COMET HALE-BOPP

The recent passage of the comet Hale-Bopp is shown at the bottom of figure [F2]. The comet crossed the path of Jupiter in February 1996, before Jupiter reached this crossing point seven months later. Then the comet crossed close to the earth's path about 14 months later (May 1997). But the earth had already gone by this crossing point about four months earlier. For its next future passage, the comet had passed close enough to Jupiter for its orbital period to be changed from about 4000 years to 2300 years [R6]. As was noted in the Summary, the plane of the comet's orbit is perpendicular to the earth's orbital plane (ecliptic). If Hale Bopp's coming was delayed just seven months, then it would have been on a near collision course with Jupiter in October 1996. Also, if the delay was eight months, then it would have crossed near the earth in January 1998.

The past orbit for Hale-Bopp (about 4000 years ago) cannot be calculated precisely enough to ascertain how close it passed to Jupiter and the earth. However, the past orbit, upper plot [F2], was calculated [R13] assuming a very close passage to both Jupiter (0.01 AU) and the earth (0.1 AU), as was described in the Summary. For this calculation, the time between the Jupiter and earth crossings was 15 months, as compared to 14 months for the recent passage. *Note: one AU = 93 million miles.*

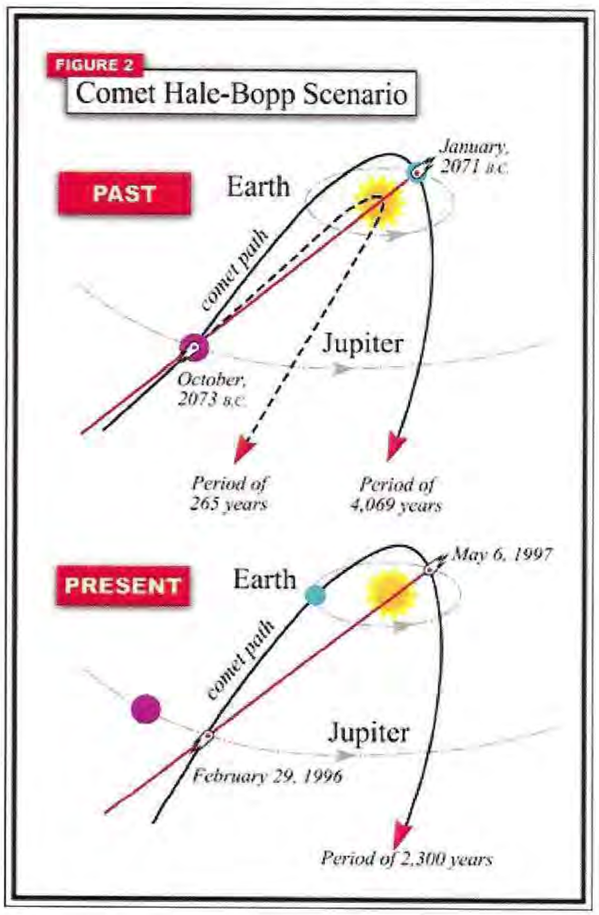
Jupiter's orbital period is 11.863 years. If Jupiter had completed exactly 343 orbits prior to the near collision date of October 1996, then this past crossing would be 4069 years ago, October 2073 B.C. (11.863 x 343). This period (4069 years) is close to Yeoman's period (4200 years) [R6]. Similarly, the near earth crossing would be 4069 years earlier than January 1998; that is, January 2071 B.C. [F2]. As was noted in the Summary, Hale Bopp's 2071 B.C. earth passage is close (within five years) to the time of the Biblical Sodom and Gomorrah catastrophe dated 2066 B.C. [R12].

A negative time increment was used for this simulation [R13] to back the comet away from the earth (January 2071 B.C.), past Jupiter (October 2073 B.C.), and then out of the solar system. The simulation suggests that the past-past orbit had a very eccentric orbit with a period of only 265 years. When the comet passed Jupiter (October 2073 B.C.) its orbit was deflected upward, coming down near the earth 15 months later, with the comet's period changed from 265 years to about 4000 years.

A calculated billion tons of fragments are assumed to have been torn from Hale-Bopp with its close Jupiter passage, going on to strike Israel, as was noted in the Summary. According to Weaver [R10] Hale-Bopp's nucleus is about 20 miles in diameter. Even if the comet's nucleus has a mean specific density of only 0.05 (one twentieth of the density of water), its mass would be about one trillion tons. Losing one billion tons of fragments on its close passage to Jupiter would reduce its overall mass just one tenth of one per cent.

[R13] Sanctuary, G. E., "Whence Cometh Comet Hale Bopp?", 1998, unpublished.

[F2] Comet Hale-Bopp Scenario



http://www.gsanctuary.com/3craters.html#3c_r13
www.bgu.ac.il/geol/hatzor/

ABOUT THE AUTHOR

As an engineer before retirement, the last assignment that Mr. Sanctuary had was the responsibility for simulating the F-16 airplane (six degrees of freedom), even before first flight. Using this simulation, he worked with the test pilots to design the fly-by-wire flight control system. His experience as a former pilot in the Navy was helpful. The F-16 was far more complex to simulate than the solar system with just three degrees of freedom.

Mr. Sanctuary trusts in Newtonian mechanics (using numerical integration), even for the calculation of comet or asteroid orbits interacting with the planets in the solar system, utilizing observational data supplied by the Minor Planet Center.

georgesanctuary@yahoo.com

Jim Harman

From: Jim Harman [jharman@cfl.rr.com]

Sent: Saturday, December 16, 2006 3:05 PM

To: 'George Sanctuary'

Subject: RE: Three Craters In Israel

George,

Thank you for the prompt reply. I am a CPA who loves the Lord and have been looking for His soon return for His Bride. My wife and I have had a prophecy ministry since 1989, with a mailing list of about 75 other believers who are also looking for the Lord's soon return.

I am attaching a draft of an article that I just completed this week. I took the liberty of referencing your site and your wonderful article. You will note that I used your calculation of 265 years as the original orbit and then used the calculations by Don Yeoman regarding the orbit that just ended in 1997.

I was amazed when I added the two orbital lengths together and discovered that it is highly possible that Comet Hale-Bopp may have actually preceded the Great Flood by 120 years. This, of course, corresponds to what God said in Genesis 6:3.

Before I send it out to people on our mailing list I wanted to find out a little bit more of how you arrived at the 265 years. You mention the "simulation". Is this a computer program, or some type of mathematical formula? While I am a CPA and I am good with math, I never went past Calculus in college...so you are on a completely different level than I am.

Again, thank you so much for your information. When I send the final article out, I plan to explain that these projected orbital lengths are best estimates and can not be relied upon with absolute certainty. The whole point of all of this is to show people that Jesus is coming back again very soon and Comet Hale-Bopp could be the very sign that He was referring to that would announce His return.

Your Brother in Christ,

Jim Harman

-----Original Message-----
From: George Sanctuary [mailto:georgesanctuary@yahoo.com]
Sent: Saturday, December 16, 2006 1:12 PM
To: Jim Harman
Subject: Re: Three Craters In Israel

Dear Jim Harman,
Thank you for your response to my paper on the "Three Craters in Israel". Using Newton's Law one can integrate past time histories of celestial objects by simply using a negative time increment in the simulation. I did assume that there was a close encounter between Comet Hale Bopp 4000 years ago. Running the simulation backward in time then produced the much shorter period (265 years) for the comet prior to this close encounter. Of course, this scenario is impossible to guaranty that there was this perfect timing in the past, but it is certainly possible. My wife and I have been to all three of the craters in Israel. Awesome! I have recently flown over them on my PC Microsoft Simulator X, and it is obvious that they are sunken craters, about 1000 feet below the surrounding landscape (2500 feet). It seems possible that the comet fragments could have struck only the Dead Sea, which was then at normal sea level, and was quickly vaporized to 1300 feet below sea level, raining salt, etc. upon the surrounding territory. The reduction of the water pressure from the Dead Sea may have resulted in sink holes, including the Three Craters.

Jim, what sort of educational or other experience do you have, besides your Christian testimony?
In Christ, George.
~~~~~~
~~~~~~

Jim Harman <jharman@cfl.rr.com> wrote:

George,

I read your article on the web and found it very interesting. Like yourself, I am a Christian who believes God's word is true and that it holds the key to what the world is looking for.

In your article you mention that Comet Hale-Bopp had an original orbit of 265 years that was changed when it had an encounter with the solar system some 4,000 to 4,200 years ago. I was just wondering how you came up with the number of 265 years? Was it a calculation based upon the mathematics of the objects in space or some other basis that you arrived at it?

Any help you can provide would be much appreciated.

Thank you,

Jim Harman

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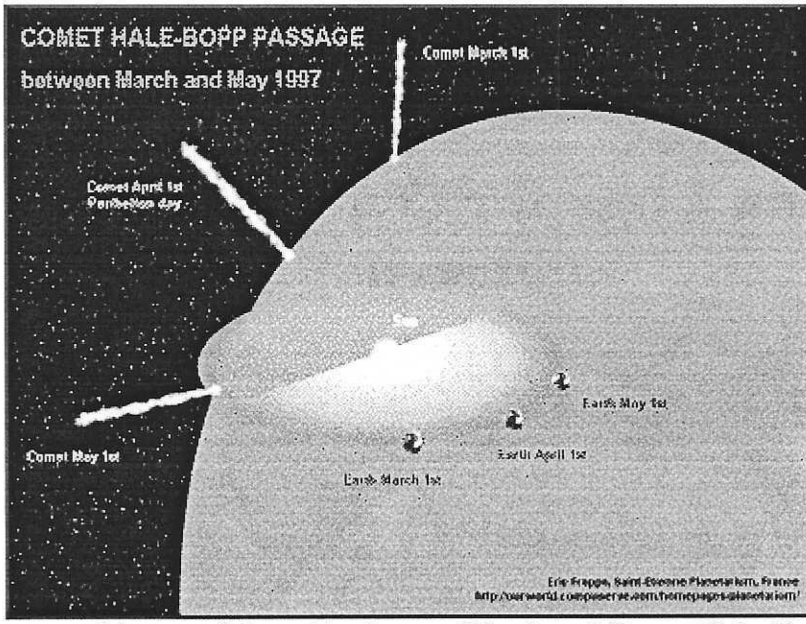
Comet Hale-Bopp Orbit and Ephemeris Information



77K

This chart is a ray-traced image of the orbit planes of Earth and Comet Hale-Bopp and their positions from March to May 1997. Courtesy of Eric Frappa from the Saint-Etienne Planetarium in France.

Orbit and Ephemeris Information for Comet 1995 O1 Hale-Bopp

Don Yeomans - JPL
March 4, 1997

Additional observations through March 3, 1997 have been used to update the orbit, ephemeris, and error analysis.

```
ORBIT UPDATE
 Object: Comet Hale-Bopp (1995 O1)
 JPL Ref. Solution: 55
 Planetary Ephemeris: DE403
 No. Observations:  1892
 Observation Arc:  1993 Apr 27 - 1997 Mar  3

 ---- Residual Summary ----        RA        Dec       Total
 Mean                            -.017      .025       .030
 RMS, unweighted                  .718      .949       .841

 ---- Corrected Elements (J2000):  Solution 55
   Epoch  2450571.50000 = 1997 May  3.0
                            Post-Fit Std.Dev.
e    0.995103273            0.000000929
q    0.914117707            0.000001540
```

Tp	2450539.6384314	0.0001091	1997 Apr 1.13843
Node	282.4708087	0.0000059	
w	130.5909555	0.0000856	
i	89.42965142	0.0000255	

ORBITAL ELEMENTS FOR COMET HALE-BOPP (1995 O1)
The following (J2000) osculating orbital elements can be used to generate ephemeris data using two body programs. However, care must be taken to select an orbital element set with an epoch close to the desired ephemeris output times.

Epoch (TDB)	e	q	Node	w	i	Tp
1997 Feb 21.0	.9950842	.9141189	282.47067	130.59078	89.42978	1997 Apr 1.13838
1997 Mar 13.0	.9950903	.9141179	282.47069	130.59086	89.42978	1997 Apr 1.13836
1997 Apr 2.0	.9950967	.9141178	282.47076	130.59092	89.42975	1997 Apr 1.13838
1997 May 2.0	.9951032	.9141177	282.47081	130.59096	89.42965	1997 Apr 1.13843
1997 Sep 29.0	.9950761	.9140385	282.46927	130.58588	89.42837	1997 Apr 1.13737

e: Eccentricity
q: Perihelion passage distance (AU)
Node: Longitude of the ascending node (deg.)
w: Argument of perihelion (deg.)
i: Inclination (deg.)
Tp: Perihelion passage time (TDB)

ORIGINAL AND FUTURE ORBITAL PERIODS
By integrating the above orbit forward and backward in time until the comet leaves the planetary system and then referring the osculating orbital elements to the solar system barycenter, the following orbital periods result:

Original orbital period before entering planetary system = 4200 years
Future orbital period after exiting planetary system = 2380 years

The difference between the inbound and outbound orbital periods is due primarily to an approach to Jupiter (0.77 AU) in April 1996

EPHEMERIS UNCERTAINTIES
Absolute (inertial) plane-of-sky ephemeris uncertainties (1-sigma) over this interval are as follows:

1997 Feb.	< 1"
1997 Mar.	< 2"
1997 Apr.	< 2"
1997 Aug.	< 3"

EPHEMERIS (WITH PERTURBATIONS) FOR COMET HALE-BOPP (1995 O1)
JPL Ref. Orbit 55 by D.K. Yeomans, Mar. 4, 1997
Ephemeris data at 1 day steps (0 hours UTC)

Date (UT)	R.A. J2000	Dec.	Delta	Deldot	r	Theta	Beta	Moon	PsAng	PsAM
1997 Mar 1	21 21 58.51	+33 17 10.4	1.489	-25.61	1.067	45.7	41.7	96	329.5	231.
1997 Mar 2	21 27 35.30	+34 02 47.6	1.474	-24.79	1.059	45.9	42.2	88	330.3	232.
1997 Mar 3	21 33 24.71	+34 48 23.2	1.460	-23.93	1.050	46.0	42.7	80	331.1	234.
1997 Mar 4	21 39 27.23	+35 33 50.0	1.447	-23.03	1.042	46.0	43.3	72	331.9	235.

1997	Sep	1	07	50	03.73	-24	59	16.7	3.007	6.09	2.536	53.3	18.6	47	236.9	12.
1997	Sep	2	07	50	52.15	-25	23	33.3	3.010	6.03	2.548	53.8	18.6	53	237.5	12.
1997	Sep	3	07	51	39.85	-25	47	53.7	3.014	5.97	2.560	54.4	18.7	60	238.2	12.
1997	Sep	4	07	52	26.80	-26	12	17.8	3.017	5.92	2.573	54.9	18.7	68	238.8	12.
1997	Sep	5	07	53	12.99	-26	36	45.6	3.020	5.87	2.585	55.4	18.7	76	239.5	12.
1997	Sep	6	07	53	58.41	-27	01	17.0	3.024	5.82	2.597	55.9	18.8	85	240.1	12.
1997	Sep	7	07	54	43.04	-27	25	52.0	3.027	5.78	2.609	56.4	18.8	93	240.8	12.
1997	Sep	8	07	55	26.87	-27	50	30.4	3.030	5.75	2.621	57.0	18.8	102	241.4	12.
1997	Sep	9	07	56	09.90	-28	15	12.2	3.034	5.71	2.633	57.5	18.8	110	242.1	13.
1997	Sep	10	07	56	52.09	-28	39	57.3	3.037	5.69	2.645	58.0	18.8	118	242.7	13.
1997	Sep	11	07	57	33.45	-29	04	45.6	3.040	5.66	2.657	58.5	18.9	125	243.4	13.
1997	Sep	12	07	58	13.96	-29	29	36.9	3.044	5.64	2.669	59.0	18.9	130	244.0	13.
1997	Sep	13	07	58	53.60	-29	54	31.3	3.047	5.63	2.681	59.6	18.9	134	244.7	13.
1997	Sep	14	07	59	32.36	-30	19	28.6	3.050	5.62	2.693	60.1	18.9	134	245.3	13.
1997	Sep	15	08	00	10.22	-30	44	28.7	3.053	5.61	2.705	60.6	18.9	130	246.0	13.
1997	Sep	16	08	00	47.18	-31	09	31.5	3.057	5.61	2.717	61.1	18.9	124	246.6	13.
1997	Sep	17	08	01	23.22	-31	34	37.0	3.060	5.61	2.729	61.6	18.9	116	247.3	13.
1997	Sep	18	08	01	58.31	-31	59	44.9	3.063	5.62	2.741	62.1	18.9	107	248.0	13.
1997	Sep	19	08	02	32.45	-32	24	55.3	3.066	5.63	2.753	62.6	18.9	97	248.6	13.
1997	Sep	20	08	03	05.62	-32	50	08.0	3.070	5.64	2.765	63.1	18.9	88	249.3	14.
1997	Sep	21	08	03	37.79	-33	15	22.9	3.073	5.66	2.777	63.6	18.9	79	250.0	14.
1997	Sep	22	08	04	08.95	-33	40	39.9	3.076	5.68	2.789	64.1	18.9	71	250.6	14.
1997	Sep	23	08	04	39.07	-34	05	58.9	3.079	5.70	2.801	64.6	18.9	64	251.3	14.
1997	Sep	24	08	05	08.14	-34	31	19.6	3.083	5.73	2.812	65.1	18.9	58	252.0	14.
1997	Sep	25	08	05	36.13	-34	56	42.1	3.086	5.76	2.824	65.6	18.9	54	252.7	14.
1997	Sep	26	08	06	03.01	-35	22	06.0	3.089	5.80	2.836	66.1	18.9	51	253.4	14.
1997	Sep	27	08	06	28.77	-35	47	31.3	3.093	5.83	2.848	66.6	18.9	51	254.1	14.
1997	Sep	28	08	06	53.38	-36	12	57.7	3.096	5.88	2.860	67.1	18.8	53	254.8	14.
1997	Sep	29	08	07	16.81	-36	38	25.1	3.099	5.92	2.872	67.6	18.8	56	255.5	14.
1997	Sep	30	08	07	39.04	-37	03	53.3	3.103	5.98	2.883	68.1	18.8	61	256.2	15.
1997	Oct	1	08	08	00.04	-37	29	22.0	3.106	6.03	2.895	68.6	18.8	66	256.9	15.

```
R.A. J2000  Dec. = Geocentric astrometric right ascension and declination
                   referred to the mean equator and equinox of J2000.  Light time co

Delta            = Geocentric distance of object in AU

Deldot           = Geocentric radial velocity of object in km/s

r                = Heliocentric distance of object in AU

Theta            = Sun-Earth-Object angle in degrees

Beta             = Sun-Object-Earth angle in degrees

Moon             = Object-Earth-Moon angle in degrees

PsAng            = Position angle of extended radius vector in degrees

PsAMV            = Position angle of minus velocity vector in degrees

TMag             = Total magnitude =  -.4 + 5.00*log(Delta) +  7.50*log(r)
```

Comet Hale-Bopp Home Page