



SAN FRANCISCO Amateur Astronomers

SHARING THE WONDERS OF THE UNIVERSE

May 1993

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Information Line Number: (415) 905-6445

The SFAA Board of Directors meets on the second Wednesday of each month at 8:00 P.M. at the Copper Penny Restaurant, Geary and Masonic. All club members are welcome at Board meetings.

The SFAA Bulletin is a forum in which club members may share their ideas and experiences in astronomy. We encourage you to participate and welcome your letters, sketches and articles on astronomical subjects. Please send your contributions to: SFAA Bulletin Editor, 190 Chilton Avenue, San Francisco 94131. Deadline is the 18th of the month before publication.

Coming May 19—"The Magellan Mission"

The San Francisco Amateur Astronomers holds lecture meetings on the third Wednesday of each month at 8:00 P.M. at Morrison Planetarium, California Academy of Sciences, Golden Gate Park. The next monthly lecture meeting will be on May 19, when Dr. G. Leonard Tyler from Stanford University will tell us all about the Magellan Mission to Venus.

Dr. Tyler received his M.S. and Ph.D. degrees from Stanford University, where he has been a Professor of Electrical Engineering since 1974. He has also served as a consultant to the Stanford Research Institute, NASA, the Jet Propulsion Laboratory and other organizations.

He was the team leader for the Voyager and Mars Observer Radio Science Teams; a member

of the Magellan Project Science and Radar Investigation Groups and the Viking Radio Science Team; an associate member of the Mariner Venus-Mercury Radio Science Team; and a co-investigator on the Apollo Bistatic-Radar Experiment. His technical achievements include development and application of occultation techniques for studying the outer planets, the measurement of Titan's atmosphere, and co-selection of the Viking I landing site on Mars.

Dr. Tyler has authored more than 150 technical research papers and is an expert in electromagnetic theory, radar astronomy and the design and execution of experiments in space. He served on the NASA Committee on Planetary Exploration from 1983-87 and has won NASA Medals for Exceptional Scientific Achievement three times.

Mount Tamalpais

The San Francisco Amateur Astronomers holds monthly star parties at Rock Springs on Mount Tamalpais on the Saturday nearest the New Moon. The next club star party will be on Saturday evening, **May 22**, beginning at dusk. In conjunction with our monthly star parties, Mount Tamalpais State Park sponsors a series of public astronomy programs during the summer and autumn months at the nearby Mountain Theatre. At 8:30 P.M. on May 22, Lucinda DeLorimier will be telling *Star Stories*.

We received great news from the Mount Tamalpais Rangers in April. Our star parties have now been given the status of *special events*, which makes our presence on the mountain acceptable to the state governing agency without the need to worry about insurance. SFAA volunteers will be responsible for maintaining order at each month's star party. Joel Goodman and Michel Kotski are in charge of the star party on May 22.

Be sure to call the star party hotline (905-6445) before you leave home to check the weather conditions on the mountain.

Potpourri

- The Third Annual SFAA Yosemite Star Party is scheduled for the weekend of **July 9-10** at Glacier Point. For complete information and a registration form, see page 11 of this issue.
- Volunteers are needed to provide solar viewing to the general public on the first Sunday of each month at the California Academy of Sciences in Golden Gate Park. If you can help out, please call Bob Levenson at 584-5756.
- Bill Cherrington has been busy introducing the public to astronomy. On February 2 he presented a public lecture entitled *Introduction to Astronomy* to a group called The Sunrisers that meets Tuesday mornings in West Portal. He repeated his lecture on April 18, this time to The Singletarians of the Unitarian Church at Geary and Franklin. Bill's presentation consists of basic information about the Solar System, slides of deep sky objects and an invitation to all present to attend our monthly lecture meetings and star parties on Mount Tamalpais.



Star charts in the SFAA Bulletin are based upon The Sky for Windows available from Software Bisque. Photographs are from The Buil-Thouvenot CCD Atlas of Deep Sky Objects available from Sky Publishing.

Sometimes the most amazing things happen, and the workaday world hardly seems to notice. When this happened twice in April, SFAA members were there to witness the events. Here are their first-hand reports:

A Daylight Occultation

After a night of astrophotography and observing I hit the sack about 2:00 A.M. and set my alarm for 5. When I awoke I was treated to a beautiful sight: a thin crescent Moon rising with Venus. I left my C-8 tracking on the planet and went back to sleep.

After a couple of hours of shuteye I checked the eyepiece again in broad daylight. There was Venus, in crescent phase like a small Moon itself, drawing ever closer to an all but invisible Moon. At about 8:20 A.M. the limb of Venus touched the thin limb of the Moon and began to disappear. It took about three minutes for the Moon to fully cover the planet; I had the feeling I was witnessing a kind of *Venus-Set*.

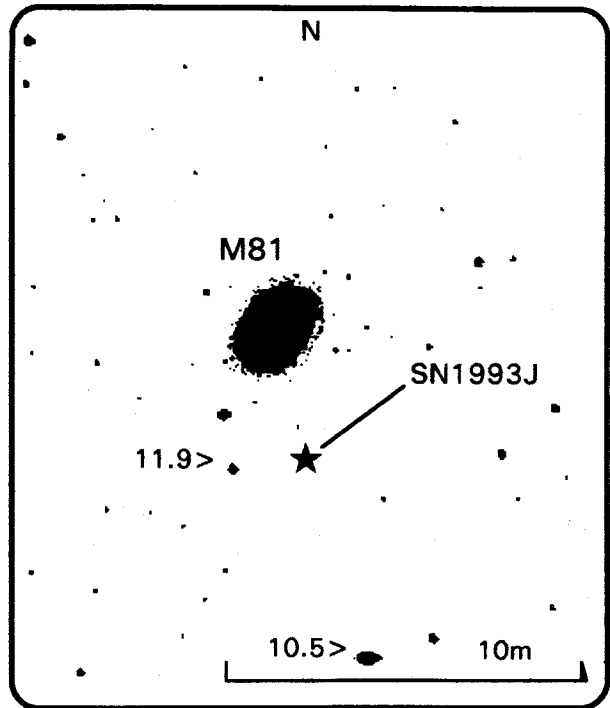
About 50 minutes later the planet suddenly reappeared, its tip like a tiny claw reaching around the edge of the Moon. Its reappearance was much faster, taking perhaps a minute. For a few seconds, we could just make out the invisible dark edge of the Moon. In all, a fascinating sight!

—Dan Smiley

A Supernova in M81

The explosion of a red giant star in an outer spiral arm of M81 is only less spectacular than a daylight occultation of Venus because it is happening a billion times further away or so. (If it were the Sun, the blaze would vaporize the Earth!)

Supernova 1993J is pretty easy to locate. It forms one angle of a right triangle with two fainter field stars lying a couple of arcminutes away from the visible core of the galaxy.



Based upon brightness comparisons with two nearby field stars, the supernova appears to be about 11th magnitude. This is about the expected apparent magnitude of a Type II supernova occurring at a distance of 10 million light years.

—Jim Shields

Jupiter in May

by Fred Sammartino

This is a great time to look for moon shadows. First put on the old Cat Stevens tune *Moon Shadow*, then wait for a clear night on any of the dates listed below. Io's shadow is easy to spot (no pun intended) and the most common. It's right in the middle of the single dark belt on Jupiter (the southern belt is still missing). It might look like a dark knot or storm at first, but during moments of clear seeing, it will resolve into a perfect little dot, almost as wide as the belt. For a real challenge, look for the bright moon hovering above the cloud tops after you've seen the shadow.

It's also fun to watch the moon start or end a transit. It takes a good 10 minutes for the moon to completely detach itself from the disk of Jupiter. When can you first identify the moon as a tiny white "zit" on the edge of Jupiter on a transit exit? Following are times (PDT) for moon shadow transits visible from the Bay Area in May. Look on the *evening* of the day given, all AM times are after midnight that evening in this table.

Moon and Shadow Transits

evening	moon	TransitStart	ShadowStart	TransitEnd	ShadowEnd
Sun. May 2	Io	-	-	9:19 PM	10:03 PM
Fri. May 7	Io	2:28 AM	3:18 AM	-	-
Sun. May 9	Io	8:55 PM	9:46 PM	11:06 PM	11:58 PM
Thu. May 13	Callisto	over	north	pole at	9:13 PM
Fri. May 14	Ganymede	-	-	-	10:35 PM
Sun. May 16	Europa	-	-	9:06 PM	11:05 PM
	Io	10:43 PM	11:41 PM	12:54 AM	1:52 AM
Fri. May 21	Ganymede	-	11:50 PM	10:23 PM	2:33 AM
Sun. May 23	Europa	9:03 PM	11:14 PM	11:32 PM	1:42 AM
	Io	12:32 AM	1:35 AM	2:43 AM	-
Tue. May 25	Io	-	-	9:11 PM	10:15 PM
Fri. May 28	Ganymede	11:12 PM	-	2:03 AM	-
Sun. May 30	Europa	11:31 PM	1:52 AM	2:01 AM	-
Tue. Jun 1	Io	-	9:59 PM	11:02 PM	12:11 AM

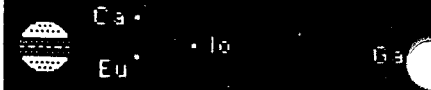
Have you spotted the spot yet? Look right where the "missing belt" of Jupiter *should* be up to 1 1/2 hour before or after the times listed below when the spot is at the center of the disk.

Red Spot near central meridian

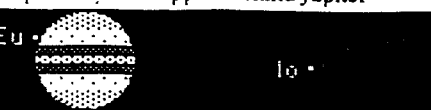
Sat. May 1, 11:45 PM	Tue. May 11, 10:01 PM	Sun. May 23, 2:05 AM
Tue. May 4, 1:24 AM	Thu. May 13, 11:40 PM	Sun. May 23, 9:56 PM
Tue. May 4, 9:15 PM	Sun. May 16, 1:18 AM	Tue. May 25, 11:35 PM
Thu. May 6, 10:53 PM	Sun. May 16, 9:09 PM	Fri. May 28, 1:13 AM
Sun. May 9, 12:32 AM	Tue. May 18, 10:48 PM	Fri. May 28, 9:05 PM
Tue. May 11, 2:10 AM	Fri. May 21, 12:26 AM	Sun. May 30, 10:43 PM

Here are some interesting moon configurations to look for during the month. Moons and spot pass right to left in front of Jupiter. Moons not shown are out of the field of view.

Wed. May 5, 10:53 PM - triangle of moons. Europa & Callisto in conjunction




Friday, May 7, 9:50 PM. Europa ready to disappear behind Jupiter




Later that evening, watch Europa slowly brighten into visibility near Io as it exits eclipse from Jupiter's shadow


2:05 AM




2:10 AM



at 3:30 AM, Io shadow is plainly visible under the red spot




Friday, May 14, 9:15 PM - rare Ganymede shadow near central meridian




Sunday, May 16 - Europa shadow & red spot, then Io transit & shadow


9:12 PM




10:00 PM




10:40 PM




11:50 PM



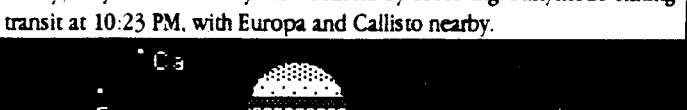
12:55 AM




1:45 AM



Friday, May 21 - Start out your weekend by observing Ganymede exiting transit at 10:23 PM, with Europa and Callisto nearby.

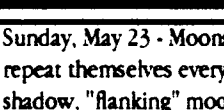


At 12:50 AM, see the strange moon lineup and Ganymede shadow

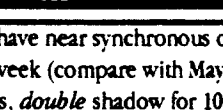


Sunday, May 23 - Moons have near synchronous orbits, so patterns repeat themselves every week (compare with May 16 & 30). Europa shadow, "flanking" moons, double shadow for 10 minutes at 1:40 AM!

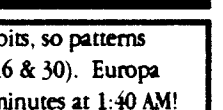
11:35 PM




12:05 AM



1:40 AM



Monday morning, May 31, 2:15 AM - Europa shadow, Io ready to transit



Killer Comets Do In Dinosaurs

—Joel W. Goodman

The title reads like a headline from sensationalist rags like the National Enquirer, but this one is for real. It is now widely accepted that the mass extinctions that occurred 65 million years ago, including the demise of the dinosaurs, were a direct consequence of the impact that blasted out the Yucatan's Chicxulub crater, which at 200 km in diameter is the largest impact crater yet identified on this planet. Debris from the impact, rich in minerals such as iridium that are normally in very low abundance in the earth's crust, have been dated at 65.0 ± 0.5 million years, in excellent agreement with the end of the Cretaceous Period. The dating game is based on the decay of radioactive potassium-40 to argon-40 in rocks, which occurs at an extremely steady pace. When rock is liquified by a high-energy impact, the argon escapes and the clock is reset to zero. Thus, analysis of the abundance of argon-40 in the sample reveals how long ago the last reset took place. In this case, the answer is---you guessed it---65 million years, give or take.

So the main element of the mystery has been solved, but vital details remain obscured. Did Chicxulub act alone or were there co-conspirators? This may seem nit-picking, but it gets to the fascinating question of whether the culprit was an asteroid or a swarm of comets. Two or more simultaneous impacts by asteroids would be extremely unlikely, unless a single asteroid broke up prior to impact, peppering our planet with its fragments. Comets, on the other hand, frequently break up, as witnessed on at least 20 occasions in modern times. So the fragmentation of a single large comet or, in another scenario, several members of a swarm of comets shaken loose from the Oort Cloud by a passing star, could produce multiple simultaneous hits upon our poor unsuspecting planet.

Well and good, you say, but where's the evidence? As it turns out, the evidence happens to be in Iowa, a far cry from the Yucatan. The relatively modest Manson crater, a mere 35 km across, has been largely buried for many eons, but the body was recently exhumed by drilling and the unearthed material subjected to argon dating. Lo and behold, the answer is --- 65.0 ± 0.4 million years, compelling evidence for at least two essentially simultaneous impacts, which supports the cometary origin hypothesis. Mind you, Manson was a mere wimp compared to Chicxulub and could not have wreaked the ecological damage on its own, but it likely made a humble contribution to the devastation wrought by its big brother and, more importantly, it does lend credence to the cometary theory. And who knows, if we keep digging we may come up with more craters of the same vintage.

Smile

Astronomy Week in the High Sierras

August 15—20, 1993

The Sierra Nevada Field Campus of San Francisco State University, located alongside the scenic North Fork of the Yuba River, provides an idyllic mountain setting for study in astronomy and the environmental sciences. The field campus lies just east of Sierra City in the foothills of the spectacular Sierra Buttes. Facilities include a two-story dining hall and laboratory. There are tent platforms with tents and cots, and outdoor flush toilet facilities with hot water and showers.

Tuition costs for astronomy week are \$123.00. Dining hall costs are \$13.75 per day, and include two excellent all you can eat hot meals and a sack lunch. Use of the field station tents, cots and washrooms costs \$9.00 per night, or individual camping and use of washrooms costs \$5.00 per night.

Astr 216

Practical Observational Astronomy (1)

A field laboratory course in the practical aspects of observational astronomy from a field location which has truly dark skies. Topics covered include star identification and the use of small to moderate sized telescopes to locate and observe the moon, planets, sun and stars, double and variable stars, star clusters, nebulae, the Milky Way and other galaxies from an ideal observation site.

J. Peters August 15—20

For the last eight years SFAA members have participated in activities at the Sierra Nevada Field Campus during astronomy week. Again this year Jim Shields and Steve Gottlieb will be teaching students how to use big amateur telescopes to explore the treasures of the Summer Milky Way. (Ray Cash—Le Pennec may join us.)

Daytime sessions during astronomy week cover basic astronomical principles, the use of star charts and other observing aids, and observing the Sun. Nightly sessions feature constellation identification, learning to use a telescope, methods for finding and identifying deep sky objects, and lots of hands-on observing through a variety of telescopes, including two 17.5" Dobsonians, for truly spectacular views of the deep sky.

The nearby Gold Lakes Basin offers great hiking trails and swimming in clear mountain lakes during the daytime. It's the perfect astronomy vacation.

To register contact the field station director:

Before June 1:

**Jim Steele
School of Science
San Francisco State University
1600 Holloway Avenue
San Francisco, CA 94132**

After May 30:

**C/O Sierra Nevada Field Campus
Star Route
Sattley, CA 96124
(916) 862-1230**

Obscure Galaxy Catalogues

by STEVE GOTTLIEB

A special interest of mine is collecting historical astronomical catalogues and comparing results made by the earlier visual observers. Most amateurs are aware of the monumental surveys completed in the late 18th century and early 19th century by William and John Herschel as much of the NGC was based on their discovery lists. In the latter half of the 19th survey, Lord Rosse's observing results with his massive 72" reflector at Parsonstown, Ireland are fascinating reading as dozens of galaxies revealed spiral structure under the power of this telescope. By the early 20th century, photography rapidly began to supplant visual work as large regions of the sky could be completely surveyed down to much fainter magnitudes than was visually possible.

I've recently come across two obscure works, one being the first photographic survey of the NGC in the 1920's and the other a fascinating visual study of the NGC done at the Vatican Observatory also published in the 1920's. These works originated around 1910, overlapping at the end of the great visual era of discovery and the beginning of the emerging photographic era of astronomical investigations.

"Die Herschel-Nebel" is a 1926 catalogue compiled by Karl Reinmuth, based on photographic surveys of the sky (down to about -20°) completed at the Heidelberg Observatory. The work began in 1912 based on plates taken by Wolf through the 40cm Bruce telescope and 71 cm Waltz reflector. Data includes Equatorial and Galactic Coordinates (equinox 1875.0), dimensions, position angle, galaxy type and fairly detailed descriptions based on NGC-type abbreviations. Only NGC galaxies are covered but there is a lot of good material here for such an unknown work. For a flavor of the photographic descriptions, here is the description for NGC 1; "pretty faint, considerably small, round, pretty gradually much brighter middle nucleus, *16 south-following 0.8', *15 north-following 1.0', NGC 2 1.9' south"

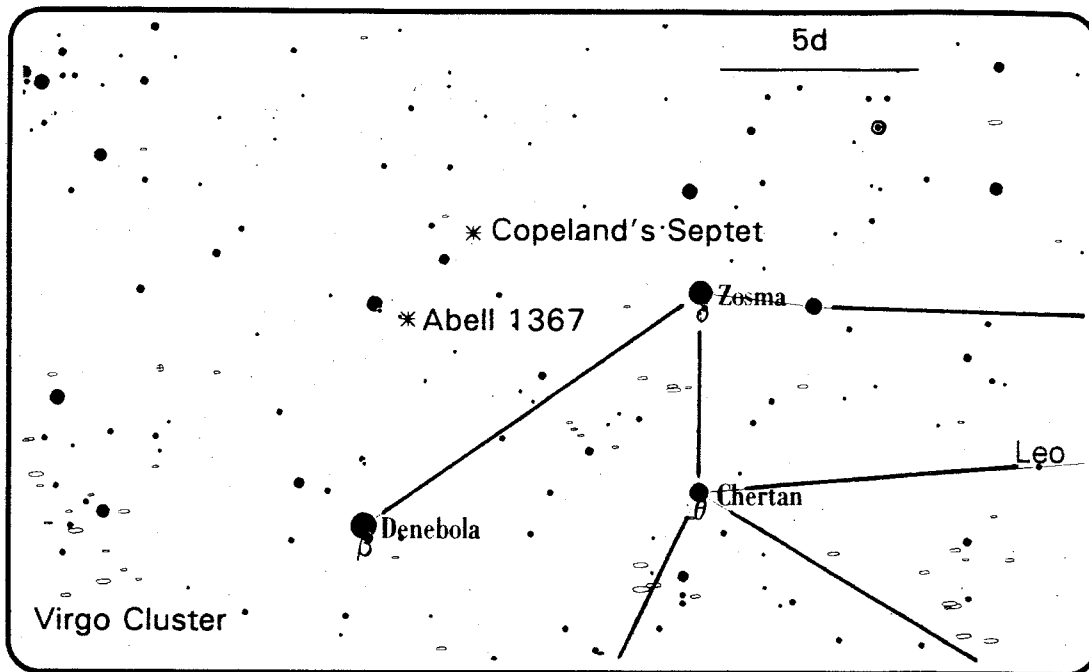
Soon after 1910 at the Vatican Observatory, Father Johann Hagen conceived the idea of a "Durchmusterung" of Nebulae. "The present need is to elaborate from the great mass of Nebulae an edition, homogeneous in every respect, as to position, size and description, and complete to a well-defined limit of intrinsic brightness." He was referring to the fact that the descriptions in the NGC are not on a homogeneous scale due to different observers, telescopes, observing conditions, magnifications used, etc. A description of "pretty bright" might have a very different meaning from one observer to the next. Hagen also wanted to make sure that this catalogue was complete down to a well-defined limit and no brighter nebulae were left out. He wanted to put visual observations on a stronger foundation by using a scale which could later be matched to a precise magnitude once sufficient photometry had been done to correlate the two scales.

As a preliminary step, Hagen observed the entire list of NGC nebulae (this included galaxies and some nebulae such as planetaries) down to -20° and put them on a brightness scale, down to 12 at the faint end. These were not intended to indicate magnitude but the smallest graduated scale by which he could separate galaxies into "bins" based on surface brightness (not total magnitude). In Hagen's words, "the plan was to survey the entire NGC of Dr. Dreyer and to establish a numerical scale for nebulae, analogous to the classes to stellar magnitude, all other considerations, in particular the discovery of new nebulae, to be strictly excluded from the programme as hindrances to its completion.

For this project Hagen used the Vatican visual f/15 Merz refractor (mounting by Gautier in Paris) which had a clear aperture of 406 mm (16"). A magnification of 122X was used with a field of 25.5 arc minutes. A steel "lamella" of 1.08 arc minute width was used at the focal plane to occult bright objects in the field, estimate small diameters and to point in the direction of north-south to time differences in RA between the galaxy and nearby stars.

Hagen considered a nebula to be at the "limit of visibility" when it could be just barely viewed by direct vision. This type of object was assigned a number of 10. If an object would disappear from direct vision but could still remain easily visible with averted vision it was given a number of 11. If the objects was seen only intermittently with averted vision, a 12 was assigned. Numbers brighter than 10 were used although rigorous definitions are not given in the catalogue. Hagen mentions though that the nucleus of M31 received a grade of 1 while the outer regions were assigned a 10. The only thing really missing from this project were detailed visual descriptions as only nearby field stars are mentioned.

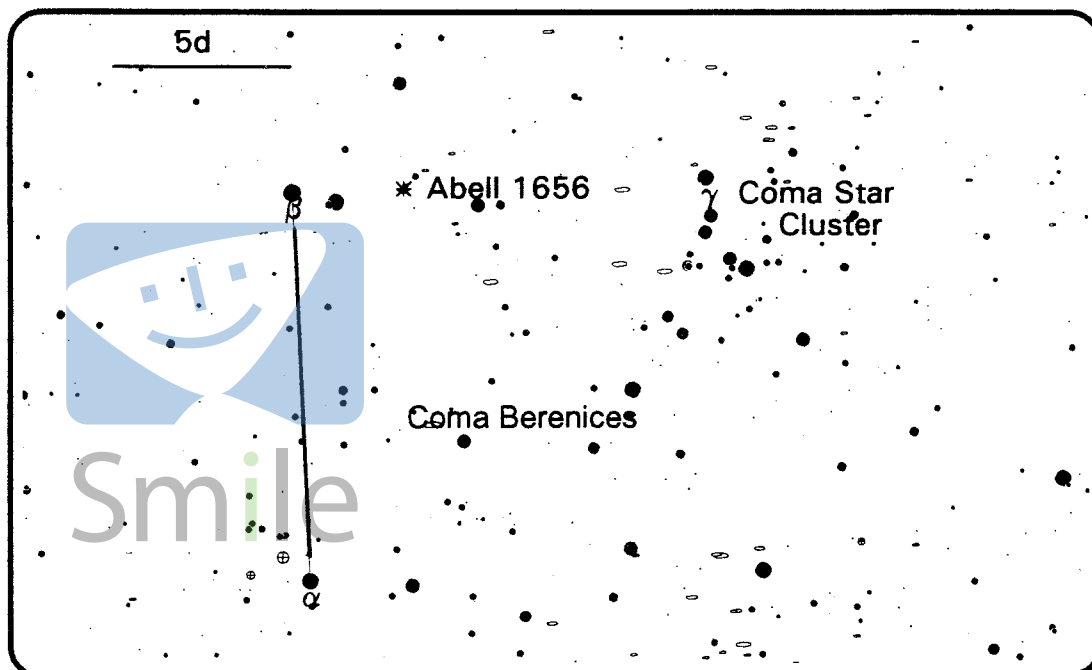
Between the publication of the Zone and General catalogues, Reinmuth's "Die Herschel-Nebel" appeared which fulfilled part of Hagen's dream to create a uniform catalogue that could allow meaningful statistical conclusions. Hagen was clearly partial to visual results, although the explosion of more accurate photometry of bright galaxies would shortly render Hagen's work unnecessary to professionals. -7-



Springtime Galaxy Clusters

Above—It's easy to locate the Leo Galaxy Cluster (Abell 1367). Look for a fourth magnitude star about five degrees north of Denebola. Just southwest of this star you'll find the brightest member of the cluster, 13th magnitude NGC 3842.

Below—The Coma Galaxy Cluster (Abell 1656) isn't hard to find either. Draw a line between the top of the Coma Star Cluster and fourth magnitude Beta Comae Berenices. About 2.5 degrees west of Beta look for the pair of 11th magnitude giant ellipticals, NGC 4874 and 4889, that dominate the galaxy cluster.

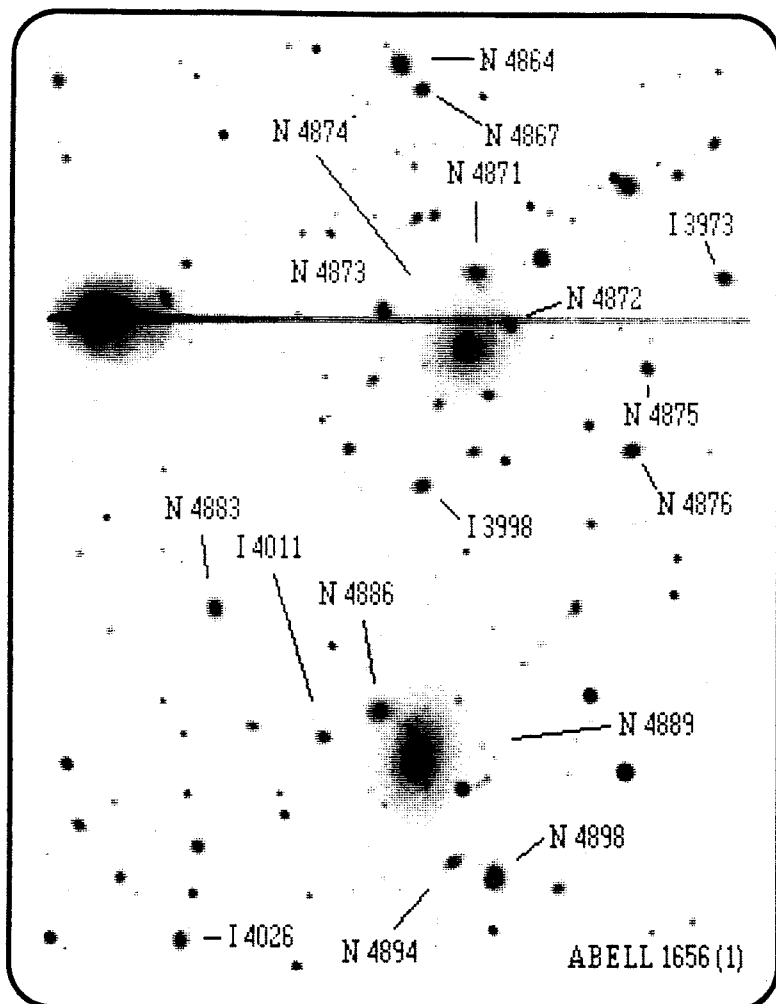


Galaxy Clusters

After the Virgo Cluster, the best and brightest galaxy clusters in the northern sky are in Leo and Coma Berenices. Both these clusters are around 350 million light years away.

The Leo Cluster (Abell 1367) is an irregular cluster containing a scattering of spiral and elliptical galaxies. In contrast, the Coma Cluster (Abell 1656) is the classic rich regular cluster, nearly circular in outline, with very few spirals and dominated by a pair of supergiant elliptical galaxies, NGC 4874 and 4889 (shown at left). The former is surrounded by a virtual cloud of "fuzzy stars" to the very limits of visibility. At least 17 are visible in a 17.5" telescope.

—Jim Shields

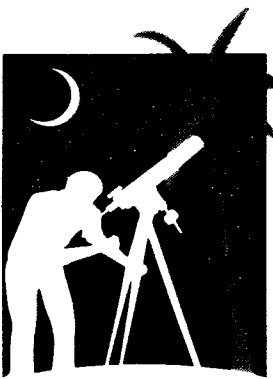


Bright Star Atlas 2000.0

For several years I've been looking around for a good lightweight star atlas to use while observing in the city. I wanted one with the entire sky on less than a dozen pages; all deep sky objects bright enough to see in city skies; information tables of magnitudes, distances, etc.; and 9"X12" durable, thin, easy to carry everywhere.

Wil Tirion developed the *Bright Star Atlas 2000.0* which matches my wishes all except the distances to the deep sky objects. I keep it with me along with Guy Ottewell's *Astronomical Atlas* and *Ottewell's Astronomical Companion*. Now when I read interesting articles in *S&T* I immediately look them up in the *Deep Sky Atlas* and make notes. As I indicated at the beginning, I also find the atlas invaluable during my sidewalk astronomy outings as well as my dark sky outings.

—Tom Kellogg



UNIVERSE '93

A National Astronomy Expo and Conference
July 10-15, 1993, San Diego State University—San Diego, CA

Presented by: **The Astronomical Society of the Pacific & Astronomy magazine**

You are invited to one of the largest and most exciting public events in astronomy for 1993—one expressly designed to be accessible to everyone interested in astronomy, regardless of background or experience.

As part of its 105th Annual meeting, the **Astronomical Society of the Pacific** is presenting a very special weekend of lectures, exhibits, and demonstrations on popular astronomy and amateur astronomy. Among the many outstanding speakers who are giving talks at **UNIVERSE '93** are:

- ☆ **Sally Ride**: *Observing Earth from Space—the U.S. Space Program*
 - ☆ **Timothy Ferris**: *Cosmology—The Origins of the Universe*
 - ☆ **William Hartmann**: *The Solar System Through Science & Art*
 - ☆ **Richard Berry**: *The Latest Results in Amateur Image Processing*
 - ☆ **David Crawford**: *Light Pollution: The Theft of the Night*
 - ☆ **William Kaufmann**: *Black Holes and Warped Spacetime*
 - ☆ **Ed Krupp**: *Under Maya Skies: The Astronomy of the Ancient Maya*
 - ☆ **Sallie Baliunas**: *Solar and Stellar Cycles—*
Understanding Solar Change and the Earth's Climate Change
 - ☆ **Harding E. Smith**: *Active Galaxies: Starbursts, Quasars & Black Holes*
 - ☆ **Stephen Saunders**: *Magellan's Exploration of Venus*
 - ☆ **Alexei Filippenko**: *Stellar Explosions—Celestial Fireworks*
 - ☆ **Alan Dyer**: *Selecting Your First Telescope*
 - ☆ **Stephen Edberg**: *Chasing and Observing Solar Eclipses*
 - ☆ **David Levy**: *Comet Hunting*
- Other special guests are still being added to the schedule.

The weekend will also feature computer software and telescope demonstrations, an interactive "Solar System Walk," a special "Meet-the-Speaker" area for informal questions and book-signings, an opportunity to win exciting door prizes, and an evening Star Party with the San Diego Astronomy Association on the grounds of the Reuben H. Fleet Theater & Space Center in beautiful Balboa Park.

UNIVERSE '93 Astronomy Expo & Fair

Saturday, July 10 & Sunday July 11

Tickets are available at the door:

Aztec Center, 5300 Campanile Drive, San Diego State University

Weekend Pass: (Sat. & Sun.) \$25 each

Day Pass: (Saturday or Sunday) \$15 each

☆ Students of all ages/Seniors

Weekend Pass: (Sat. & Sun.) \$18 each

Day Pass: (Saturday or Sunday) \$10 each

☆ Children under 12 FREE when accompanied by an adult

UNIVERSE '93 is also co-sponsored by the American Association of Variable Star Observers, Association of Astronomy Educators, Association of Lunar and Planetary Observers, the Astronomical League, International Amateur-Professional Photoelectric Photometry, International Dark-Sky Association, Planetary Society, Western Amateur Astronomers, Young Astronaut Council, Griffith Observatory, Mount Laguna Observatory, Reuben H. Fleet Space Theater & Science Center, and the San Diego Astronomy Association

Astronomical Society of the Pacific • 390 Ashton Ave. • San Francisco, CA 94112 •
(415) 337-1100 • Fax: (415) 337-5205

Yosemite Star Party July 9—10

CAN YOU BELIEVE IT, ANOTHER YEAR HAS PASSED SINCE OUR LAST STAR PARTY TRIP TO YOSEMITE, AND DUE TO GREAT DEMAND, THE SFAA HAS APPLIED AGAIN, SUCCESSFULLY, FOR ANOTHER SPECIAL STAR PARTY DATE FOR THE SUMMER OF 1993.

DUE TO THE ADVERSE WEATHER CONDITIONS AT GLACIER POINT, THERE ARE ONLY SEVERAL WEEKENDS DURING THE ENTIRE SUMMER PROGRAM SEASON THAT ARE AVAILABLE FOR ASTRONOMY CLUBS TO PARTICIPATE. THIS 1993 SEASON HAPPENS TO BEGIN ON JUNE 27 AND END ON AUGUST 29, LEAVING **ONLY THREE NEW MOON (IDEAL) WEEKENDS FOR TWELVE COMPETING ASTRONOMY CLUBS. OUR CLUB CANNOT EXPECT TO GET A NEW MOON WEEK-END EVERY YEAR.**

THIS YEAR THE SFAA HAS BEEN AWARDED JULY 9 AND 10, A FRIDAY AND SATURDAY EVENING, FOR OUR WEEKEND. ON FRIDAY, JULY 9, THE 20 DAY OLD MOON RISES AT 11:34 PM. ON SATURDAY, JULY 10, THE MOON RISES AT MIDNIGHT. AFTER THE GENERAL PUBLIC LEAVES AT MIDNIGHT, YOU HAVE THE REST OF THE NIGHT (BOTH NIGHTS) TO OBSERVE.

THE RULES FOR THIS SFAA FUNCTION ARE SIMPLE:

1. THIS IS OPEN TO **SFAA MEMBERS** AND THEIR FAMILIES OR **SFAA MEMBERS** AND THEIR SPECIFIC GUESTS, ONLY.
2. EACH MEMBER MUST BRING AT LEAST **ONE TELESCOPE** TO SHARE WITH THE GENERAL PUBLIC **ON BOTH NIGHTS**. BORROWING ANOTHER MEMBER'S TELESCOPE IS ENCOURAGED, ESPECIALLY IF YOU DON'T ALREADY HAVE ONE.
3. THE TOTAL NUMBER OF ADULTS PERMITTED IN THE GROUP CAMPSITE IS **STRICTLY LIMITED TO 30**, SO, PLEASE **CUT OFF AND RETURN THE APPLICATION STUB BELOW**, WITH THE CORRECT FEE, TO SAVE YOUR RESERVATION. REGISTRATION IS ON A FIRST COME - FIRST SERVED BASIS.

.....

A BASIC FEE OF \$10.00 IS CHARGED PER ADULT (CHILDREN UNDER 18 ARE FREE). THIS FEE IS FULLY REFUNDABLE IF YOU PARTICIPATE **ON BOTH EVENINGS**; FORFEITED IF YOU DO NOT (THE MONEY WILL GO INTO OUR GENERAL FUND). YOU CAN ALSO DONATE SOME OR ALL OF YOUR FEE, IF YOU WISH, TO THE SFAA GENERAL FUND SINCE ALL OTHER YOSEMITE PARK FEES HAVE BEEN WAIVED FOR US DURING OUR STAY ON JULY 9 & 10, (AND WE COULD USE THE MONEY FOR FUTURE EVENTS).

NO OF ADULTS @ \$10.00 EA.=....., TOTAL ENCLOSED =.....

NO OF CHILDREN UNDER 18 YEARS IS (ARE).....

SFAA MEMBER:.....QUESTIONS ??? (415)584-5756

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Founded in September, 1952, the San Francisco Amateur Astronomers (SFAA) is an association of people who share a common interest in astronomy and other related sciences. Our membership consists of people from all walks of life, educational backgrounds and ages. Many SFAA members own their own telescopes; some have been made by hand in local telescope-making classes and vary in size from six to 25 inches diameter.