

Astronomers do not know, how to calculate masses

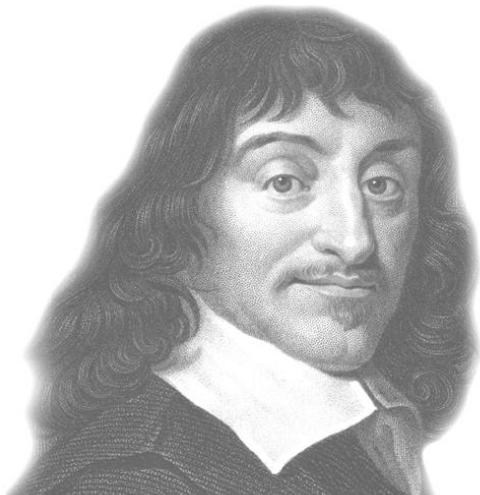
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Shortcomings of lucky guess of Newton, that central mass can be calculated, using orbital parameters of secondary celestial body are highlighted. Analysis of calculation from the point of vortical physics is made. Results support low viscosity Sun and semi-liquid Earth concepts.

Keywords: Newton's modification of Kepler's Third law, Descartes, vortical celestial mechanics, low viscosity Sun, liquid Earth

Астрономы не знают, как определять массы небесных тел

Приведены недостатки суждения Ньютона о том, что массу первичного небесного тела можно определить по орбитальным параметрам вторичного. Расчет по принципам Декарта говорит в пользу малой вязкости Солнца и полужидкой Земли.



DesCartes and Newton. From Spratt, Jean-Sébastien, "The Descartes-Newton paradox: Clashing theories of planetary motion at the turn of the eighteenth century" (2016). *Senior Capstone Projects*. Paper 609.

Seeker of celestial harmony Johannes Kepler discovered a relationship between the average distance of a planet from the Sun (semi-major axis, **A**, measured in Astronomical Units) and the amount of time it takes a planet to orbit the Sun once (orbital period, **P**, measured in years). For solar system planets, the semi-major axis to the third power equals the period squared:

$$A^3 / P^2 = \text{constant}$$

Since the fact of solar rotation was known to ancients even before the era of telescopes and seminal work of Gilbert „De Magnete” was published in 1600, Kepler mentioned in *Astronomia Nova* (1609), that planets could be driven in orbits by magnetic field of the Sun.

Knowing orbital data of moons of Saturn and Jupiter, as well as radiusses of these, Newton moved further, stating that

$$(M + m) * k = A^3 / P^2$$

were **M** and **m** are masses of primary and secondary celestial body, respectively.

Here he faced priority dispute with „system of the world” of Hooke and thoughts of others (Bennett, 1975). This factor leads to somewhat alchemical writing style of Newton in some points.

Disciples of Newton does not decipher full logic of master (*attractions are rather impulses*) and write plain

$$GMm/A^2 = mv^2/A$$

were **v**- mean orbital speed of planet.

Processing:

$$GMm/A = mv^2$$

Planet is flowing in Cartesian vortex, neither its mass, nor surface area are important, only sort of angular momentum of central body **GM** imparted kinetic energy for planet in accordance with vortical geometry. From data of “interplanetary magnetic field” one can conclude, that tangential pressure of vortex for first two astronomic units indeed diminishes as function **1/A**, but radial pressure- as function **3.8/A^{1.66}** (cf. Alksnis, 2015).

Hegel in his time ascribed “Newton’s modification of Kepler’s third law” as a trickery, stating, that nothing new has been said (cf. Wang). This doubtful method however imported terms of mass and force in astronomy. Now we should perform something similar- to find hidden principles of DesCartes in writings of Newtonians.

We can write cause for orbital movement of secondary body (revolution of primary) as

$$V * d * \omega_{eq} * k$$

were **V**- volume of primary, cubic meters, **d**- density of primary, kilograms per cubic meter, **ω_{eq}** - equatorial rotation speed, radians/sec, **k**- coefficient, showing, how effective is vortex of central body in transfer of angular momentum “through the vacuum” relative to calculated **$V * \omega_{eq}$** .

Table 1. shows comparison of our improvised “primary mover” **$V * d * \omega_{eq} * k$** with Keplerian **A^3 / P^2** for different primary and secondary bodies.

Primary	Volume V, m ³	Equatorial rotating speed, ω_{eq} rad/sec	V* ω_{eq}	Sec- ondary	Mean orbital distance A, m	Period P, sec	A ³ /P ²	k* d
93 Minerva	1.48E+15	2.92E-04	4.32E+11	Gorgo- neion	3.75E+05	9.59E+04	5.73E+06	1.33E-05
93 Minerva	1.48E+15	2.92E-04	4.32E+11	Aegis	6.23E+05	2.08E+05	5.60E+06	1.30E-05
216 Kleopatra	1.03E+16	3.25E-04	3.35E+12	Alex- helios	6.78E+05	2.01E+05	7.75E+06	2.32E-06
217 Kleopatra	1.03E+16	3.25E-04	3.35E+12	Cleo- selene	5.64E+05	1.07E+05	1.56E+07	4.66E-06
45 Eugenia	5.12E+15	3.06E-04	1.56E+12	Prince	1.18E+06	4.12E+05	9.69E+06	6.19E-06
87 Sylvia	1.22E+16	3.36E-04	4.10E+12	Remus	7.06E+05	1.19E+05	2.50E+07	6.10E-06
87 Sylvia	1.22E+16	3.36E-04	4.10E+12	Romulus	1.35E+06	3.15E+05	2.47E+07	6.03E-06
22 Kalliope	2.40E+15	4.22E-04	1.01E+12	sec	1.10E+06	3.11E+05	1.36E+07	1.34E-05
107 Camilla	5.52E+15	3.61E-04	1.99E+12	sec	1.25E+06	3.21E+05	1.89E+07	9.48E-06
107 Camilla	5.52E+15	3.61E-04	1.99E+12	third	3.40E+05	4.32E+04	2.11E+07	1.06E-05
Haumea	1.10E+19	4.44E-04	4.89E+15	Hi'iaka	4.99E+07	4.32E+06	6.67E+09	1.36E-06
Haumea	1.10E+19	4.44E-04	4.89E+15	Namaka	2.56E+07	1.58E+06	6.73E+09	1.38E-06
Earth	1.08E+21	7.22E-05	7.80E+16	Moon	3.84E+08	2.36E+06	1.02E+13	1.30E-04
Uranus	6.83E+22	1.00E-04	6.83E+18	Miranda	1.29E+08	1.22E+05	1.44E+14	2.11E-05
Neptune	6.25E+22	1.08E-04	6.77E+18	Proteus	1.18E+08	9.69E+04	1.73E+14	2.56E-05
Saturn	8.27E+23	1.67E-04	1.38E+20	Mimas	1.85E+08	7.78E+04	1.05E+15	7.60E-06
Jupiter	1.43E+24	2.31E-04	3.30E+20	Io	4.22E+08	1.53E+05	3.22E+15	9.76E-06
Sun	1.41E+27	2.92E-06	4.11E+21	Mercury	5.79E+10	7.60E+06	3.36E+18	8.16E-04

Within, so to speak, advanced Cartesian dynamics, revolution of solid celestial bodies should produce less effective vortices in comparison of vortices from spinning liquid bodies. This should influence value of $k*d$ (last column of table 1.). Vortices of Jovian planets appear to be not very effective, if one calculate them from all volume. Presumed liquid water vortices of Uranus and Neptune generally are not more effective than presumed liquid hydrogen vortices of Jupiter and Saturn, if one take into account volume differences. General picture is logic, signaling about low viscosity (supercritical) Sun and partially liquid Earth.

Thinking logically, above mentioned should mean more dense asteroids and less dense Earth. Since Keplerian/Newtonian calculation traditionally has been main argument for dense Earth with large piece of iron in center (Wiki), avalanches in geophysical theory should be ahead.

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