Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS

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The Table Mesa Blowout
by Tom Polakis

Some would use the word persistence, others might call it stupidity, but eight of us showed up at Table Mesa on Saturday, January 27, for an ill-fated observing session. All weather forecasts called for clear but windy conditions but we knew better than to listen to them.

As Phil Dahl and myself set up our scopes at sunset, I can remember one of us using the words "a little breezy" to describe the weather. These words used later would be like calling a June day in Gila Bend "a little warm." Steve Coe and A. J. Crayon were set up in time to watch a beautiful young crescent moon set over a nearby hill. This would prove to be the highlight of the evening. Next, Rick Rotramel set up his 16", followed by Dick Jacobsen and Pierre Schwaar. Pierre showed himself to be the sickest individual of us all, setting up his 20" $f/5$; 100 inches of focal length towering above the top of his van. We figured at least it would make a good wind vane. Rich Walker was the last to show, setting up his 8" Newtonian, oblivious to the elements.

...the Celestron 8...was humming a middle C.

Steve gave the ultimate test to both his camera tracking platform and his patience. We should get good data on Agfachrome 1000 film's response to headlights and taillights from his session. After a five minute exposure, it got blasted at the 4:55 mark. I remember a line of obscenities which the wind must have carried at least down to Bell Road. Phil demonstrated the Celestron 8's "tuning fork" mount design, which I believe was humming a middle C. My 13" wasn't faring that much better. The Double Cluster became the Quadruple Cluster, the Trapezium showed eight stars, etc. After some long bull sessions, A. J. and Steve headed back toward Phoenix, feeling that this "sacrifice" would insure perfect conditions for the rest of us. It didn't happen. Less than an hour later, four of us packed up to go to a new site, The Waffle House, where we observed some coffee. Rich Walker stayed behind, hopefully not with an observing list of sub-arcsecond double stars.

Well, it doesn't always work out here in the nation's astronomy mecca. If it isn't dew, heat, high clouds, or chiggers, it's the wind. After all, this **was** a New Moon Saturday night. What were we expecting?

Great Red Spot
by Jim Van Nuland

You may have read reports that the Great Red Spot has suddenly reverse direction. I am slightly puzzled by this; my ongoing observations show the Spot sort of bouncing about an average position, with little indication of east or westward trend.

How long will the Southern Equatorial Belt be absent? I searched through **Sky & Telescope** and found a photo on March 3, 1957 that looks just like our present Jupiter! The observer states that the Great Red Spot is more prominent than he had seen in 30 years (!). There was also a photo dated March '56 with normal belts. July, 1960 **S&T** has two drawings that show normal belts, with no mention of previous fading. So the SEB might have been faded for two to three years.

Great Red Spot on Meridian MST

D	M	d	time	D	M	d	time
Th	3	1	028am	Su	3	18	724pm
Th	3	1	821pm	Tu	3	20	910pm
Sa	3	3	211am	Th	3	22	1045pm
Sa	3	3	1000pm	Su	3	25	026am
M	3	5	1142pm	Su	3	25	812pm
Tu	3	6	732pm	Tu	3	27	951pm
Th	3	8	115am	Th	3	29	1135pm
Th	3	8	913pm	F	3	30	725pm
Sa	3	10	1045pm	Su	4	1	900pm
Su	3	11	637pm	Tu	4	3	1038pm
Tu	3	13	029am	F	4	6	812pm
Tu	3	13	817pm	Su	4	8	948pm
Th	3	15	957pm	Tu	4	10	1132pm
Sa	3	17	1138pm				

At the predicted times, the Spot will be facing nearest the Earth, and so will appear on the central meridian of the apparent disk of the planet. The Spot moves its own length in about 40–50 minutes. Good seeing and a power

of about 200–300 are needed. Begin half an hour before the given time. Focus carefully, then scan the southeast quadrant of Jupiter. Watch carefully for those moments when the air is especially stable, and the Spot will show itself in all its glory.

To tell the author about your observations, write Jim Van Nuland, Calico Observatory, 3509 Calico Ave., San Jose, CA 95124 (408)371–1307.

Comet Comments
by Don Machholz

There is no lack of comets to observe over these next few months, even the first discovery of 1990 is visible in moderate-sized scopes. Due to the length of this month's comet news, "Seeking Comets" will not be included.

It is hard to predict how well Comet Austin will do. It is looking strong as it nears its Apr. 9 perihelion, so perhaps a close approach of 0.350 AU from the sun will not destroy it. However, since it appears to be a new comet to the solar region, possibly its present brightness is due to more volatile chemicals which will burn out by perihelion. If this occurs, and this is a fate shared by Comet Kohoutek in 1973, then it will be dimmer than expected in April and May. As it now looks, however, it should appear best in late April through May as it travels across the northern morning sky. During this time it dims from magnitude 1.5 to magnitude 3. The tail may be quite long too, but since the comet will be near the earth, you may need dark skies to see it well.

Comet Austin (1989c$_1$)

Date	RA-1950-Dec	RA-2000-Dec	Elong	Sky	Mag
02–28	01h09.7m −19°00'	01h12.1m −18°44'	38°	E	6.9
03–05	01h16.1m −14°58'	01h18.6m −14°42'	35°	E	6.4
03–10	01h22.7m −10°37'	01h25.2m −10°21'	32°	E	5.8
03–15	01h29.3m −05°52'	01h31.8m −05°37'	28°	E	5.2
03–20	01h35.7m −00°39'	01h38.3m −00°24'	25°	E	4.5
03–25	01h41.4m +05°07'	01h44.0m +05°22'	22°	E	3.6
03–30	01h45.6m +11°29'	01h48.2m +11°44'	20°	E	2.7
04–04	01h46.2m +18°23'	01h48.9m +18°38'	19°	E	1.7
04–09	01h40.2m +25°11'	01h43.0m +25°26'	20°	E	1.0

Between now and early April the comet is in our evening sky. It sets near astronomical twilight. Comet Austin passes north of the sun, and it should always be visible to Northern Hemisphere observers, although in twilight near perihelion. If you are planning public star parties, Comet Austin rises about 50 minutes before astronomical twilight on Saturday morning April 21. A crescent moon will also be up. The following week it rises nearly two hours before astronomical twilight. For those wanting evening observation, on Saturday May 19 the comet rises just before midnight (Daylight time) in a moonless sky. The following Saturday, Memorial weekend, the comet rises around 10:30 PM. I've prepared a special Comet Austin Observer's Packet which is available to the readers of this column for $0.65 in postage stamps.

Periodic Comet Wild (1990a): Discovered by Paul Wild on a photographic plate exposed Jan. 21, this comet has an orbital period of 6.24 years, never getting closer than 1.95 AU from the sun. It is presently magnitude 12, possibly a bit brighter. It reaches perihelion on July 4. *(For comments, you can reach Don Machholz at (408) 448–7077.)*

Comet Skorichenko-George (1989e$_1$)

Date	RA-1950-Dec	RA-2000-Dec	Elong	Sky	Mag
02–28	23h22.6m +39°39'	23h25.0m +39°55'	49°	E	8.4
03–05	23h44.6m +40°32'	23h47.1m +40°49'	48°	E	8.3
03–10	00h07.4m +41°16'	00h10.0m +41°33'	47°	E	8.3
03–15	00h30.9m +41°50'	00h33.6m +42°06'	46°	E	8.2
03–20	00h54.8m +42°11'	00h57.6m +42°27'	45°	E	8.2
03–25	01h19.0m +42°19'	01h21.9m +42°35'	44°	E	8.2
03–30	01h43.1m +42°14'	01h46.1m +42°29'	42°	E	8.2
04–04	02h06.8m +41°55'	02h09.9m +42°10'	41°	E	8.2
04–09	02h30.1m +41°25'	02h33.2m +41°38'	39°	E	8.2

Comet Tuttle-Giacobini-Kresak (1989b$_1$)

Date	RA-1950-Dec	RA-2000-Dec	Elong	Sky	Mag
02–28	18h30.8m −14°27'	18h33.7m −14°25'	61°	M	11.5
03–05	18h49.5m −14°05'	18h52.3m −14°01'	62°	M	11.8
03–10	19h07.2m −13°38'	19h10.0m −13°33'	63°	M	12.1
03–15	19h23.8m −13°07'	19h26.6m −13°01'	63°	M	12.4
03–20	19h39.5m −12°34'	19h42.3m −12°27'	64°	M	12.7
03–25	19h54.2m −12°00'	19h57.0m −11°52'	66°	M	13.1
03–30	20h08.0m −11°24'	20h10.7m −11°15'	67°	M	13.4
04–04	20h20.8m −10°49'	20h23.5m −10°39'	69°	M	13.8
04–09	20h32.7m −10°14'	20h35.5m −10°03'	71°	M	14.1

Periodic Comet Wild (1990a)

Date	RA-1950-Dec	RA-2000-Dec	Elong	Sky	Mag
02–28	09h04.1m +22°26'	09h07.0m +22°14'	153°	E	11.9
03–05	09h00.9m +22°27'	09h03.8m +22°15'	147°	E	11.9
03–10	08h58.4m +22°24'	09h01.3m +22°12'	142°	E	11.9
03–15	08h56.7m +22°16'	08h59.6m +22°05'	137°	E	11.9
03–20	08h55.9m +22°05'	08h58.8m +21°53'	132°	E	11.9
03–25	08h56.0m +21°49'	08h58.9m +21°37'	127°	E	11.9
03–30	08h57.0m +21°30'	08h59.8m +21°18'	122°	E	11.9
04–04	08h58.8m +21°07'	09h01.7m +20°55'	114°	E	11.9
04–09	09h01.4m +20°40'	09h04.3m +20°29'	114°	E	12.0

Periodic Comet Schwassmann-Wachmann 3 (1989d$_1$)

Date	RA-1950-Dec	RA-2000-Dec	Elong	Sky	Mag
03–05	15h33.7m +01°47'	15h36.3m +01°37'	112°	E	13.4
03–10	15h52.7m +01°12'	15h55.2m +01°03'	111°	E	13.0
03–15	16h13.9m +00°31'	16h16.4m +00°24'	111°	E	12.6
03–20	16h37.8m −00°18'	16h40.4m −00°24'	109°	E	12.1
03–25	17h05.0m −01°16'	17h07.6m −01°20'	107°	E	11.7
03–30	17h35.9m −02°25'	17h38.5m −02°27'	104°	E	11.3
04–04	18h10.7m −03°44'	18h13.3m −03°43'	100°	E	10.9
04–09	18h49.2m −05°10'	18h51.9m −05°06'	95°	E	10.6

Bits and Pieces

Astronomy Electronics Conference

The Electronics Oriented Astronomers (EOA) Conference will be held Saturday, March 17, 1900, sponsored by the Orange County Astronomers (OCA). Contact Gene Lucas, 934–1889, for more details.

Reach 11 Star Party

The next Star Party is March 17 at Reach 11. This will be a Public Star Party so bring your family, friends, and neighbors. Those of you bringing telescopes, please arrive by 6:00 pm. Reach 11 is at the corner of Union Hills and Tatum Blvd.

1990 SAC Meetings	1990 SAC Star Parties
March 9	Reach 11 March 17
April 13	April 21
May 11	Sedona May 19
June 8	June 16
July 6	July 14
August 10	August 18
September 7	September 15
October 5	October 13
November 2	November 10
December 8	December 15

Membership Roster

It looks like we will be sending out a printed membership list with addresses and phone numbers, possibly with the May newsletter. This will only go to club members. If any of you do not want to be included on this list please let the newsletter editor know.

Space News

At about a minute before 10 pm PST Friday, February 9, Galileo passed 10,000 miles above Venus (41 degrees south of the equator). Data recorded during the fly-by will be played back in October, although some pictures are already being sent back very slowly. Galileo gained 4,990 MPH from the gravity assist as planned.

Launch dates of the Space Shuttle have been push back a month due to some problems with a segment of one of the boosters. This means that the Hubble Space Telescope won't be launched until April. By the time you read this, the HST should be next in line for launch.

Minutes of the February Meeting

Pete Burggraaf started the meeting with a summary of up coming events (see the attached calendar). Cathe Becker then present the treasurer's report. Anyone having problems with magazine subscriptions done through the club contact Cathe Becker. A. J. Crayon announced that the next Deep Sky Subgroup meeting will be at the McGrath's on March 15th. A motion to donate the old projection screen to Riverside was made and passed. Gene Lucas will see that the club is recognized for the contribution. Steve Coe then showed more slides taken with the barndoor tracker.

After the break the main speaker was Dr. George Coyne, Director of the Vatican Observatory. He gave a very interesting talk on the birth of stars and galaxies. —*Phil Dahl, SAC Secretary*

Directions to SAC Events

SAC General Meetings 7:30 PM at Grand Canyon University, Fleming Building, Room 103 — 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.

New Electromagnetic Launcher

Albuquerque, N.M. — An electromagnetic launch technology, with one possible application being earth-to-orbit launch of small satellites, is being developed at Sandia National Laboratories.

The novel technology may be able to serve as an alternative to rockets for launch of small satellites (up to 400 kilograms, or 1,000 pounds), especially where quick response times are needed. The technology may also offer lower launch costs per payload mass for such payloads. Such capabilities might have both military and commercial applications.

The technology uses electromagnetic induction and involves no sliding electrical contact between projectile and barrel. So far the basic principles of the technology have been demonstrated in a series of experiments and tests over the past several years at a remote canyon test site south of Sandia's main facilities in Albuquerque.

This work has achieved a record velocity for contactless electromagnetic launchers of 1 kilometer per second with a 160-gram projectile.

The Sandia work is now entering the phase of exploratory development with later phases of advanced and engineering development still ahead.

The experiments and demonstrations have been supported by a sophisticated computer code, WARP 10, which has successfully anticipated all experimental results. This shows, according to Sandia scientists M. Bill

Cowan (founder of the Sandia program) and Melvin M. Widner (creator of WARP 10), that the basic physical principles involved in the launcher technology are now well understood, and it is cause for optimism that scale-up to larger systems poses no fundamental obstacles.

Experiments now are underway with a larger, six-stage launcher, which fires a 4-kilogram (10-pound) projectile that is $5\frac{1}{2}$ inches in diameter.

The work will soon be scaled up to a still larger, 10-stage launcher that will have the full barrel diameter, about $2\frac{1}{2}$ feet, and full-mass capability needed in an eventual earth-to-orbit launch facility. This launcher will be built in Sandia's new Strategic Defense Facility, and the test projectiles will be caught indoors.

After that the concept would be scaled up still further by adding more stages to the launcher — increasing the length of the flyway along which the launch mass is accelerated. For earth-to-orbit launch, the flyway would consist of many stages each powered by its own capacitor bank and elevated to an angle about 30 degrees above horizontal. It would need to be located at a suitable launch site.

The launch mass in the full-scale concept for an earth-to-orbit launcher would include an armature, a removable aeroshell, a small rocket motor, and the payload. An existing mockup looks like a small rocket or a very large artillery shell. It is cylindrical, with the tapered aeroshell at the front providing streamlining to reduce friction through the earth's atmosphere.

The electromagnetic launcher would provide enough velocity — about 4.5 kilometers per second at the end of the flyway — to send the main part of the projectile above the earth's atmosphere. (The armature would separate and drop away shortly after launch.)

Once the projectile was above the earth's atmosphere, the aeroshell would drop away and the rocket motor would fire to provide the additional increment of velocity — about another 4.5 kilometers per second — needed to achieve orbit.

In that sense it is a hybrid system, combining acceleration from electromagnetic launch and above-atmosphere rocket firing. This hybridization minimizes cost and risk for electromagnetic launch. *To be continued next month...*

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—Meade Model 2120, 10", $f/10$ Schmidt-Cassegrain; 3 years old; mint condition; 7 mm, 15.5 mm & 20 mm eyepieces; assorted filters; 2X teleneg-ative; AC & DC power cords; Minolta T-ring; piggy-back bracket; diagonal prim; observer's chair. $1,495. Call Greg Kar, 993–9339.

Telescope—Meade Model 2080/LX3, 8", Schmidt-Cassegrain; Hardly used—excellent condition; Multi-coated/Silvered Optics group; quartz electronic LX drive system (never used); equatorial wedge; 9.7 mm & 26 mm Super Plössl eyepieces; 2 filters; foam lined carrying case; field tripod. Asking $1,150, or OBO. Call Marty Wicoff at 246–1105 (ans. mach.).

Universal Time and Date of Total Lunar Occultations for Phoenix (33.5º Lat., 112.1º Long.)
Corrected from Standard Station NM (1) and LA (2)

Mo/DY/YR	H1:M1:S1	H2:M2:S2	Mag	Star Info	PH	PA1	PA2	PS	ELG	MAL	MAZ	SAL	SAZ
03/09/90	11:28:35	11:30:59	5.0	ZC1442 (R Leo)	DD	172	186	89	159	15	275	-29	75
03/17/90	8:45:42	8:44:58	3.0	ZC2287 (π Sco)	DB	86	103	65	243	17	138	-54	31
03/17/90	10:05:28	10:05:01	3.0	ZC2287 (π Sco)	RD	319	303	64	244	26	154	-43	56
03/19/90	10:38:06	10:37:35	4.4	ZC2554 (χ Sgr)	RD	318	304	50	269	17	141	-36	63
03/20/90	12:26:03	12:25:40	3.3	ZC2721 (ϕ Sgr)	RD	230	224	43	283	24	152	-14	81
03/20/90	17:39:07	17:38:43	2.1	ZC2750 (σ Sgr)	DB	90	73	41	286	16	223	47	136
03/20/90	NL:NL:NL	18:47:53	2.1	ZC2750 (σ Sgr)	RD	NL	243	41	287	6	234	55	160
03/22/90	18:20:24	18:19:29	1.1	Mars	DB	44	25	27	311	30	215	53	149
03/22/90	19:34:55	19:36:46	1.1	Mars	RD	248	265	27	311	20	230	57	181

NOTES:
Subtract 7 hours for correct Mountain Standard Time and Day.
H1,M1,S1 = Hrs,Min,Dec (Std Sta NM)
H2,M2,S2 = Hrs,Min,Dec (Std Sta LA)
PH = Phenomenon, i.e. RD = (R)eappearance on (D)ark Limb
PA1 = Position Angle of star from north point of moon (90=East) (NM Std Sta)
PA2 = Position Angle of star from north point of moon (90=East) (NM Std Sta)
PS = Percent Sunlit
ELG = Elongation of moon from sun (180 = full; 270 = 3^{rd} Qtr)
MAL = Moon Altitude in degrees (90 = directly overhead)
MAZ = Moon Azimuth (90 = East)
SAL;SAZ = Sun Altitude;Azimuth
NL = Not Listed at Standard Station