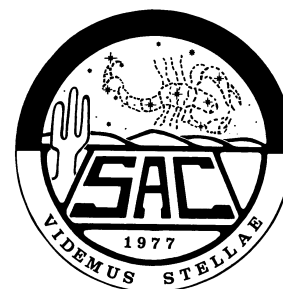


Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



November 1991 — Issue #178

The Ugly Truth about those Beautiful Sunsets

by Tom Polakis

Anybody who cared to look to the west after sunset in recent months has probably noticed some pretty spectacular colors. While the typical clear-night Arizona twilight appears as a blue-green shade near the horizon and progresses into a deep blue color further up, recent twilights have displayed strong orange and pink hues that show remarkable structure. It's pretty apparent that the ash cloud from the recent eruption of the Mount Pinatubo volcano in the Phillipines is affecting the upper atmosphere. And while this may be rewarding astronomers with exquisite twilight displays, it isn't helping our views of the night sky.

Brian Skiff of Lowell Observatory recently provided me with some interesting data that shows just how much the volcanic ash affected Flagstaff. As part of his observations with the 21-inch telescope on Mars Hill, Lowell astronomer Don Thompson measured atmospheric ex-

Quick Calendar

Star Party
Buckeye Hills Recreation Area
Saturday, November 9

Saguaro Astronomy Club meeting
Friday, November 22
Elections for 1992 SAC Offices
Swap Meet

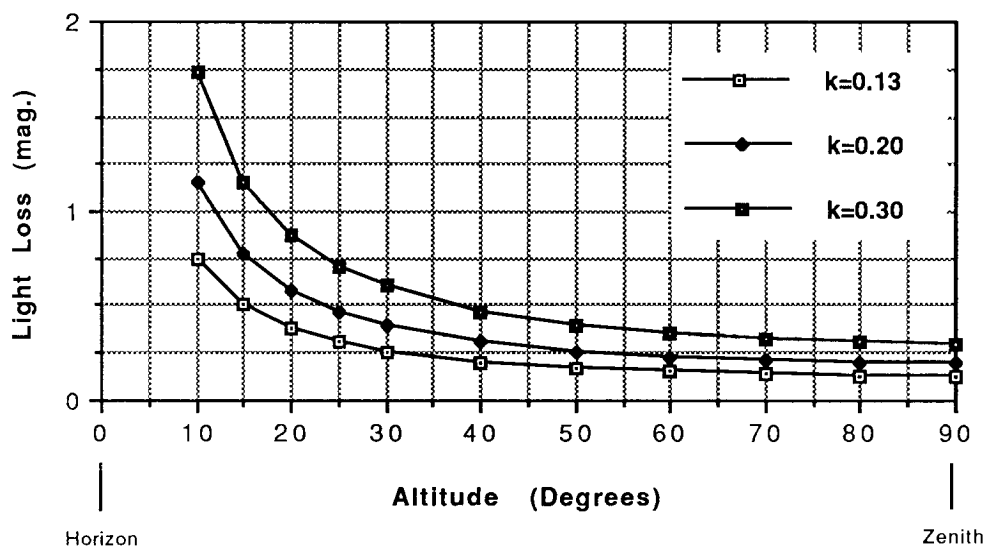
tinction on clear nights in the months of June, July, and August. He plotted extinction in yellow light and the difference in extinction between yellow and blue light. The data was obtained by observing standard stars through yellow and blue filters at various altitudes.

Extinction is merely a quantitative way of expressing sky transparency. The value of an extinction coefficient is multiplied by the number of airmasses the observer is looking through to get the difference in magnitudes of an object relative to how it would appear with no atmosphere. In other words, if we are viewing through two airmasses with an extinction coefficient of 0.15, then the star appears 0.30 magnitudes dimmer than it would

from space. The number of airmasses depends on the angle of the object off the horizon. Obviously, looking straight up corresponds to looking through one airmass. As we approach the horizon, however, the number of airmasses increases dramatically.

The Lowell measurements showed the typical summer extinction values of around 0.13–0.14 through early July even though Pinatubo had already erupted several weeks earlier. But by August, the measurements showed an increase in extinction to values around 0.18. The extinction climbed as high

Light Loss vs. Altitude & k



as 0.30 on some early-September nights before settling down to around 0.20. The difference between blue and yellow extinction was also altered by the volcano. The blue light was more dramatically affected by the ash cloud as the b-minus-y extinction climbed from its typical 0.055 to around 0.070. The ash cloud is obviously more of a red filter than the familiar 'neutral density' of desert dust.

What does all this mean for those of us who like to view an occasional galaxy or nebula from Buckeye Hills? Not much, as long as you keep the scope pointed well above the horizon. The graph shows how the light loss varies with altitude for three different values of extinction. The lowest curve is for a typical Flagstaff extinction of 0.13. The middle and upper curves are for high and extremely high extinctions of 0.20 and 0.30. Note how, especially for the upper curve, the dimming becomes very significant near the horizon. So if you want that great view of the Fornax galaxy cluster, remember you could be losing nearly a magnitude relative to an ash-free night. For objects at least halfway to the zenith, however, most amateurs will be hard-pressed to notice the loss of a couple tenths of a magnitude due to the ash. The curves shown here are based on Flagstaff's high elevation and should realistically all be shifted up a constant amount for the dusty, low desert observing sites around Phoenix.

While not many of us are equipped with photometers, there are obvious signs to look for to tell whether or not you're in for a great night. Note the appearance of the horizon just after sunset. There should be no 'structure' visible in the glow and the color should be nearly deep blue. During the day, the immediate vicinity of the sun (not the sun itself!) should be nearly the rest of the sky's color, not a pale blue or white.

Hopefully, by the time you see this in print, all of this will be only an academic discussion as the volcanic ash will have dispersed further. Not likely, as past experience has shown that this stuff could be with us for a couple years. Also, I just looked outside tonight and witnessed yet another beautiful, I mean ugly, pink twilight.

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.

Bits and Pieces

Coming Events

Elections are coming! Nominations for the offices of the Saguaro Astronomy Club, that began at the October meeting, are still open until the start of the November meeting. If you weren't at the October meeting and weren't nominated for an office and would still like to be nominated, please contact SAC President Paul Lind.

Those already nominated are: for President, Paul Lind; for Vice-President, Steve Coe; for Treasurer, Bob Dahl; for Secretary, A.J. Crayon and Susan Morse; for Properties, Rich Walker.

The end of the year party is almost upon us. See details in next month's newsletter.

Several Public Star parties are being planned for the Spring. Currently it looks like South Mountain in February, Reach 11 in March, and Thunderbird Park in April.

1991 SAC Meetings

November 22
December 14 Party
— 1992 —
January 17
February 14
March 20

1991 SAC Star Parties

November 9
December 28
— 1992 —
January 25
February 22
March 28

December Newsletter Deadline

Be sure to mail items to be included in the newsletter by Nov 20. Items sent later will not be included, but will be inserted in the next newsletter. It will also be possible to hand-in items at the meeting.

Letters to the Times

Alibi for Speeders

To the Editor:

As a pedestrian, I commend the activities of New York City's Police Department in enforcing traffic laws that apply to intersections (news story May 14). Our endangered species needs all the protection the law affords.

As a physicist, however, I must point out that many drivers who accelerate through yellow lights or travel through red ones may not be deliberately defying regulations. To a motorist driving fast enough, the Doppler effect can cause a light that appears yellow to the stationary observer to shift to green, and a red light can shift to yellow.

The speeds required for the Doppler effect seem to be attained by a significant percentage of city drivers.

Daan Zwick
Rochester May 15, 1983

Beware of Speed Traps

To the Editor:

I advise motorists not to use the Doppler effect as a defense for running a traffic light, as Daan Zwick appears to suggest in a May 28 letter. In order for red to appear yellow to the driver, an automobile would have to be approaching the traffic light at a speed of 54,878,937 miles per hour. For yellow to appear green, the required speed is a mere 17,416,480 miles per hour.

Allan Koszyn
Yonkers, N.Y. May 28, 1983

Comet Comments

by Don Machholz

Three new comets, two very unusual, have been discovered lately. Periodic Comet Hartley remains brighter than expected, continued positions are provided.

Comet McNaught-Russell (1991v): Robert McNaught and Kenneth Russel photographed this object in early August at magnitude seventeen. This comet will be closet the sun next April at 3.3 AU but should not get much brighter.

Comet McNaught-Russell (1991w): The same team picked up this object on Sept. 3 at eighteenth magnitude. The orbit suggests a near record perihelion of 7.1 AU. It will not get much brighter.

Periodic Comet Spacewatch (1991x): T. Gehrels of Kitt Peak, using the 36-inch Spacewatch telescope, discovered a twenty-first magnitude comet on Sept. 8. The orbit is of only 5.32 years. It was closest the sun (1.58 AU) last December.

Don Machholz (916) 346-8963

SAC Officers

| | | |
|----------------------------|-------------------|----------|
| President | Paul Lind | 863-3077 |
| Vice President | Virginia Campbell | 253-3025 |
| Secretary | Phil Dahl | 839-8990 |
| Treasurer | Bob Dahl | 582-5526 |
| Properties | Rick Rotramel | 439-4701 |
| Chairman of SACNEWS/Editor | Paul Dickson | 841-7044 |

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.

Telescope—Coulter Odyssey 8 with Telrad, better than current model — let me show you why, \$375, Pete Burggraaf, 995-4273 (days) 995-1964 (evenings).

Telrad Base—\$9.00, Pete Burggraaf, 995-4273 (days) 995-1964 (evenings).

Darkroom Timer—CP-900 Touch Timer, digital, programmable, controls enlarger and safelight, times processing, \$90 or trade for Televue Plössl, Pete Burggraaf, 995-4273 (days) 995-1964 (evenings).

Telescope—Meade DS-10 10" *f*/4.5 Newtonian with finder, 2 eyepieces, and 2x barlow. Includes declination and variable RA motors. \$850. Bob Lindquist 759-1809.

| Periodic | Comet | Hartley | 2 | (1991t) |
|----------|------------------|------------------|-------|---------|
| Date | RA-1950-Dec | RA-2000-Dec | Elong | Sky Mag |
| 10-26 | 09h45.2m +06°00' | 09h48.2m +05°47' | 65° | M 10.4 |
| 10-31 | 09h56.6m +04°23' | 09h59.2m +04°08' | 67° | M 10.6 |
| 11-05 | 10h06.6m +02°49' | 10h09.2m +02°35' | 69° | M 10.8 |
| 11-10 | 10h15.8m +01°21' | 10h18.4m +01°06' | 71° | M 10.9 |
| 11-15 | 10h24.1m -00°02' | 10h26.7m -00°17' | 74° | M 11.1 |
| 11-20 | 10h31.5m -01°20' | 10h34.1m -01°35' | 77° | M 11.3 |
| 11-25 | 10h38.1m -02°33' | 10h40.6m -02°48' | 80° | M 11.4 |
| 11-30 | 10h43.7m -03°40' | 10h46.2m -03°56' | 83° | M 11.6 |
| 12-05 | 10h48.4m -04°42' | 10h50.9m -04°58' | 87° | M 11.7 |

| Periodic | Comet | Wirtanen | (1991s) |
|----------|------------------|------------------|---------------|
| Date | RA-1950-Dec | RA-2000-Dec | Elong Sky Mag |
| 10-26 | 10h45.9m +13°30' | 10h48.6m +13°13' | 54° M 10.9 |
| 10-31 | 11h02.3m +12°36' | 11h05.0m +12°19' | 55° M 11.0 |
| 11-05 | 11h17.9m +11°42' | 11h20.6m +11°25' | 56° M 11.2 |
| 11-10 | 11h32.7m +10°49' | 11h35.4m +10°33' | 57° M 11.4 |
| 11-15 | 11h46.8m +09°59' | 11h49.4m +09°42' | 59° M 11.6 |
| 11-20 | 12h00.2m +09°10' | 12h02.7m +08°54' | 61° M 11.8 |
| 11-25 | 12h12.8m +08°25' | 12h15.3m +08°08' | 62° M 12.0 |
| 11-30 | 12h24.7m +07°43' | 12h25.3m +07°27' | 65° M 12.1 |

| Periodic | Comet | Faye | (1991n) |
|----------|------------------|------------------|---------------|
| Date | RA-1950-Dec | RA-2000-Dec | Elong Sky Mag |
| 10-26 | 01h46.4m +06°10' | 01h49.0m +06°25' | 174° E 10.0 |
| 10-31 | 01h47.2m +04°58' | 01h49.8m +05°13' | 169° E 10.0 |
| 11-05 | 01h48.3m +03°51' | 01h50.9m +04°06' | 164° E 10.0 |
| 11-10 | 01h49.8m +02°52' | 01h52.4m +03°07' | 159° E 10.0 |
| 11-15 | 01h51.8m +02°30' | 01h54.4m +02°17' | 154° E 10.1 |
| 11-20 | 01h54.4m +01°48' | 01h56.9m +01°38' | 149° E 10.1 |
| 11-25 | 01h57.6m +00°58' | 02h00.2m +01°10' | 145° E 10.2 |
| 11-30 | 02h01.5m +00°58' | 02h04.0m +00°54' | 141° E 10.3 |
| 12-05 | 02h06.0m +00°25' | 02h08.6m +00°48' | 137° E 10.4 |