



SAN FRANCISCO AMATEUR ASTRONOMERS

Sharing the Wonders of the Universe

November 1992

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And So It Begins!

The next regular meeting is on **Wednesday, November 18** at 8:00 PM at the California Academy of Sciences, Golden Gate Park. The speaker is Dr. Jill Tarter, Principal Investigator for the SETI Institute at NASA—Ames Research Center and a member of the Astronomy Department at UC Berkeley. The title of her talk is *And So It Begins!: NASA's search for Extraterrestrial Intelligence*.

Jill Tarter studied engineering physics at Cornell University and began graduate work there in theoretical physics, but interrupted her studies to begin a family, relocate to California and change her field of interest. She earned her M.A. and Ph.D. in astronomy from the University of California at Berkeley.

As a graduate student at UC Berkeley, she became involved in a small project searching for radio signals from extraterrestrial civilizations using the Hat Creek Observatory 85-foot telescope. She was the only person

around who still remembered how to program an archaic, but free, computer that formed the core of the instrument package of the SERENDIP project, which is still on going after many stops and starts.

Dr. Tarter now serves as the Project Scientist for NASA's SETI Microwave Observing Project. As such, she has the opportunity to plan and conduct thorough observations of the sky through a set of narrowband and pulse sensitive filters never before systematically employed by astronomers. She also enjoys the constant opportunity provided by SETI to study topics in biology, geophysics, chemistry, paleontology and many other fields that relate to the question of the existence of life elsewhere in the universe.

In September 1989 Dr. Tartar received the Life-time Achievement Award for her contributions to the search for extraterrestrial intelligence by Women in Aerospace, a professional association in Washington, D.C.

Mount Tamalpais

The next star party at Rock Springs on Mount Tamalpais is on Saturday evening, **November 21**, beginning at dusk. Bring along your binoculars and telescopes, star charts and love of the night sky to share with other SFAA members and the general public.

An Evening on Cathedral Hill

About 12 SFAA members attended a recent lecture and discussion by Dr. Timothy Ferris at the First Unitarian Church in San Francisco. The title of the talk was *The Origin and Evolution of our Universe*.

As Dr. Ferris mentioned to me, particle accelerators and churches have much in common. Fermi Lab in Illinois is modeled after a famous cathedral in France. In a sense both are searching for the ultimate and deepest mysteries of the cosmos.

The wine and cheese reception that followed was the finishing touch to a great evening. Thanks again to Dr. Ferris and to Maria Watts of Saybrook Society.

—John Muhilly

Another Look At Sugarloaf


Although we don't agree with Jim Webster's opinion of Rock Springs, we are in complete concurrence with his favorable review of Sugarloaf State Park near Sonoma. We had a look for ourselves the weekend of September 19.

After a short stretch of freeway driving, we found the remainder of the trip a pleasant surprise. The scenery along Highway 121 was beautiful, with lots of new wineries, fruit stands and other places of interest to enjoy. Just outside the park entrance, among shade trees and a creek, is Orestis Italian outdoor cafe, a perfect place to stop for brunch or dinner before or after a star party weekend.

About half of the 50 campsites were occupied that weekend. We enjoyed showing Saturn to the campers, many of whom were seeing it for the first time.

The problem at Sugarloaf's main campground is light from campfires and lanterns, but the group campground may be ideal. It's large and well-shaded by oak trees, with good horizons and a barbecue. We would like to organize a club weekend star party there. If you're interested, please call the SFAA hotline (905-6445) and leave a message.

—Loretta Botta & John Muhilly



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.

September 26th was a dream-come-true type of day for a great star party: warm, clear and calm. The sight of the closed gate at the Pantoll ranger station left me dumbfounded. The sign read *Closed Due to Extreme Fire Danger*. The ranger said, "The star party is cancelled—period!"

I sat in the parking lot, ate my dinner and thought it over. Then I drove to a parking spot a few hundred yards from Pantoll station and set up my 13" scope. Joseph Del Fiorentino and Bob Shasna from American Canyon had the only other telescope there. We had a few dozen enthusiastic star lovers reveling over the sights of Saturn, M13, the Dumbbell Nebula, the Ring Nebula and the Andromeda Galaxy

To make up for the cancelled lecture, we had a discussion on UFOs. The fact that I've never read about nor spoken with an amateur astronomer who has seen one is evidence enough to dispel any belief in their existence I might have, though I'd love to obtain evidence to the contrary. Then we lay on our backs listening to a guided tour of the stars and constellations on tape. All in all, not a bad star party.

—Tom Kellogg

The 1993 *Observer's Handbook* will be available in the bookstore of the California Academy of Sciences in mid-November. Members of the Academy receive the usual discount. Only 20 copies have been ordered, so SFAA members may wish to call 750-7306 and reserve a copy in advance.

—Lonny Baker

This is the season to take to the sidewalk with your telescope. The stars come out by 6:00 P.M. and the holiday activities increase pedestrian traffic. Halloween is one of my favorite days to pass out a most unexpected *treat* to those ghosts, goblins and angels that fill the streets. A glimpse of Saturn or the first quarter moon is sure to please them.

Once you've witnessed the spark of elation that zaps a person on his first view through a telescope, you're bound to return to the sidewalk to delight Christmas shoppers, New Year's serenaders and plain old ordinary commuters and strollers. Don't delay; do it tonight!

—Tom Kellogg

Extreme Fire Danger

Observer's Guide Available

Trick or Treat

An Abundance of Planets

—Joel W. Goodman

With the inauguration last month of a new and enormously more potent phase of Project SETI (Search for Extraterrestrial Intelligence), the old conundrum of the frequency in the galaxy of planets inhabited by technologically advanced civilizations returned to center stage. The potential success of SETI naturally hinges on that unknown quantity, and educated guesses, which are based on a cascade of variables, range hither and yon, depending on the optimism or pessimism of the guesser. While we have no idea as yet about the frequency of inhabited planets circling other stars, we are accumulating persuasive evidence that planetary systems are a commonplace outgrowth of normal stellar evolution.

Our Solar System is believed to have evolved by gradual accretion of gas and dust that initially formed the Sun, the remainder of the material forming a kind of circumstellar disk around the Sun that eventually accreted into the planets, satellites and smaller bodies that comprise the Solar System we know today. The major part of this process probably took only 100 thousand to 10 million years, a very brief span on the cosmic time scale, although some accretion continues even today (meteorites impacting Earth, for example). Thus, although our Solar System is about 4.5 billion years old, the accretion process that formed the major bodies was largely completed within the first 10 million years, when the Sun was still in its infancy. The circumstellar disk surrounding very young "protostars", then, can be considered an indicator of solar systems in the making, and the frequency of circumstellar disks around protostars can furnish compelling evidence about the abundance of planetary systems in our galaxy. Consequently, the task at hand is to detect such disks around infant stars.

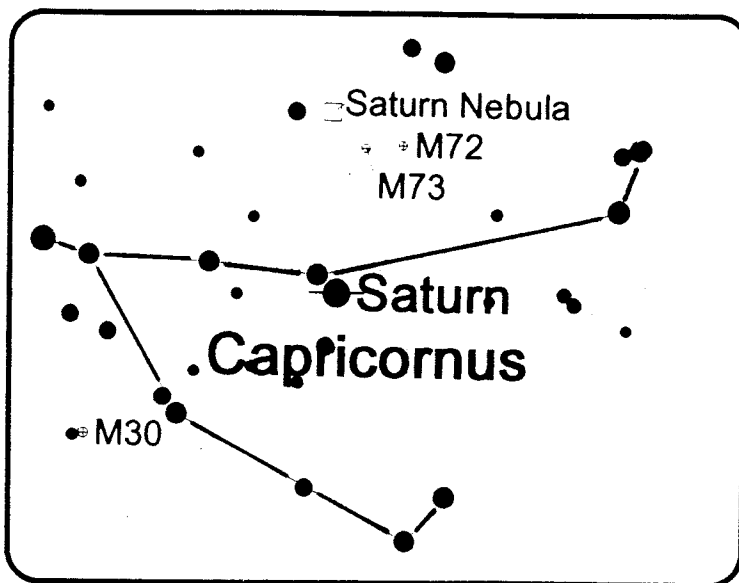
Fortunately, tools are now available that permit astronomers to follow the evolution of circumstellar disks from the earliest phases of stellar conception to the later phases of planetary formation. The existence of circumstellar disks was first inferred from infrared spectrometry, but a newer, more powerful technique for this purpose is high-resolution polarimetry, which can discern polarization patterns caused by light scattered by minute dust particles in the disk. Thus far, about 3 dozen infant stars have been examined this way and all have yielded polarization images indicative of circumstellar disks. Two stars in Cassiopeia that are barely out of the celestial womb and still in the nursery, V376 Cas and V633 Cas, both less than a million years old and just emerging from the protostellar cores from which they formed, illustrate the results that have been obtained. Polarization imaging of V376 Cas reveals a circumstellar disk with a radius of 500-750 astronomical units (AU), making it some 10-15 times the size of the Solar System. The disk around V633 Cas is smaller and has not been resolved well enough to accurately estimate its size. In general, the disks that have been detected by polarimetric imaging range in size from 100-1000 AU.

(Continued on page 9)

Saturn and the Saturn Nebula

The planet Saturn, now in Capricornus, is a stirring sight in the night sky and, when viewed through a telescope of any size, is a magnificent object with its rings so visible. Nearby, in the same area of the sky, is the Saturn Nebula (NGC 7009), a planetary nebula in Aquarius, presently only seven degrees north and five minutes east of Saturn itself. Though the Saturn Nebula was first seen by Sir William Herschel in 1762, it was not until Lord Rosse observed it in 1850 that it received its popular name, because of the faint extensions projecting from opposite sides of the main disc. Its current proximity to Saturn enables us to see and feel what Lord Rosse saw and felt in those early days of astronomical discovery!

While we are here, let's glance at two other nearby objects just minutes west of the Saturn Nebula, Messier's M-72 and M-73. M-72 (NGC 6981) is a rather remote globular cluster about 56,000 light-years distant, with stars of 15th magnitude and quite difficult to resolve, though the cluster itself is rather loosely concentrated. M-73 (NGC 6994) is merely a Y-shaped asterism of four faint stars which Messier described in 1780 as "three or four small stars which look like a nebula at first sight." These deep sky objects should prove simple to locate with a telescope, particularly if you start with Saturn and scan the nearby stars.

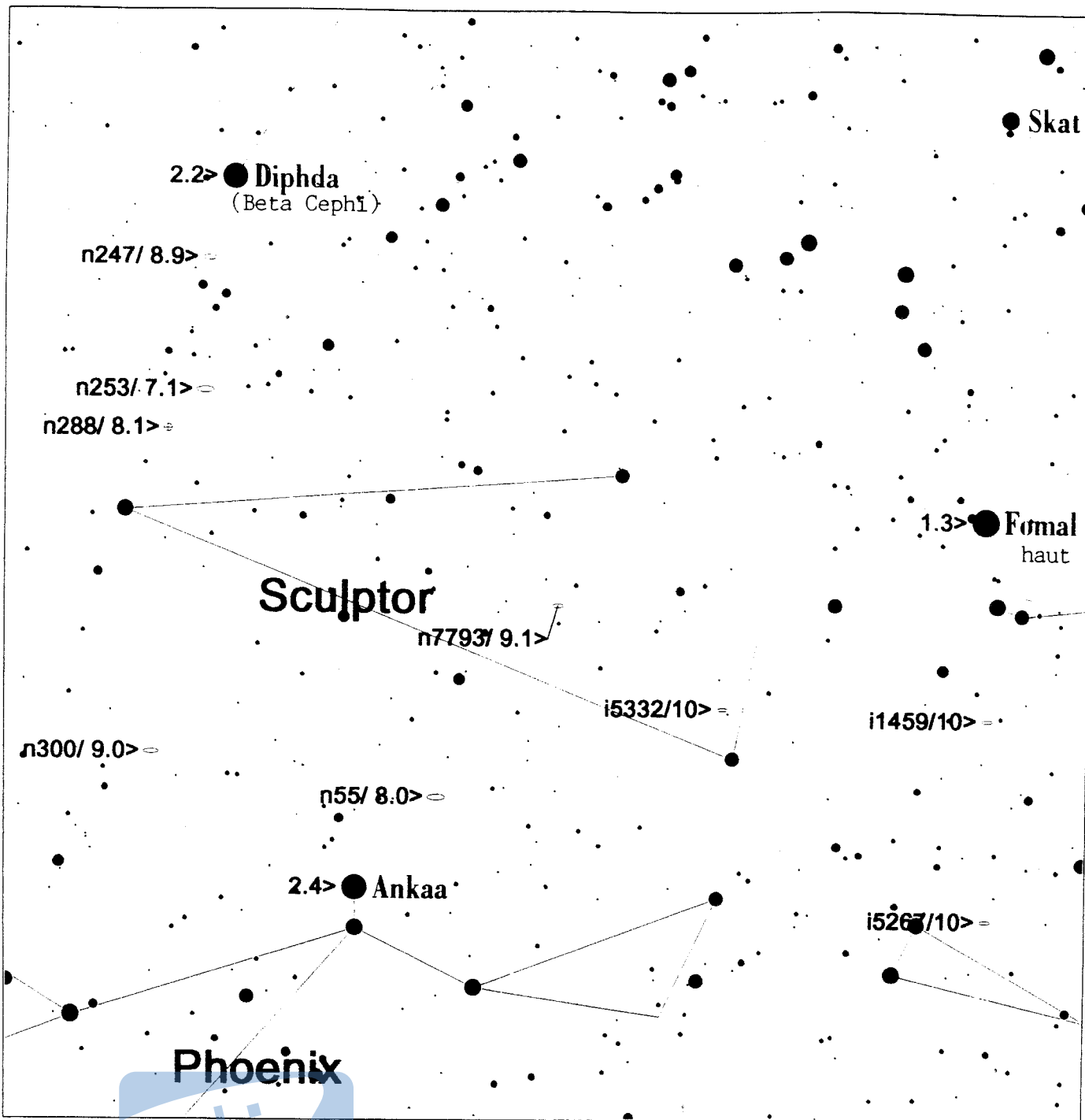


—Gordon Ridley

WANT ADS

Members' advertisements for astronomy gear are free and will run three times. Just send your ad to SFAA Bulletin Editor, 190 Chilton Avenue, San Francisco 94131. Please notify the bulletin editor if an item is sold so that it may be deleted. This service is provided to club members only on a space-available basis.

- ◆ **For Sale:** Prices reduced on new hardcover books—A Portfolio of Lunar Drawings by Harold Hill, \$25; Observing Visual Double Stars by Paul Couteau, \$15; Men from Earth by Buzz Aldrin, \$10. Call Jeff Felton at 564-7082.
- ◆ **Wanted:** A ride from San Francisco to star parties at Mount Tamalpais. Please call and leave a message at 338-7436. Craig Harrison.



THE SCULPTOR GROUP

Stars:

- 9.5 ● 5.0
- 9.0 ● 4.5
- 8.0 ● 3.8
- 7.5 ● 3.1
- 7.0 ● 2.8
- 6.0 ● 2.5
- 5.6 ● 2.0
- 5.3 ● 1.0

NGC Objects:

- Galaxy
- ⊖ Open Cluster
- ⊕ Globular Cluster
- Planetary Nebula
- ◇ Nebula
- ⊞ Cluster+Nebulosity
- Star
- Other NGC Objects

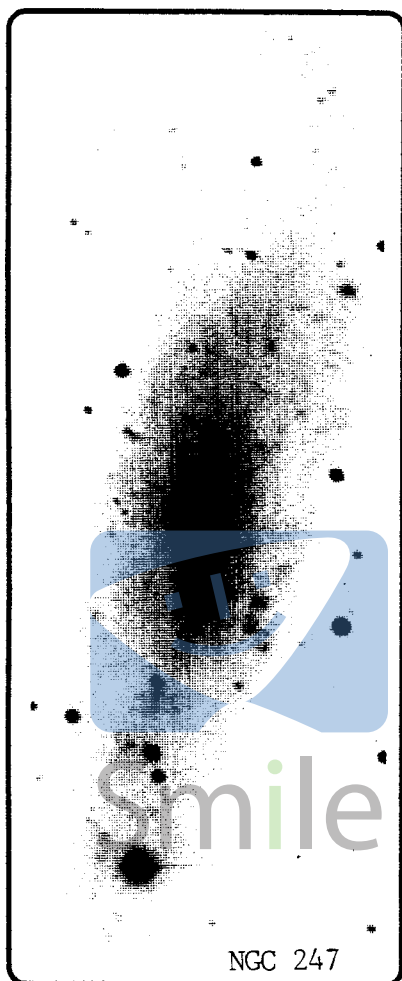
Solar System Objects:

- ☉ Sun
- ♁ Mercury
- ♀ Venus
- ♂ Mars
- ♃ Jupiter
- ♄ Saturn
- ♅ Uranus
- ♆ Neptune
- ♇ Pluto
- ☾ Moon
- ☄ Comet
- ♁ Asteroid

Center @ RA:23h59m20s Dec:-31d16'02"
 Date:11/21/1992 Time: 20:00

The Sculptor Group of Galaxies

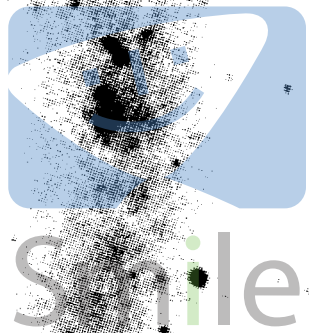
One of these cold and clear winter nights, after you have admired the Great Andromeda Galaxy, turn your scope toward the southern horizon and go galaxy hopping in the constellation of Sculptor. About ten million light-years away, the Sculptor Group is one of the nearest aggregations of galaxies to our own Local Group. It's pretty easy to locate—find Beta Ceti (Diphda) and proceed south.



The best known galaxy in the group is NGC 253, which bears some comparison with M31 itself. Both galaxies are sharply inclined to our line of sight. NGC 253 fills a 20 arcminute field and appears extraordinarily dusty, with dark absorption patches and bright HII regions visible throughout. Perhaps M31 would look something like this if it were five times further away. (Be sure to check out NGC 288, a bright globular cluster about a degree south.)

Because of their relative closeness, the galaxies in the Sculptor Group are very large. NGC 247 is another big edge-on spiral about five degrees north of NGC 253, just over the Sculptor border in Cetus. It's almost as large, but considerably fainter. Look for a long nebulous streak halfway between Beta Ceti and NGC 253.

NGC 55



The Sculptor Group

The last two giant spirals in the Sculptor Group are around 12 degrees south of NGC 253, which means that you'll need a low dark southern horizon. Try to observe them near the meridian, when they're at their highest in the sky. (Better yet, have a look at them on your next trip to the southern hemisphere.)

NGC 55 is a huge edge-on spiral, with a bright off-center core and an apparent dark gap between its core and one arm. In contrast, NGC 300 is seen nearly face-on. It's a large oval of very faint nebulosity surrounding a small bright nucleus. On photographs it strongly resembles M33 far away to the north.

The galaxies in the Sculptor Group are among the show-piece objects of the southern sky. They're impressive even from northern California. Imagine what they must look like from Chile or Australia!

—Jim Shields

NGC 300

Comet Swift-Tuttle Returns

—from *Comet Comments* by Don Machholz

Periodic Comet Swift-Tuttle (1992t): Japanese amateur T. Kiuchi recovered this comet with 25x150 binoculars on Sept. 26. It brightened rapidly from magnitude 11.5 at recovery to 9.5 one day later.

This is the same comet seen in 1737 by Kegler, and by many others in 1862. It reaches perihelion on Dec. 12 as it moves southward in our evening sky. It may get brighter than indicated below, but a large coma size and a diffuse appearance may make the comet a difficult object in binoculars. N. Hemisphere observers will lose sight of it by Christmas.

Periodic Comet Swift-Tuttle is responsible for the Perseid meteor shower each year. The intensity next year is expected to peak on Aug. 12.0 UT, when it is daylight in the U.S. but early morning in Europe.

EPHEMERIS

PERIODIC COMET SWIFT-TUTTLE (1992t)

DATE (UT)	RA (2000)	DEC	ELONG	SKY	MAG
10-15	14h10.5m	+57°17'	67°	E	8.1
10-20	14h56.2m	+54°44'	67°	E	7.8
10-25	15h40.7m	+50°56'	67°	E	7.5
10-30	16h21.6m	+45°52'	65°	E	7.2
11-04	16h57.8m	+39°44'	64°	E	7.0
11-09	17h29.1m	+32°55'	62°	E	6.8
11-14	17h55.8m	+25°49'	58°	E	6.7
11-19	18h18.5m	+18°50'	54°	E	6.6
11-24	18h38.0m	+12°16'	51°	E	6.6
11-29	18h54.9m	+06°16'	47°	E	6.6
12-04	19h09.7m	+00°51'	43°	E	6.6
12-09	19h22.8m	-03°59'	38°	E	6.7

An Abundance of Planets (Continued from page 4)

The best resolved disk is that around the more fully evolved star β -Pictoris, which is adolescent. The dust particles in that disk are larger than those in younger disks, representing a later stage of accretion, and were initially detected by IRAS, the Infrared Astronomy Satellite. They are also large enough to scatter visible light, directly revealing the edge-on disk of β -Pictoris, which spans about 400 AU.

The detection of circumstellar disks around young stars strongly supports the abundance of planetary systems in the universe. Indeed, if the stellar evolutionary model is correct all stars may be attended by planetary offspring. While the model doesn't directly tell us that intelligent life exists out there, planets are certainly an essential antecedent to life and it remains for SETI to take the next giant step.

Make checks payable to San Francisco Amateur Astronomers and mail to:
 Treasurer, San Francisco Amateur Astronomers, 32 Penhurst Avenue, Daly City 94015.
 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.

Select one category:

- \$20 enclosed, individual membership
- \$20 enclosed, foreign membership
- \$25 enclosed, family membership
- \$25 enclosed, institutional membership
- \$5 enclosed, youth membership (under 18)

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SAN FRANCISCO AMATEUR ASTRONOMERS
MEMBERSHIP APPLICATION

**San Francisco
 Amateur Astronomers**

c/o Morrison Planetarium
 California Academy of Sciences
 Golden Gate Park, San Francisco, CA 94118

Features

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