

## WILL MARS GET GONGED?

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By now most of you readers got a look at Mars by eye in the high east or south during December 2007. Altho he was at a far opposition, being at best 88-1/2 million kilometers away with a disc not quite 16 seconds across, he was a brilliant red star in the yearend evening sky. I didn't think we had much to say about Mars this time around due to its so-so apparition.

Wrong!

On 20 November 2007 a tiny asteroid was discovered by the Catalina asteroid project, one of many hundred found in the second half of November. At first it didn't attract much attention. It was logged, named 2007-WD5, and tracked for a couple days. Large Moon then interfered, postponing further inspection until early December.

At that time we realized that this stone may collide with Mars! No, I'm not making this crap up. There is a real, 1 in 75, chance of a crash over our heads, literally, if it occurs in local evening! -- on January 30 of 2008! That's WITHIN THIS MONTH!! If there is a crash, it'll become the SECOND strike against a planet in a single lifetime.

What was the first?

Where were you when comet Shoemaker-Levy-9 whacked Jupiter? Were you among the two thousand or so spectators in Central Park, awed by telescope views of the holes that the comet punched in Jupiter? I was.

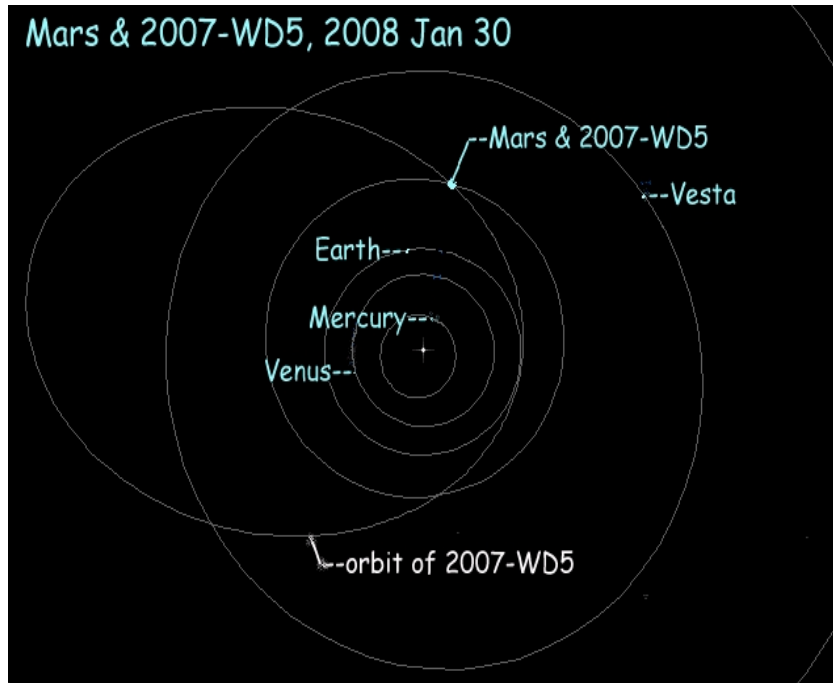
Will we see something similar in January 2008?

No one will flat out say so or not. The crash would be on a close planet, on its Earth-facing side, on solid ground. Every Mars probe will inspect the sky and ground of Mars for this event as the confidence in an actual strike builds up.

On the other hand, the chances are 75/1 there will be a miss and Mars will suffer no annoyance. It would be a close call, a flyby at a couple Mars diameters. These odds are continuously adjusted but so far have remaining amazingly good, for such a potential calamity.

Being intersted in astrodynamics, I took my own cut at this asteroid with the JPL HORIZONS ephemeris and 'Dance of the planets'. The latter is my workhorse solar system dynamics model.

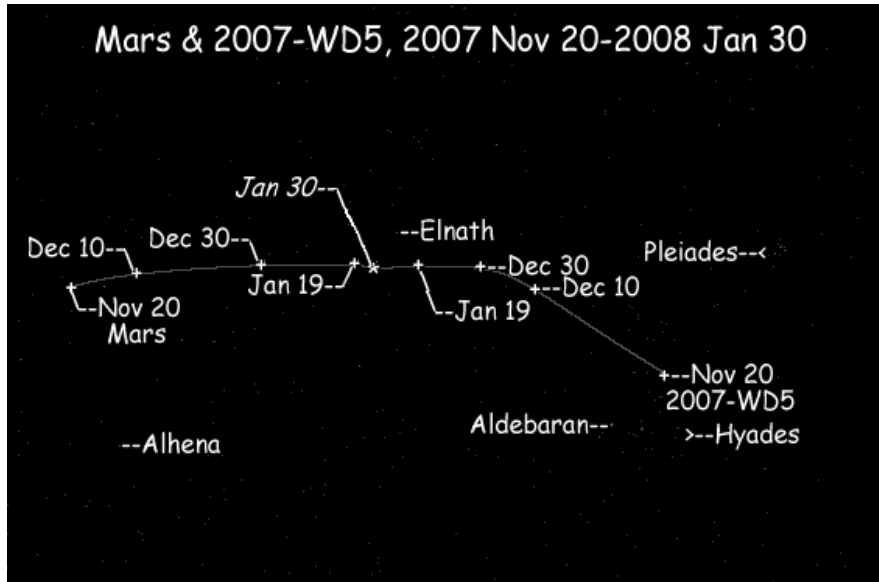
The first diagram here shows a bird's eye view of the inner planets with asteroid 2007-WD5. The orbit is the instant path as at 2007 November 27, the epoch for which the first good preliminary path was worked up. This is the so-called two-body trajectory of the asteroid, that with no disturbances (let alone collisions) from other bodies.



Only the part from near Earth (3 o'clock on the diagram) to about halfway to Mars was observed so far as at late December 2007. Even that was only sporadic due interference of the Moon, which was always large when it passed near the asteroid in the sky. In the case of a miss, the path after January 30 will be divergent from the plotted orbit by Mars's gravity.

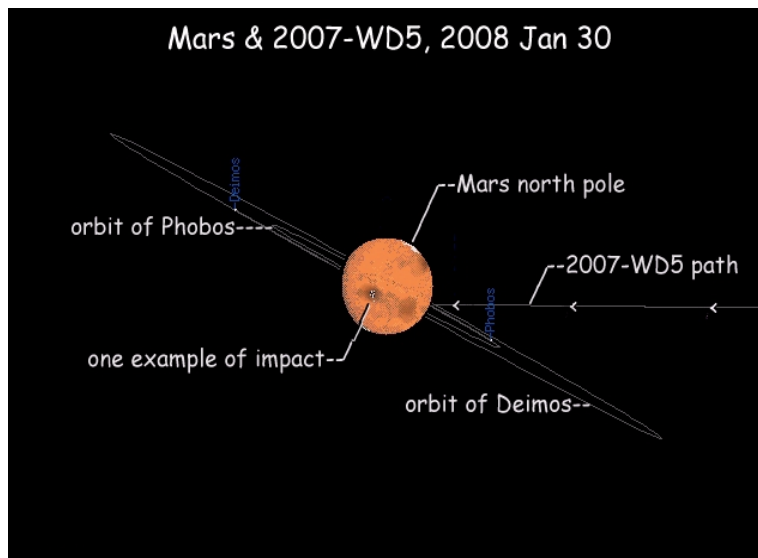
The meet on January 30th on this chart is utterly indeterminate. We're working with thousands of kilometers leeway on a chart drawn to millions of kilometer scale. Yet it gives a good overview of the situation.

The next chart is the view from Earth as Mars and asteroid close in among the stars of Taurus. The rock is in prograde motion eastward. It was first seen near the Hyades, then it arcs toward Elnath. Mars is in retrograde, migrating from Gemini, marked by Alhena, and ends up in Taurus near Elnath, to possibly get gonged.



There's no way any small scope will spot 2007-WD5. It takes a really large instrument equipped for delicate imaging to see it. But it's fun (or whatever) to point to the rock in the sky day by day. I marked 20-day intervals on the paths of Mars and asteroid.

The third illustration is one example of a collision, out of many possible by jiggering the asteroid's orbit. I did this while being careful to stay well within the JPL zone of error. It's a simulated view of Mars with a huge telescope, more like Hubble than your astronomy friend's rig.



The splat is a stylized crash mark. No one knows what the real impact will produce. The various potential impact spots are along the low north latitudes on the front side of Mars. The one here is where 2007-WD5 landed on this particular run.

I did NOT prove there WILL be a collision. Most of my runs ended in close flybys several Mars diameters away. In fact, the ratio of misses to hits in my trials was about 50 to 1. (Yes, I seem to have

too much time on my hands.) If I forced more misses I was stepping on the edge of the JPL error zone.

What we may really see if there is a strike is anyone's guess. It may be invisible in small scopes from the tiny size of Mars's disc and bright surface. Or, in a flight of fancy, the Mars crust will smash open, gushing lava, steam, gas all over hell's creation. After the dust settles (OK, dissipate), the solar system has eight planets. For real. With no need for a rigged vote.

. The chances are there is no contact and Mars will shine as red and bright as before. Yet, this episode will get us wondering. What if we did not have the luxury of a decades-long warning, like for Apophis? Suppose next week we find a stone heading our way to hit in only a couple months?