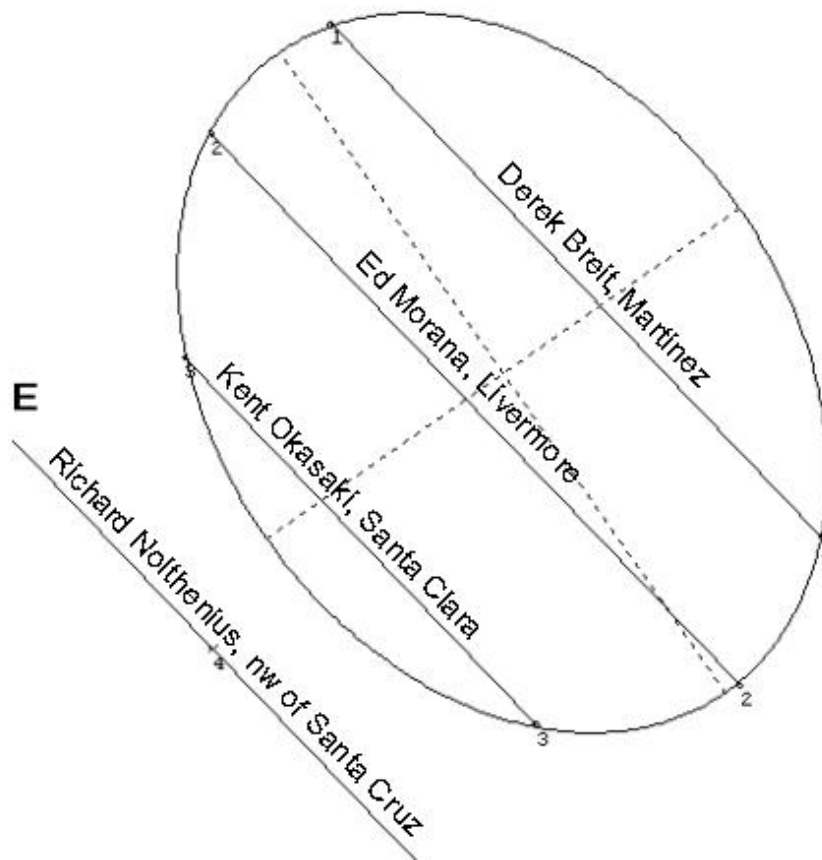




Occultation of 10.8-mag. TYC 0714-00946-1 in northern California

(238) Hypatia 2005 Feb 23 168.9 ±0.4 x 124.9 ±1.0 km PA 34.9 ±0.5

Geocentric X 4856.5 ±0.2 Y 3615.4 ±0.2 km



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ON THE COVER:

Steve Preston posted a prediction for the occultation of a 10.8-magnitude star in Orion, about 3° from Betelgeuse, by the asteroid (238) Hypatia, which had an expected diameter of 148 km. The predicted path passed over the San Francisco Bay area, and that turned out to be quite accurate, with only a small shift towards the north, enough to leave Richard Nolthenius, observing visually from the coast northwest of Santa Cruz, to have a miss. But farther north, three other observers video recorded the occultation from their homes, and they were fortuitously located to define three well-spaced chords across the asteroid to accurately measure its shape and location relative to the star, as shown in the figure. The dashed lines show the axes of the fitted ellipse, produced by Dave Herald's WinOccult program. This demonstrates the good results that can be obtained by a few dedicated observers with a relatively faint star; a bright star and/or many observers are not always necessary to obtain solid useful observations. – David Dunham

Publication Date for this issue: July 2005

Please note: The date shown on the cover is for subscription purposes only and does not reflect the actual publication date.

The next issue, Volume 12, Number 2 will be published in August

What to Send to Whom

Send new and renewal memberships and subscriptions, back issue requests, address changes, email address changes, graze prediction requests, reimbursement requests, special requests, and other IOTA business, but **not observation reports**, to:

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Secretary & Treasurer
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Stillwater, OK 74074 USA
Email: business@occultations.org

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Nashville, TN 37218-3133 USA
Email: editor@occultations.org

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Email: JManek@mbox.vol.cz

Send observations of occultations that indicate stellar duplicity to:

Henk Bulder
Noorderstraat 10E
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Email: h.j.bulder@freeler.nl

Membership and Subscription Information

All payments made to IOTA must be in United States funds and drawn on a US bank, or by credit card charge to VISA or MasterCard. If you use VISA or MasterCard, include your account number, expiration date, and signature. (Do not send credit card information through e-mail. It is neither secure nor safe to do so.) Make all payments to **IOTA** and send them to the Secretary & Treasurer at the address on the left. Memberships and subscriptions may be made for one or two years, only.

Occultation Newsletter subscriptions (1 year = 4 issues) are US\$20.00 per year for USA, Canada, and Mexico; and US\$25.00 per year for all others. Single issues, including back issues, are 1/4 of the subscription price.

Memberships include the *Occultation Newsletter* and annual predictions and supplements. Memberships are US\$30.00 per year for USA, Canada, and Mexico; and US\$35.00 per year for all others. Observers from Europe and the British Isles should join the European Service (IOTA/ES). See the inside back cover for more information.

IOTA Publications

Although the following are included in membership, nonmembers will be charged for:

Local Circumstances for Appulses of Solar System Objects with Stars predictions US\$1.00
Graze Limit and Profile predictions US\$1.50 per graze.
Papers explaining the use of the above predictions US\$2.50
IOTA Observer's Manual US\$5.00

Asteroidal Occultation Supplements will be available for US\$2.50 from the following regional coordinators:

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Southern Africa--Brain Fraser - fraserb@intekom.co.za
Australia and New Zealand--Graham Blow; P.O. Box 2241; Wellington, New Zealand

Japan--Toshiro Hirose; 1-13 Shimomaruko 1-chome; Ota-ku, Tokyo 146, Japan

All other areas--Jan Manek; (see address at left)

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The Largest Members Of Our Solar System - 2005

Hal Povenmire

Most of us know the major members of the solar system~ and we know the largest half dozen objects. However~ with the discovery of new objects and more precise measurements~ the order of large objects becomes more difficult after the first dozen. The order has also changed rather dramatically in the last few years. This order is according to diameter rather than mass. Asteroids are indicated by their number in front of their name. A moon or satellite of a planet is indicated by the initial of the planet followed by the number of the moon. A general rule is that the objects farther from the Sun have a lower specific gravity. The number of large transneptunian objects being found will certainly make changes in the lower end of this list. The list is comprised from many sources~ so there will be discrepancies~ but it is still worth some study. The smaller objects usually do not have spherical shapes~ so the diameter listed is an average or estimate. The diameters are expressed in miles and kilometers.

		Miles	Kilometers	+/- (Km)
1.	Sun	864,988.8	1,392,000	250
2.	Jupiter	86,885.4	139,822	6
3.	Saturn	72,370.7	116,464	6
4.	Uranus	31,519.9	50,724	7
5.	Neptune	30,600.2	49,244	19
6.	Earth	7,917.9	12,742.0	0.01
7.	Venus	7,521.2	12,103.6	1.0
8.	Mars	4,212.5	6779	0.003
9.	Ganymede J3	3,273.7	5268.2	0.3
10.	Titan S6	3,200.2	5150.0	2
11.	Mercury	3,032.1	4872.4	1.0
12.	Callisto J4	2,995.5	4820.6	1.5
13.	Io J1	2,263.9	3643.2	0.5
14.	Moon	2,159.2	3474.8	1.0
15.	Europa J2	1,939.6	3121.4	0.65
16.	Triton N1	1,681.0	2705.2	2.4
17.	Pluto	1,485.1	2390	5
18.	Titania U3	980.4	1577.8	1.8
19.	Oberon U4	965	1552.7	
20.	Rhea S5	949.5	1528	4.0
21.	Iapetus S8	905	1456	8.0
22.	90377 Sedna	902	1452	118
23.	90482 Orcus	845	1360	260
24.	50000 Quaoar	782	1260	95
25.	Umbriel U2	740	1190.7	2.8
26.	Charon P1	737	1186	13
27.	Ariel U1	719.4	1157.8	0.6
28.	Dione S4	695	1118	5.0
29.	55636 2002 TX300	666	1072	117
30.	28978 Ixion	661	1064	83
31.	Tethys S3	660	1062	1.5
32.	20000 Varuna	646	1040	100
33.	1 Ceres	578	930	3.9
34.	55565 2002 AW197	545	878	62
35.	55637 2002 UX25	544	876	185
36.	2002 MS4	467	752	145
37.	2002 KX14	460	740	

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38.	19308 1996 TO66	460	740	
39.	2003 QW90	460	740	
40.	2002 TC302	450	724	141
41.	2003 AZ84	447	720	150
42.	2001 QF298	440	708	
43.	2002 WC19	440	708	
44.	26375 1999 DE9	440	708	
45.	28435 1995 SM55	430	692	
46.	84922 2003 VS2	428	690	153
47.	90568 2004 GV9	424	682	130
48.	Proteus N5	418	672.6	
49.	42301 2001 UR163	416	670	143
50.	2 Pallas	325	523	
51.	4 Vesta	316	508.4	
52.	Enceladus S2	310	498.8	0.2
53.	Miranda U5	300	482.7	
54.	10 Hygiea	266	428	
55.	Mimas S1	240	386.2	
56.	511 Davida	209	336.3	
57.	704 Interamnia	206	331.4	
58.	2060 Chiron	198	318.6	
59.	52 Europa	193	310.5	
60.	Nereid N2	190	305.7	
61.	2000 EB173	187	300.9	
62.	1995 SM55	179	288	
63.	1993 WH24	170	273.5	
64.	1999 TC36	170	273.5	
65.	1999 DE9	170	273.5	
66.	15 Eunomia	169	272	
67.	87 Sylvia	168	270.3	
68.	3 Juno	166	267.1	
69.	16 Psyche	164	263.9	
70.	Hyperion S7	160	257	
71.	31 Euphrosyne	154	247.8	
72.	65 Cybele	153	246.2	
73.	1999 CD158	153	246.2	
74.	107 Camilla	147	236.5	
75.	451 Patientia	143	230	
76.	324 Bamberga	141	226.9	
77.	624 Hektor	139	223.6	
78.	532 Herculina	139	223.6	
79.	48 Doris	139	223.6	
80.	29 Amphitrite	136	218.8	
81.	121 Hermione	135	217.2	
82.	Phoebe S9	135	217.2	
83.	375 Ursula	134	215.6	
84.	13 Egeria	133	214.0	
85.	45 Eugenia	133	214.0	
86.	94 Aurora	131	210.8	
87.	7 Iris	126	202.7	
88.	702 Alauda	125	201	

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89.	19 Fortuna	124	199.5	
90.	1998 WW31A	124	199.5	
91.	24 Themis	123	198	
92.	372 Palma	121	195	
93.	128 Nemesis	120	193	
94.	Janus S10	120	193	
95.	6 Hebe	119	191.5	
96.	154 Bertha	119	191.5	
97.	76 Freia	118	190	
98.	130 Elektra	118	190	
99.	22 Kalliope	116	186.6	
100.	259 Aletheia	115	185.0	
101.	Himalia J6	115	185.0	
102.	Larissa N7	115	185.0	
103.	41 Daphne	113	181.8	
104.	747 Winchester	110	177	
105.	776 Berbericia	110	177	
106.	120 Lachesis	110	177	
107.	790 Pretoria	109	175	
108.	566 Stereoskopia	108	173.8	
109.	911 Agamemnon	108	173.8	
110.	96 Aegle	108	173.8	
111.	153 Hilda	108	173.8	
112.	194 Prokne	108	173.8	
113.	59 Elpis	107	172	
114.	386 Siegena	107	172	
115.	Amalthea J5	106	170.5	
116.	93 Minerva	106	170.5	
117.	54 Alexandra	106	170.5	
118.	1437 Diomedes	106	170.5	
119.	Puck 1985 U1	105	169	
120.	9 Metis	105	169	
121.	334 Chicago	105	169	
122.	444 Gyptis	105	169	
123.	241 Germania	105	169	
124.	409 Aspasia	104	167	
125.	14 Irene	104	167	
126.	185 Eunike	102	164	
127.	165 Loreley	102	164	
128.	804 Hispania	100	161	
129.	354 Eleonora	100	161	
130.	139 Juewa	100	161	
131.	11 Parthenope	100	161	
132.	173 Ino	99	159.3	
133.	39 Laetitia	99	159.3	
134.	190 Ismene	99	159.3	
135.	89 Julia	99	159.3	
136.	488 Kreusa	98	157.7	
137.	536 Merapi	98	157.7	
138.	150 Nuwa	97	156	
139.	85 Io	97	156	

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140.	238 Hypatia	97	156	
141.	145 Adeona	96	154.5	
142.	Galatea N6	95	152.8	
143.	168 Sibylla	95	152.8	
144.	117 Lomia	95	152.8	
145.	49 Pales	95	152.8	
146.	51 Nemausa	95	152.8	
147.	1172 Aneas	94	151	
148.	20 Massalia	93	149.6	
149.	283 Emma	93	149.6	
150.	137 Meliboea	93	149.6	
151.	1998 WW31B	93	149.6	
152.	361 Bononia	92	148	
153.	308 Polyxo	92	148	
154.	18 Melpomene	92	148	
155.	209 Dido	92	148	
156.	211 Isolda	92	148	
157.	617 Patroclus	91	146.4	
158.	144 Vibia	91	146.4	
159.	106 Dione	91	146.4	
160.	420 Bertholda	91	146.4	
161.	508 Princetonia	91	146.4	
162.	588 Achilles	91	146.4	
163.	895 Helio	91	146.4	
164.	196 Philomela	91	146.4	
165.	690 Wratislavia	90	144.8	
166.	95 Arethusa	90	144.8	
167.	Despina N5	89	143	
168.	69 Hesperia	89	143	
169.	489 Comacina	89	143	
170.	349 Dembowska	89	143	
171.	762 Fulcova	88	141.6	
172.	268 Adorea	88	141.6	
173.	8 Flora	87	140	
174.	212 Medea	87	140	
175.	216 Kleopatra	87	140	
176.	111 Ate	86	138.4	
177.	344 Desiderata	86	138.4	
178.	705 Erminia	86	138.4	
179.	247 Eukrate	85	136.7	
180.	146 Lucina	85	136.7	
181.	147 Protogeneia	85	136.7	
182.	141 Lumen	84	135	
183.	187 Lamberta	84	135	
184.	279 Thule	84	135	
185.	356 Liguria	84	135	
186.	471 Papagena	84	135	
187.	47 Aglaja	84	135	
188.	1173 Anchises	84	135	
189.	134 Sophrosyne	83	133.5	
190.	200 Dynamene	82	132	

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191.	92 Undina	82	132	
192.	419 Aurelia	82	132	
193.	654 Zelinda	82	132	
194.	712 Boliviana	82	132	
195.	159 Aemilia	81	130.3	
196.	602 Mariana	81	130.3	
197.	46 Hestia	81	130.3	
198.	27 Euterpe	81	130.3	
199.	1867 Deiphobus	81	130.3	
200.	405 Thia	80	128.7	
201.	276 Adelheid	79	127	
202.	410 Chloris	79	127	
203.	104 Klymene	79	127	
204.	70 Panopaea	79	127	
205.	68 Leto	79	127	
206.	3317 Paris	79	127	
207.	90 Antiope	78	125	
208.	78 Diana	78	125	
209.	5 Astraea	78	125	
210.	176 Iduna	78	125	
211.	126 Valleda	78	125	
212.	129 Antigone	78	125	
213.	81 Terpsichore	77	123.9	
214.	225 Henriette	77	123.9	
215.	381 Myrrha	77	123.9	
216.	618 Elfriede	77	123.9	
217.	3063 Makhaon	77	123.9	
218.	105 Artemis	76	122.3	
219.	127 Johanna	76	122.3	
220.	350 Ornamenta	76	122.3	
221.	2241 Alcahous	76	122.3	
222.	772 Tanete	76	122.3	
223.	2920 Automedon	76	122.3	
224.	2797 Teucer	76	122.3	
225.	74 Galatea	76	122.3	
226.	476 Hedwig	75	120.7	
227.	360 Carlova	75	120.7	
228.	466 Tisiphone	75	120.7	
229.	490 Veritas	75	120.7	
230.	521 Brixia	75	120.7	
231.	38 Leda	74	119	
232.	53 Kalypso	74	119	
233.	203 Pompeja	74	119	
234.	328 Gudrun	74	119	
235.	388 Charybdis	74	119	
236.	909 Ulla	74	119	
237.	1093 Freda	74	119	
238.	596 Scheila	73	117.5	
239.	34 Circe	73	117.5	
240.	481 Emita	72	115.8	
241.	683 Lanzia	72	115.8	

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242.	56 Melete	72	115.8	
243.	814 Taurus	72	115.8	
244.	57 Mnemosyne	72	115.8	
245.	505 Cava	71	114	
246.	230 Athamantis	71	114	
247.	659 Nestor	71	114	
248.	91 Aegina	71	114	
249.	545 Messalina	71	114	
250.	140 Siwa	71	114	
251.	751 Faina	71	114	
252.	275 Sapienta	71	114	
253.	595 Polyxene	71	114	
254.	206 Hersilia	70	112.6	
255.	266 Aline	70	112.6	
256.	522 Helga	70	112.6	
257.	Epimetheus S11	69	111	
258.	1467 Mashona	69	111	
259.	37 Fides	69	111	
260.	40 Harmonia	69	111	
261.	1208 Troilus	69	111	
262.	23 Thalia	69	111	
263.	346 Hermentaria	68	109	
264.	164 Eva	68	109	
265.	221 Eos	68	109	
266.	357 Ninina	68	109	
267.	365 Corduba	68	109	
268.	1269 Rollandia	68	109	
269.	739 Mandeville	68	109	
270.	514 Armida	68	109	
271.	98 Ianthe	68	109	
272.	506 Marion	68	109	
273.	713 Luscinia	68	109	
274.	788 Hohensteina	68	109	
275.	1583 Antilochus	68	109	
276.	35 Leukothea	67	107.8	
277.	63 Ausonia	67	107.8	
278.	233 Asterope	67	107.8	
279.	240 Vanadis	67	107.8	
280.	Portia U12	66	106.2	
281.	42 Isis	66	106.2	
282.	175 Andromache	66	106.2	
283.	181 Eucharis	66	106.2	
284.	393 Lampetia	66	106.2	
285.	570 Kythera	66	106.2	
286.	748 Simesia	66	106.2	
287.	791 Ani	66	106.2	
288.	192 Nausikaa	66	106.2	
289.	162 Laurentia	65	104.6	
290.	191 Kolga	65	104.6	
291.	2223 Sarpedon	65	104.6	
292.	3451 Mentor	65	104.6	

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293.	30 Urania	64	103.0	
294.	114 Cassandra	64	103.0	
295.	148 Gallia	64	103.0	
296.	303 Josephina	64	103.0	
297.	401 Ottilia	64	103.0	
298.	626 Notburga	64	103.0	
299.	663 Gerlinde	64	103.0	
300.	1021 Flammario	64	103.0	
301.	1390 Abastumani	64	103.0	
302.	2357 Phereclos	64	103.0	
303.	2456 Palamedes	64	103.0	
304.	260 Huberta	63	101.4	
305.	313 Chaldaea	63	101.4	
306.	404 Arsinoe	63	101.4	
307.	491 Carina	63	101.4	
308.	674 Rachele	63	101.4	
309.	769 Tatjana	63	101.4	
310.	1015 Christa	63	101.4	
311.	1902 Shaposhnikov	63	101.4	
312.	2674 Pandarus	63	101.4	
313.	326 Tamara	62	99.8	
314.	345 Tercidina	62	99.8	
315.	635 Vundtia	62	99.8	

1455 asteroids larger than 24 miles (37.6 km)

12,000 asteroids larger than 9 miles (16 kilometers)

12,001. 12753 Povenmire 9 16

References:

- 1) Dunham, D.W. and Muhonen, D.P. (2001) Tables of Libration-Point Parameters for Selected Solar System Objects. Journal of the Astronautical Sciences, Vol. 49, No. 1, pp. 197-217.
- 2) Akeam, Haluk (Feb. 2004) Radial Comparison of Solar System Bodies
<http://www.tenspheres.com/tools/largestlist.com>

Editor's note: David Dunham writes: An older, out-of-date version of Ref. 1 was originally published, but the correct reference is now given above and values from it were used in the table of diameters, except for Venus, where Hal Povenmire found a transcription error for the radius of Venus in Table 1.2 of Ref. 1; the correct radius that should have been given there is 6051.9 km."

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IOTA's Mission

The International Occultation Timing Association, Inc. was established to encourage and facilitate the observation of occultations and eclipses. It provides predictions for grazing occultations of stars by the Moon and predictions for occultations of stars by asteroids and planets, information on observing equipment and techniques, and reports to the members of observations made.

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Observers from Europe and the British Isles should join IOTA/ES, sending a Eurocheck for EURO 25,00 (bank-transfer-costs included) to the account IOTA/ES; Bartold-Knaust-Strasse 8; D-30459 Hannover, Germany; Postgiro Hannover 555 829-303; bank code number (Bankleitzahl) 250 100 30. Sending EURO 20 EU-members must use the IBAN- and BIC-code as additional bank-address (IBAN: DE97 2501 0030 0555 8293 03, BIC: PBNKDEFF). German members should give IOTA/ES an “authorization for collection” or “Einzugs-Ermaechtigung” to their bank account. Please contact the Secretary for a blank form. Full membership in IOTA/ES includes one supplement for European observers (total and grazing occultations) and minor planet occultation data, including last-minute predictions; when available. The addresses for IOTA/ES are:

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(IOTA maintains the following web sites for your information and rapid notification of events.)

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<http://www.occultations.org>

This site contains information about the organization known as IOTA and provides information about joining IOTA and IOTA/ES, topics related to the *Occultation Newsletter*, and information about the membership--including the membership directory.

IOTA Lunar Occultations, Eclipses, and Asteroidal and Planetary Occultations Site

<http://www.lunar-occultations.com>

This site contains information on lunar occultations, eclipses, and asteroidal and planetary occultations and the latest information on upcoming events. It also includes information explaining what occultations are and how to report them.

