



San Francisco Amateur Astronomers

c/o Josephine D. Randall Museum
199 Museum Way, San Francisco 94114

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BULLETIN FOR SEPTEMBER 1988

This month marks the 36th Anniversary of the founding of the San Francisco Amateur Astronomers

Date: WEDNESDAY, SEPTEMBER 21

Time: 8:00 p.m.

Place: Auditorium, Josephine D. Randall Museum
114 Museum Way, San Francisco

Speaker: DR. SETH SHOSTAK
Researcher, Mira Technology
Los Altos, CA.

Subject: "WHEN GALAXIES MEET"

Unlike stars, galaxies frequently collide with one another. When they do, the results can be dramatic, both to the appearance and to the future history of the offending galaxies.

In this illustrated talk, Seth Shostak will discuss close galaxy encounters of various kinds, including near-misses, passage of one galaxy through another, and possible galaxy cannibalism. The related phenomenon of galaxy stripping will also be handled. The result of all this activity will be shown as a varied bestiary of galaxy types: ring galaxies, warped galaxies, galaxies with "antennas", giant elliptical monster galaxies, and head-tail radio galaxies.

Dr. Shostak is a radio astronomer who has used telescopes in both America and Europe, including the Arecibo dish, and the Westerbork Synthesis Radio Telescope. He has also made several award-winning films on astronomy, one of which will be shown during the course of the evening.

IN MEMORIAM

We all mourn the passing on July 30th, of Gilbert Longtin, a fellow member of the San Francisco Amateur Astronomers and a good friend to many of us. He was currently serving on the Board of Directors as Speaker Chairman, in which capacity he provided the club with many fine speakers. A very moving memorial service was held on August 3rd at Daphne Fernwood Chapel in Mill Valley, attended by a number of his fellow club members, among others. We will all miss him personally, and also his good services to our club.

Gilbert was a long-time member and supporter of the San Francisco Society for Prevention of Cruelty to Animals. Contributions in his name may be made to the SPCA. Envelopes for this purpose will be available at our September meeting.

SFAA MEMBERSHIP BENEFITS

Membership dues of \$15 per year include the monthly SFAA Bulletin and free entry to all club activities, such as lecture meetings, star parties, summer picnics, etc. In addition, you may obtain subscriptions to SKY & TELESCOPE, ASTRONOMY, DEEP SKY and TELESCOPE MAKING (any or all) at greatly reduced rates. For more information please contact Chelle Beard, SFAA Treasurer, 32 Penhurst Avenue, Daly City 94015. Phone: 878-4965 evenings.

Your dues are the lifeblood of the club. Please pay them on time to ensure uninterrupted receipt of the Bulletin and the magazines.

THANK YOU, THANK YOU!

The SFAA acknowledges with gratitude the generous contribution made to the club by member Frank Silva. Thank you, Frank!

**THE PLANETARY SOCIETY
Will Co-Sponsor the Following
Mt. Tamalpais/Pleasant Hill Events
For Mars Watch '88:**

**MARS LECTURES & OBSERVING SESSIONS
in cooperation with
SAN FRANCISCO AMATEUR ASTRONOMERS
MT. TAMALPAIS STATE PARK**

**Saturdays, September 10 & October 8, 1988
Sunset - 11:00 p.m.
Mt. Tamalpais State Park
Rock Springs area
Information: (415) 848-7622**

The evening program will include a viewing session featuring Mars, along with such targets as Saturn, Neptune, Jupiter and deep sky objects. A lecture on Mars will be given by a Mars researcher from NASA/Ames Research Center at the Mountain Theater at 8:00 p.m. This is an outdoor amphitheater. Both lecture and viewing session are FREE.

Directions: From Highway 101 take the Highway 1/Stinson Beach exit. At first stop light, turn left on to Shoreline Highway (also Highway 1). Stay on this for about 2 miles, then turn left on to Panormaic Highway. In 3/4 miles the road splits 3 ways. Take the middle fork and stay on this for 5 miles. Turn right at the Pan Toll Ranger Station and continue about 1 1/2 miles up to the Rock Springs area. Mountain Theater is within walking distance. As parking is limited, PLEASE CARPOOL.

As usual, we will meet at 7 pm at the Shoreline Shopping Center parking lot in Mill Valley and caravan up the mountain together. We're expecting a good public turnout, so please join us and bring your telescopes along. REMEMBER! When you leave the Star Party, if you have parked in the upper section of the Rock Springs parking lot, TURN ON your headlights BEFORE you leave your parking place. SAFETY FIRST!

BOARD OF DIRECTORS MEETING

The next meeting of the Board of Directors will be held on Wednesday, September 14 at 8 pm in the library of the Josephine D. Randall Museum at 114 Museum Way. We invite and urge all club members to attend Board meetings and to participate in the "nuts and bolts" activities of the club.

NEW MEMBERS

The SFAA takes great pleasure in welcoming to our ranks seven new members this month. They are Nancy Sherman, Richard Ricciardi, Ian McLaren, Marshall Lyons, Patricia Sargent, Bill May, and Gary Hale. We hope to see you often at meetings and Star Parties and invite you to take an active interest and role in the functioning of the club.

SNAPSHOTS OF THE SKY - by Jim Shields

We're all tourists of the night sky and it's nice to have some snapshots of the places we've visited. That's why I've gotten interested in astrophotography recently. At this point I don't really care about spending hours of my limited observing time guiding or trying to make my photos as much like the experts' as possible. Since astrophotography is extremely demanding and frustrating, it's just as well to adopt such a relaxed attitude when you're just getting started. (After all, if someone showed you his slides of Mexico, would you criticize his technique?)

If you're interested but haven't yet given astrophotography a try, I suggest you forget about prime focus or eyepiece projection (except possibly of the moon) for the time being and try piggybacking with the new superfast color print film, Konica SR-V3200. All you really need is a camera and an equatorial mount with a reliable clock drive; if you don't already own the latter, you can make or buy a simple camera platform for \$100 or less.

By using superfast color film you can capture nebulosity with very short exposures, often of ten minutes or less. Another advantage is that you probably won't have to guide much. In fact, unless you have a drive corrector, you might as well forget about guiding. Just polar align as best you can, open the shutter and spend your time observing until your timer beeps.

Unfortunately the color prints are pretty grainy and often come out with bright or icky brown skies, despite the best efforts of the photo lab. I prefer black and white, anyway, because it's more like what we see, but nobody makes fast black and white film that is suitable for photographing nebulosity. Kodak recently released its new T-Max 3200 film, but chose not to make it red sensitive. Try it for star fields and clusters.

The real fun begins once you've gotten some half-decent negatives, especially if you can do your own processing and developing. The nice thing about fooling around in the darkroom is that you can do it when the sky is overcast or the moon is full.

I recently purchased an inexpensive slide duplicator from Spiratone in order to make black and white slides from my color negatives, using unhypered Technical Pan film. The slide duplicator makes it easy to increase the contrast and darken the sky background. Typical exposures, using a standard 100-watt bulb for illumination, range from about 1/8th to 1/2 second but trial-and-error seems to be the only rule.

You can go one step further, and really boost the contrast, by recopying the black and white slides onto another roll of Technical Pan film. You end up with negatives (or positive slides) from which you can make prints. So far my results have been surprising and often rather weird. You may want to give it a try yourself.

If you've been doing some astrophotography lately, why not share your ideas and experiences with other SFAA members (like myself) by writing an article for an upcoming issue of the Bulletin?

ABELL 262 IN ANDROMEDA - by Steve Gottlieb

One of the largest known structures in the universe is the Perseus/Pisces supercluster. This huge filament of galaxy clusters extends from Abell 426 in Perseus through Abell 347 and 262 in Andromeda into the NGC 507 and 383 galaxy groups in Pisces. Even at a distance of nearly 300 million light years, this chain of galaxies extends more than 40° across the sky.

Studies have shown that this supercluster is a true filament--its depth is about the same as its relatively narrow minor axis. Its angular extent is at least 200 million light years. It has been proposed that the supercluster may extend southwest into Pegasus, which would mean its overall length would be nearly one billion light years! The supercluster may also be linked to the Lynx/Ursa Major supercluster to the north.

Because of their relatively modest distances from us (only 300 million light years!), several of the galaxy clusters in this supercluster provide rich, spectacular fields for larger amateur scopes. As an observing project, I decided to focus on the Abell 262 cluster in Andromeda. This cluster is somewhat unusual in that most of the bright galaxies are spirals rather than ellipticals or SO's.

The center of Abell 262 is defined at $01^h 49.8^m +36^\circ 09'$ (1950). Although the core includes a rich concentration of nine NGC galaxies, the cluster has been classified as Irregular--clumpy but not dominated by any bright galaxies and only mildly concentrated toward the center. Over 100 galaxies within Abell 262 (down to magnitude 15.7 photographic) are catalogued in the Catalog of Galaxies and Clusters of Galaxies (CGCG); this provided my starting point. In addition, many of the spirals (those with major diameters of at least one arcminute) are also catalogued in the Uppsala General Catalog of Galaxies (UGC), which provided magnitudes, diameters, position angles, galaxy types and additional notes of interest.

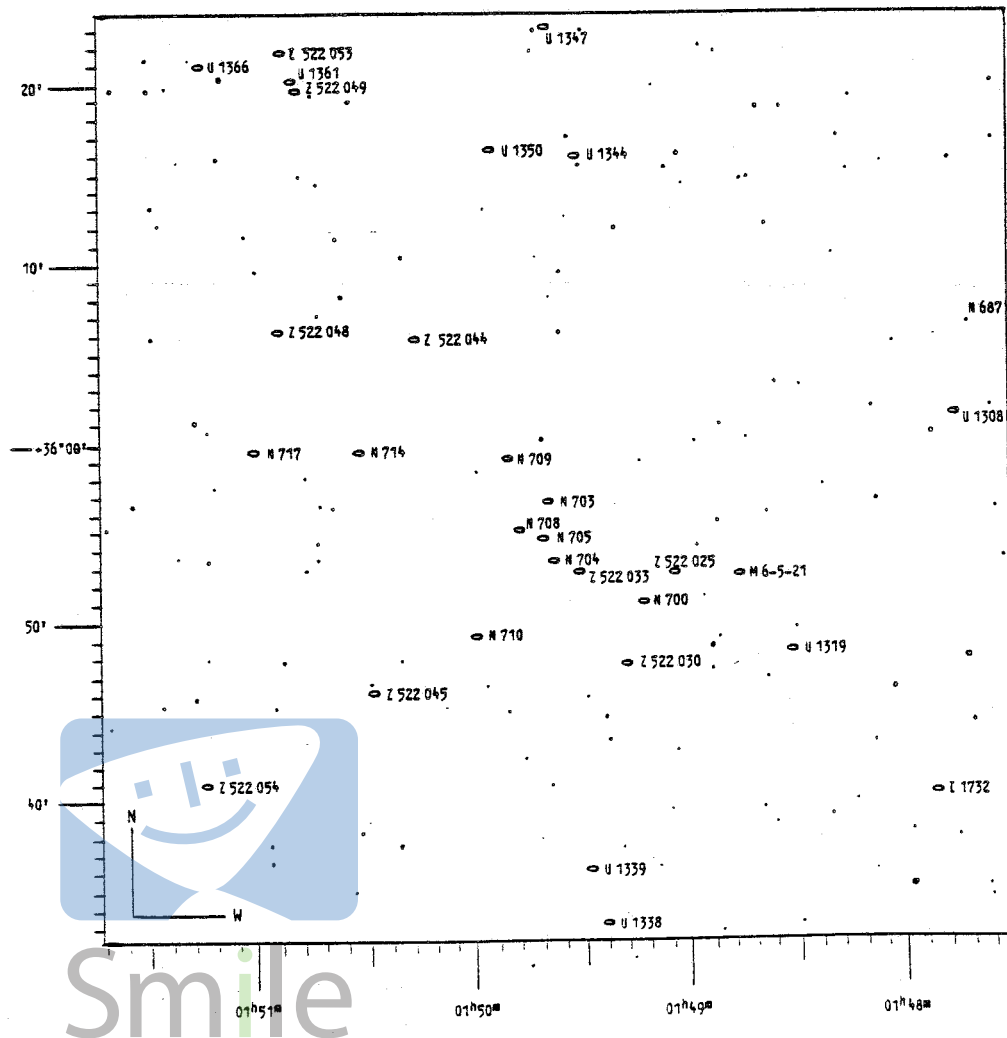
William Herschel was the first visual observer of Abell 262 and discovered four of the brightest galaxies in the central region. His son, John, reobserved the cluster and added NGC 712 to the north. Lord Rosse and his assistants observed the cluster on nine different occasions and discovered or co-discovered (along with D'Arrest) four more NGC galaxies.

I observed the cluster on eight occasions, beginning in December 1982 from Mount Tamalpais with my 13.1" scope and as recently as December 1987 using my 17.5" scope from Digger Pines. I identified a total of 47 cluster members down to photographic magnitude 15.7, the majority of which were so-called anonymous galaxies not found in the NGC or IC catalogues.

This observing project was an excellent learning experience in tracking down and correctly identifying faint galaxies in rich fields. For those with larger scopes and sufficient experience in observing galaxies, the Abell galaxy clusters provide the ultimate challenge in visual observing. Detailed observing notes can be found in an article I co-authored in the summer 1988 issue of the Webb Society Quarterly Journal.

In visually approaching a rich galaxy cluster such as Abell 262, a detailed finder chart is essential to reach the faintest members and for proper identification. The finder chart below of the cluster's central region should help get you started.

(Editor's note: Two of the brighter galaxy clusters in the autumn and winter sky are Abell 262 in Andromeda and Abell 426 in Perseus, and you don't have to be an expert like Steve in order to observe them. I observed Abell 262 last winter from Fiddletown with my 17.5" scope and had no trouble identifying 12 cluster members--only 35 fewer than Steve! Observing galaxy clusters in rich fields is a bit like looking for needles in a haystack. How many can you find?)



CENTRAL REGION OF ABELL 262

DRESS UP FOR THE OCCASION!

What? You don't have an SFAA T-shirt or sweatshirt yet? I mean one of those fancy, elegant, neat stardo shirts that will immediately distinguish you in any crowd. They're available - come to the next meeting and see Chelle Beard. They are terrific buys at \$10 and \$15 each respectively. We also have some great coffee mugs with the SFAA emblem for \$6. DON'T PROCRASTINATE! BUY!!!

BULLETIN EDITOR

Meanwhile, (as Jim said last month) the search continues for a permanent Bulletin editor. Irving is doing this issue and will probably be able to do the October run. If you have some spare time on a regular monthly basis and think you might be interested, call Irving at 641-0770.

In any case, we still solicit and welcome articles and notices from all of you. The submission deadline remains the 18th of the month. Please address all material to: SFAA Bulletin, c/o Irving Hochman, 35 Amber Drive, San Francisco 94131.

BUILD YOUR OWN DOBSONIAN TELESCOPE...

Would you like to build a bigger and more powerful telescope than you ever thought you could own-- for an amazingly low price? Well, it's possible, with hand tools and readily obtainable materials, to build an 8 inch or 10 inch Newtonian reflector for a few hundred dollars...

Dobsonian telescopes are for people who wish to explore the heavens with a telescopic 'eye' much larger than their own. They are inexpensive, stable, easy to aim and by far the most portable big telescope design around.

John Dobson, developer of the design that carries his name, has helped thousands, young and old, to grind and polish telescope mirrors out of glass blanks, including portholes. You will learn basic optical principles, and hands-on glass-working techniques to produce a mirror good to a few millionths of an inch!

TELESCOPE MAKING CLASS

9 weeks ♦ Oct. 11th - Dec. 6th ♦ 7 - 9pm

**at the California Academy of Sciences,
Golden Gate Park, San Francisco**

♦ Stargazing session at first class meeting! ♦

**For more information please call
Sidewalk Astronomers at: 527-4026**

Use this scale to measure angular distances between objects on diagrams below.



ABRAMS PLANETARIUM SKY CALENDAR SEPTEMBER 1988

An aid to enjoying the changing sky

This monthly calendar is available with membership in the Astronomical Society of the Pacific, 390 Ashton Ave., San Francisco CA 94112.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>Evening Planets: Mars is very bright orange "star" rising in E in twilight. Saturn is in S to SSW at dusk. Mercury sets 2° 16' S of W in bright twilight first 3 weeks; very difficult from N states, higher and easier from southern. Jupiter, very bright, rises in ENE within 3 hrs after sunset at month's end.</p> <p>Planets at Dawn: Venus is brilliant, well up in E (rises in ENE 3½ hrs before sunrise). Jupiter is very bright, very high SSE to SW. Mars is very bright, sinking SW to W.</p>	<p>Northmost Moon passes directly overhead in central Florida (Orlando) and S Texas within 1½ hours after sunrise. From northern U.S., Moon is very high in south about 1½ hours after sunrise.</p>	<p>North is up. Stars shown in field (x binoc). 58 Oph (mag 5) Saturn Uranus 9 Spr, -7 Spr 4 MG (Lagoon Nebula)</p>	<p>Uranus finder: Broad and narrow tracks show paths of Saturn and Uranus in Sept. Planets linger near right end of tracks first half of month, then move with increasing speed to left.</p>	<p>Moon covers part of Pleiades late Thurs evening (western U.S.) or early Fri. See box for right.</p> <p>Four hours after sunset: Pleiades Jupiter * ENE</p>	<p>Times of reappearance of brighter Pleiades from behind dark limb of Moon for selected cities: Thurs Sept 1: Los Angeles 11:24 and 11:36 pm PDT; Chicago 12:31, 12:43 am MDT. Fri Sept 2: Denver 12:03, 12:31, 12:43 am MDT. E. Lansing 2:43, 2:49 am EDT; Boston: 2:45, 2:50 am EDT. Use telescope for best view of these occultations.</p>	<p>10 Today: Most distant Moon of 1988. New Moon tonight at 9:49 p.m. PDT (12:49 a.m. EDT on Sept. 11).</p>
<p>11 15 minutes after sunset: Use binoculars as sky darkens to see Mercury and Spica.</p> <p>Summer solstice in S hemisphere of Mars; S pole tipped 25.4° toward Sun.</p> <p>Saturn at aphelion, 10.04 a.u. from Sun.</p>	<p>12 30 minutes after sunset: Mercury and Spica in same binocular field as Moon.</p>	<p>13 Morning: Castor, Pollux, Moon, Venus in east (Midnight, about ¾ hour before sunrise)</p>	<p>14 Evening (midnight, about ¾ hour after sunset, the usual time for our "evening" diagrams): Moon WSW Spica Merc.</p>	<p>15 Evening: Mercury at greatest elongation, 27° E of Sun and 4° W (LR) of Spica. Moon WSW Spica Merc.</p>	<p>16 Friday's Moon: See next box right. Minor planet Ceres (mag 7.3) at opposition tonight, in Cetus.</p>	<p>17 Friday & Saturday evenings, Saturn Moon occults Antares Tau Sco Sat 17:17 Sco 16:16</p>
<p>18 Moon Tues 20 Moon Mon 19 TEAPOT</p> <p>Sept 19: Mercury 1.1° S of Spica; visible southern states.</p> <p>All night: Moon near Mars.</p> <p>Evening: Harvest Full Moon</p>	<p>19 Rest of Sept: Saturn's rings tipped 26° 56' from edge-wise, giving as best view of their north face in Saturn's 29.5-year orbit.</p>	<p>20 Mars nearest Earth. Distance 36.5 million miles. At its closest since 1971, Mars won't be this close again until 2003.</p> <p>Sept 28, morning: Can you guess what will happen six days from now?</p>	<p>21 Autumnal equinox 3:20 p.m. EDT. Moon rises within ½ hour later each evening Sept 22-27 from northern U.S. Moon occults Delta Cap (Goat's Tail) tonight, except AK, HI, most of FL. 3½ hours after sunset: Pleiades Moon Jupiter * Aldebaran * Beta Tauri ENE</p>	<p>22 Sept 23, morning: Venus * Regulus</p>	<p>23 Morning: Jupiter reaches turning point 6° NW of Aldebaran; moves 10° W next 4 months. Evening: Moon E * Mars ESE</p>	<p>24 Mars will remain an evening "star" until July 1989, but then it will glow dimly at mag +1.8 in the western twilight, only 170 as bright as its glorious showing this month. Keep track of Mars until it disappears next July.</p>

Magnitudes: Venus - 4.3 to - 4.1; Mars - 2.3 to - 2.8; Jupiter - 2.4 to - 2.6; Mercury (Sept 1-21) 0.0 to + 0.3; Saturn + 0.4 to + 0.5; Uranus 5.8 to 5.7; Neptune 8. **Telescope:** Venus shrinks from 21" to 17" across, while lighted fraction increases from 55% to 68%. Mars grows to nearly 24" across. The S pole is tipped 20° 22' toward Earth and 25° toward Sun; see Sept 5, 11, 21, 27. The S polar cap is shrinking rapidly. Dark Syrtis Major is near center of Mars' disk Sept 25 at 11 p.m. EDT (8 p.m. PDT), and 0.6 hour later each night. At midmonth, Jupiter is 43" across, and Saturn's ring system, tilted nearly 27°, extends 38". **Motions:** Sun goes 29° E, from Leo into Virgo Sept 16. Mercury at dusk on Sept 1 is 23° E of Sun and 21° W (lower right) of Spica. In this poor apparition from mid-northern latitudes, Mercury gets barely 1° up in mid-twilight from lat 40° N, about ¾ hour after sunset; see Sept 14, 15, 19. Thereafter Mercury fades and drops even lower. Venus goes 33° E, from Gemini through Cancer into Leo; watch Venus approach Regulus until Oct 4. Mars retrogrades (goes W) 7°, from Cetus into Pisces, and will align with E side of Great Square of Pegasus in early Oct. Jupiter creeps only 0.9° E Sept 1-24, then begins retrograde; see Sept 24. Saturn and Uranus end retrograde Aug 30 and Sept 5, respectively. By end of Sept Saturn goes 0.8° E, and Uranus 0.3° E. See Sept 18-20, and Uranus finder on calendar.

THE "GALILEO MUSEUM" in FLORENCE - by Irving Hochman

In Florence, there is a wonderful Museum of History of Science, sometimes referred to as the Galileo Museum, full of antique scientific instruments. The building, the Palazzo Castellani next to the Uffizi Gallery on the Arno, is one of the oldest in Florence, dating back to an epoch before 1180. It was then a castle and still part of the city walls.

With the flourishing of commercial and political life in the Italian city-states, came a renewed interest and knowledge of Graeco-Roman sciences. This reached its magnificent fruition in the work of Galileo in and around 1600.

Galileo used and developed a variety of specific scientific instruments: astrolabes, compasses, lenses, telescopes, magnets, quadrants and various mathematical instruments, all of which are displayed in this museum. Two telescopes made by Galileo are described as follows:

1) Telescope of Wood covered with Paper - 1.36 m. long, with a biconvex lens of 26 mm. aperture and 1.33 m. focal length; plano-concave eyepiece; magnification 14X.

2) Telescope of Wood covered with Leather with Gold Decorations - 0.92 m. long, with a biconvex objective of 16 mm. useful aperture and 0.96 m. focal length, biconcave eyepiece; magnification 20X.

These are the instruments with which he discovered Jupiter and its four largest satellites. We now know too, that Galileo inadvertently recorded Neptune in 1613 while observing Jupiter. (See ASTRONOMY, August 1988, page 31)

In the area of compasses, Galileo made notable improvements on some of them. He developed a measuring and calculating device that would remain in use until the slide-rule replaced it (as a calculator) in the 19th century. He set up a shop in his home in Padua and hired an artisan to produce it for sale and gifts. The Giovilabio is a contrivance wholly new in the early 17th century and possibly unique to Galileo. When he discovered the Jovian moons he realized that they could be used to solve the old problem of finding longitudes on the earth's surface. That is, moons could be thought of as celestial chronometers, and with appropriate tables they could be used to establish the angular distance of any point on Earth from some arbitrary prime meridian. Therefore, providing correct tables of the motions of those moons and devising calculating techniques became important. Galileo's solution was this Giovilabio, an instrument incorporating information about the moons' motions and a capacity for making computations about those motions. This tool was clearly in the realm of modern, specialized scientific instrumentation.

A great part of our modern scientific method is based directly on the genius, courage and character of Galileo Galilei, in whose debt we shall always remain.

WANTED: Four to six-inch Douglas at 386-1876. (1)
Call

Members' ads are free and will run three times. Please notify the Bulletin editor if an item is sold so the ad may be deleted. This service is provided monthly on a space-available basis.

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