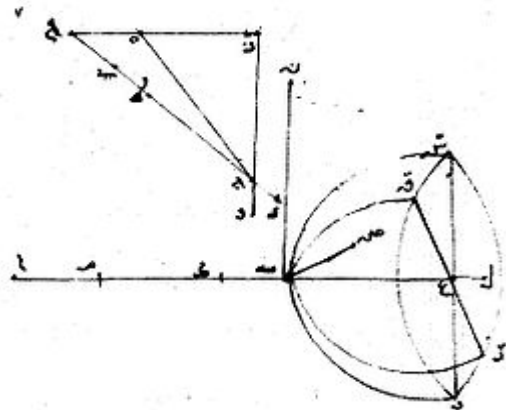


Nahhas' 1973 discovery of Earth's axial tilt illusion of 23.4393°



لانه ان ماته عليها سطح مستوي غيره فلان هذا السطح يقطع سطح برتر
 على نقطة تب تلازم من ان يقطع احد خطي ب ن بص فليكن ذلك
 الخط مستوي الفصل المشترك بين هذا السطح وبين سطح قطع و ر
 خط مستوي فلان هذا السطح يماس على نقطة تب بخط
 مستوي تر قطع و س ر على نقطة تب وكذلك خط مستوي وهذا حال
 فلان يماس مستوي تب على نقطة تب سطح مستوي غير سطح ب ن نص

Greetings: My name is Joe Nahhas founder of real time physics and astronomy

This is 10th century Persian born Arab educated and citizen of 8th - 13th century Abbasid State with Bagdad as Capitol 10th century Bagdad citizen Ibn Sahl document stating in Arabic light reflections laws later known as Snell's law or the optics textbooks law $\sin i = n \sin r$ where i = incident beam and r = reflected beam (top of picture). He included how light would go around a sphere bottom of picture. Robert Hooks spring method used by Henry Cavendish introduced a spherical error of $(8\pi/15) = (4\pi/3)(2/5)$

The $(4\pi/3)$ is from spherical volume

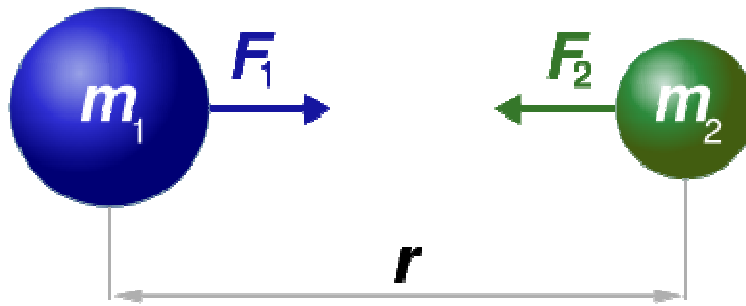
And $(2/5)$ is from spherical moment of inertia

The use of 24 hours = 86400 seconds and not Earth's rotation period $T_e = 86160.09$ seconds introduced another error

Air density of 1.2041 kilogram/ meters³ error

And air permittivity $\epsilon_a = 1.00058968$ or index of refraction $n_a = 1.000293$ were not present in any calculations.

Newton's law is:



$$F_1 = F_2 = G \frac{m_1 \times m_2}{r^2}$$

Where F = force between two objects with masses m_1 and m_2 and r is the distance between their centers and G the proportionality constant with state of the art measurement of 6.6729×10^{-11} with experimental error of ± 0.0005

[1] Measurement techniques volume 39, No.10, 1996

Measurement of the gravitational constant using torsion balance

O.V. Karagioz; V.P.Izmailov; UDC 528.27; $G = (6.6729 \pm 0.0005) \times 10^{-11}$

G has a dimensional unit $[G] = [1/\rho, 1/T^2]$

$$G = 1/ (8\pi/15) \rho \varepsilon_a T_e^2 = 6.3729882 \times 10^{-11}$$

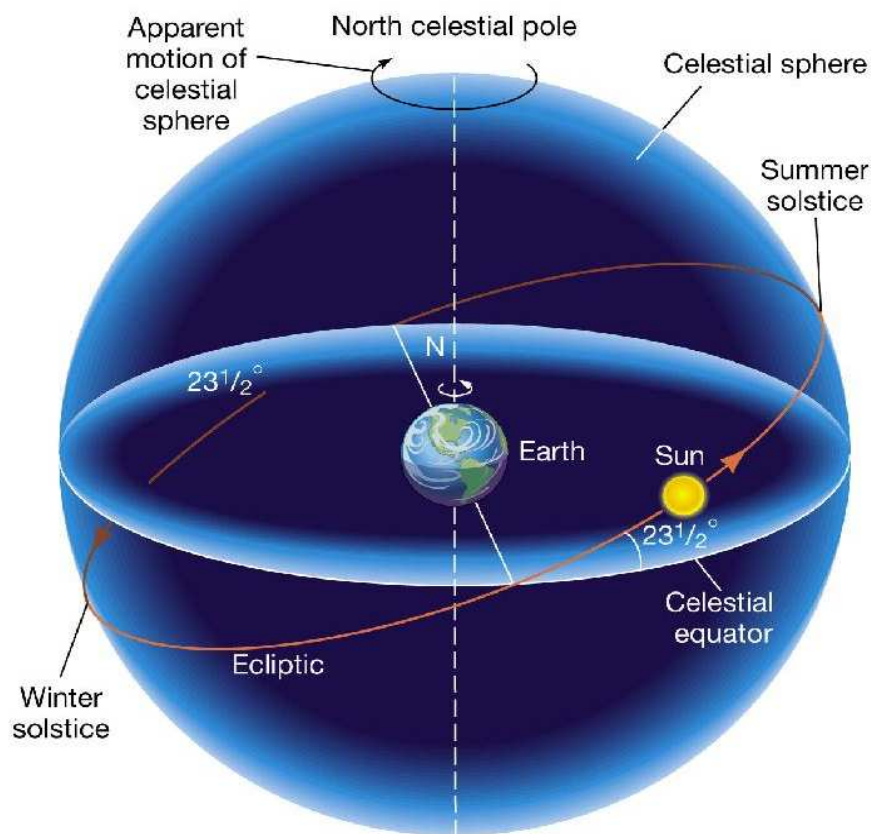
$$\text{Or } G = 1/ (8\pi/15) \rho n_a^2 T_e^2$$

$$\text{And } \varepsilon_a = 1.00058986 \text{ and } n_a^2 = 1.000293^2 = 1.000586$$

What Ibn Sahl described is light visual incident and reflected of a sphere is not the same as light incident on and reflected of a plane and the light incident of a sphere should be tracing a circle. A circle has a circumference of 2π and the moment of inertia of a sphere is $(2/5)mr^2$. The error in visualizing light from a celestial object according to Ibn Sahl is $1/ (2\pi)$.

The spring method used where an error of $2/5$ is multiplied, then the total error $1/(2\pi)(2/5) = 5/4\pi$. The vertical projection angle of light coming from a celestial object like the Sun would be measured in modern and Nobel terms as an error of axial tilt and not an actual tilt. Also, $\sin^{-1}(5/4\pi) = i = 23.44617328$. The index of refraction of air is $n_a = 1.000293$ and $i/n_a = 23.4393^\circ$

The actual measurement by modern and Nobel physicists is $i = 23.4393^\circ$



This modern and Nobel astronomy celestial sphere used for past 500 years and used by 21st century space agencies and is basis of modern and Nobel astronomy is a Crystal Ball according to Ibn Sahl in 10 century and according to Joe Nahhas in 1973. General science Journal: Author Joe Nahhas

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