Why do planets have different day lengths?

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Abstract
The original accretion disks that moons, planets, extra Solar planets, binary stars and Globular Clusters supposedly came from would prevent them from having the angular and orbital momentum they now have. They would be too big originally and overlap each other and destroy their neighbours rotation. No known force can start planets spinning on their axis with the angular momentum they have today.

"The planet of mass *M* acquires angular momentum *L* from the incoming material, and material with both positive and negative angular momentum will be accreted. The net magnitude is difficult to estimate without detailed hydrodynamic modelling, although some dimensional arguments have been employed to provide rough estimates. [Page 1169]

"Both positive and negative angular momentum material would mix as it descends toward the planet. Numerical simulations have not yet determined this angular momentum distribution."

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http://history.nasa.gov/SP-345/ch16.htm

This fact constitutes one of the main difficulties of all Laplacian-type theories; these theories claim that the secondary bodies as well as the central body derive from an initial massive nebula which, during its contraction, has left behind a series of rings that later form the secondary bodies. Each of these rings must have had essentially the same angular momentum as the orbital momentum of the secondary body formed from it, whereas the central body should have a specific angular momentum which is much less. No reasonable mechanism has been found by which such a distribution of angular momentum can be achieved during contraction. The only possibility one could think of is that the central body lost most of its angular momentum after it had separated from the rings.

Closely connected with the problem of transfer of angular momentum is another basic difficulty in the Laplacian approach, namely, support of the cloud against the gravitation of the central body. As soon as the cloud has been brought into rotation with Kepler velocity, it is supported by the centrifugal force. In fact, this is what defines the Kepler motion. But the acceleration to Kepler velocity must necessarily take a considerable amount of time, during which the cloud must be supported in some other way.

Attempts have been made to avoid this difficulty by assuming that the Laplacian nebula had an initial rotation so that the Kepler velocities were established automatically. This results in an extremely high spin of the Sun, which then is supposed to be carried away by a "solar gale." This view could be theoretically possible when applied to the planetary system but lacks support in the observational record of early irradiation of grains (see secs. 5.5 and 16.2). When applied to the satellite systems the proposed mechanism fails also in principle. One of the reasons is that it is irreconcilable with the isochronism of spins.

The volume of a sphere is

[1]

$$V = \frac{4}{3}\pi R^3$$

Where V= volume and R= radius.
If the volume is known the radius can be calculated:

[2]

$$R = \sqrt[3]{\frac{V}{4\pi \div 3}}$$

The volume of the original accretion cloud is thus:

[3]

$$v = \frac{M}{p}$$

v = volume, cubic metres
M = objects current mass, kilograms
P = original nebulae density, one gram per cubic kilometre, [10^{-12} kilograms per cubic metre] [1]
The radius of the original cloud is thus:

[4]

$$r = \sqrt[3]{\frac{M \div p}{4\pi \div 3}}$$

With the Solar System's major planets of Mercury to Neptune, they would have had such large clouds in their original form that it would be impossible for them to have formed their axial rotational motion. The clouds would overlap and destroy each other's rotation. If evolution were true their angular momentum must have an entirely different origin to that of the Sun. To start with there would be no relevant sub rotations in the Solar Nebulae. The origin of the moons orbital rotational motion around the parent planet would necessitate a third mechanism because of the same problem of overlapping clouds and a third type of rotational vector.

Sun's nebulae radius	= 78,002,760,496 kilometres
	= 260,009 light seconds
	= 4,333 Light minutes
	= 72 light hours
	= 3 Light Days

Accretion Nebula Radius

Objects Name	Orbital Radius, Kilometres	Gas Cloud Radius, Kilometres
Sun	0	78,002,760,496
Mercury	58,344,000	414,672,981
Venus	107,712,000	1,082,710,643
Earth	149,600,000	1,125,595,644
Mars	224,400,000	539,320,132
Jupiter	777,920,000	7,682,895,560
Saturn	1,421,200,000	5,135,983,331
Uranus	2,872,320,000	2,894,223,358
Neptune	4,502,960,000	2,894,223,358
Pluto	5,909,200,000	141,816,165

[Table 1]

Accretion Clouds Overlap

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Mercury	X	X	X	X					
Venus	X	X	X	X	X				
Earth	X	X	X	X	X				
Mars	X	X	X	X	X				
Jupiter	X	X	X	X	X	X	X	X	X
Saturn	X	X	X	X	X	X	X	X	X
Uranus			X	X	X	X	X	X	X
Neptune							X	X	X
Pluto									X

[Table 1]

If the Sun transmitted angular momentum out top the planets [2] what would we expect? The force field is proportional to the distance from the source. With most force fields [Like Gravity] it is the radius squared. If the force at Jupiter's orbital radius is one than the force on Mercury per square meter would be 178 times greater. We would expect planets to have much shorter day length than Jupiter's. Ones further out should have much longer day lengths. The fact that day lengths come in pairs rules out this source of planetary rotation.

Predicted Versus Actual Day Lengths

Planets Name	Fields Power Ratios	Actual Day Length, Seconds	Jupiter's Day Length, Seconds	Predicted Day Length, Seconds
Mercury	178	5,080,320	35,510	200
Venus	52	21,081,600	35,510	681
Earth	27	86,400	35,510	1,313
Mars	12	88,906	35,510	2,955
Jupiter	1	35,510	35,510	35,510
Saturn	0.30	36,979	35,510	118,521
Uranus	0.07	64,627	35,510	484,118
Neptune	0.03	69,293	35,510	1,189,822
Pluto	0.02	551,856	35,510	2,049,005

[Table 3]

Jupiters Moons Name	Initial Orbital Velocity[m/s]	Final Orbital Velocity[m/s]	Percentage Total	Acceleration Per Year
Metis	9,674	31,496	69.28%	2.18217029
Adrastea	9,636	31,373	69.28%	2.17367536
Amalthea	8,118	26,428	69.28%	1.831003442
Thebe	7,340	23,894	69.28%	1.655385766
Io	5,326	17,333	69.27%	1.200693557
Europa	4,222	13,741	69.27%	0.951868552
Ganymede	3,344	10,880	69.27%	0.753591164
Callisto	2,521	8,203	69.27%	0.56824362
Themisto	1,272	4,140	69.28%	0.286781025
Leda	1,034	3,365	69.28%	0.233128373
Himalia	1,022	3,326	69.28%	0.230423616
Lysithea	1,009	3,285	69.28%	0.227574032
Elara	1,008	3,280	69.28%	0.227211709

Jupiters Moons Name	Acceleration Since 1610 Metres Per Second
Metis	873
Adrastea	869
Amalthea	732
Thebe	662
Io	480
Europa	381
Ganymede	301
Callisto	227
Themisto	115
Leda	93
Himalia	92
Lysithea	91
Elara	91

Angular Velocity of a sphere
[5]

$$w = \frac{2\pi}{t}$$

w = angular velocity
t = rotation time in seconds

The Moment of Inertia of a sphere
[6]

$$I = \frac{2Mr^2}{5}$$

M = mass, kilograms,

r = radius, metres

Angular Momentum of a Sphere
[7]

$$\boldsymbol{w} = \frac{4\pi M r^2}{5t}$$

Centripetal Force Of An Orbiting Sphere
[8]

$$\boldsymbol{F} = \boldsymbol{M}\frac{\boldsymbol{v}^2}{\boldsymbol{r}}$$

F = Force, Newtons
M = Mass of orbiting sphere, kilograms
v = Orbital velocity, metres/second
r = Metres between the centre of both objects

Kinetic energy of an orbiting sphere
[9]

$$E = \frac{1}{2}mv^2$$

E = Joules
m = mass in kilograms
v = velocity in metres per second

Angular Momentum and Kinetic Energy

Planets	Angular Momentum	Angular Energy	Angular Momentum	Angular Energy
Name	Newtons	Joules	Mercury = 1	Mercury = 1
Mercury	8.69E+29	1.07E+24	1	1
Venus	2.33E+31	6.94E+24	27	6
Earth	7.07E+33	5.15E+29	8,144	478,870
Mars	2.12E+32	1.50E+28	245	13,974
Jupiter	6.88E+38	1.22E+35	791,720,333	113,268,143,389
Saturn	1.27E+38	2.16E+34	146,421,562	20,115,881,621
Uranus	2.57E+36	2.50E+32	2,961,471	232,800,385
Neptune	2.40E+36	2.18E+32	2,762,070	202,506,120
Pluto	7.18E+28	8.17E+23	0.08	0.76

[Table 1]

The Formation Of Jupiter's Moons

Object	Orbital Radius	Max Cloud Radius
Jupiter's Moons	Kilometres	Kilometres
Metis	127,690	9,634,023
Adrastea	128,690	3,756,035
Amalthea	181,366	36,932,154
Thebe	221,889	21,952,321
Io	421,700	1,285,833,285
Europa	671,034	1,046,978,409
Ganymede	1,070,412	1,530,781,075
Callisto	1,882,709	1,381,344,797
Themisto	7,393,216	9,937,283
Leda	11,187,781	16,419,318
Himalia	11,451,971	65,727,468
Lysithea	11,740,560	23,196,368
Elara	11,778,034	39,262,373
S/2000 J 11	12,570,424	13,860,632
Carpo	17,144,873	18,129,486

[Table 3]

The physical process of viscous dissipation is poorly understood. Accretion results from the transfer of angular momentum outwards by an unknown viscous action between shearing material. Progress in accretion theory has been made largely by packing viscosity physics inside a dimensionless parameter. More sophisticated approaches which regard viscosity to be the result of magnetic stresses, hydrodynamic turbulence and/or tidal action have been encouraging but theorists have enormous freedom to maneuver in an area which has been poorly constrained by observation.
http://lheawww.gsfc.nasa.gov/users/still/research/disk.html

http://www.sjsu.edu/faculty/watkins/densityrotation.htm
http://www.sjsu.edu/faculty/watkins/planetarysweep.htm

Planet's	Mass	Day Length	Mass Versus
Name	Earth = 1	Earth = 1	Day Length
Sun	332,981.79	25.05	13,292.69
Mercury	0.06	58.65	0.000943
Venus	0.82	243.02	0.003354
Earth	1.00	1.00	1.00
Mars	0.11	1.03	0.10
Jupiter	317.83	0.41	768.56
Saturn	95.16	0.44	216.07
Uranus	14.83	0.72	20.65
Neptune	17.08	0.67	25.49
Pluto	0.00	6.39	0.00

[Table 4]

Thayer Watkins states [**http://www.sjsu.edu/faculty/watkins/planetarysweep.htm**] that there are only three pairs of orbital ratios

1. Earth, Mars
2. Jupiter, Saturn
3. Uranus, Neptune

Actually there are four because Mercury and Venus have very similar ratios.

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Finally, the coupled planet–disk evolution model described here assumes that the viscous torque between the disk and the surface of the planet will maintain the planet's rotation rate at the limit of rotational stability as the planet contracts. Yet ultimately, Jupiter and Saturn must be left with less angular momentum than this to account for their current ∼10 hr rotational days, which are about a factor of 3 longer than their critical rotation periods. Accounting for sub-critical rotation is a well-known issue for Jupiter and Saturn, as well as for protostars. Protostars, also believed to grow through mass delivered via a viscous accretion disk, have observed rotation rates that are often much slower than breakup (e.g., Herbst et al. 2002). Proposed solutions to account for protostar angular momentum loss may also apply to gas giant planets, including (1) "disk-locking", or magnetic coupling between the central object and its disk that results in angular momentum transferred to the disk beyond the co-rotation radius (where the Kepler velocity equals the primary rotational velocity; e.g., Koenigl 1991; Takata & Stevenson 1996) and (2) magneto-centrifugally driven "X-winds" that originate from the inner accretion disk, diverting mass and angular momentum that would otherwise be delivered to the primary (e.g., Shu et al. 2000). A full treatment of this issue in the context of the current model will involve, e.g., modifying the disk profile to include the magnetic torque and assessing the expected degree of ionization in the disk, which are planned topics of future work.
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`The Effect of Resistivity on the Nonlinear Stage of the Magneto Rotational Instability in Accretion Disks'', by T.P. Fleming, J.M. Stone, & J.F. Hawley, The Astrophysical Journal, 530, 464.

Extra Solar Planet WASP 12b

According to astronomy magazine **[www.Astronomy.com**, June 2010 page 21] this planet's atmosphere is being syphoned away by the star it is orbiting at a rate of 6.9 billion tonnes per second [Nature Magazine, February 25, 2010]. Within 10 million years the planet will be syphoned away to nothing!

Mass = 2.679 x 10^{27} kilograms
Radius = 127,970,680 metres
Surface gravity = 10.916 metres/second [Earth's = 9.81 metres/second]
Escape velocity= 52,858 metres/second [Earth's = 11,182 metres/second]
Orbital period = 94,299 seconds [1.09 days]
Orbital radius = 1,600,000 kilometres

How could such a planet have formed when the initial accreting planetoid would never have enough gravity to maintain an atmosphere. The parent star would destroy it before anything could even start forming.

Why do planets have different day lengths?

If the planets formed by evolution why do they have different day lengths? If a planet derived its rotational energy from the orbital velocity of the surrounding material we would expect that the closer to the Sun the shorter the day length. The material that Mercury accreted from had ten times the orbital velocity/kinetic energy that the material Pluto came from. Pluto's day length however, is ten times shorter than Mercury. If we compare the day length [seconds] to the orbital velocity [metres/second] there is no relationship

If tidal resonance forces caused the day lengths we would expect the year/day ratio to be less than or equal to one. The year day ratio is the year length [seconds] divided by the day length [seconds].

Planets	Year/Day	Velocity/Day
Name	Ratio	Ratio
Mercury	1.4966	48.36
Venus	0.9209	145.68
Earth	365	707.49
Mars	668	3.64
Jupiter	10,540	6.81
Saturn	25,140	3.7
Uranus	41,043	5.43
Neptune	75,062	11.88
Pluto	339,326	14.6

[Table 5]

Many moons in the Solar System have achieved synchronous orbit where the moon rotates exactly once on its axis per orbit around the planet. The Moon orbits the Earth this way so only one side is ever visible to people on Earth.

Some Solar System Moons With Synchronous Orbits

Jupiter	Saturn	Uranus	Neptune
Metis	Io	Miranda	Proteus
Adrastea	Europa	Ariel	Triton
Amalthea	Ganymede	Umbriel	
Thebe	Callisto	Titania	
Io	Metis	Oberon	
Europa	Adrastea		
Ganymede	Amalthea		
Callisto	Thebe		
Themisto			
Leda			
Himalia			
Lysithea			
Elara			

[Table 6]

If the planets received their rotation this way we would expect the year day ratio to be less than or equal to one. The planets rotational motion has to be propped up all along the way as it accretes matter. As it accretes matter its rotational speed would decrease dramatically. Suppose it were spinning once every 10 hours when it was one kilometre wide. When its mass accretes to become ten times more than the starting value, the amount of rotation decreases by a factor of ten because the original energy is dispersed over ten times as much mass. For moons to form around the planet, the planet must have an outside force continually applying rotational torque to increase its angular momentum and kinetic energy.

http://en.wikipedia.org/wiki/Formation_and_evolution_of_the_Solar_System

"The evolution of moon systems is driven by tidal forces. A moon will raise a tidal bulge in the object it orbits (the primary) due to the differential gravitational force across diameter of the primary. If a moon is revolving in the same direction as the planet's rotation and the planet is rotating faster than the orbital period of the moon, the bulge will constantly be pulled ahead of the moon. In this situation, angular momentum is transferred from the rotation of the primary to the revolution of the satellite. The moon gains energy and gradually spirals outward, while the primary rotates more slowly over time."

Since tidal resonance forces and orbital accretion cannot deliver the torque it must come from some other source. If the Sun transmitted torque out to Jupiter or Saturn to make them spin on their axis it is not doing this today! A major problem with this is that the force field could not deliver the torque properly. Since tidal forces are proportional to the distance cubed this would mean that Mercury being 15 times closer to the Sun than Jupiter, would receive experience a force field 2,370 times greater than at Jupiter's distance from the Sun.

This force would make the inner planets spin to fast on their axis and blow them to pieces. The surface gravity on the planet's equator is defined below.

[10]

$$g = \frac{GM}{R^2}$$

g= Surface gravity [metres/second]
G= 6.673 x 10^{-11}
M = planets mass, kilograms
R= planets radius, metres

The equatorial velocity on the planet's surface is calucalted by the next formula

[11]

$$V = \frac{2\pi R}{T}$$

V= Equatorial rotational Velocity, Metres/Second
R = Planets Radius, metres
T = Day length, seconds

[12]

$$\Psi = V \times \sqrt{\frac{f}{F}}$$

$$\Psi = \frac{2\pi R}{t} \times \sqrt{\frac{GM \div R^2}{Mv^2 \div R}}$$

f = Current Surface gravity force, Newtons
F = Current Centripetal force, Newtons
V = Current Equatorial Velocity, Metres/Second
Ψ = Final Equatorial Velocity, Metres/Second

This formula [14] enables us to determine how fast a planet can spin on its axis before the centripetal force overpowers the gravitational force and the planet disintegrates.

[13]

$$E = \frac{MR^2}{5} \times [\frac{2\pi}{T}]^2$$

E = Angular kinetic energy, Joules
T= day length, seconds

[14, 15, 16]

$$\omega = \Omega_J R^5 \qquad \frac{\Omega_J}{\omega} = R^5 \qquad \sqrt[5]{\frac{\Omega_J}{\omega}} = R$$

ω = Current Angular momentum, Newtons
R= Current radius, kilometres
Ω = Starting Angular [Jupiter's] momentum, Newtons
[17]

$$\psi = E_S R^5$$

ψ = Current Angular energy, Joules
E = Original Angular [Saturn's] energy, Joules
R= Current radius, metres

Accretion time for Jupiter, Saturn etc = 10 million years (Planets radius increases by 7.1492 metres/year)
www.wikipedia.com/Planetary_formation.htm

If Jupiter and Saturn had uniform density and day lengths during their formation we can use the following constants to work out their angular momentum and kinetic energy. We calculate the momentum and energy when they were one kilometre in radius. The increase in momentum and energy as the planets grow in size is the constant multiplied by the new radius [metres] raised to the power of five.

Momentum Constant, Jupiter, Ω_J	**0.394615447332398**
Energy Constant, Jupiter, E_J	**0.0000349255423011397**
Momentum Constant, Saturn, Ω_S	**0.191051128745412**
Energy Constant, Saturn, E_S	**0.0000157796279992756**

The mass of the planet equals volume times density.

[18]

$$M = \frac{4}{3} p\pi r^3$$

P =Density, kilograms/cubic metre

The moment of inertia of a solid sphere is
[19]

Can be rewritten as

$$I = 2\times\frac{4}{3}\frac{p\pi r^3 r^2}{5}$$

Simplified down to:
[20]

$$I = \frac{8p\pi r^5}{15}$$

The angular momentum can be rewritten as
[21]

$$\omega = \frac{8p\pi r^5}{15}\times\frac{2\pi}{t}$$

Simplified down to:
[22]

$$\omega = \frac{16p\pi^2 r^5}{15t}$$

Since only the radius is varying the constant is thus:
[23]

$$\Omega_J = \frac{16p\pi^2}{15t}$$

What is the volume of material that is being accreted per second?
R = Shells outer radius
r = shells inner radius.
[24]

$$V = \frac{4\pi(R^3 - r^3)}{3}$$

What is mass of the shell of a hollow sphere?
[25]

$$M = \frac{4\pi p(R^3 - r^3)}{3}$$

What is the moment of inertia of a hollow sphere with a thick shell?
http://cnx.org/content/m14292/latest/
[26]

$$I = \frac{2M}{5} \times \frac{(R^5 - r^5)}{(R^3 - r^3)}$$

What is the angular momentum of the shell?
[27]

$$\omega = \frac{2\pi}{t} \times \frac{2M}{5} \times \frac{(R^5 - r^5)}{(R^3 - r^3)}$$

Simplified down to:
[28]

$$\omega = \frac{4\pi M}{5t} \times \frac{(R^5 - r^5)}{(R^3 - r^3)}$$

If we compare the angular momentum of a surface shell 31 metres deep with a planet of radius 1000 kilometres with a surface shell on a planet of radius ten times greater we find that the matter [surface shell] has 100 times as much momentum per kilogram of mass. The mass of the planet has increased by a factor of 1,000. The gravitational force should cause the in falling captured material to have 1,000 times as much momentum as the original shell but it does not.

How much force is needed per second to the shell to maintain a uniform day length?
[29]

$$\Sigma = \frac{4\pi(R^3 - r^3)}{3} \times \frac{4\pi}{5t} \times \frac{(R^5 - r^5)}{(R^3 - r^3)}$$

The formula reduces down to
[30]

$$\Sigma = \frac{16\pi^2(R^5 - r^5)}{15t}$$

A planet's day length in seconds is
[31]

$$t = \frac{2Mr^2}{5} \times \frac{2\pi}{\omega}$$

How much angular momentum is needed to destroy the planet?

The day length must equal Λ for this to happen
[32]

$$\Lambda = \frac{2\pi R}{V \times \sqrt{f \div F}}$$

The angular momentum needed is:
[33]

$$\Pi = \frac{2Mr^2}{5} \times \frac{2\pi}{\Lambda}$$

This can be written as:
[34]

$$\Pi = \frac{2Mr^2}{5} \times \frac{2\pi}{(2\pi R \div (V \times \sqrt{f \div F})}$$

Simplified down to:
[35]

$$\Pi = \frac{2Mr^2}{5} \times \frac{1}{(R \div V) \times \sqrt{f \div F}}$$

Or either:
[36]

$$\Pi = \frac{2Mr^2}{5} \times [\frac{R}{V}\sqrt{f \div F}]^{-1}$$

If the angular momentum of the planet is □□newtons when the planet finishes accreting, how much time after that before the planet destroys itself if the Sun keeps sending angular momentum to the planet? We deduct the current angular momentum from the destruction momentum and using formula 30 we get the answer in seconds.

[37]

$$T = [\Pi - \theta] \div \frac{16\pi^2 (R^5 - r^5)}{15t}$$

To determine the torque and final day length we first calculate the distance ratios

[38]

$$\lambda = (\frac{J}{\mu})^3$$

λ= Planet's Distance ratio
μ = Planet's orbital radius, metres
J= Jupiter's orbital radius, metres

This formula below shows how much torque a planet receives compared to Jupiter's, based on the torque Jupiter is receiving at the same time if Jupiter had an identical radius. We calculate the amount of force Jupiter receives per second and then calculate the amount another planet the same size would receive. We just factor in the distance and density differences.

Planets	Accretion Rate	Orbital Radius	Distance/Density	Destruction Time
Name	Metres/Year	Cubed Ratios	Ratio	Years
Mercury	3968.8694	2430.05	579.16	5
Mercury	31.803305	2430.05	579.16	633
Venus	3968.8694	372.45	95.99	5
Venus	31.803305	372.45	95.99	633
Earth	3968.8694	140.95	33.81	268
Earth	31.803305	140.95	33.81	33459
Mars	3968.8694	39.85	14.04	268
Mars	31.803305	39.85	14.04	33459
Jupiter	3968.8694	1.00	1.00	7655
Jupiter	31.803305	1.00	1.00	955379
Saturn	3968.8694	0.16	0.32	7655
Saturn	31.803305	0.16	0.32	955379
Uranus	3968.8694	0.02	0.02	148316
Uranus	31.803305	0.02	0.02	18514661
Neptune	3968.8694	0.01	0.00	148316
Neptune	31.803305	0.01	0.00	18514661
Pluto	3968.8694	0.00	0.00	185159
Pluto	31.803305	0.00	0.00	23265145

[Table 7]

[39]

$$\tau = (\frac{J}{\mu})^3 \times \frac{P}{p}$$

This formula below shows how much angular momentum a planet has

[40]

$$\omega = \frac{(J \div \mu)^3}{(P \div p)} \times \Omega$$

Jupiter's current radius equals other planets radius
Ω = Jupiter's simultaneous angular momentum

This formula below shows how much angular kinetic energy a planet has

[41]

$$e = \frac{(J \div \mu)^3}{(P \div p)} \times E$$

E = Jupiter's simultaneous angular kinetic energy
Jupiter's current radius equals other planets radius

[42]

$$t = \frac{2Mr^2}{5} \frac{(J \div \mu)^3}{(P \div p)} \times (\frac{2\pi}{\omega})$$

t = Planets day length, seconds
w = Jupiter's simultaneous angular momentum

Field Torque and Day Lengths

Planets Name	Fields Power Ratios	Planets Mass Ratios	Regional Torque Strength	Day Length Seconds
Mercury	2,370	6,360	15,075,571	0.0000000004
Venus	377	357	134,602	0.000005
Earth	141	318	44,713	0.000020
Mars	42	2,891	120,440	0.0000002280
Jupiter	1	1	1	35,510
Saturn	0.164	3	0.55	12,458
Uranus	0.0199	22	0.43	475
Neptune	0.0052	19	0.1	2,362
Pluto	0.0023	159,000	363	0.00000016

[Table 8]

The above table shows how fast the planets would be spinning on their axis if the rotational motion was delivered to the planets from the Sun. To transmit enough rotational motion form the Sun to Jupiter, the field would be so powerful it would destroy all the planets in between.

The table below shows how fast the planets would be spinning on their axis if rotational power came from the Sun. The spaghetti day length is how fast the planet must spin on its axis to start disintegrating. The day length ratio column is how many times in error the rotational rate is. The far right column [four] is column three divided by column two.

Planets Name	Day Length Seconds	Spaghetti Day Length Seconds	Spaghetti Day Length Ratio
Mercury	0.0000000004	5,311	13,277,500,000,000
Venus	0.000005	4,976	938,230,636
Earth	0.000020	5,070	255,072,522
Mars	0.0000002280	5,898	25,868,421,053
Jupiter	35,510	10,670	0
Saturn	12,458	14,045	1
Uranus	475	9,837	21
Neptune	2,362	9,408	4

Pluto	0.00000016	8,658	54,521,410,579

[Table 9]

30 Earth Masses

According to current evolutionary scenarios it took millions of years of accretion for Jupiter and Saturn to accumulate 30 Earth masses of matter [1.7928 x 10^{26} kilograms]. The rest [Jupiter 90%, Saturn 68%] only took 10,000 years.

http://en.wikipedia.org/wiki/Solar_nebula

In effect, the frost line acted as a barrier that caused material to accumulate rapidly at ~5 AU from the Sun. This excess material coalesced into a large embryo of about 10 Earth masses, which then began to grow rapidly by swallowing hydrogen from the surrounding disc, reaching 150 Earth masses in only another 1000 years and finally topping out at 318 Earth masses. Saturn may owe its substantially lower mass simply to having formed a few million years after Jupiter, when there was less gas available to consume.[29]

http://en.wikipedia.org/wiki/Nebular_hypothesis

To resolve this issue an idea has been brought forward that they initially accreted in the Jupiter-Saturn region and then were scattered and migrated to their present location.[41] Once the cores are of sufficient mass (5–10 Earth masses), they begin to gather gas from the surrounding disk.[2] Initially it is a slow process, which can increase the core masses up to 30 Earth masses in a few million years.[17][40] After that the accretion rates increase dramatically and the remaining 90% of the mass is accumulated in approximately 10,000 years.[40]

http://adsabs.harvard.edu/abs/2007A%26A...473..311F

For the last 10,000 years Jupiter would require almost 16,000 times as much angular torque to keep it spinning at its current day length. Saturn would require 2,000 times increase. Below are some tables illustrating this.

Jupiter/Saturn Table 1.
First columns, volume, radius [30 Earth masses].
Mass % remaining
Volume % remaining.

Jupiter/Saturn Table 2.
Yearly momentum increase [Newtons], momentum attained [Up to 30 Earth masses].
Final momentum, full mass. Momentum difference, [318 Earth masses minus 30 Earth masses]
Momentum %. The momentum percent 30 Earth masses has compared to fully grown planet.
Yearly momentum increase [Newtons], momentum attained [30 to 318 Earth masses].
Rate increase. How many times faster momentum must be added in the last 10,000 years.
Momentum ratio. How many times more momentum the fully grown planet has compared to only 30 Earth masses.

Field force = 0.071830963 Newtons per kilo per year.

Jupiter

Jupiter	Volume	Radius	Mass Attained%	Mass Remainder %
30 Earth Masses	1.35E+23	31,803,306	9.43	90.57
	Cubic Metres	Metres	Volume %	Volume Remainder
			8.80	91.20

Momentum Attained	Final Momentum	Momentum Difference	Momentum %	Momentum Ratio
1.28391E+37	6.88E+38	6.75E+38	1.866908939	53.56
Yearly Momentum Rate		Yearly Rate	Rate Increase	
4.27971E+30		6.74882E+34	15,769.34	

Saturn

Saturn	Volume	Radius	Mass Attained%	Mass Remainder %
30 Earth Masses	2.60E+23	39,579,757	31.58	68.42
	Cubic Metres	Metres	Volume %	Volume Remainder
			32.78	67.22

Momentum Attained	Final Momentum	Momentum Difference	Momentum %	Momentum Ratio
1.85573E+37	1.27E+38	1.27E+38	14.59046346	6.85
Yearly Momentum Rate		Yearly Rate	Rate Increase	
6.18577E+30		1.27188E+34	2,056.14	

Conclusion

The origin of the planets day lengths cannot come from miniature rotating nebulae inside the Solar Nebulae because the clouds would be so big that they would overlap each other and destroy each other's rotational torque. The rotation cannot come from tidal resonance forces because the day lengths are too long. The power cannot be tidal forces transmitted from the Sun because no mechanism is known to do this. Furthermore, to transmit that much power to Jupiter would mean that planets closer to the Sun like Mercury and Venus would receive too much power and be destroyed.

1.
http://en.wikipedia.org/wiki/Giant_molecular_cloud

2.
http://history.nasa.gov/SP-345/ch16.htm

3.
http://en.wikipedia.org/wiki/Galileo_Galilei