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

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:

$$\mathbf{A^3 = P^2}$$

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

$$\mathbf{M + m = A^3 / P^2}$$

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

$$\mathbf{GMm/A^2 = mv^2/A}$$

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

Processing:

$$\mathbf{GMm/A = mv^2}$$

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 $\mathbf{mv^2}$ for planet in accordance with vortical geometry. **m** on the left side of equation do not mean any real mass. 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 $\mathbf{3.8/A^{1.66}}$ (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- found hidden principles of DesCartes in writings of Newtonians.

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

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

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

Table 1. shows comparison of our improvised "primary mover" with Keplerian $\mathbf{A^3 / P^2}$ for different primary and secondary bodies.

Primary	Volume, in Earth's volumes	Rotation radians per day	Relative volume x rotation	Secon-dary	Semi-mayor axis A, Moon distances	Period P, hours	A^3/P^2	k* d
93 Minerva	1.37E-06	25.20	3.45E-05	Gorgo-neion	9.77E-04	26.64	5.03E-04	14.59
93 Minerva	1.37E-06	25.20	3.45E-05	Aegis	1.62E-03	57.7	4.92E-04	14.26
216 Kleopatra	9.54E-06	28.08	2.68E-04	Alex-helios	1.77E-03	55.7	6.81E-04	2.54
216 Kleopatra	9.54E-06	28.08	2.68E-04	Cleo-selene	1.47E-03	29.8	1.37E-03	5.12
45 Eugenia	4.74E-06	26.40	1.25E-04	Petit	3.07E-03	114.4	8.51E-04	6.80

				Prince				
87 Sylvia	1.13E-05	29.04	3.28E-04	Remus	1.84E-03	32.95	2.19E-03	6.70
87 Sylvia	1.13E-05	29.04	3.28E-04	Romulus	3.52E-03	87.6	2.17E-03	6.63
22 Kalliope	2.22E-06	36.48	8.11E-05	sec	2.85E-03	86.3	1.19E-03	14.75
107 Camilla	5.11E-06	31.20	1.59E-04	sec	3.26E-03	89.3	1.67E-03	10.42
107 Camilla	5.11E-06	31.20	1.59E-04	third	8.85E-04	12	1.85E-03	11.61
Haumea	1.02E-02	38.40	0.391	Hi'iaka	1.30E-01	1199	0.586	1.50
Haumea	1.02E-02	38.40	0.391	Namaka	6.67E-02	438.7	0.591	1.51
Earth	1.00E+00	6.24	6.24	Moon	1.00E+00	655.2	894.50	**143.35**
Uranus	6.32E+01	8.64	546.4	Miranda	3.36E-01	33.91	1.27E+04	23.17
Neptune	5.79E+01	9.36	541.67	Proteus	3.06E-01	26.93	1.52E+04	28.08
Saturn	7.66E+02	14.40	11026.67	Mimas	4.82E-01	21.6	9.20E+04	8.35
Jupiter	1.32E+03	19.92	26375.56	Io	1.10E+00	42.46	2.83E+05	10.72
Sun	1.31E+06	0.25	3.29E+05	Mercury	1.51E+02	2112	2.95E+08	**896.99**

Within, so to speak, advanced Cartesian dynamics, revolution of solid celestial bodies produce less effective vortices in comparison of vortices from spinning liquid bodies. This shoud influence value of **k*d**. Indeed, we see that if assume solar density as 1400 kg /kubic meter, coefficient **k** here is 0.64. If we assume Earth's density 4000 kg/cubic meter, coefficient **k** becomes $3.6*10^{-2}$. If we assume density of 87 Sylvia 2500 kg/cubic meter, coefficient **k** is $2.7*10^{-3}$. 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 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. Avalanches in geophysical theory should be ahead.

References

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