scienceastronomy/astronomy/dusty\\_worlds\\_020123-1.html](http://www.space.com/scienceastronomy/astronomy/dusty_worlds_020123-1.html)

Dr. Grant Williams received the 2001 Lucas Award for "Late-Time Observations of Type 1a Supernova". As the latest Lucas recipient, Dr. Williams is a current post doctoral researcher and principal on the "90Prime" Steward Observatory imager:

<http://compton.as.arizona.edu/90prime/contact.html>

The imager is being built in the CCD lab at San Diego State University.

Since I quickly ran out of astrophysical knowledge, I asked each how they became interested in astronomy. Director Strittmatter listened to BBC radio broadcasts by Fred Hoyle, Drs. Smith and Meyer were interested by the space exploration programs, and one, Dr.

Olszewski, has an 8" Schmidt Cass telescope he uses and shares with students.

All the faculty and Lucas Award recipients showed an interest in who Bill Lucas was and a 'thanks' for his support. I'm pleased to report Bill and Betty Lucas's wonderful gift to the astronomy community is alive and well at the University of Arizona's Steward Observatory. More information on Bill and Betty Lucas can be found in the following article or on the SDAA web site at:

<http://sdaa.org/SDAACcontacts/lucas.htm>

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## Book Signing - Timothy Ferris by John Restivo

Bestselling author and avid astronomer Timothy Ferris will be signing the latest of his ten books, *Seeing in the Dark*, on Saturday, October 5th at the Ruben H. Fleet Science Center. A former newspaper reporter and editor of *Rolling Stone* magazine, he is a frequent contributor to the *New Yorker* and a columnist for *Contentville.com*. His numerous articles and essays have appeared in over 50 periodicals, including the *Chronicle of Higher Education*, *Forbes*, *Harper's*, *Life*, *National Geographic*, *Natural History*, *Nature*, *Newsweek*, *Time*, *Reader's Digest*, *Scientific American*, *The Nation*, *The New Republic*, *The New York Review of Books* and *The New York Times*.

He has written and narrated two television specials, "The Creation of the Universe," which has aired in network prime time annually for the past 15 years, and "Life Beyond Earth," which premiered on PBS November 10, 1999. He produced the *Voyager* phonograph record, an artifact of human civilization, containing music and sounds of Earth and encoded photographs launched aboard the *Voyager* interstellar spacecraft, and was among the journalists selected as candidates to fly aboard the Space Shuttle in 1986. He is a consultant

to NASA on the long-term goals of space exploration and currently serves on the space agency's Near-Earth Object Steering Group. Mr. Ferris has received the American Institute of Physics prize, the American Association for the Advancement of Science prize and Guggenheim Fellowship. His books have been nominated for the National Book Award and Pulitzer Prize. Professor Ferris has taught at four universities and is currently emeritus professor at the University of California at Berkeley.

The SDAA has been invited to set up telescopes at the fountain area for solar observing. Mr. Ferris's latest book strongly emphasizes the importance amateur astronomy has both on the world and its assistance to professional astronomers. His lecture begins at 12:30p.m., followed by his book signing. Come and meet Mr. Ferris and enjoy some solar observing before trekking to TDS for the evening's star party.

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## Palomar Observatory Tours by Kent Richardson

I have tentatively scheduled two one-hour guided tours of the Palomar Observatory for the afternoon of November 16. These are "behind the scenes" tours not open to the general public. The times I asked for are 2:00PM and 3:00PM. They can accommodate up to 30 people per tour, so there are 60 spots available. Once I receive confirmation from the observatory on the exact times, I will post a note on the Yahoo group and open a database for sign-ups. This is a great opportunity to learn some of the history of this amazing instrument and to see it up close. Hopefully we can fill up both tours. If we have more people sign up than they can accommodate, I may be able to schedule additional times on the 16th, or for sure on a future date. More details will follow.

## Astronomy 101

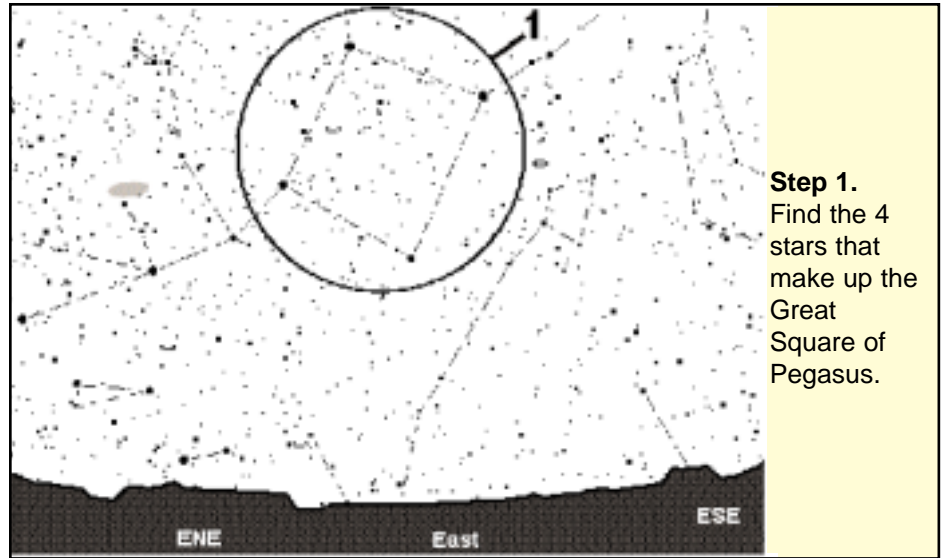
### How far can you see?

Whenever the subject of vision comes up at parties, there's always someone who claims they can see at fly on a dog's tail at 200 yards. The next time someone boasts about their vision, ask them "How far can you see?" When they give you their answer, whatever it is, tell them that you can see objects 2.2 million light years away! Here's how to do it. In our evening sky, the constellation Andromeda is rising in the east just after dark. In that constellation is a very famous galaxy known as M31 or "The Great Andromeda Galaxy." This galaxy, very similar to our Milky Way in size and shape, is approximately 2.2 million light years distant (one light year is 5,865,696,000,000 miles). It's so bright and large, it can be seen with the naked eye if you know where to look. For this month's article, I'm going to give you a step by step guide for finding M31 without optical assistance.

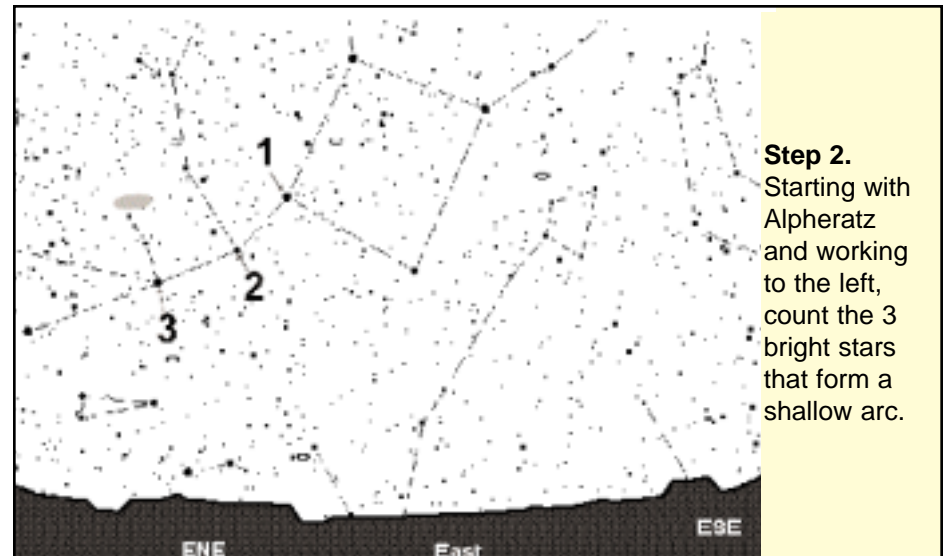
**Step 1.** Find the four stars that make up "The Great Square of Pegasus" as circled in this picture. The "Great Square" is quite large in the sky, about the size of your fist at arm's length, and the four stars that make it up are fairly bright. It's called the Great Square of Pegasus because "most" of the stars in it are in the constellation of Pegasus; however, one star, the one to the lower left, is actually alpha Andromeda, or Alpheratz, Arabic for "the horse's navel". Alpheratz was once considered to be part of Pegasus and not Andromeda.

**Step 2.** Now it's just a matter of counting to three to get to M31. Start by counting Alpheratz as number one, then, working to the left, count the next two stars, in a shallow arc, as two and three, as indicated in the picture here. There aren't many bright stars in this part of the sky, so finding the stars to count isn't too confusing. The number three star in your counting is "Mirach" which means "the loins" I won't go into detail here.

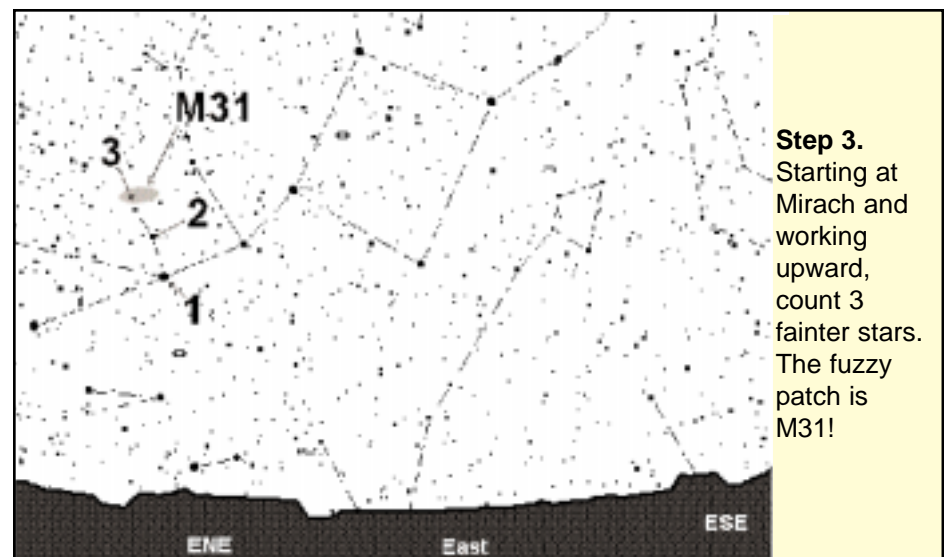
**Step 3.** Now again, counting to three and



**Step 1.** Find the 4 stars that make up the Great Square of Pegasus.



**Step 2.** Starting with Alpheratz and working to the left, count the 3 bright stars that form a shallow arc.



**Step 3.** Starting at Mirach and working upward, count 3 fainter stars. The fuzzy patch is M31!

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# San Diego Astronomy Association

## Camp With The Stars by Michael Dietz

This month our Camp With The Stars program will be in the desert on October 5th at Vallecito Stage Station Campground. If you have a telescope that you can share with the campers, you are welcome to join us and camp for free. If you like, you can come up on Friday and enjoy the campground an extra day/night. Don't forget to bring a towel and swimsuit so you can take a dip in the pool at Agua Caliente Hot Springs for free.

To reach Vallecito Stage Station take I-8 East to Ocotillo, and then take Hwy. S-2 North about 30 miles to the campground which is about 4 1/2 miles north of Agua Caliente Hot Springs. Those of you that are coming from the North County area can take Hwy. 78 through Julian to Scissors Crossing. Turn right and head south on Hwy S-2 to the campground. If you plan on attending please let me know at (619)334-9930 so I can make arrangements to accommodate everyone.

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John Restivo  
Bob Wetzel

## SkyWatch for October, 2002 John Mood



[ Times PDT ] [ \* = Easy ] [ \*\* = Moderate ] [ \*\*\* = Difficult ]

Humorous note:-- At this year's bar-b-q, someone described himself to me as a "one-&-a-half asterisk astronomer"! I loved it, even tho' I've always thought of these as "stars" like on a touch telephone, rather than asterisks.

Sat., 5 Oct. ---- STAR PARTY @ Tierra del Sol.

Sun., 6 Oct. ---- NEW MOON, 4:18 a.m.

Thurs., 10 Oct. ---- MARS & MERCURY only 2° 50" apart this morning (see below).

Sat., 12 Oct. ---- STAR PARTY @ Tierra del Sol.

Mon., 21 Oct. ---- FULL MOON, 12:20 a.m.

Sun., 27 Oct. ---- goto PST; gain an hour by moving clox back 1 hour @ 2:00 a.m.

Sat., 2 Nov. ---- STAR PARTY @ Tierra del Sol.

Mon., 4 Nov. ---- NEW MOON, 12:34 p.m. {PST}

Sat. 9 Nov. ---- STAR PARTY @ Tierra del Sol.

#### EVENING PLANETS:

VENUS [ \*½ ] is in Libra, the Scales; it's bright but low on the horizon 1st ½ of month, then slips from sight; worth a try 'cause w/ scope it is a very thin crescent. NEPTUNE (mag. 7.9) [ \*\* ] & URANUS (mag. 5.8) [ \*½ ] are still visible in Capricornus, the Goat. SATURN [ \* ] is now high enuf before midnight to turn yr scope on to its glorious rings; it's located on the border of Taurus, the Bull, and Gemini, the Twins.

#### MORNING PLANETS:

JUPITER [ \* ] is in Cancer, the Crab, & now available for good telescopic viewing before dawn breaks. As the month goes on, MARS [ \*½ ] is dimming, while MERCURY [ \*½ ] brightens dramatically; both are in western Virgo & are w/in 4° of ea other 7th to 14th (see above, 10 Oct.).

#### BEGINNING OBSERVERS ----

It's that glorious time of the year again when one can examine the closest large galaxy to our own Milky Way. I'm speaking of M-31, the Great Galaxy in Andromeda

[ \* ]. It's not only the most distant object visible to the naked eye, but the wheeling spiral is a treat in any size scope. Its actual distance is the subject of some controversy. For decades it was considered to be 2.2 million light years away; then in late '80s, 1.88 mill. l. y.; then Hipparcos in '97 estimated 2.93 mill. l. y. Don't forget its 2 satellite elliptical galaxies, M-110 closer in [ \*½ ], & M-32, dimmer & farther out [ \*\* ].

#### EXPERIENCED OBSERVERS ----

Try for the star cloud NGC-206 [ \*\* ] on the south arm of M-31 & the open cluster [ \*\*\* ] & globular cluster [ \*\*\* ] just outside NGC-206. Don't forget the 2 other satellite galaxies of M-31, both in Cassiopeia, NGC-185 [ \*\* ] & NGC-147 [ \*\* ].

#### TIERRA DEL SOL

LAT = 32° 36' 46" N ( ± 0.1" ), LONG = 116° 19' 55" W ( ± 0.1" ), ELEV = 3710' ( ± 5' ), at the bathroom, as determined from USGS 7.5 min 1/24000 map.

Send comments & questions to me by phone (619)225-9639, USPS (4538 Long Branch Av., San Diego, CA 92107) or my newe-mail address

( 1happyalien@cox.net ).

¡HAPPY VIEWING!

## Focusing for Astrophotography—Part 7 by Jerry Lodriguss

Editor's Note: This is part seven in a series of articles written by Jerry Lodriguss that are being reprinted in the newsletter with his permission. You can see more of Jerry's work at [www.astropix.com](http://www.astropix.com).

### Different Methods of Focusing

#### 6. By star trail test on the film

This method was described by E. S. King in his 1931 classic book on astrophotography, *A Manual of Celestial Photography*.

Focus can be tested on the film by making a series of test exposures and varying the focus during a time exposure. A simple tripod can be used instead of a tracking mount as the stars are allowed to trail across the film. A record is made during the exposure of which trail corresponds to a scale on the focusing ring of the camera lens, or focuser knob or draw tube on a telescope.

The film is then developed and examined under high magnification and the best focus is determined by the star trail with the narrowest width.

A black card placed in front of the aperture of the lens or telescope briefly between focus changes will help to differentiate different settings. Each trail should be of a sufficient exposure to leave a suitable trail on the film for the focal length of the lens being used, and a longer exposure can be used on either the first or last exposure to indicate which trail is the first or last focus setting.

#### Considerations

All factors previously discussed concerning the exact location of the film and its flatness must be considered in these tests also.

Film of the same type to be used for actual astrophotography should be used for the tests as the location of the emulsion, and hence the focal plane, will change depending on the thickness of the film used. Kodak's Technical Pan film is much thinner

than other films and special attention should be paid to this.

Care must be taken to select a star field with stars of the appropriate brightness so the test trails are not over-saturated for the particular film and developer combination chosen making the trails difficult to judge. The same film used for actual astrophotography should be used in the tests as the film's thickness will affect the results.

A starfield near the celestial equator will trail the fastest and is generally preferred.

It is a prerequisite that the focus of the telescope or lens must be repeatable in relation of the markings of the focus indicator scale. Telescopes that focus by moving the mirror can be problematic due to mirror slop. Auto-focus lenses that decouple the internal focusing mechanism can also be non-repeatable.

For both lenses and telescopes, focus should be approached by turning the focuser in the same direction during actual focusing as when the tests were performed.

If this method is repeated on nights of different temperature, a chart can be compiled plotting focus versus temperature change, and exact focus can be accomplished on nights where temperature variations would change the focus.

For a telescope with a rack and pinion focuser, an inexpensive dial micrometer can be used to indicate focus position that is accurate to 1/1000th of an inch, or 25 microns.

#### 7. Hybrid Methods

You can also combine various methods of focusing discussed here.

#### Star Trails Combined with a Hartmann Mask

A variation of the star trail focusing method combines it with a Hartmann Mask.

This method was described in detail in an article in *Sky and Telescope* magazine by Chuck Vaughn in February 1991. It is the method Chuck used to focus his Olympus 350mm f/2.8 telephoto lens for astrophotography.

The method is pretty much the same. The mask should be oriented with the center of the holes on a north-south line so the double images don't overlap on the film.

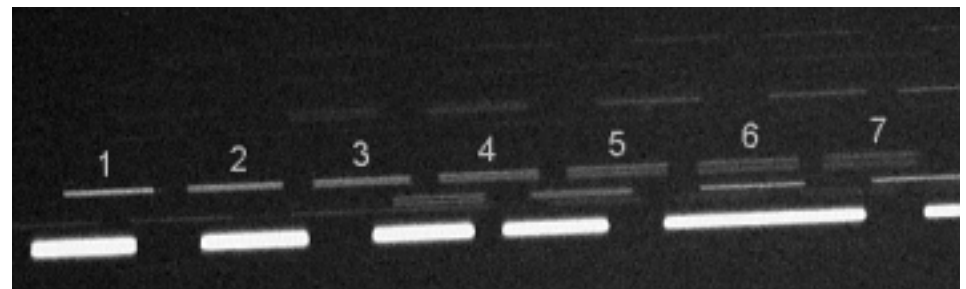
For this test, a focusing scale was constructed with the finest divisions that could be made with an extremely thin and sharp pencil point, and the divisions at the smallest separation possible so that the lines did not merge. The scale was then attached to the focusing ring of a Nikon 300mm f/2.8 lens.

The focusing scale was examined with a high power magnifier and the lens ring turned the least amount possible each time, always approached in the same direction.

You can see on the image the difficulty that a star that is too bright presents. Try to pick a starfield with stars of different brightness and realize that the best ones will be on the fainter side.

Only half of the star trail that is numbered is presented here in order to give the image a sufficient scale so that it could be meaningfully evaluated. The other half not shown on the left side is pretty much a mirror image of the right side of the image.

We can see that the double trails are widest



Hartmann Mask Star Trail Test

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## Focusing for Astrophotography (continued from page 6)

and that they get closer as correct focus is approached with the best focus being the trail numbered 1.

### Focusing Filters

This method is also excellent for determining the focus of filters, especially hydrogen-alpha filters for work with Kodak's Technical Pan film since these filters can hardly be seen through at night and visually focusing them is extremely difficult.

Be careful of temperature shifts. One way to do this is to determine the focus at a given temperature, and mark the focusing ring twice, once without the filter and once with it and record the difference. Then in the future, at any given temperature, you can determine the focus visually without the filter, and move the focus by the amount determined by the previous test for the filter.

### Knife Edge and High Power Magnifier

Joe Mize has described using a knife edge combined with a high power magnifier at the focal plane of the camera.

Joe says the advantage of this setup as being able to focus with the magnifier as one would focus an eyepiece in the telescope, since the magnifier is focused on the knife edge, which presumably is coincident with the location of the film's emulsion.

This method could cause problems however with the eye's accommodation causing inaccuracies in focus if the magnifier is used alone without the knife edge. A magnifier is not needed for knife edge focusing. But if the knife edge is, in fact, where the emulsion of the film will be, it ensures that the focus of the magnifier is in the same place.

A short focal length magnifier with a lot of power will help greatly in the accommodation problem.

A more serious problem if the photographer does not have a second body dedicated to focusing is that you can only focus the camera once at the beginning of the photography session, and if the temperature or focus changes during the night, you cannot

refocus because you have film in the camera. Also, it can be very inconvenient to try to knife edge focus with a refractor pointing overhead.

### 8. Parfocalize an eyepiece with the camera?

It is possible to parfocalize an eyepiece with the film plane of the camera.

The telescope is then focused visually with the eyepiece and the camera is substituted.

The Taurus Astro Camera uses this method and astrophotographers have reported success with it.

The problem again is the eye's accommodation, it can make up for tiny differences in the true focus, and the image will not be exactly focused.

If this method is used, the shortest focal length eyepiece possible should be used to overcome the eye's accommodation.

### 9. Aerial Method

For certain applications where high focal ratios are employed, a convenient method of focusing through the camera is the aerial method where a clear screen is used.

It is called the "aerial" method because with a clear screen there is nothing for the image to project on and the image seems to float in the air.

In photomicrography and planetary astrophotography, high focal ratios, sometimes from  $f/25$  to  $f/100$  can cause a normal focusing screen to be extremely difficult to use because it will be so dark. Special focusing screens that are completely clear or clear in a circle in the center can be used. These screens usually have a cross hair, or double cross hairs etched onto the bottom of the focusing screen that coincides with the film plane.

The problem with focusing an aerial image is, again, the ability of the eye to accommodate and adjust for slight variances in focus.

To overcome this problem with the aerial method, you must focus your eye on the cross hair and keep it focused there while you focus the object at the same time. A difficulty in astrophotography as opposed to photomicrography is that the field will

be black and the cross hairs invisible. They must be illuminated in some method such as shining a red flashlight down the telescope tube during focusing.

Once a visual focus is obtained on the aerial image of an extended source such as a planet, the head is moved back and forth while the cross hair is held in focus. If the object moves relative to the cross hair due to parallax, then the focus is off. When the focus is exact, the object will not move relative to the cross hairs when the head is moved from side to side.

As with any other focusing method that employs the camera's focusing screen and optical system, adding magnification to view the image can greatly improve chances of success.

### 10. Autofocus

Some advanced camera systems, such as the Nikon F5 and Canon EOS, have autofocus mechanisms built into the camera body that work in conjunction with autofocus lenses and are sensitive enough to focus on a star with a sufficiently fast optical system. These body / lens combinations can be used to auto-focus on a bright star or planet (1st magnitude) or object with sufficient contrast, but should be tested first for reliability.

Some of these systems also offer a focus indicator that will work when attached to other optical systems such as telescopes if the  $f$ /ratio speed of the optics is bright enough for the auto-focus detection system in the camera body. It has been reported by Wil Milan that the Nikon system, will work with  $f$ /ratios as slow as  $f/6$ . Again, tests should be undertaken to determine the reliability of such a method with your particular equipment.

It may be difficult to correctly place the star exactly on the auto-focus detector because the detector is relatively small, and although usually well marked on the groundglass, it can be very difficult to see against a black sky in the dark. Shining a red flashlight down the tube of the telescope will illuminate the groundglass and

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## Focusing for Astrophotography (continued from page 7)

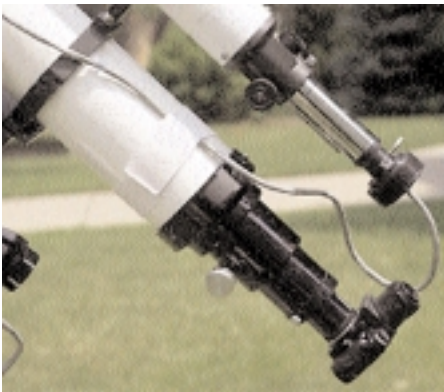
the star can then be correctly positioned on the auto-focus detector. Once correctly placed, the flashlight should be turned off so as to not compromise the auto-focus system which works on contrast detection. Some bodies like the F5 illuminate the focusing rectangle that is active when the shutter button is partially depressed.

### Focusing the ST-4 Autoguider

For astrophotography with an autoguider such as the SBIG ST-4, it can be very helpful to parfocalize the autoguider CCD with a high power guiding eyepiece with a double cross hair reticle.

Once it is parfocal, you just focus the eyepiece and center the guidestar in the cross hair box and it will be nearly centered on the CCD chip.

Accommodation is not much of a problem because I use a short focal length guiding eyepiece and a 3x barlow.



**ST-4 Autoguider**

### Detailed Method

The autoguider must be focused first in this method.

The first couple of times out, practice focusing by the numbers. Familiarize yourself with the operation and variables of the ST-4.

A rough focus can be accomplished by putting a piece of frosted "Scotch" tape over the end of the draw tube of the guidescope or off-axis guider. The ST-4 ccd chip is situated so that it lies at the end of the 1.25 inch barrel, which will be at the end of the

draw tube on the focuser it fits into.

Next, roughly center the star on the CCD chip by using the cross hair box in the guiding eyepiece. Focus the eyepiece by sliding it in and out of the draw tube and not by adjusting the focuser.

Replace the guiding eyepiece with the ST-4 CCD head.

Once a star of correct brightness is located on the CCD chip, the readout if monitored as the focus is changed till the readout if maximized at its greatest numerical value. Care must be taken to not pick a star that is too bright for a given integration and boost or the CCD will saturate. Readings should be kept under a value of 75, and a range of 20 to 60 is probably optimum.

The scope should be allowed to settle down for several integration cycles before values are examined, this allows vibrations from touching the scope to change the focus to die down.

Note that it is normal for readout values to vary by approximately 10 percent due solely to the scintillation of the star from seeing. Try to pick a night of good to excellent seeing to nail the focus of the ST-4.

Keep going on the focus direction until the numbers begin to decrease, meaning you have gone past the point of best focus. Now head the focus back in the other direction until the numbers reach their highest values again. Remember to monitor the numbers for several integration cycles each time you move the focus before drawing any conclusions.

The ST-4 is now focused. Note the focus can change for the ST-4 with different temperatures, just like the focus of a telescope or camera lens.

Lock the guidescope focuser down.

If you are using a separate guidescope, once you have focused the ST-4, mark the draw tube to indicate where the focus is for the ST-4. I scribed a line with an exacto knife, and then colored it with a permanent marker so it would be more easily visible at night in the dark.

I also scribed another line indicating where

the visual focus for the guidescope is with a diagonal. Sometimes when the scope is pointed overhead, the eyepiece can be at an extremely uncomfortable angle when viewed straight through. In these cases a diagonal helps enormously. You can even use the ST-4 with the diagonal in this case if you have sufficient lock downs on the guidescope draw tube and the diagonal.

After you have determined the exact focus of the ST-4, you can parfocalize your guiding eyepiece with it.



**Mark the Draw tube of the Guidescope**

### Parfocalize Your Guiding Eyepiece

After you have determined the focus of the ST-4 and locked the focuser down, place your barlow in the guidescope and lock it down with the two draw tube lock down screws (you do have two don't you?).

Place your guiding eyepiece in the barlow. Now, here's the trick part, focus the eyepiece on a star by sliding it in and out of the barlow. Then lock it down really well, with your two set screws in the barlow. You do have two here also don't you? My second one is hidden here in this photo on the

(continued on page 9)



# San Diego Astronomy Association

## Star Party Report by Michael Dietz

Stars In The Park will be held on Wednesday, October 2nd, and Wednesday, November 6th. Star party nights at the site in Tierra Del Sol will be on October 5th and 12th. We will be at Vallecito Stage Station on October 5th for our Camp With The Stars program.

The 8 star parties currently scheduled for October will, weather permitting, put us over the 100 mark for the 3rd consecutive year. This is truly a remarkable achievement. Many thanks are due to all those of you who have participated in the star party program and who have helped make it such a tremendous success.

On Tuesday October 8th, we will have a 7 p.m. star party at San Pasquel Elementary. Contact Bob Nanz for details.

We will be in Lakeside on the 9th for a 7 p.m. star party at Lemon Crest elementary, located at 12463 Lemon Crest Drive.

On Thursday Oct. 10th, we will have a 7 p.m. star party at Francis Parker School located at 6501 Linda Vista Road.

Our final star party of the month will be in Jamul at Indian Hills Campground, located at 15763 Lyons Valley Road.

As always, please contact one of the star party directors (Rich Bentley, Mike Dietz, Joe McGerald, or Bob Nanz) to let them know that you will be attending. That way they can let you know of any changes or cancellations.

## Program Meeting for October by John Restivo

Our Program Meeting will be on the 16th at Mission Trails Regional Park. I am pleased to announce a special guest speaker, Dr. Art Young, Emeritus Professor of Astronomy at San Diego State University. His topic, "What Causes the Seasons, Really? or How to Barbecue a Chicken, Correctly." Daily and seasonal variation of temperature on the surface of the Earth results from the thermodynamics of heat transfer from the Sun to the Earth. Basic

astronomy textbooks explain how the orientation of the axis of rotation of the Earth to its orbital plane causes changes in the inclination of (noon) sunlight, thereby affecting the (efficiency) of surface heating. Dr. Young will explain how the textbooks are wrong, oversimplifying these astrophysical principles. Dr. Young received his B.S. in Physics (1960) from Allegheny College; M.A. Astronomy (1965) from Indiana University; Ph.D. Astronomy (1967) from Indiana University. He was a Visiting Astronomer at Lick Observatory (1975-76); Visiting Astronomer at Kitt Peak National Observatory (1969-1996); Visiting Astronomer at High Altitude Observatory (1982-1985); Professor of Astronomy at San Diego State University (1967-2000) and Emeritus Professor of Astronomy (S.D.S.U.) (2000-present). Research includes stellar spectroscopy, and he was the first astronomer to use and publish CCD observations of stellar spectra (1979). Dr. Young's talk for this Program Meeting will become an essay for the Griffith Observatory Essay Contest for 2003. His previous four essays have been published in the Griffith Observer. The doors open at 6:30 p.m. Join me in a fun and educational evening with a very prolific lecturer that the SDAA has had pleasure in presenting before. I look forward to seeing many of you there.

## Astronomy 101

(continued from page 4)

starting at Mirach (as 1), count upward, three fainter stars. At the third star you will detect a faint fuzzy patch in the sky. This is M31 or the "Great Andromeda Galaxy." If you have binoculars or a small scope, M31 will appear as a large oval "cloud." This cloud is actually a galaxy containing over 400 billion stars, and is one of the "Local Group" of galaxies in our cosmic neighborhood.

So the next time someone asks "How's your vision?" tell them, "Fine, I can see 2 million light years away." In next month's article, I'll give you a little more ancient information about Andromeda, her husband Perseus and her mother Cassiopeia.

## Focusing for Astrophotography (continued from page 8)

side of the barlow facing down.

You can also parfocalize the guiding eyepiece by itself without the barlow if you don't have one with an inexpensive locking ring that you can get from SBIG.

Next time you go out, the guiding eyepiece will be parfocal with the ST-4, and you can focus it, and center the star in the guiding eyepiece box at the same time, thereby focusing the ST-4 and centering the guidestar on the chip.

Also, I find with the ST-4, the AP 130EDT, and a 12mm guiding eyepiece and 3x barlow, I know exactly how faint of a star I can guide on at a one second integration with a boost of 3 or 4 in the brightness Adjust average mode. With this setup, if I can see the star in the guiding eyepiece, I can guide on it at that setting.

I like to keep the integration time around 1 second to minimize problems with the tracking of the mount. If the seeing is not good enough to permit corrections every second, I use an average of 4 integrations.

I have also attached a simple holder for the ST-4 on the guidescope for convenience when the guiding eyepiece is being used. Instead of hunting around for a place to hang the ST-4 and possibly stress the cable going into the head, I just place it in the holder on the guidescope.

I made the holder from a 1/25 inch stiff eyepiece cap by drilling a hole into the bottom of the cap and mounting it on the guidescope.



Parfocalize the guiding eyepiece with the ST-4 by adjusting the eyepiece in the barlow and locking it



# San Diego Astronomy Association

## SDAA Board Meeting Minutes August 28 & September 10, 2002

In attendance was President Jim Traawek, Vice President John Restivo, Treasurer Jennifer Pesqueira, Recording Secretary Melinda Baker, Star Party Director Michael Dietz, Education Director Bob Wetzel, SDAA Email Group Moderator Scott Baker, Newsletter Co-Editor Julie Quinn, and guests Brian Staples and the Kelly family.

The meeting was called to order at 7:13 pm and the minutes were accepted as read.

**Treasurer's Report :** The total number of members in the SDAA is 539, which is down six from last month. The account standings are as follows: MM \$8356; CD 1 \$5155; CD 2 \$5485; and Checking \$9509 for a total of \$28,505. This report was accepted as read.

**Star Party Report:** The Julian fires cancelled the star party at William-Heise, but the star party at Paso Picacho is still a go. Thus far there have been 84 for the year, and there will be 100 by the end of October. Business cards are being created by Brian Staples for the Star Party Coordinators.

**Education Report:** Lots of new books have been donated, and some will be used in the upcoming banquet.

**New Member Report:** The new member packets are still going out, but the red vinyl which is provided in them is becoming hard to come by. The Yahoo group is going well.

**Pad Report:** Bill Quackenbush was able to complete the electrical hookups for the new pads, with help. The new pads now hve power, but one row of old pads have none. This will be looked into.

**Site Maintenance Report:** The weather has been so warm nothing has been done.

**Observatory Report:** A request was put in to go to a Sea World event with a solar filter.

**Old Business:** The annual barbecue went wonderfully, many thanks to Terry Stewart for his work on the grill. The Board Meeting will be moved back to the old location, and the 2nd Tuesday of every month.

**New Business:** There will be a star party at Imperial Beach Tuesday, September 10th. The media will be there, and volunteers are needed. An author will be coming to The Space Theatre in October. The media will be there, and volunteers with solar filters are needed. The lock combinations will soon be changing.

**Banquet Business:** The Banquet will be held

on January 18th at the Hanalei Hotel from 6:30pm to midnight. The food will be served buffet style, the invitations will be in the upcoming newsletter.

The meeting was adjourned at 8:26pm.

## Treasurer's Report by Jennifer Pesqueira

With the addition of the following new members we now have 554 SDAA members. Please welcome our new members: Vincent Bert, Richard Chen, Jim Jordan, Donna Lupiancci, Everett Mehner, Andy Tripp, and Tim Woodard. Welcome to SDAA! May you enjoy clear dark skies.

I had a computer snaffoo! Can members who recently sent me an address change, new phone number or new email address, please send it to me again at treasurer@sdaa.org.

Sorry for the hassle. Thank You.

*Clip and Save*

## 2002 Board of Directors and Chairpersons

**President**, Observatory Director, Jim Traweek  
email: President@sdaa.org .....619-477-7279

**Vice President**, John Restivo  
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**East County Star Party Coordinator**, Joe McGerald  
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**So. County Star Party Coordinators**, Rich Bentley & Stewart Hall  
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**TDS Site Director**, Terry Stewart  
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## SDAA Calendar of Events October 2002

S	M	T	W	T	F	S
		1	2 Stars in the Park 7 pm	3	4	5 Star Party at Tierra Del Sol  Camp with the Stars at Vallecito Stage Station
6	●	7	8 SDAA Board Meeting - 7 pm  San Pasquel Elementary 7pm	9 Lemon Crest Elementary 7pm	10 Francis Parker School 7pm	11
12						12 Star Party at Tierra Del Sol
13	●	14	15	16 Program Meeting	17	18
19						
20	○	21	22	23	24	25
26						
27		28	29	●	30	31

# The Back Page

## TDS Combo Change by Jim Traweek

As a security precaution, we change our gate combinations annually. This includes the front gates, electric box, well pump, and walk thru gate to the warm room. Check the mailing address label on your October newsletter (yes, this one) for the new combo. It is not posted here, because the newsletter goes on the "world wide web". The change will be in effect after the October 5th star party. Remember to write it down and put in your eyepiece case or someplace that is sure to come to the site with you. Restroom and warm room combos remain unchanged.

## FOR SALE:

LX-90 with Pelican Case, Meade 2" Star Diagonal, 40mm Orion Kellner Eyepiece (2"), Meade 1.25" diagonal, 26mm eyepiece, & dewshields. Like-new, with all packing materials. \$1,500.00  
Marty Dine (858) 270-8009

## Acknowledgments by Michael Dietz

The club would like to thank Bill Armstrong, Dean Belcher, Rich Bentley, Tim Boller, Jim Brown, Peter DeBaan, Erik DeVine, Mike Dietz, Jim Eely, S2 Hall, Jose Magsaysay, Nick Marilao, Ken Olson, Jennifer Pesqueira, Ed Uribe, George Varga, Charlie Wallis, Bill Whalen, and Marjorie White for helping with the school star parties, Camp With The Stars, and Stars In The Park programs. Your efforts are greatly appreciated by the students, parents and teachers.

## Banquet Update by Diana Kelly

We have picked out a place to host next years event: The Red Lion Hanalei Hotel. If you have any specific dietary requirements, please feel free to e-mail Shawn Kelly at [sdkelly@solarturbines.com](mailto:sdkelly@solarturbines.com). I will need to submit these requests no later than Nov.1st,2002. In the next newsletter: The guest speaker and menu as well as invitations.

## MEMBERSHIP INFORMATION

Send dues and renewals to P.O. Box 23215, San Diego, CA 92193. Include any renewal cards from Sky & Telescope, Astronomy, or Odyssey magazine in which you wish to continue your subscription. The expiration date shown on your newsletter mailing label is the only notice that your membership in SDAA will expire. Dues are \$35 for Contributing Memberships; \$25 for Senior (Basic) Membership; \$3 for each Family membership. In addition to the club dues the annual rates for magazines available at the club discount are: Sky & Telescope \$29.95, Astronomy \$29, and Odyssey \$25.46. Make checks payable to S.D. Astronomy Assn. PLEASE DO NOT send renewals directly to Sky Publishing. They return them to us for processing.

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