

distance

The Urth list — 6 messages, 4 voices, 10 Apr 2002

<https://urth.darkrealm.vip/thread/urth/3137>

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maa32 — 10 Apr 2002, 04:29

Well, Blattid, since you put it so succinctly, the choice is easy. Of course the 30,000 league figure is incorrect! Which means that Green might only fluctuate a tiny amount from its 80,000 league distance, which is where the moon is in our day. Of course, this means that the inhumu have to fly a long way, but that's cool with me (after all, that tree ship can fly a long way, too - and I don't think they are much different).

And this distance, closer to 80,000, wouldn't screw up the tides as much and wouldn't seem to be such a weird system; it might just fluctuate a little bit, like a moon in a slightly unstable orbit due to recent gravitational disturbances. In this case, a new sun coming. Sure, let's say that Green is at 60,000 leagues at conjunction, making it ... about the same size as Lune.

Thanks! You made everything so much easier! So we know that the moon was moved from about 80 to 50 thousand leagues in Severians day ... a fluctuation of about 30 thousand leagues ... if a new gravitational vortex where to disrupt this system, would the moon act like a gyroscope and oscillate in and out of orbit, first close and then far, between 60 and 100 thousand leagues, until it reached a stable orbit somewhere around 80,000? Like an old fashioned weight scale: you step on it, and then it goes back and forth until it reaches equilibrium, and equal distance on the up and down swing until there is no perceptible movement.

Would a new gravitational well induce this kind of alteration in an orbit? Could this continue for a long time, reducing a little bit over time? Also, let's keep in mind that the moon is proportionally very large for a satellite when compared with the earth's mass. It is huge compared to the satellites of most of the gas giants.

I hereby gladly revoke my uncritical acceptance of 30,000 leagues. You guys were so right; that figure sucks. That astronomer is one shady dude! Thanks. Marc Aramini

Dan'l Danehy-Oakes — 11 Apr 2002, 18:26 · follows maa32

Well, Blattid, since you put it so succinctly, the choice is easy. Of course the 30,000 league figure is incorrect! Which means that Green might only fluctuate a tiny amount from its 80,000 league distance,

I'm no orbit mechanic, but that seems unlikely with a six-year period, and very unlikely to cause the inhumu to be able to cross only for a short period.

Thanks! You made everything so much easier!

Oh. Good.

So we know that the moon was moved from about 80 to 50 thousand leagues in Severians day

Ahem. We do not know that it "was moved." I believe that most models suggest that the Moon will in fact move closer over (geological) time.

... the moon is proportionally very large for a satellite when compared with the earth's mass. It is huge compared to the satellites of most of the gas giants.

Correct; we are actually best regarded as a double-planet system. (The center about which the Earth-Moon system mutually orbits is, if I am not mistaken, not actually inside the Earth.)

Jerry Friedman — 11 Apr 2002, 19:56 · follows Dan'I Danehy-Oakes

--- Dan'I Danehy-Oakes <ddanehy at siebel.com> wrote:
Well, Blattid, since you put it so succinctly, the choice is easy. Of course the 30,000 league figure is incorrect! Which means that Green might only fluctuate a tiny amount from its 80,000 league distance,

I'm no orbit mechanic, but that seems unlikely with a six-year period, and _very_ unlikely to cause the inhumani to be able to cross only for a short period.

I quite agree.

Thanks! You made everything so much easier!

Oh. Good.

So we know that the moon was moved from about 80 to 50 thousand leagues in Severians day

Ahem. We do not know that it "was moved." I believe that most models suggest that the Moon _will_ in fact move closer over (geological) time.

Not that I've ever heard. See for example <<http://www.astronomynotes.com/angmom/s2.htm>>, <http://www.ridgenet.net/~do_while/sage/v2i2f.htm>, and with the least detail but the greatest appearance of reliability, <http://helios.gsfc.nasa.gov/qa_earth.html#earthslow>. I think it's extremely unlikely that our moon turned into Severian's Lune on its own.

... the moon is proportionally very large for a satellite when compared with the earth's mass. It is huge compared to the satellites of most of the gas giants.

Correct; we are actually best regarded as a double-planet system. (The center about which the Earth-Moon system mutually orbits is, if I am not

mistaken, not actually inside the Earth.)

Not quite. The formula for the position of the center of mass is $x_{cm} = (m_{moon} x_{moon} + m_{earth} x_{earth}) / (m_{moon} + m_{earth})$, where x's are positions and m's are masses. If we let x_{earth} be 0 and use the radius of the moon's orbit for x_{moon} , we find the center of mass to be about 4620 km from the center of the earth, less than the radius of the earth, which is about 6380 km.

Jerry Friedman

Jerry Friedman — 11 Apr 2002, 20:44 · follows Jerry Friedman

--- maa32 <maa32 at dana.ucc.nau.edu> wrote:

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of about 30 thousand leagues ... if a new gravitational vortex where to disrupt this system, would the moon act like a gyroscope and oscillate in and out of orbit, first close and then far, between 60 and 100 thousand leagues, until it reached a stable orbit somewhere around 80,000?

The only possible orbits, once the disrupting force has stopped, are the familiar ellipses and the parabolic and hyperbolic escape orbits.

Like an old fashioned weight scale: you step on it, and then it goes back and forth until it reaches equilibrium, and equal distance on the up and down swing until there is no perceptible movement.

Gravity doesn't work that way (unless there are other forces, like those of a spring or a string).

Would a new gravitational well induce this kind of alteration in an orbit?

Nope.

Could this continue for a long time, reducing a little bit over time?

Nope. Sorry to be so negative, but I really don't see how the Blue- Green system can work the way Wolfe sketchily describes it, unless there's some weird solution to the three-body problem that I don't know about. Or unless the planets have something like giant rocket engines on them or a very long cable between them. (Aha! Now we know how the inhum cross!) ...

Jerry Friedman

Dan'l Danehy-Oakes — 11 Apr 2002, 21:11 · follows Jerry Friedman

Jerry -- Hey, I said I'm no orbital mechanic!

I remembered that the E/M system orbited a mutual center which wasn't the center of the Earth; obviously I was a bit off about where it was.

As for the Moon getting closer to the Earth, well, that's just stuff I remember from like 1960s LIFE magazines...

Jeff Wilson — 12 Apr 2002, 05:02 · follows Dan'l Danehy-Oakes

From:

"Dan'l Danehy-Oakes" <ddanehy at siebel.com

I'm no orbit mechanic, but that seems unlikely with a six-year period, and _very_ unlikely to cause the inhum to be able to cross only for a short period.

Thanks! You made everything so much easier!

Oh. Good.

So we know that the moon was moved from about 80 to 50 thousand leagues in Severians day

Ahem. We do not know that it "was moved." I believe that most models suggest that the Moon _will_ in fact move closer over (geological)

time.

It's moving away, a fact available to SF writers through such obscure channels as the "Peanuts" comic strip. This is because of an obscure means of conserving angular momentum lost by the earth from tides on the moon; this may point to fiddling by Abaia or other Dark Lords, as moving Lune closer and increasing its mass/gravity would make tides more severe, something directly impacting Abaia's aquatic minions.

This kind of mechanics may have escaped a simple potato chip engineer, but as an SF writer with such sublime grasp of quantum electrodynamics that he can dramatize them as "How I Lost the Second World War and Helped Turn Back the German Invasion," I can only wonder.

... the moon is proportionally very large for a satellite when compared with the earth's mass. It is huge compared to the satellites of most of the gas giants.

Correct; we are actually best regarded as a double-planet system. (The center about which the Earth-Moon system mutually orbits is, if I am not mistaken, not actually inside the Earth.)

You are mistaken; the barycenter is about 1000 miles deep inside the earth at all times. But this is not necessarily meaningful; the Jupiter-Sol barycenter is outside the sun, but no one's suggesting this is a binary solar system.

Jeff Wilson

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