SJAA

Jack M. Zeiders
EDitor
292-0107

NOVEMBER '76

WHAT'S GOING ON IN THE CLUB :

October 30: Los Gatos Red Cross, 8:00 P.M.

Ed Schell has organized an evening get together loosely organized around astronomy. If you are interested in a casual evening why not drop by. To get there take Hwy. 17 to Los Gatos, exit west at the Hwy. 9 turn off. The building is around lquarter mile from 17. You go through town and up a short hill, it's on the right and well hidden .

November 5: Olinder Center 7:30 P.M.

The feature of November's meeting is a lecture by Dr. Donald De Vincenzi, the Assistant Chief of the Extraterrestrial Biology Division at N.A.S.A. I had the pleasure of hearing Dr. De Vincenzi speak when I attended the A.A.N.C. conference at Lawrence Hall. If you missed that lecture this will probably be your only chance to hear him speak on the current Mars probes.

November 12: Debbie Moore's home, board meeting, 8:00 P.M.

November 20: El Sereno, Club star*party dusk-dawn

The Park District management wishes to maintain a policy of one way traffic on the access road at all times. To assure this the club will impliment a cerfew for incomming traffic at 11:00 P.M. Those already at the site will please refrain from departing un-till this time.
There will be signs posted for outbound traffic as wellas inbound. If for any reason someone should be locked in, call Ed Shell at; 356-7498

December 3: Olinder Center 7:30

The December meeting is another fantastic slide night and personal business session. Bring your slides and prints to share with the crew. The success of these slide nights depends on your partic-pation.

December 10: Jim Van Nuland's home, board meeting, 8:00 P.M.

December 18: Skyline site, Club star party dusk-dawn

(ED NOTE). The bulletin is again looking for those fine potential cover photos that I know are lurking somewhere in your secret places. Why not submit one, two, or more of your black and white prints or maybe some drawings. You'r work may become immortalized on the cover of the S.J.A.A. Bulletin

Rattley Rattles

Rattley Rattles on and on and on . . . Sorry, I keep making mistakes and having to cover my tracks, but thats the price you pay for editing your own work. I have two more corrections that need to be mentioned at this time. First, in the article for ξ Sco, line 16 has the P.A. of the C component given as 48°, this should have been given as 54°. Second, in the article for ε Equ, line 7 says in parentheses "P.A. decreasing, separation increasing", this should be changed to read "P.A. decreasing, separation decreasing".

From this months articles on I am going to change the format a little. As several persons in the club have access to computers, or hand held calculators and have shown me that they wish to work out these double star computations on their own, I am going to be giving the orbital elements listed with the kind of accuracy necessary for these computations instead of in the rounded-off form that I have been giving it in. This will mean that instead of giving the authority or computer of the orbit in the top portion of the article, it will be given in individual write-up portion.

The following list contains the non-rounded orbital elements for the binary stars already listed in the articles in a rounded-off format. Each binary in the following list has two lines of information. The first line lists the star name, 1975 position, ADS number, constellation, authority and date of computation. The second line lists the orbital elements in the following order: period in years, date of periastron passage, eccentricity, semi-major axis of the true orbit in seconds of arc, inclination in degrees, argument of periastron in degrees, and the angle of the ascending node in degrees.

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Σ 1998   16 03 -11 18    9909   ξ Sco   P. Baize 1942
    45.69   1951.14  0.74    0.72    36.9   348.2   201.7
Grant    16 28 -26 22   10074   α Sco, Antares   W. D. Heintz 1956
   900       1889      0.0     3.21    86.3     0.0   273.0
Σ 2382   18 44 +39 39   11635   ε¹ Lyr   U. Guntzel-Lingner 1956
  1165.6    1152.4    0.19    2.78   138      165.7    29
Σ 2383   18 44 +39 36   11635   ε² Lyr   U. Guntzel-Lingner 1956
   585       1644.5    0.49    2.95   120.5    92.0    17.4
β  648   18 56 +32 52   11871   Lyr   G. V. Schrutka-Rechtenstamm 1939
    61.203  1971.877  0.2489  1.24   115.16  279.35   48.13
HdO150   19 01 -29 55   11950   ζ Sgr   W. H. van den Bos 1960
    21.138  1963.666  0.205   0.532  110.6     1.4    74.5
HN 126   19 03 -21 34   11989   Sgr   K. Gottlieb 1948
   665       1912.7    0.62    2.256  118.1   142.5    70.4
β  151   20 36 +14 29   14073   β Del   P. Couteau 1962
    26.65   1962.72   0.35    0.475   63.6   346.4   178.6
Σ 2737   20 59 +04 11   14499   ε Equ   G. Zeller 1965
   101.485  1920.37   0.705   0.647   92.17  340.19  105.15
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Astronomically Yours;

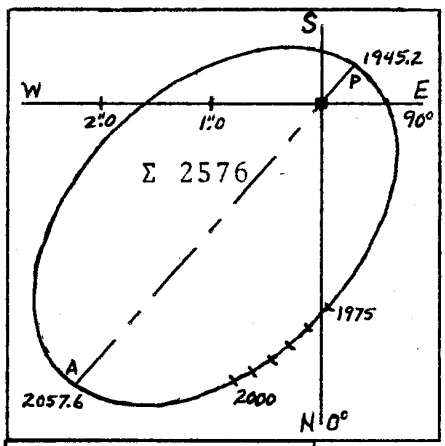
Gerald W. Rattley

The Orbits of Visual Binary Stars . . contributed by Gerald W. Rattley

Elements of the orbits as listed in the Third Catalogue of the Orbits of Visual Binary Stars by W. S. Finsen and C. E. Worley, 1970.

star name	1975 pos RA	dec	P yrs	T yr	e	a "	i °	ω °	Ω °
Σ 2576	19 44.7	+33 34	224.7	1945.237	0.762	2.048	152.71	312.07	94.84
λ Cyg	20 46.5	+36 23	391.3	1795	0.45	0.777	133.8	298.4	138.6
τ Cyg	21 13.8	+37 56	49.8	1939.7	0.24	0.85	134.5	120.8	160.4

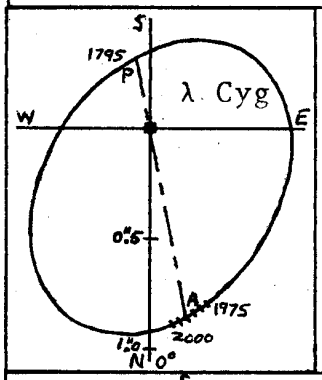
Σ 2576 (ADS 12889) in Cygnus; this system has components of magnitudes 8.5 and 8.6 whose spectra are both K5, making the colors deep yellow or orange. The orbit is of the preliminary type computed by W. Rabe in 1948. The distance of this binary from the Sun is around 20 parsecs or 65 lt-yrs, making the true separation in orbit about 40 a.u. average. This system is currently widening to a maximum, 3".4, in 2065. Apastron will be passed in 2057. Though this binary is relatively faint, it is interesting in another respect as it is a member of a larger system containing at least two other stars making this a four star system. 17 Cygni at a distance of 808" to the north-east (1975 pos: 19 45.6 +33 42) shares the same common proper motion as Σ 2576 and is located at about the same distance from the Sun (22 parsecs). 17 Cygni is itself the double star Σ 2580 (ADS 12913) with components of magnitudes 5.1 and 8.1, spectra dF3 and K4, and colors very yellow and bluish. In 1953 the separation of Σ 2580 was 26" in P.A. 70°. Σ 2580 is relatively fixed and there has been no orbit determined for it as yet.



Ephemeris for Σ 2576:

1975	2°.0	1".85	1990	348°.9	2".36
1980	356.9	2.04	1995	345.6	2.50
1985	352.6	2.21	2000	342.7	2.63

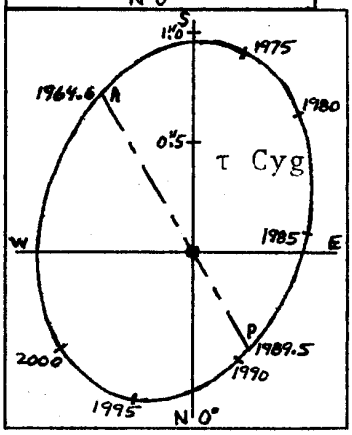
Lambda Cygni; OΣ 413 (ADS 14296); the components of this system have magnitudes of 4.7 and 6.1 with a system spectra of B6ne. The brighter star is a spectroscopic binary making this a triple system. The orbit is premature, computed by W. Rabe in 1948. According to this orbit, apastron passage will occur in 1990, after which the separation will reach a maximum of 0".94 in about 2048. The distance from the Sun is about 140 parsecs (400+ lt-yrs) with the mean true separation in orbit of the two visable components being 110 a.u.



Ephemeris for λ Cygni:

1975	18°.0	0".83	1990	10°.9	0".87
1980	15.6	0.85	1995	8.7	0.88
1985	13.2	0.86	2000	6.5	0.89

Tau Cygni; AGC 13 (ADS 14787); the two components of this system have magnitudes of 3.9 and 6.3 with the system spectra being dF0n. The orbit of this binary is very definitive and was computed in 1940 by G. Van Biesbroeck. A maximum of 0".95 occured in 1972 and the system is now closing to a minimum of 0".46 which will occur in 1987. The next maximum of 0".95 will not occur again until 2022. At 25 parsecs distance from the Sun, the mean true separation of the components in orbit is about 19 a.u. Ephemeris for τ Cygni:



1975	166°.0	0".94	1990	23°.5	0".53
1980	142.7	0.79	1995	338.5	0.72
1985	99.2	0.52	2000	306.0	0.74

The Orbits of Visual Binary Stars . . contributed by Gerald W. Rattley

Elements of the orbits as listed in the Third Catalogue of the Orbits of Visual Binary Stars by W. S. Finsen and C. E. Worley, 1970.

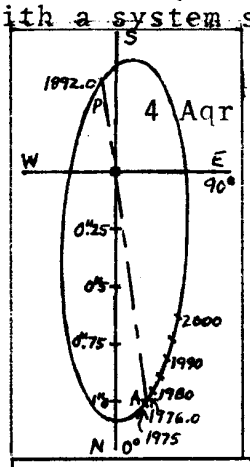
star name	1975 pos RA	dec	P yrs	T yr	e	a "	i °	ω °	Ω °
4 Aqr	20 50.1	-05 44	168	1892	0.424	0.8	68.7	31.3	175.4
Σ 2744	21 01.8	+01 26	1532	528	0.57	2.56	137	26	91
24 Aqr	21 38.1	-00 12	48.7	1971.71	0.86	0.423	55.2	295.0	139.8
97 Aqr	23 21.3	-15 10	63.16	1942	0.12	0.42	78	178	99

4 Aquarii; Σ 2729 (ADS 14360); component magnitudes are 6.4 and 7.2 with a system spectra of dF3. This orbit is a reliable one computed by S. Vlaicu in 1962. Maximum separation, 1".1, occured in 1958 and the system is now closing. Apastron passage took place this year 1976. The distance of this system from the Sun is 45 parsecs and the mean separation of the components in orbit is 35 a.u. Ephemeris for 4 Aquarii:

1975	7°.4	1".01	1985	12°.3	0".91	1995	18°.8	0".77
1980	9.7	0.96	1990	15.3	0.84	2000	23.0	0.69

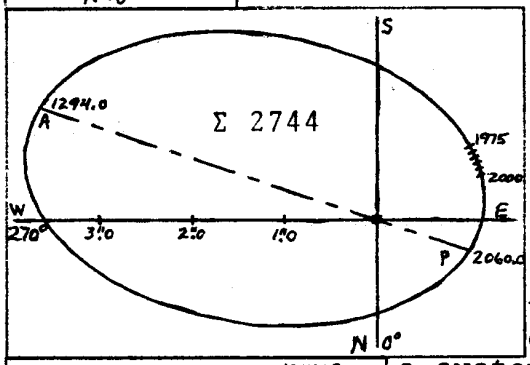
Σ 2744 (ADS 14573) in Aquarius; component magnitudes are 7.0 and 7.5 with a system spectra of F5. The orbit is a premature computation by G. M. Popovic, 1960. According to this orbit the system is closing to a minimum of 0".95 which should occur around 2092. Periastron will be passed in 2060. The distance from the Sun is 60 parsecs and the mean separation in the true orbit is around 150 a.u. Ephemeris for Σ 2744:

1980 125°.4 1".27 1990 119°.6 1".25 2000 113°.5 1".23

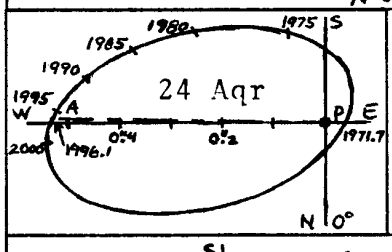


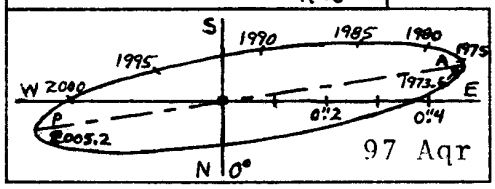
24 Aquarii; β 1212 (ADS 15176); this is a close rapid binary which should serve well for testing 10 or 12 inch optics. The component magnitudes are 7.4 and 7.7 with spectra of F7 and F8. This is a reliable orbit computation by A. Danjon in 1942. The system is currently widening to a maximum of 0".54 which will occur in 2000. Minimum occured in 1972 and the next minimum, >0".1, will not occur until 2021. Apastron passage will occur in 1996. This system is 40 parsecs from the Sun and has a true mean separation in orbit of 17 a.u. Ephemeris for 24 Aquarii:

1975	201°.4	0".19	1990	259°.8	0".47
1980	234.7	0.31	1995	267.6	0.52
1985	249.7	0.40	2000	274.4	0.54



97 Aquarii; Hu 295 (ADS 16708); this is a very close rapid binary which is only good to the amateur as a test double for very large optics, 12 inches or more. The component magnitudes are 5.9 and 6.1 with a system spectra of A3n. This is a reliable orbit computation done by W. H. van den Bos in 1953. Apastron passage and a maximum of 0".47 occured in 1974 and the system is now closing to a minimum of less than 0".1 in 1992 after which it will open to another maximum of 0".37 in 2005. The distance of this system from the Sun is 53 parsecs giving a mean true separation in orbit of 22 a.u. Ephemeris for 97 Aquarii:





1975	99°.9	0".47	1990	143°.0	0".12
1980	105.1	0.41	1995	245.7	0.14
1985	113.6	0.29	2000	269.4	0.30

occulting zone

LUNAR OCCULTATIONS

Nov	PST	Mag	Ill	El	CA	PA	Star, Notes
11	9:27:04R	3.6	76-	4	64S	255	λGem
12	10:50:55R	6.4	66-	9	43S	238	
14	1:03:21R	5.1	56-	23	60S	257	κCnc A.M.
20	6:10:15D	2.9	1-	4	-49S	150	9 α^2Lib A.M.
	6:54:48R		1-	12	50S	248	at sunrise
25	5:14:12D	3.2	25+	36	82N	66	βCap Twilight
	6:17:33D	8.8	25+	30	79N	63	
	6:33:02R	3.2	25+	28	-85S	249	βCap again
26	8:59:05D	8.8	36+	17	69N	92	SAO 164320*
	9:20:51D	8.6	36+	13	33N	64	
27	5:44:36D	8.0	45+	45	18S	141	Deep twilight
	7:27:44D	8.5	46+	39	32S	127	
	10:36:26D	7.4	47+	10	75N	54	
28	10:20:17D	7.9	57+	24	66N	44	

* SAO 164320 is variable -- min mag 10.1

Negative Cusp Angles indicate that that event occurs on the bright limb. The column "Ill" is the percent of the moon that is illuminated. + means waxing; -, waning. "El" is the elevation of the moon. See also last month's Occulting Zone.

GREAT PINK SPOT OF JUPITER

Observation of the "Red" spot continues to be difficult. The spot was seen by myself as a dark yellow, and by Gerry as a "grayish red" lighter than the belts. Recently-formed belts are crowding the spot both north and south, adding to the trouble. But it's a fine view when it can be seen, so give it a try. Look from 1 to 1-1/2 hours before and after the predicted times for the Red Spot. This month Jupiter is at its largest.

Watch for Jupiter very near the moon Nov. 7 evening -- it was occulted earlier, visible in Antarctica, etc.

The inset notes refer to satellite events. The first is a roman number referring to the satellite I-IV. Then the following abbreviations are used: I, ingress; E, egress; D, disappearance; R, reappearance; Ec, eclipse; Oc, occultation; Tr, transit of satellite; Sh, transit of shadow.

Only the events which are close to red spot times are given. The notes refer to the spot time preceeding it in the listing.

Jim Van Nuland, 371-1307

Red Spot Times

da	mo	d	h	m	
Su	10	31	10	56	PM
Tu	11	2	4	43	AM
W	11	3	0	34	AM
W	11	3	8	25	PM
F	11	5	2	12	AM
		I Tr. E. 1:36			
F	11	5	10	03	PM
		I Oc. R. 10:55			
Su	11	7	3	50	AM
		II Tr E 3:16			
Su	11	7	11	41	PM
M	11	8	7	32	PM
W	11	10	1	19	AM
W	11	10	9	10	PM
F	11	12	2	57	AM
I ShE 3:11;I TrE 3:19					
F	11	12	10	48	PM
		III Sh I 10:21			
Su	11	14	4	35	AM
M	11	15	0	26	AM
M	11	15	8	17	PM
		II Ec. D. 9:01			
W	11	17	2	4	AM
All 4 East, close					
W	11	17	9	55	PM
Opposition tonight					
F	11	19	3	42	AM
I ShI 2:56;I TrE 3:03					
F	11	19	11	33	PM
		I Oc D 0:13AM			
Sa	11	20	7	24	PM
		(Star Party)			
Su	11	21	5	20	AM
(2nd @ star party)					
M	11	22	1	11	AM
M	11	22	9	02	PM
W	11	24	2	49	AM
All 4 East, close					
W	11	24	10	40	PM
Sa	11	27	0	18	AM
Sa	11	27	8	09	PM
M	11	29	1	56	AM
M	11	29	9	47	PM
W	12	1	3	34	AM
W	12	1	11	25	PM
IITrE 11:07 ShE11:53					
Th	12	2	7	16	PM