

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



August 1995 — Issue #223

v7.27

A Method of Checking Eyepieces for Defects

by Rick Blakley

While inspecting an improperly assembled Kellner eyepiece some years ago, I stumbled on a method of checking newly-acquired eyepieces for manufacturer-generated or user-induced defects on the lenses. I had received the eyepiece from a well known supplier that guaranteed satisfaction, and so I chose to give the item a closer look-over. Right away, I noticed that the barrel carrying the field lens was screwed into the eyelens cap backwards. A stop, that was properly positioned ahead of the field lens toward the telescope's objective, was, instead, positioned between the field lens and eye lens. No Kellner has an arrangement like that (though the Huyghens does)! As I held the eyepiece

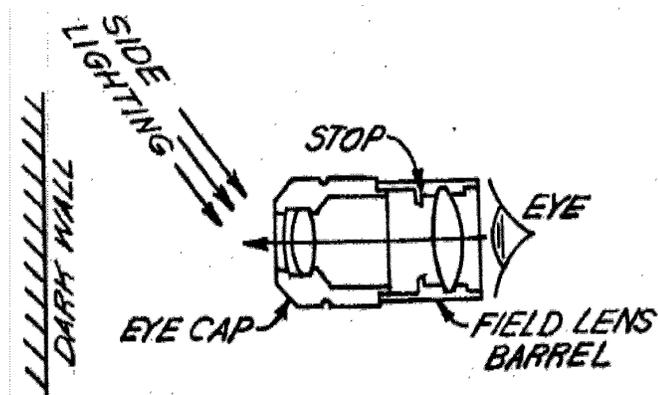


Figure 1

up at an angle to the sun to illuminate the interior (to locate the stop inside), I noticed glints coming off of the eyelens as I peered through the field lens. When I turned the eyepieces, I saw that the glints did not change direction, in fact, they were *precisely* parallel. I touched the eyelens to assure that I was not observing fingerprints on its surface; I was not. I finally decided that the glints were coming from parallel scratches, illuminated by the sun, that were left on the glass by the manufacturer! I

Quick Calendar

SAC Meeting
7:30 PM, Friday, August 4

SAC Star Party
Buckeye Hills Recreation Area
Saturday, August 19

found that I could alter the distance to the eyelens by screwing the field-lens barrel to differing positions, and inspect any of the surfaces of the two-element eyelens, including, with defects present, the cemented interface. I then removed the eyelens cap and inspected the field lens in its barrel looking through the "wrong" end of the eyelens cap. The field lens was also bad! I was annoyed with having to contend with returning the product, but I felt the inspection technique was important, so that the effort was not a total loss. This eyepiece became the first of four I was to reject from this supplier (**ALL** came with the stop in the wrong position)!

Figure 1 shows the arrangement I have first described, and can be used whenever an eyepiece barrel carrying one lens element can be separated from the eyelens cap (I have shown the stop in its improper position, this allows the eyelens to be "in focus"). Pointing the eyepiece toward a dark wall greatly enhances any glinting. One should take care to avoid allowing the sun a direct path to the eye. Figure 2 provides a method for inspecting eyepieces that can't, or shouldn't, be disassembled.

SAC Officers

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Such-A-Deal

SUCH-A-DEAL is a place to advertise equipment, supplies, and services related to amateur astronomy. This is a free service for SAC members and friends. SAC is not responsible for the quality of advertised items or services.

For Sale—10" Meade Dobsonian $f/4.5$. Includes Telrad & 3 1 1/4" Meade MA eyepieces. Mirror has passed all tests with flying colors. \$575 firm. Call Doug Allen. Eves. 935-4455

For Sale—Meade 10" $f/6.3$ Schmitt-Cassegrain Telescope. Set-up for SBIG CCD. Includes solar filter, off-axis guider and choice of one eyepiece — \$1500. Call Adam Sunshine at 780-1386.

The lens I use as a magnifier is a plastic one of about four-inch focus on eyepieces of 1/2 inch focal length or greater. For eyepieces with foci less than 1/2 inch, I use a magnifier that has that about a two inch focus.

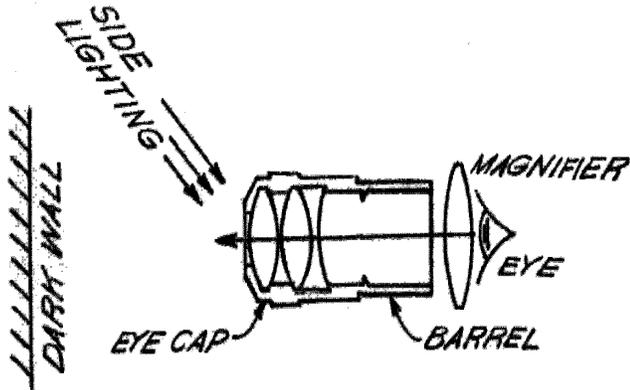


Figure 2

An eyepiece can be inspected from either end. One must simply find the position of the magnifier that will reveal the lens surface desired for inspection. This can be accomplished quite easily, and a help is to realize that the magnifier acts as the eyepiece of a microscope. The idea is to observe the surface of the *next lens over*. This is easy for two-component systems (Kellners, Ramsdens,

Huyghens, Plössls, RKE's, and Orthoscopies), and may work for three-component systems (I haven't tried it with those).

As one moves the magnifier towards the first component in the observing direction, the component's outside face will come into view, but it will not be well illuminated and the view may be awash with reflections from the room. The first component's second face (its interior face) will come into view next and will be inadequately illuminated. Reflections from the first face may still be bothersome. Soon, the first face of the second component will come into view. Any reflections from the first component will likely be out of focus (the observer's position may well block light from the room playing on the first component anyway).

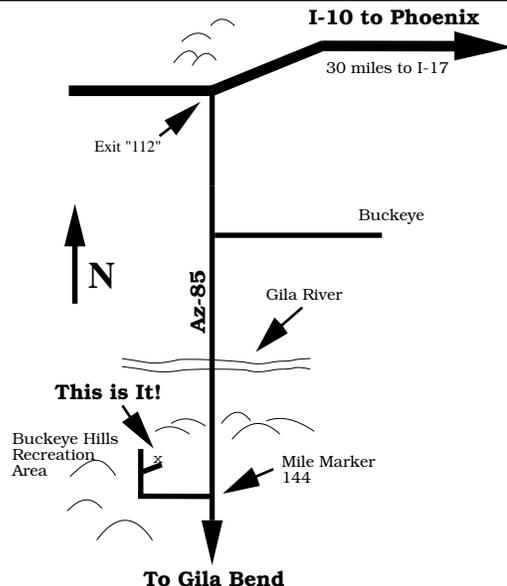
If dust, oil, coating or minor-surface defects on the first (interior) surface of the second component are not seen, move the eyepiece toward the sun a bit, taking care to avoid the sun flashing through the component into the eye. At some angle to the sun, the sorts of light-scattering defects or contaminants just listed should appear. As they do, turn the eyepiece around its optical axis. Any scratches there will flash in and out of view as their angle with the sun becomes perpendicular. Pits will also be shown. Moving the magnifier in yet further will bring

Directions to SAC Events

SAC General Meetings 7:30 PM at Grand Canyon University, Fleming Building, Room 105 — 1 mile west of Interstate 17 on Camelback Rd., north on 33rd Ave., second building on the right.

SAC Star Parties at Buckeye Hills Recreation Area Interstate 10 west to Exit 112 (30 miles west of Interstate 17), then south for 10.5 miles, right at entrance to recreation area, one-half mile, on the right. No water and only pit toilets. Please arrive before sunset; allow one hour from central Phoenix.

SAC Deep Sky Subgroup Meeting at John & Tom McGrath's, 11239 N. 75th St., Scottsdale, 998-4661 — Scottsdale Rd. north, Cholla St. east to 75th St., southeast corner.



the second (exterior) face of the second component into view, and it can be inspected in the same way. Any oil or dirt on the exterior surfaces of components may appear to be defects, and so the surfaces should be cleaned, if possible, before checking. Soon, however, the difference between scratches and smears will be obvious as scratches tend to glisten and flash as the correct angle to the light is achieved, while the response of smears is rather constant, by contrast, for any any.

Inspecting a component's surfaces from the "opposite" end of the eyepiece has three advantages:

- (1) Annoying reflections from the inspected surface are eliminated.
- (2) A bright side-light source (the sun) is conveniently available for dramatically lighting any defects.
- (3) A dark background is seen directly through the lens

system facilitating observation of the defects.

Perhaps using a similar method will enhance the judging of "loose" lenses and uncoated mirrors, by inspecting through their backs.

I inspected my entire collection of eyepieces using these methods, and found that the simpler designs usually had the better lenses.

Bits and Pieces

Minutes of the July Meeting

Upon opening the meeting President Bob Gardner asked for and got a treasurers report from Adam Sunshine. After which six visitors introduced themselves.

AJ Crayon announced the July Deep Sky Meeting and Rich Walker discussed an upcoming Public Star Party

Comet Comments

by Don Machholz

(916) 346-8963 CC204.TXT July 6, 1995

Periodic Comet d'Arrest moves rapidly southward as the earth overtakes it in our path around the sun. Meanwhile, Periodic Comet Jackson-Neujmin begins to brighten in our morning sky. It should become magnitude eleven in September, when it approaches to within 0.43 AU of us.

6P/d'Arrest					
Date	RA-2000-Dec	Elong	Sky	Mag	
07-22	23h05.3m	+01°02'	131°	M	9.3
07-27	23h19.7m	-01°47'	134°	M	9.2
08-01	23h33.5m	-04°57'	136°	M	9.1
08-06	23h46.6m	-08°23'	139°	M	9.1
08-11	23h58.8m	-11°58'	142°	M	9.1
08-16	00h09.8m	-15°35'	144°	M	9.2
08-21	00h19.5m	-19°06'	146°	M	9.3
08-26	00h27.7m	-22°24'	147°	M	9.5
08-31	00h34.4m	-25°24'	147°	M	9.7
09-05	00h39.6m	-28°01'	147°	M	9.9
09-10	00h43.5m	-30°13'	147°	M	10.2

Two faint comets have been recovered recently, both by Jim Scotti at Kitt Peak. Comet P/1995 M1 (Shoemaker-Levy 4) was recovered on June 22 at mag-

nitude 22. The following night Scotti recovered Comet P/1995 M2 (Parker-Hartley). It orbits the sun in 8.9 years. Neither will become bright enough for amateur's scopes.

Kazimeras Cernis of Vilnius, Luthuania has recently presented a paper on comet hunting. With over 2000 hours of comet hunt over 20 years, Cernis makes some keen observations on the current state of the subject. He found the average search time for a visual comet discovery from 1975 through 1994 was 410 hours. But when we compare the Northern Hemisphere and Southern Hemisphere, we find a jarge difference. In the Northern Hemisphere Cernis averaged 615 hours per find, while the Japanese observers averaged 627 hours for 25 finds and I averaged 610 hours. For Southern Hemisphere comet hunters the average is only 180 hours for each comet discovery.

58P/Jackson-Neujmin					
Date	RA-2000-Dec	Elong	Sky	Mag	
07-22	21h22.3m	+03°11'	150°	M	13.4
07-27	21h24.6m	+02°46'	153°	M	13.1
08-01	21h26.7m	+02°06'	157°	M	12.9
08-06	21h28.7m	+01°09'	161°	M	12.7
08-11	21h30.7m	-00°05'	165°	M	12.4
08-16	21h32.8m	-01°38'	168°	M	12.2
08-21	21h35.2m	-03°28'	169°	M	12.0
08-26	21h38.2m	-05°34'	169°	E	11.9
08-31	21h41.8m	-07°53'	167°	E	11.7
09-05	21h46.2m	-10°21'	163°	E	11.5
09-10	21h51.7m	-12°52'	159°	E	11.4

6P/d'Arrest
 1995 July 27.36197
 1.34587 AU
 178.0504°
 138.9874°
 019.5232°
 0.6140404
 6.51 years
 MPC 20122

Orbital Elements
 Perihelion Date
 Perihelion
 Argument of Perihelion
 Ascending Node
 Inclination
 Eccentricity
 Period
 Source of 2000 Elements

58P/Parker-Neujmin
 1995 Oct. 06.61876
 1.381125 AU
 200.3470°
 160.7177°
 013.4779°
 0.6614285
 8.24 years
 MPC 20123

What's Up

by Steve Coe

August 1995

Sagitta

This is the time of year when the magnificent glowing band of the Summer Milky Way stretches from horizon to horizon, north to south. I absolutely adore the view of Our Galaxy, naked eye, binoculars or telescope, it is spectacular! Of all the beautiful and brand new things Dave Fredericksen and I got to see when we visited Australia, I remember best the view of the Milky Way ablaze with Sagittarius and Scorpius straight overhead. Of course, from the point of view of the Australians, it is the Winter Milky Way. No matter, even if it is cold, that panorama will keep your feet warm. We do live in a beautiful part of The Galaxy. So, let us move from the obvious Milky Way constellations and this month try Sagitta, the Arrow.

NGC 6838 (M 71) This compact star cluster has been called a compressed open cluster and a globular. It is bright, pretty large, very rich and much compressed at 135X in my old 17.5". At 165X on a good night, I can see an arrowhead shape to the cluster and count 56 stars across the mottled face of this cluster. The cluster is easy to pick out of the Milky Way with the 10 X 50 binocs. I have observed this object in several large scopes and it is always difficult to determine where the cluster stops and the background stars begin. In the Lines' 20" f/6 at 150X and in the Lowell Observatory 24" Clark refractor at 380X this very compact cluster was fascinating. There are many curving lines of stars with dark lanes between them. Both of these large, long focus scopes would show about 100 stars resolved. It is entered as a globular in Sky Catalogue 2000 and the position is given as 19 53.8 +18 47.

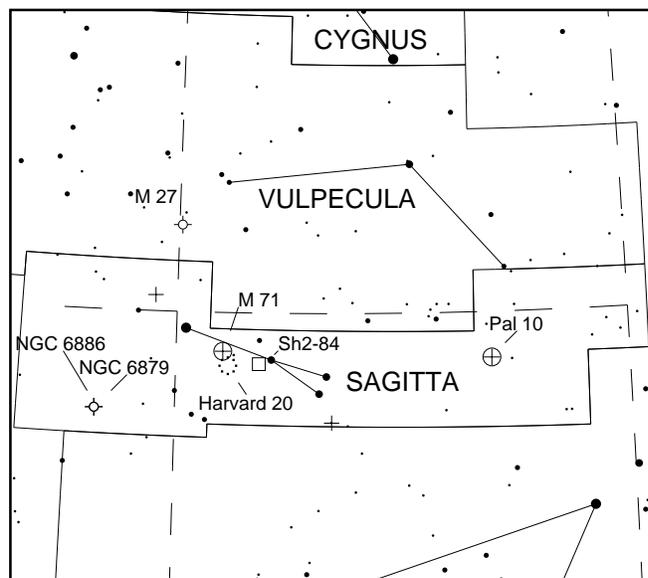
NGC 6879 is pretty bright, very small, not brighter in the middle. It is just a non-stellar disk at 220X in the 13" f/5.6. Averted vision makes it grow. This tiny planetary is at 20 10.5 +16 55.

NGC 6886 Pretty bright, very, very small, little elongated. Just a central star with a tiny, elongated haze around it at 220X. The grey-green color gave it away, located at 20 12.7 +19 59.

Palomar 10 is located at 19 18.2 +18 34. It is one of the globular clusters spotted on the survey plates taken at Mt. Palomar using the 48" Schmidt camera, hence the name. Seeing as how all the bright

and easy globulars had been discovered by 19th century observers, these are all quite difficult objects to spot. Using the 13" I saw Pal 10 as: very faint, pretty small, somewhat brighter in the middle at 100X. No stars were seen with any power up to 320X. It is just a grainy spot at all powers.

Harvard 20 is an open cluster found on the survey plates taken at the turn of the century by the Harvard Photographic Patrol. It is pretty faint, pretty small and elongated. A poor cluster of 15 stars. It is not well detached at 100X. Located at 19 53.1 +18 20.



Sh2-84 is one of a list of faint emission nebulae found by Sharpless from the red Palomar Survey plates. I see it as pretty faint, pretty large, much elongated at 135X with the UHC filter. The south side of the nebula is brighter and several stars are involved. It looks somewhat like a small version of the California Nebula. This curved gas cloud can be found at: 19 49.0 +18 24.

Double Stars in Sagitta

HN 84 this wide binary star is at the tail feathers of the Arrow. At 100X, they form a lovely blue and gold pair. The "HN" designation stands for Herschel Number. Located at: 19 39.4 +16 34.

X SGE is one of the bizarre Carbon stars, which have the spectra of carbon soot displayed within their spectral lines. Many of these stars display beautiful colors. I see X Sge as medium orange in a gorgeous field of view. It is at: 20 02.9 +20 30.

at Thunderbird Park. He will have more details when they are finalized.

For Show-n-Tell Pierre Schwaar had a video tape of a ring less Saturn, Atlantis/Mir on a local TV news program and Jupiter with its Great Red Spot.

After the break Susan Pritchard introduced the speaker for the evening. He was Randall Whitlock who

spoke on "little bitty planetary bodies" which we know as meteorites. His discussion centered on the origins, classification, where to look and how to identify meteorites. Randall is also assisting Peter Manly author a book on meteorites.

—A.J. Crayon, SAC Secretary

August 1995

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
All Times are Mountain Standard Time					SAC Meeting Grand Canyon University, Fleming Rm. 105	
		1	2	3	4	5
6	First Quarter Moon 5:53 A.M. 7	8	EVAC Meeting (SCC: Rm. PS172) 9	Full Moon 11:15 A.M. Sun enters Leo 4 P.M. 10	Yesterday Earth passes back through the plane of Saturn's rings 11	Perseid Meteors Peak: 6 A.M. and 9 P.M. Z.H.R. 60+ 12
13	14	15	16	Last Quarter Moon 8:03 P.M. 17	18	SAC Star Party Buckeye Hills (members&guests) 19
Venus at superior conjunction with the Sun (moves into evening sky) 20	21	22	23	24	New Moon 9:30 P.M. 25	Mars 2.0°NNE of Spica (evening) 26
27	28	29	30	31		

Magazines & Discounts

Club members may subscribe to astronomical magazines at reduced rates through the club Treasurer. See the Member Services Form on the back page of this newsletter. Furthermore, club members are encouraged to align their subscriptions with the Jan.–Dec. calendar year. This eases the burden both on the Treasurer and the Publisher by permitting a single Group Renewal to be placed in the autumn for the upcoming calendar year.

Those members who experience problems with their subscriptions to *Astronomy* magazine may call Kalmbach Publishing Customer Service at (800) 446-5489.

Those members who experience problems with their subscriptions to *Sky & Telescope* magazine may call Sky

Publishing at (800) 253-0245.

Besides the club discount on *Sky & Telescope* magazine, Sky Publishing offers club members a 10% discount on all other Sky publications. This means books, star atlases, observing aids, Spotlight prints, videos, globes, computer software, and more.

Club members who subscribe to *Sky & Telescope* through the Club Discount Plan may order Sky publications directly, at the above toll-free number, without going through the club Treasurer. Simply mention the Club Discount Plan and give the Saguaro Astronomy Club name to receive the discount. Sky Publishing will check their records to verify that you are eligible to receive the discount.

Saguaro Astronomy Club Member Services Form

Membership

Memberships are for the calendar year and are prorated as follows: Jan - Mar 100%, Apr - Jun 75%, Jul - Sep 50%, Oct - Dec 25%.

- \$20.....Individual Membership (\$28 for '96)
- \$30.....Family Membership (one newsletter) (\$42)
- \$100.....Business Membership (includes advertising)
- \$4.....Nametag for members
- \$10.....Newsletter Only (\$14 for '96)

Subscriptions

The following magazines are available to members. Subscribe or renew by paying the club treasurer. You will receive the discounted club rate only by allowing the club treasurer to renew your subscription.

- Sky & Telescope.....\$24.00 for one year
- Astronomy.....\$20.00 for one year

Write your name, address, and phone number in the space below.

Make checks payable to SAC.
Mail the completed form to:
Adam Sunshine
SAC Treasurer
20401 N 30th Drive,
Phoenix AZ 85027

SAC and SAC Meetings

Saguaro Astronomy Club (SAC) was formed in 1977 to promote fellowship and the exchange of scientific information among its members—amateur astronomers. SAC meets monthly for both general meetings and star parties, and regularly conducts and supports public programs on astronomy.

SAC meetings are usually held on the Friday nearest the full moon. This means that over the course of the year, meetings are not held on same week of the month. The same is true of the club's star parties. Star parties at Buckeye Hills are mostly held on the Saturday of the third quarter moon.

1995 SAC Meetings

Jan. 13
Feb. 10
Mar. 17
Apr. 14
May 12
Jun. 9
Jul. 14
Aug. 4
Sep. 8
Oct. 6
Nov. 3
Dec. 9 Party

1995 SAC Star Parties

Date	Sunset	Moonrise
Jan. 28	5:56pm	5:15am
Feb. 25	6:22pm	4:00am
Mar. 25	6:41pm	2:50am
Apr. 22	7:05pm	1:30am
May 20	7:26pm	12:10am
Jun. 24	7:42pm	3:00am
Jul. 22	7:36pm	1:40am
Aug. 19	7:11pm	12:20am
Sep. 23	6:24pm	5:15am
Nov. 18	5:25pm	2:40am
Dec. 16	5:23pm	1:25am

SAC General Meetings 7:30 PM at Grand Canyon University, Fleming Building, Room 105 — one mile west of Interstate 17 on Camelback Rd., north on 33rd Ave., second building on the right.

SACNEWS

c/o Paul Dickson
7714 N 36th Avenue
Phoenix AZ 85051

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