

Freaky Orbits

The Whorl list — 2 messages, 2 voices, 03 Apr 2000

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Michael Andre-Driussi — 03 Apr 2000, 15:54

Adam Stephanides and Kieran Mullen,

I am interested in your notes--of course you know I've been puzzling over the orbital details, too.

Lately I've been thinking along the lines of those freaky orbits of Saturn's moons Janus and Epithemis (sparked into posting this by the refs to shepherd moons). Took me a few minutes just now, but I found a clean and easy reference:

'Co-orbiting satellites are another weird example of a resonance. Saturn's tiny moons Janus and Epithemis nearly share an orbit; but one never passes the other. They're forever going faster and slower in the orbit, approaching as though to pass a baton in a relay, only to drop back before getting close enough to touch. As seen from Saturn, they'd get closer, slow down, and then separate again as though they'd "bounced off" each other. Things would look even more bizarre from one of the moons themselves; you'd see the other moon approaching, but you'd slow down and it would speed up as you got closer, until finally it would flee out of sight. Then the whole pattern would repeat half an orbit later--but you'd have to go around to the other side of the satellite to watch it again.'

'The interaction is like that between a ring and a shepherd . . . '

'The co-orbiters in Saturn's system are stable, and perhaps co-orbiting planets occur somewhere, though I don't know that anyone's looked at the dynamics. Two Earthlike worlds, forever chasing each other around a star, is not a setting anyone's used, so far as I know!' (Gillett, WORLD-BUILDING, p. 34).

So I think we have a third model to consider.

Model 1: Two Planets (Earth and Venus), with standard Bode-Titus style orbits and a comparatively wide separation (significant fraction of an Astronomical Unit). (Problems: to see one as a looming disk from the surface of the other, the world has to be much closer than this suggests. Possible solution: ditch Bode-Titus! <g>)

Model 2: Double Planet (Sainte Anne/Sainte Croix; Urth/Lune) quite close, celestially speaking (which makes it hard to work in that "six year" bit), orbiting around a common center between them (as well as going around the primary star).

Model 3: Co-orbiting Planets. Freaky orbit.

Granted, there are immediate problems: if the model is exactly like that of Saturn's moons, then it couldn't be once every "six local years," it would have to be "twice every local year." (Where local year = orbit.)

The Double Planet mode would work if you can have a wildly elliptic orbit, such that the two bodies get close every six local years--I haven't thought about this particular angle long enough to form an opinion up or down! (Every six years! Holy cow, that's like a comet or something! Or maybe the freaky orbits of Pluto and Neptune--whoops, there's a fourth model--where sometimes Pluto, the "furthest planet from Sol," is sometimes inside the orbit of Neptune.)

(Doh! Adam already mentioned something about the wildly elliptic orbit for Double Planet approach.)

Model 4: Crossing Orbits (like Pluto and Neptune). Only slightly less Freaky. (Mercury's got a Freaky Thang, too, but not germane to my rambling here.) But making the Crossing Point a Close Encounter every six years, hwoof! That's nigh impossible, even with short "inner world" orbits. Scratch this model in favor of number 3.

Anyway, just throwing out some wild thoughts. Keep working, guys; I'm reading your notes and enjoying it. Just a little dizzy right now, I'll try to stablize and contribute more asap.

=mantis=

*This is WHORL, for discussion of Gene Wolfe's Book of the Long Sun.

Jim Henley — 04 Apr 2000, 12:10 · follows Michael Andre-Driussi

-----Original Message-----

From: Michael Andre-Driussi [mailto:mantis at sirius.com]

Sent: Monday, April 03, 2000 6:55 PM

Anyway, just throwing out some wild thoughts. Keep working, guys; I'm reading your notes and enjoying it. Just a little dizzy right now, I'll try to stablize and contribute more asap.

What if the orbits are not in the same plane?

Best,

Jim

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