SJAA EPHEMERIS

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BIG LENS ASTROPHOTOGRAPHY

Amateur Astrophotographer Chuck Vaughan will be our guest speaker June 1st. Chuck will be discussing the use of modern telephoto lenses for long exposure astrophotography. Several of Chuck's astrophotos have appeared in Astronomy and Sky and telescope, rivaling those taken with the Schmidt camera. Program begins at 8pm. The Board of Directors meeting will be held the same night at 6 pm. SJAA members are welcome to attend and participate.

AUCTION XI - RESULTS

Auction XI was held on May 4 as previously advertised. Attendance was rather light, and the club's earnings were correspondingly light, perhaps $400 or a little more. Many fairly-priced items went unsold, through there was brisk trade in the $1 items! The large room at the Milpitas main library was excellent, larger and better than the Red Cross building. The hole in the parking lot has appeared early in the week without warning, but even so, there was more space than at the Red Cross.

Is the recession causing people to spend less? Was there trouble in finding the library? Did the parking problem send people away? Were prices too high? Do people actually do other things unrelated to amateur astronomy? Please pass along your thoughts on this, especially regarding the location. Should we go back there next year?

A. B. GREGORY AWARD

Nominations are still being sought for the 1991 Dr. A. B. Gregory Award, given in recognition for outstanding contributions of time and effort to others in amateur astronomy. There are other awards given for amateur research, public service, and other worthy endeavors; The SJAA presents this award for "people helping people". Dr. Gregory never met a problem that he didn't help solve -- how to set up a telescope, finding some information, suggesting new techniques, loaning a book, and endless encouragement.

The nominating committee is Bob Fingerhut (Chair), Steve Greenberg, and Jim Richardson. Phone numbers inside. Call and write a short letter giving reasons why the candidate should be recognized. The award, given only once to an individual, is awarded at the Annual Picnic in July.

JUNE 1 8 PM CHUCK VAUGHAN ASTROPHOTOGRAPHY

June 1: General Meeting at 8 pm. Big lens astrophotography featured by Chuck Vaughan. Board of Directors meets at 6:30 pm before the meeting.

June 8: Halls Valley Group public star party at Grant Ranch.

June 15: Star Party at Henry Coe State Park. Sunset until dawn.

June 21: (Friday) public star party at Branham Lane Park. Volunteers welcome and needed.

June 22: introductory Astronomy class at 8 pm. Los Gatos Red Cross building.

July 6: SJAA annual picnic, at the Grant Ranch Park in the San Filipe picnic area. Picnic starts at noon.

July 11: Eclipse of the Sun. Good partial in the Bay Area. First contact at 10:11 am, max coverage 64% at 11:21. 4th contact at 12:35.

July 13: Halls Valley Group public star party at Grant Ranch. The star talk, part of the Introductory Astronomy class, will be omitted as both teachers are off chasing the total eclipse.

July 19: (Friday) Public star party at Branham Lane Park. We need volunteers.

SJAA HOTLINE
24 HOUR INFORMATION
408-997-3347

YOSEMITE STAR PARTY

Our session under the incomparable skies of Glacier point will be on July 12 and 13, immediately following the solar eclipse. We will have nearly six hours of full darkness each night. A few members will be going up on Thursday to show the 50% eclipsed Sun.

Reservations are ***still*** being accepted; contact Jim Van Nuland, 408-371-1307 10 am to 11 pm. The limit for free admission is 30 people (not cars). We are expected to have at least one scope per two people. PLEASE, do not sign up unless you are reasonably sure you can be there. Last year Jim had so many cancellations at the last minute that we sent only 28 people, out of 45 who'd signed up and many who I had not added to the waiting list. This isn't fair to the Park, and it isn't fair to people on the waiting list who made other plans.

SJAA NICPIC

The annual picnic will again be held this year at Grant Ranch county park. It will be in the San Filipe picnic area. This is the area on the right of the

main road, a little short of Telescope Row. A short Star Party will follow as the Moon rises at 1:40 am. This is an excellent time for members to get out and socialize a little. Bring your solar filters and telescopes. The evening star party that follows can be a lot of fun. More specific details on the food situation in next months bulletin.

DE ANZA PLANETARIUM

De Anza Planetarium is now running astronomical programs, and would like to add real-time telescope observing on the last Friday of each month. Shows run from 7:30 to 8:30 and 9:00 to 10:00, so the scopes would be needed until somewhat after 10. If you'd like to participate, call Bob Walker at the planetarium, (408) 864-8814 during the day.

In addition, he'd like support on June 2, De Anza day; June 7, evening, for a school group; and July 11, during the eclipse. First contact at 10:11, maximum obscuration 64% at 11:21, 4th contact at 12:35 pm.

JUNE STARRY NIGHTS

- Richard Stanton

This month rather than cover the month's celestial events, I'm going to try to provide an answer to one of our member's questions. The kind of question that gives me a headache.

The focal length of an astronomical telescope when divided by the focal length of an eyepiece yields a magnification factor. Why? Not how, but WHY? The challenging part of this question, after thinking it through, is how to answer it in plain down-home language without the shield of abstruse vernacular and mathematics. Let's see if I can carry it off.

Because it just does!

Next question? Oh well, it didn't work with my kids either, so on with it.

Essentially there are three optical systems involved that contribute to the answer. The three systems are the telescope, the eyepiece, and the human eye. No matter what type of telescope you are using there is a limited area available for gathering incoming light or view. That light or view (let's say a view of the whole enchilada), regardless of whether it is reflecting from a mirror or passing through a primary lens is bent by curved glass to bring it to a focus over a certain distance. That distance is called the focal length and is always a fixed number (even if you can adjust the focal length of your telescope for different views, when you actually stop to view something it is a fixed focal length.) At this stage we have taken the telescope's view of the whole enchilada and bent it to focus onto a smaller area but the view of the whole enchilada is still there, just really tiny.

The smaller area with the teeny tiny view of the whole enchilada is the eyepiece. As the light or view passes through the eyepiece it is bent again. Only this time the view of the teeny tiny enchilada is bent in the opposite direction to make it focus on a slightly larger area. How much larger depends upon how curved the glass it that the light is passing through. It is usually bent so much that you can no longer see the who enchilada but just the olive or something. The amount of curvature in the glass of the eyepiece and the distance to the new point of focus establishes the focal length of the eyepiece.

If the focal length of the eyepiece were the same as the focal length of the telescope there would be no magnification. One hundred divided by one hundred equals one and there is no magnification, but one hundred divided by a smaller number equals a number larger than one. That number is the magnification of the view available via a telescope of a fixed focal length and an eyepiece of a fixed focal length.

Okay, but why does the image of the enchilada or maybe just the olive look bigger in my eye?

Because it just does!

Still doesn't work, eh?

The reason that the view of the enchilada appears larger in your eye is because of its limited size. A human adult eye is roughly one inch in diameter. The eye of the great blue whale is about three inches in diameter and it's tounge weights as much as a full grown elephant ... sorry, that's another story. The human eye has a lens that focuses light on the retina. That lens is covered by a transparent cornea for protection and preliminary rough focus and an iris that controls the amount of light allowed to fall on the retina. The iris does this by dilating or contracting. (It is the iris that is colored.) The opening in the center of the iris is the pupil (always appearing black) and it is through the pupil that light passes to the human "fine" lens and on to the retina.

When the entire available pupil area (from 3.5 to 8 millimeters depending on dilation) is filled with an image of the whole enchilada, or maybe just the olive, the image appears bigger. Even though the image appears larger, if it had not been pre-sized to suit the resolution threshold of the human eye by the telescope/eyepiece system you would not be able to clearly resolve the image.

While the available magnification is fixed by the telescope focal length and the eyepiece focal length the image focus must be adjusted to suit your human lens. This adjustment does not affect magnification but simply the clarity of your view.

Fundamentally that is the whole enchilada of why telescopes and eyepieces magnify images. As an idle aside, the human eye actually does not see anything. The light photons striking on the retina produce an electrical charge which is then sent to the brain where it is translated into an image. A technical analogy of this biological seeing techniques is the Charged Coupled Device (CCD) linked to a computer for image processing. The activity of the human brain produces about 1/200 of a watt of electricity. Therefore the minds of two thousand humans may be able to turn on a 20 watt light bulb. This is why among the greater citizenry of our Galaxy the human species on Sol III are considered "dim-watted" or simply not too bright.

Now let's see....six enchiladas divided by three Carta Blancas =

METEOR NOTES
- JIM RICHARDSON

Due to the low nighttime shower activity this month, we will be discussing the various classes of meteors, their physical properties, apparent sources, and relative abundance. Most of our current knowledge about these properties comes from photographic fireball studies (meteors > magnitude -4) done over the last 50 years or so. This may sound like a long time, but good data has been collected on only about 700 fireballs so far. Of these, only 3 have been recovered on the ground as meteorites. A meteorite-causing fireball is very rare and must be at least magnitude -8 to have sufficient mass to survive the trip. Even with an accurate photographic trajectory, it is still a matter of finding a needle in a haystack once the meteorite is on the ground. In recorded scientific history, non-photographed (eyewitnessed) falls have resulted in only about 800 meteorite finds.

Studies of parent bodies - comets and asteroids - have been more successful, using space probes and infrared telescope studies to greatly increase our knowledge of these objects. What we have found is that, rather than distinct differences between the two, there exists and entire spectrum of parent bodies, ranging from low - density comets to differentiated asteroids. The similarities between asteroids and comets is made more apparent by the recent discovery of a coma - a distinctly cometary phenomena - around the asteroid Chiron, at its perihelion.

At present time, meteoroids can be roughly divided into the following classes:

COMETARY: By far the most prevalent parent body of meteoroids, forming about 90% of the total meteor population, and including ***ALL*** of the shower meteor population. These are composed of frozen water and common gasses (Nitrogen, etc.), carbon dust and other trace materials. Cometary meteoroids have extremely low densities, about 0.8 grams/cc for class IIIA fireballs, and 0.3 grams/cc for class IIIB fireballs. This composition is very fragile and highly volatile, about like water ice, and vaporize so readily when passing through the atmosphere, that it is called "friable" material. These meteoroids have virtually no chance of making it to the ground, unless an extremely large piece enters the atmosphere, in which case it will almost certainly explode at some point in its flight, due to thermal stresses. If a piece did survive the journey, it would be extremely black, float in water, and would melt and sublime away (with the exception of some dust particles) in short amount of time.

NON-DIFFERENTIATED ASTEROIDS: This class of parent bodies make up about 9% of the total meteor population, as part of the non-shower, or "sporadic" types. These meteors can make it through the atmosphere, and as meteorites, they make up about 85% of all falls. These stony meteorites are called Chondrites, due to the rounded nodules of material found within their structure, which are called chondrules. Chondrite meteorites have two major groupings:

The first group, the Class II fireballs, are the carbon-rich Chondrites, or **Carbonaceous Chondrites**, which help bridge the gap between comets and asteroids. They make up about 3% of all observed falls, and have densities of a around 2.0 grams/cc. They are characterized by the presence of 2% or more carbon, partly present as complex hydrocarbons, and of considerable hydrogen (hydroxyl groups and water).

The second group, the Class I fireballs, are what is called the **Common Chondrites**, making up about 82% of all observed falls. They have an average density of 3.7 grams/cc, and generally fall into two specific types: **Olivine-Bronzite Chondrites** (about equal amounts of bronzite and olivine) and **Olivine-Hypersthene Chondrites** (less pyrozene than olivine).

DIFFERENTIATED ASTEROIDS: This last, and largest, parent body for meteoroids causes only about 1% of the total meteor population, with no fireball classification. Due to their hardier composition, however, they make up about 15% of the observed falls. A differentiated asteroid is one with sufficient size to cause internal temperatures high enough to melt and strafify the asteroid. The higher density materials (mainly Iron) gather in the core, with Basalt/ Silicate materials forming an outer layer, and varying concentrations of other materials stratified in between. The three major groups for these meteors are:

1). Achondrites (Basalt?Silicate non-chondritic stones); with a 3-4 grams/cc density, and comprising about 8% of observed falls. These formed in the outer, or crustal, layers of the asteroid.

2). Siderolites (Stony-Irons); with a 5-7 grams/cc density, and comprising about 2% observed falls. These formed in the layers between the core and outer layers. They generally consist of round, transluscent green crystals of olivine imbedded in a matrix of iron.

3). Siderites (Irons); with a 7.9 grams/cc density, and comprising about 6% of observed falls. These are the remains of the core of a differentiated asteroid, and show signs of extremely show cooling (1-10 deg C per million years), and extremely high shock stresses, presumably from collisions. These meteorites weather so well once on the ground, they make up 55% of all meteorite finds, despite their small precentage of the fall population.

COMET COMMENTS
- Don Machholz

One faint comet has been recovered lately. Otherwise there hasn't been much comet activity. This is typical of the last five years when few comets have been discovered or recovered in the months of March and April. Incidently, the past five years have alternated between those which started with

high comet activity (1987, 1989, and 1991) and those which started with low comet activity (1988 and 1990).

Periodic Comet Faye (1991n): T. Seki of Japan recovered this comet on April 16 in the morning sky. At that time it was magnitude 18. This object, discovered in 1843, has a 7.4 year orbital period. It will be closest the Sun at 1.59 AU on Nov. 16. The return is favorable, Periodic Comet Faye should be visible in amateur-sized scopes late this summer. By October it is expected to be roughly ninth magnitude.

Two other periodic comets, presently quite faint, should be visible to us in the coming months. They are Periodic Comet Hartley 2 and Periodic Comet Wirtanean. A long-period comet discovered earlier this year, Comet Helin-Lawrence, will also be bright enough for us to see near the end of the year and through much of the next year.

ASTRO ADS

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STAR-HOPPING COUNCILMAN

- Brian Dines, The Argus

City Councilman Bob Garfinkle not only knows his way through the bureaucratic jungle, he can find his way around the Universe, too.

Garfinkle, an aspiring novelist and a technical writer for a U.S. defense contractor, has just signed a deal with Cambridge University Press to write a how-to book for amateur astronomers on star-hopping, a method of locating hard-to-find objects in the sky.

"It's a way of going from a bright celestial object to a fainter object like stars, galaxies, nebulae and star clusters," said Garfinkle, 43, whose interest in star-gazing began as a youth when he won a Boy Scout merit badge in astronomy.

Small Spot in the Sky

"Looking through a telescope, you're looking at a very small spot in the sky at any one time ... that makes it hard to find things. One of the other problems is that the sky is in constant motion relative to the Earth. "There's no road map on where to go, that's why you need to know the geography of the area. Star-hopping is a way to learning how to get around in the sky," Garfinkle said.

For example, the author said, from the big star at the end of the Big Dipper handle, Alkaid, you can go about two fields from vision south and find a galaxy called M51 located 35 million light years away. It appears as a double galaxy and isn't hard to find.

Pioneers of astronomy

The book will look at the starfinding method, but will also go into the history, theorists and pioneers of astronomy. Garfinkle said the book is basically for beginners.

He's been instructed to write it in 200 pages or less and expects to have it finished in about a year and published in two years. About one-third is already written.

Elected to the Union City Council in November 1989 after a long stint on the governing board of the Union Sanitary District, Garfinkle has often been lone, dissenting voice on council, especially

regarding planning standards and development restraint.

Garfinkle became a writer after spending 13 years working as an auto mechanic. His professional writing career began 10 years ago and he now works at Westinghous, where he writes manuals and plans.

Garfinkle said he's gotten no advance from Cambridge, but will get about $1 for each book sold. The books will sell for between $20-$25.

"I'm certainly not in this for the money," he said laughing. "This is a labor of love."

COMET EPHEMERIS

THIS MONTH'S METEORS

SHOWER NAME	DATES	DATE OF MAXIMUM	MAXIMUM VISUAL ZENITHAL RATE (per Hr.)	RADIANT POINT (ON MAX DATE) R. A.	DEC	VELOCITY km/sec.	NOTES
Tau Herculids	May 19 - June 14	June 3	< 1	15h 12m	+39	15	very slow meteors
Ophiuchids	May 19 - July	June 10	2	18h 0m	-23	27	one of many in region
June Lyrids	June 11 - 21	June 16	1-2	18h 32m	+35	31 ± 3	9/hr (1969) seen from 1966-►
Corvids	June 25 - 30	June 26	< 1	12h 48m	-19	11	very slow meteors
June Draconids	June 5 - July 19	June 28	< 1	14h36m	+49	14	100/hr (1916) 6/hr (1921)

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Big Lens
Astrophotography
June 1