

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



November 1996 — Issue #238

v10.16

Lunar Eclipse at Chaco Canyon

by Marjory Vin Williams

Where is Chaco (CHALK coe) Canyon? It is located in the ultimate nowhere. And at first it also looks like nothing, an eroded crevice with sometimes running water and further, back not extremely tall canyon walls such as one would see at Canyon de Chelly (SHAY). Even the Anasazi ruins are not at first evident. One of the pamphlets states, "Chaco Culture National Historical Park is not recognized for it's beauty but for its historical value."

But there is beauty there. In late September the canyon begins to show massed primitive colored flowers of purple, red and yellow. As you seek the ruins, you become amazed at the extent of the architecture and it's complexities. The largest ruin, Pueblo Bonito, occupied from the 800's A.D. through the 1200s, has over 600 rooms, 40 kivas and was four stories high. And at your campsite, the canyon walls seem so much higher as you sleep against them and marvel at the beautiful patina on what was once massive sand dunes and beaches.

On September 26th, Park Ranger G.B. Cornucopia, another camper and I created a three telescope star party for dozens of campers happy to be on vacation and grinning with surprise that they were about to see an eclipse and through telescopes! We set up on a road north of Fajada (fah HAUGH dah) Butte and aimed our telescopes east, down the wash. By some act of magic, the clouds parted during the eclipse. Again and again, the campers would reform lines to see the latest phase.

After a while, to rest from my scope duties, I pointed out constellations and told the campers about the Saguaro Astronomy Club in Phoenix and the Tucson Amateur Astronomy Association and invited them to join us in our outings and suggested they might find the Grand Canyon Star Party in June a grand experience. Several wanted addresses, and I, caught flat footed with none to give, told them to contact the astronomy shops in those cities. For a while, G.B. played star music tapes which lent an extra

Quick Calendar

SAC Meeting

Speaker: Jason Oftenburg
7:30 PM, Friday, October 25

SAC Star Party

Buckeye Hills Recreation Area
Saturday, November 2

SAC Deep-Sky Meeting

7:30, Thursday, November 7

SAC Meeting

Speaker: Jim Crisman
7:30 PM, Friday, November 22

Officer Elections

beauty to the vast canyon and the rose colored moon.

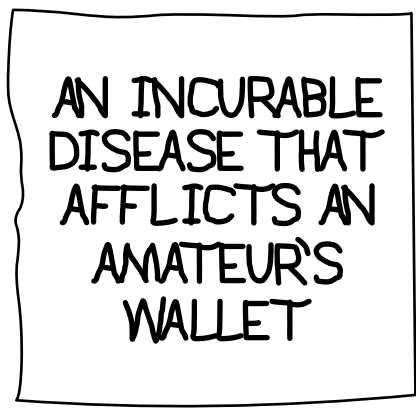
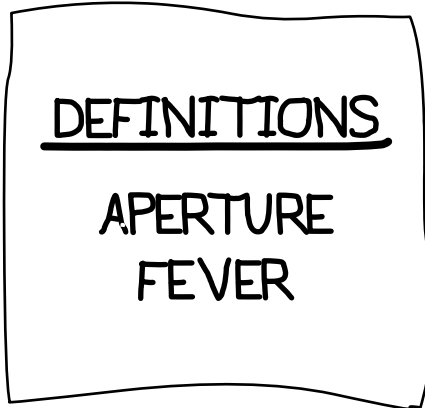
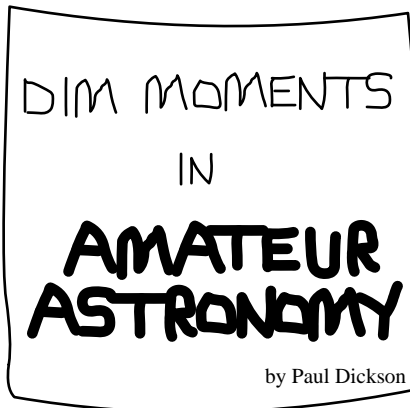
G.B. invites the members of both clubs to join him at Chaco. He will later send the dates of the two annual star parties he holds each year.

To reach Chaco, drive to Flagstaff, then to Gallup, and on to Crownpoint. From Crownpoint, it is 39 miles north to Chaco Canyon, and 20 miles of that is dirt road. Come clean because there are no showers. Take your own firewood for morning warmth. The restrooms have re-designed lighting for reduced light pollution. The camp grounds are in a round-the-corner side canyon. But even

SAC Officers

Area Code (602)

President	Gerry Rattley	892-5698
Vice President	Steve Coe	789-7786
	74040.2071@compuserve.com	
Treasurer	Regina Lawless	
Secretary	David Fredericksen	979-0513
Properties	Adam Sunshine	780-1386
	asunshine@netzone.com	
Public Events	Rich Walker	997-0711
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	a.crayon@az05.bull.com	
SACNEWS Editor	Paul Dickson	862-4678
		FAX: 841-0509
		dickson@primenet.com



there, there is little pollution and marvelous viewing to the east and south. I believe the altitude is 6200 ft. For road conditions call (505) 786-7014. Write to: National Park Service, Superintendent, Star Route 4, Box 6500, Bloomfield, NM 87413. For star party info write: G.B. Cornucopia, P.O. Box 220, Nageezi, NM 87037.

Discovery History of the Deep-Sky Objects

by Hartmut Frommert
E-mail: spider@seds.org

This article is a text version of Hartmut's Web page <http://www.seds.org/messier/xtra/history/deepskyd.html>. It is

printed here with permission. Hartmut requests comments, corrections or suggestions about his Web page.

Hartmut is the creator of the SEDS Messier Database which is at <http://www.seds.org/messier/>.

Part 2

Historic Deep-Sky Catalogs

Listed are the historic catalogs in chronological order; the number of objects and, if different, the number of entries (including those which do not correspond to real objects) is given in parentheses.

134-127 BC (2)

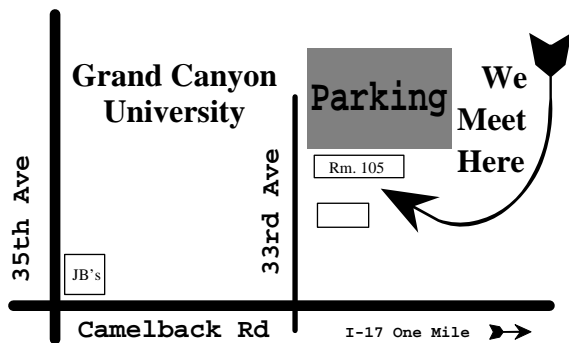
Hipparchos included two nebulous objects in his star catalog: M44 and Double Cluster (NGC 869+884, not in Messier's catalog).

127-151 AD (4/7)

Ptolemy's *Almagest* contains a list of 7, 4 of which

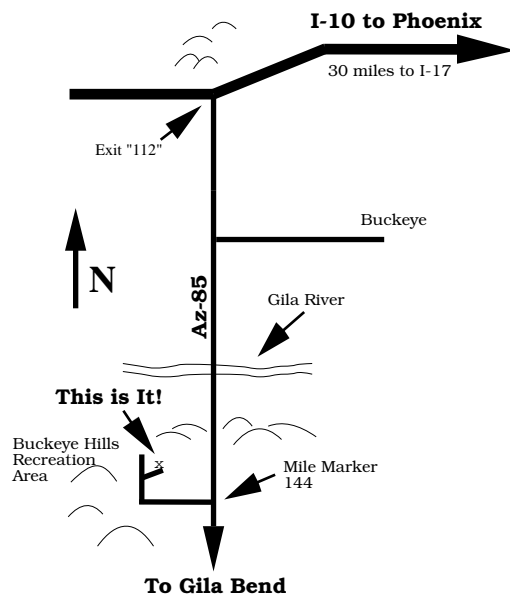
Directions to SAC Events

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 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.

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.



are real: M44 and Double Cluster from Hipparchos, and M7 (proposed "Ptolemy's Cluster") and the Coma Berenices star cluster Melotte 111 (not in Messier's catalog). Ptolemy's Almagest is available online at NASA's ADC.

964 AD (6/9)

Al Sufi lists two new objects in his *Book of Fixed Stars*: M31 and *o* Velorum = IC 2391 (not in Messier's catalog), in a list of 9 (including 6 entries from Ptolemy).

15th century (4/7)

Ulegh Begh from Samarkand compiled a new star catalog, containing the objects listed by Ptolemy.

1590 (1/7)

Tycho Brahe completed a catalog of 777 stars in 1590, which contained 7 nebulous objects, 6 of which are uninteresting asterisms, and M44.

1654 (19/ 40)

Giovanni Batista Hodierna published a list of 40 entries, 19 of which correspond to real objects, including an independent re-discovery of M31 and own true discov-

eries of M6, M36, M37, M38, M41, M47, and NGCs 2362, NGC 6231, NGC 6530 (associated with M8) and (possibly) NGC 2451.

1690 (2/16)

Johan Hevel (**Hevelius**) included, in his *Prodomus Astronomiae*, a list of 16 entries, including M31 and M44, plus 14 asterisms. Looking for one of those, Messier cataloged the double star M40.

1712, revised 1725 ("several")

John Flamsteed referred to several "nebulae" and "nebulous stars" in his star catalog *Historia Coelestis Britannica*. Three independent discoveries, including re-discoveries of unknown Hodierna objects NGC 6530 (associated with M8) and M41 and his own true original discovery of NGC 2244 around the star 12 Monocerotis (associated with the Rosette Nebula NGC 2237-9, neither the cluster nor the nebula in Messier's catalog).

1715 (6)

Edmond Halley published a list of 6 "luminous spots or patches":

Comet Comments

by Don Machholz

(916) 346-8963 CC219.TXT October 6, 1996
DonM353259@aol.com

1995 O1 (Hale-Bopp)					
Date	RA-2000-Dec	Elong	Sky	Mag	
10-24	17h35.6m -03°47'	55°	E	4.6	
10-29	17h38.1m -03°29'	51°	E	4.5	
11-03	17h41.0m -03°09'	48°	E	4.4	
11-08	17h44.3m -02°47'	44°	E	4.3	
11-13	17h48.0m -02°26'	41°	E	4.6	
11-18	17h52.0m -02°00'	38°	E	4.5	
11-23	17h56.4m -01°31'	35°	E	4.4	
11-28	18h01.1m -00°58'	33°	E	4.2	
12-03	18h06.2m -00°22'	31°	E	4.1	
12-08	18h11.6m -00°18'	29°	E	3.9	
12-13	18h17.3m -01°03'	28°	E	3.7	

Two naked-eye comets are visible in our skies this month. In the evening sky **Comet Hale-Bopp** is doing well after dimming a bit during early September. This was followed by a substantial increase in brightness and a different appearance later in the month. This should be no surprise, as comets are expected to do the unexpected. Its tail is several degrees long. Meanwhile,

Comet Tabur will be visible in both the north-western sky in the evening and the north-eastern sky in the morning for several weeks. **Periodic Comet Machholz 1**, discovered ten years ago, will be difficult in the evening sky.

C/1996 Q1 (Tabur)					
Date	RA-2000-Dec	Elong	Sky	Mag	
10-24	14h11.2m +47°18'	59°	E	5.9	
10-29	14h44.9m +42°20'	57°	E	6.2	
11-03	15h06.2m +38°03'	54°	E	6.4	
11-08	15h20.8m +34°22'	52°	E	6.7	
11-13	15h31.3m +31°11'	49°	E	7.0	
11-18	15h39.4m +28°22'	48°	E	7.3	
11-23	15h45.8m +25°52'	46°	M	7.6	
11-28	15h51.2m +23°37'	45°	M	8.0	
12-03	15h55.9m +21°36'	45°	M	8.3	
12-08	15h59.9m +19°47'	45°	M	8.6	
12-13	16h03.5m +18°09'	46°	M	8.9	

96P/Machholz 1					
Date	RA-2000-Dec	Elong	Sky	Mag	
10-24	14h34.5m -02°27'	14°	E	8.4	
10-26	14h49.6m -03°23'	15°	E	9.3	
10-28	15h03.0m -04°18'	16°	E	10.0	
10-30	15h15.1m -05°12'	16°	E	10.7	
11-01	15h26.2m -06°03'	17°	E	11.2	
11-03	15h36.4m -06°52'	17°	E	11.7	
11-05	15h45.9m -07°37'	18°	E	12.2	
11-07	15h54.7m -08°20'	18°	E	12.6	

Orbital Elements

Object:	Hale-Bopp	Tabur	Machholz 1
Peri Date:	1997 03 31.86770	1996 11 03.50419	1996 10 15.06962
Peri Dist:	0.9170703 AU	0.84001480 AU	0.1247178 AU
Arg/Peri (2000)	130.40061°	057.37495°	014.58608°
Asc Node (2000)	282.46983°	031.41231°	094.53200°
Incl (2000):	089.38442°	073.36167°	060.07415°
Eccentricity:	0.99674010	1.0	0.9586366
Orbital Period:	4700 years	Long period	5.24 years
Reference:	MPC 26879 (7-96)	MPC 27882	MPC 22033

1. in Orion: The Orion Nebula M42
2. in Andromeda: The Andromeda Galaxy M31
3. in Hercules: Globular Cluster M13 (Halley's own discovery 1714)
4. in Sagittarius: Globular Cluster M22
5. in Antonius (Scutum): Open Cluster M11
6. in Centaurus: Globular Cluster Omega Centauri (NGC 5139; Halley's own discovery 1677)

1733 (2/16)

William Derham published a list of 16 entries, two of which are objects (M31 and M7). Published in the *Philosophical Transactions* of the Royal Society for 1733.

1746 (18/20)

Philippe de Cheseaux compiled a list of 20, 2 of which are probably nonexistent (No's 2, 8), while 6 are original discoveries: No. 4 = M16, No. 5 = M25, No. 12 = M35, No. 13 = M71, No. 19 = M4, and No. 20 = M17, and two are independent re-discoveries: No. 1 = M6 and No. 17 = M22.

1755 (34/42)

Abbe Nicholas Louis de la Caille (Lacaille) published his catalog of Southern Deep-Sky objects of 42 entries, 8 of which are errata and asterisms, but 34 real objects, in the *Memoirs* of the French Royal Academy. Lacaille classified these objects according to their appearance in his scope in three classes: I, Nebulae; II, Nebulous Star Clusters; III, Nebulous Stars. This classification is hardly anyhow related to physical object classes though.

1771 (45)

Charles Messier publishes the first version of his catalog in the *Memoirs* of the Royal Academy of France.

1777 (< 50/75)

Johann Elert Bode publishes a catalog of 75 entries

1780 (< 52/77)

Johann Elert Bode's catalog's second edition was extended by two to 77 entries.

1780 (20)

Johann Gottfried Koehler

1780 (68)

Charles Messier publishes an updated version of his catalog, extended to 68 objects.

1781 (103)

Charles Messier publishes the final version of his catalog in the *Connaissance des Temps* for 1784. Later additions were finally added to this catalog in the 20th century, and bring this compilation to 110 entries. Contrary to most other compilations, there is a real object for each entry, perhaps with only one exception (M102).

1786, 1789, and 1802 (/2500)

Friedrich Wilhelm (William) Herschel, in an extensive scan with the best available instruments, compiled his comprehensive catalog of 2500 deep sky objects published in three steps. Similar to Lacaille, William Herschel divided his entries in object classes, I-VIII, so that numbers are given by, e.g., 215 H I, H I 215, H 215-1, or in a similar way. His classes are much more descriptive and more useful, although, as the nature of most objects still

had not been uncovered, his classification is merely of historical importance.

1827 (< 290/629)

James Dunlop publishes his compilation, "*A Catalogue of Nebulae and Clusters of Stars in the Southern Hemisphere observed in New South Wales.*" Unfortunately (especially for John Herschel) many of these objects were badly described and could not be verified, or were nonexistent. John Herschel, who could only identify 211 of them, quotes Dunlop's objects as Delta 1 – Delta 629.

1833 (/2307)

John Herschel publishes a catalog of nebulous objects he observed from England, containing about 525 newly discovered objects, and many of William Herschel's as well as all Messier objects recognized at that time. The entries in this catalog are usually quoted as h 1 – h 2307.

1847 (/1713)

John Herschel publishes his Cape of Good Hope observations in the book: *Results of Astronomical Observations made during the years 1834, 5, 6, 7, 8 at the Cape of Good Hope, being a completion of a telescopic survey of the whole surface of the visible heavens commenced in 1825.* Smith, Elder & Co., London. The 1713 entries in this catalog were numbered in continuation of John Herschel's 1833 catalog, and are normally referred as h 2308 – h 4021.

1864 (/5079)

John Herschel publishes his *General Catalogue*, as *Catalogue of Nebulae and Clusters of Stars*, in the *Philosophical Transactions* of the Royal Society (London), Vol. 154, p. 1–137 (1864). Objects are numbered GC 1 – GC 5079, with GC 1 to 5063 ordered by right ascension, the rest added as supplement.

1867 (500)

Heinrich Louis d'Arrest

1887 (/7840)

John Louis Emile Dreyer, *New General Catalogue*
1895 (/1530)

John Louis Emile Dreyer, *Index Catalogue*, IC I
1907 (/5836; new: /4306)

John Louis Emile Dreyer, *Index Catalogue*, IC I+II (part II appeared as *Second Index Catalogue*). This brought the number of entries in NGC and IC to 13676, of which some are erroneous though.

References:

- * **Kenneth Glyn Jones**. *Messier's Nebulae and Star Clusters*. Faber & Faber, 1968. The 2nd revised edition is Volume 2 of the *Practical Astronomy Handbooks* series, published by Cambridge University Press, 1991.
- * **Gudrun Wolfschmidt**. *Milchstraße, Nebel, Galaxien: Strukturen im Kosmos von Herschel bis Hubble* (Milky Way, Nebulae, Galaxies: Structures in Cosmos from Herschel to Hubble). Deutsches Museum, München 1995

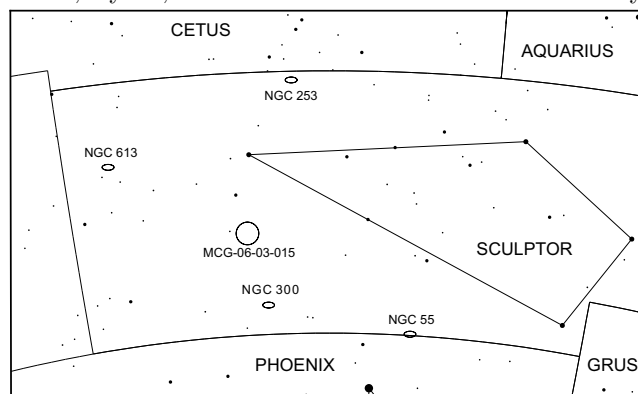
What's Up

by Steve Coe

Sculptor

November 1996

Sculptor is one of those constellations that have few bright stars, but there are some very nice deep sky objects to pick out, even in such a star-barren area of the sky. There are several other constellations like this: Eridanus, Hydra, Monoceros and Pisces seem to offer only



a few obvious places to start star hopping. However, there are lots of deep-sky objects that go un-observed because they are tough to find, often some of them are well worth the hunt.

This will be the last "What's Up" that I will write in this format. Next year Ken Reeves will start a deep-sky column to replace "What's Up." This will allow me to concentrate on another project, updating the NGC. As always, thanks to all who have taken their time to read and use the information I have been providing. Next Month, for the last "What's Up," I will provide some of my favorite observing tips, gathered from years at the eyepiece. Until then, let's look around in Sculptor.

NGC 55 is bright, very, very large and very, very elongated at 100X. It is visible in the finder. At 100X it is longer than the 40' field of view. There are several H II regions involved, a UHC filter helps a lot on these gaseous nebulae in another galaxy. The nucleus is stellar at high power and some mottling is glimpsed. It is at 0hr 15min and -39 11.

NGC 253 is one of the most beautiful galaxies in the sky. Every astrophotographer who can get at this lovely, bright edge-on will shoot it eventually. It can be seen at 0 hr 47.6 min and -25 17. On a night at Sentinel that I rated 9/10 for transparency and 8/10 for seeing it was a stunning site in a variety of instruments. This bright object was easy in binoculars or finderscope and 1 star on NE end and 3 stars on the southwest end frame the galaxy. At 60X with a 38mm Erfle eyepiece in my 13", I saw NGC 253 as very bright, very large, very much elongated 4X1 in PA 45, much brighter middle, very mottled, a beautiful convex lens shape, with many dark markings in arms. Going to 100X provided an excellent view, with a stellar nucleus evident about 20% of the time, 7 stars involved, two pretty bright oval patches in southwest arm, and lots of dark markings, the most mottling I have ever seen.

NGC 300 is at 0 hr 54.9 min and -37 41. I saw it as faint, large, and somewhat brighter in the middle at 100X. There are four stars seen across the face of this galaxy. This is a low surface brightness object. Imagine M33 only 10 degrees above the horizon.

NGC 613 looked pretty bright, pretty large, bright middle and elongated 3 X 1. There is a pretty bright star on the NE side at 100X. The outer tips of the spiral arms curve in opposite directions as if to show the direction of spiral motion. See if you agree at 1 hr 34.3 and -29 25.

MCG-06-03-015 is the designation from the Morphological Catalog of Galaxies for the Sculptor System, a dim dwarf galaxy that is a small companion to Our Milky Way. It is at 0 hr 59.9 min and -33 42. I saw it as extremely faint, very, very large, little elongated and very little brighter in the middle. That observation was with a 4.25" f/4 at 16X. When I first thought of observing this very low surface brightness object, I looked it up in Burnham's and it said "eeF", an abbreviation for extremely, extremely faint. This told me that I was only going to have a chance to see the Sculptor System from a very dark site. After trying to see this huge object with a 16" scope at low power, I reasoned that we needed a wider field of view and went after it with the little Rich Field Telescope. Every precaution was taken to get fully dark adapted and a cloth was held over the observer's head to block out extraneous light. Using all those precautions, there is a very faint, roundish blob at the correct location.

* **Curtis A. Deer.** "A History of the Study of Planetary Nebulae and Basic Models of Their Formation." *Electronic Journal of the Astronomical Society of the Atlantic (EJASA)*, Volume 5, Number 7 (February 1994).

Thanks to Glen Cozens for communicating some accurate data on James Dunlop.

Newsletter Deadline

Mail items for Such-a-Deal at least two weeks before the end of the month. Articles that need to be published in a timely fashion must be submitted or the newsletter

editor notified of the article at least 6 weeks before month they are published. Items arriving too late for an issue will be included in the next newsletter.

Bits and Pieces

Minutes from the September 5th Board Meeting

On September 5 a Board Meeting was held at the McGrath's house before the Deep-Sky Meeting. Present for the meeting were Gerry Rattley, Steve Coe, Regina

Lawless, Paul Dickson, and David Fredericksen. The main topic of discussion was the calendar for next years SAC meetings and Star Parties. We also discussed the date for the next Messier Marathon and agreed that we would leave it on the date that AJ wanted. Afterward we held the Deep-Sky Meeting.

—David Fredericksen, SAC Secretary

Minutes from the September Meeting

The September meeting was opened at 7:30 by Gerry Rattley.

Gerry asked for any guests to introduce themselves. We had several guests present.

Paul Dickson talked again about SAC's 110 Best of the NGC.

Rich Walker discussed the public star party on Oct. 19 at Thunderbird Park. Rich then talked about star parties at several elementary schools and one for Bull employees at Reach 11 on Oct. 18.

The next meeting for the Deep-Sky Group will be on Nov. 7 due to Halloween.

Gerry discussed Comet Tabur in the morning sky which is in Gemini now. It is easy in binoculars.

We talked a little about the Lunar Eclipse on the 26th of September.

Steve Coe asked for anybody that had an eclipse story to tell us about it. After the stories, we had slides of the eclipse and Sentinel from Paul Lind. Chris Schur showed us 5 slides with the new Kodak film. Pierre Schwaar showed a video of the eclipse.

At the break there was 45 people present.

After the break, Steve Coe introduced Dr. David Burstein who is a deep sky authority and he spoke about cosmology and the work that he and others have been working on. They want to study galaxies the same way that we study stars. A very interesting talk. (May the error bar be with you.)

After we finished, we went over to JB's to eat and continue our discussions.

—David Fredericksen, SAC Secretary

Constitutional Changes

The changes for the SAC constitution will be voted at the November SAC meeting. If you are a member of SAC, and did not pick up your copy of the constitution at the September or October club meetings, your copy should arrive about the same time as this newsletter.

If there are any questions about these changes, please bring them up prior to voting. Paul Dickson is the chairman of the committee that's proposing these changes so questions should be addressed to him. The intent of the changes are to reflect how the Saguaro Astronomy Club now operates. There are some areas that have changed in the past 15 years and other areas that were mentioned but never defined.

Getting Started Now What? by Wil Milan

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An interest in astronomy can be an insidious thing. All your life the sky was always there, but you never noticed it much. Then one day something happened—a science class, a look through a friend's scope, perhaps a bright comet—and you were hooked. You discovered that the great wonders of the universe were there just above your head, and suddenly you could not wait to see more and to know more.

So you bought a book or two, perhaps a magazine or two, and maybe a telescope. You were so thrilled with that first look at the wonders of the sky, but now that you've delved into it a bit you're a little bewildered, a lot confused, and starting to get discouraged. "OK, I've looked at a few things in the sky and they were great to see, but now what? What do I do next? I don't know how to use this scope, I can't find anything, and I don't understand all the lingo about ascension, declination, colimation, and whatever else."

The astronomy magazines aren't much help. They're aimed at those who already know all the basics of astronomy, but where do you go if you don't know all those things?

If those questions ring in your mind, don't think you're alone. Astronomy is a fast-growing interest and I assure you there are many others just like you feeling a bit bewildered. That's really the fault of those of us who have been at it a long time: we're very willing to share our interest with you, but then we hit you with focal-ratio-this and catadioptric-that until your eyes glaze over. Not a very warm welcome, is it?

The purpose of this "Getting Started" series is to help remedy that. In this column I'll try to explain the science, practice, and equipment of astronomy in a clear and concise way, without assuming you know any of it beforehand. You'll learn what you need to know to get started, and where to go to learn more. Some of it will be very basic, some not so basic, and it's my hope that no matter what your level of knowledge you will profit from it, if nothing else by becoming aware of what needs to be explained to beginners.

OK, so you've taken the first steps into astronomy—where do you go next? Once you have an interest, how do you develop it? Where do you start?

I hope this doesn't sound facetious, but the place to begin is the sky.

Astronomy is about the sky and what's in it. It is not about telescopes or techniques or equipment; those are just props and tools. Those are the means to an end, not the end in itself. The end of astronomy is to know the sky and what lies there, and so that end is the place to begin: by learning the sky.

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%.

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

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.....\$27.00 for one year
- Astronomy.....\$20.00 for one year

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

Make checks payable to SAC.
Mail the completed form to:

Regina Lawless
SAC Treasurer
5808 E Turquoise
Scottsdale AZ 85253

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 the same week of the month. The same is true of the club's star parties. Star parties at Buckeye Hills Recreation Area are mostly held on the Saturday of the third quarter moon.

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. See inside for a map to the meeting location.

1996 SAC Meetings

Jul. 26
Aug. 30
Sep. 27
Oct. 25
Nov. 22
Dec. 14 Party

1997 SAC Meetings

Jan. 24
Feb. 21
Mar. 21
Apr. 25
May 16
Jun. 20

1996 SAC Star Parties

Date	Sunset	Moonrise
Jul. 6	7:43PM	11:57PM
Aug. 10	7:16PM	4:46AM
Sep. 7	6:43PM	2:26AM
Oct. 5	6:06PM	1:11AM
Nov. 2	5:35PM	11:54PM
Dec. 7	5:21PM	5:02AM

1997 SAC Star Parties

Date	Sunset	Moonrise
Jan. 4	5:37PM	3:50AM
Feb. 1	6:03PM	2:35AM
Mar. 1	6:28PM	1:23AM
May 31	7:34PM	3:01AM
Jun. 7	7:44PM	1:43AM

SACNEWS

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

Stamp

First Class Mail

Inside:

- SAC Meeting — October 25
- SAC Deep-Sky Meeting — November 7
- Lunar Eclipse at Chaco Canyon
by Marjory Vin Williams
- Dim Moments by Paul Dickson
- Discovery History of the Deep-Sky Objects
by Hartmut Frommert
- Comet Comments by Don Machholz
- What's Up by Steve Coe
- Getting Started: Now What? by Wil Milan
- SAC Meeting — November 22

Officer Elections