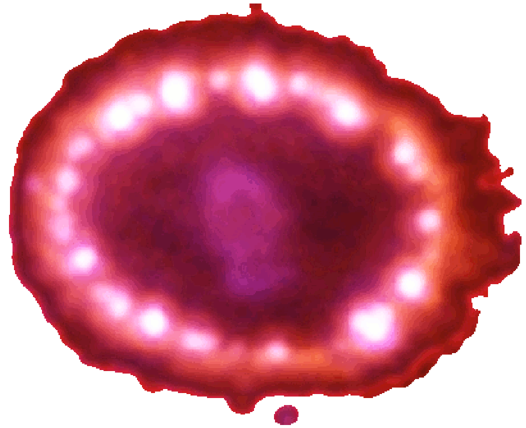
GRAVITOMAGNETISM

SUCCESSES IN EXPLAINING THE COSMOS



The purpose of this presentation

PART ONE

- To explain what Gravitomagnetism exactly is and how the magnetic part can be interpreted.

- To show that many cosmic issues can be explained by calculating it strictly, without other assumptions, just by using common sense.

- To show that the bending of light and the Mercury issue can be purely deduced and don't need to be gauges for a theory.

PART TWO

- Explain my current research, consisting of a new theory of forces: the Coriolis Gravity and Dynamics Theory.

What is Gravitomagnetism?

Coulomb's Electrostatic Law

$$\vec{F}_C = k_e \frac{q_1 q_2}{r^3}\vec{r} = q_1 \vec{E}_2$$

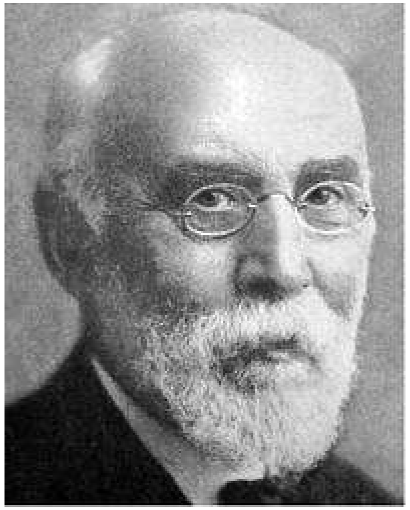
$$F \Rightarrow F$$

$$q \Rightarrow m$$

$$k_e \Rightarrow G$$

Newton's Gravity Law

$$\vec{F}_N = G \frac{m_1 m_2}{r^3}\vec{r} = m_1 \vec{g}_2$$



Lorentz force

$$\vec{F}_{L2} = q_2\left(\vec{E}_1 + \vec{v}_2 \times \vec{B}_1\right)$$

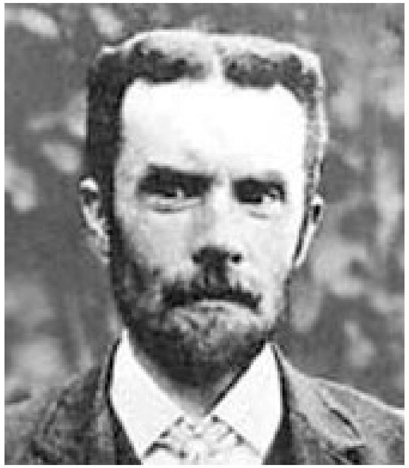
$F \Rightarrow F$

$v \Rightarrow v$

$q \Rightarrow m$

$E \Rightarrow g$

$B \Rightarrow ?\ldots\Omega$



Oliver Heaviside

Equivalent Lorentz force for gravity

$$\vec{F}_{H2} = m_2\left(\vec{g}_1 + \vec{v}_2 \times \vec{\Omega}_1\right)$$

$$\left[N = kg\left(\frac{m}{s^2} + \frac{m}{s} \cdot \frac{1}{s}\right)\right]$$

Ω = ‘gyrotation’

Heaviside – Maxwell equations

$$\vec{F}_{H2} \Leftarrow m_2\left(\vec{g}_1 + \vec{v}_2 \times \vec{\Omega}_1\right)$$

Gravitomagnetic force = gravity force + "gyrotational" force

$$\nabla \cdot \vec{g} \Leftarrow 4\pi G \rho$$

The gravity field is radial (diverges) and its amplitude is directly proportional to its mass

$$c^2 \nabla \times \vec{\Omega} \Leftarrow 4\pi G \vec{j} + \partial \vec{g}/\partial t$$

The gyrotation field's amplitude is directly proportional to a mass flow or an increasing gravity field and is perpendicular to it (encircles it)

$$\nabla \cdot \vec{\Omega} = 0$$

There are no gyrotational monopoles

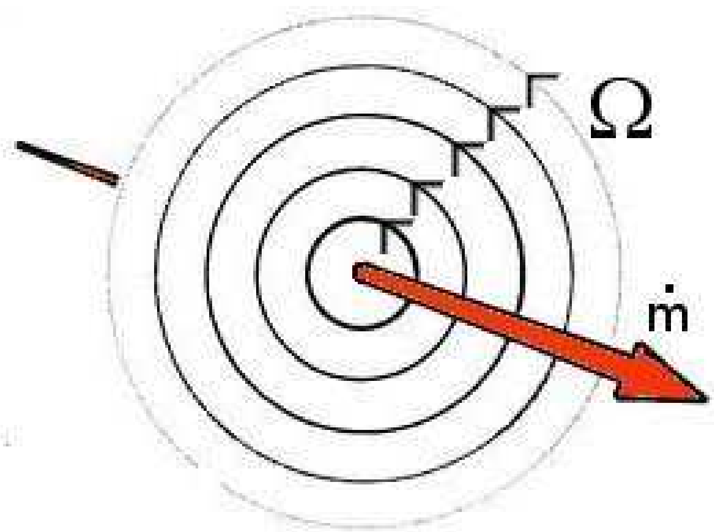
$$\nabla \times \vec{g} \Leftarrow -\partial \vec{\Omega}/\partial t$$

(Minus sign inverses vector orientation)

The induced gravitation field's amplitude is directly proportional to an increasing gyrotation field and perpendicular to it (encircles it)

The meaning of Gyrotation Ω

A linear mass flux is encircled by a gyrotation field according



$$c^2 \nabla \times \vec{\Omega} \Leftarrow 4\pi G \vec{j}$$

or

$$\oint_{2\pi R} \vec{\Omega} \, d\vec{l} \Leftarrow 4\pi G \dot{m} / c^2$$

or

$$\Omega = 2G\dot{m} / Rc^2$$

An external gravity field defines the zero velocity

The "local absolute velocity" of the mass is
defined by an external gravity field

In other words : the aether velocity of a mass is always zero

Electromagnetism and Gravity are totally similar

Maxwell equations and Lorentz force

are applicable to both

(besides the fact that masses always attract)

No further assumptions !

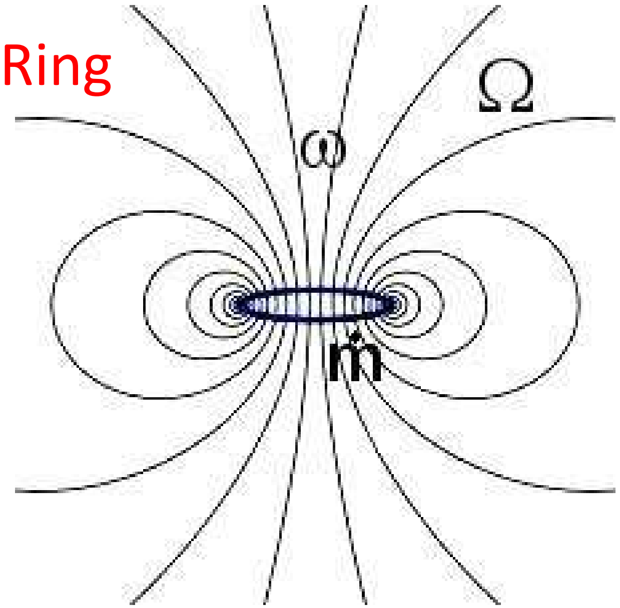
No further theories !

Just simple maths and common sense !

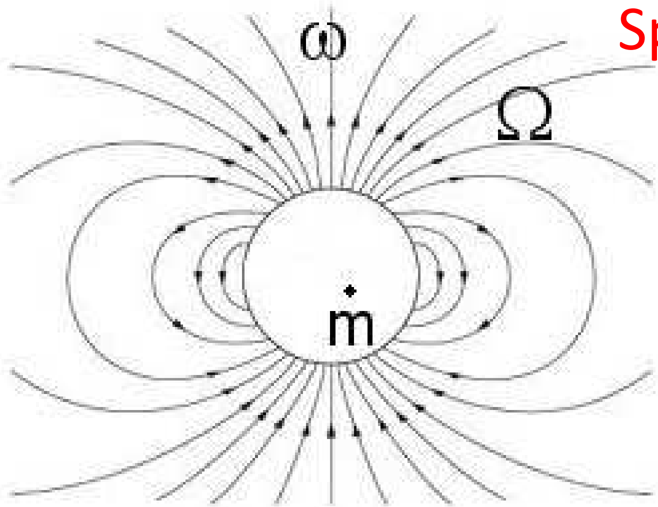
A circular mass flow induces a dipole-like gyrotation

Gyrotation of a ring is analogue to the magnetic field of an electrical dipole (steady system)

Ring



Sphere



$$\vec{\Omega}_{ext}(r) = \frac{GI}{2r^3c^2}\left(\vec{\omega} - \frac{3\vec{r}(\vec{\omega}\cdot\vec{r})}{r^2}\right)$$

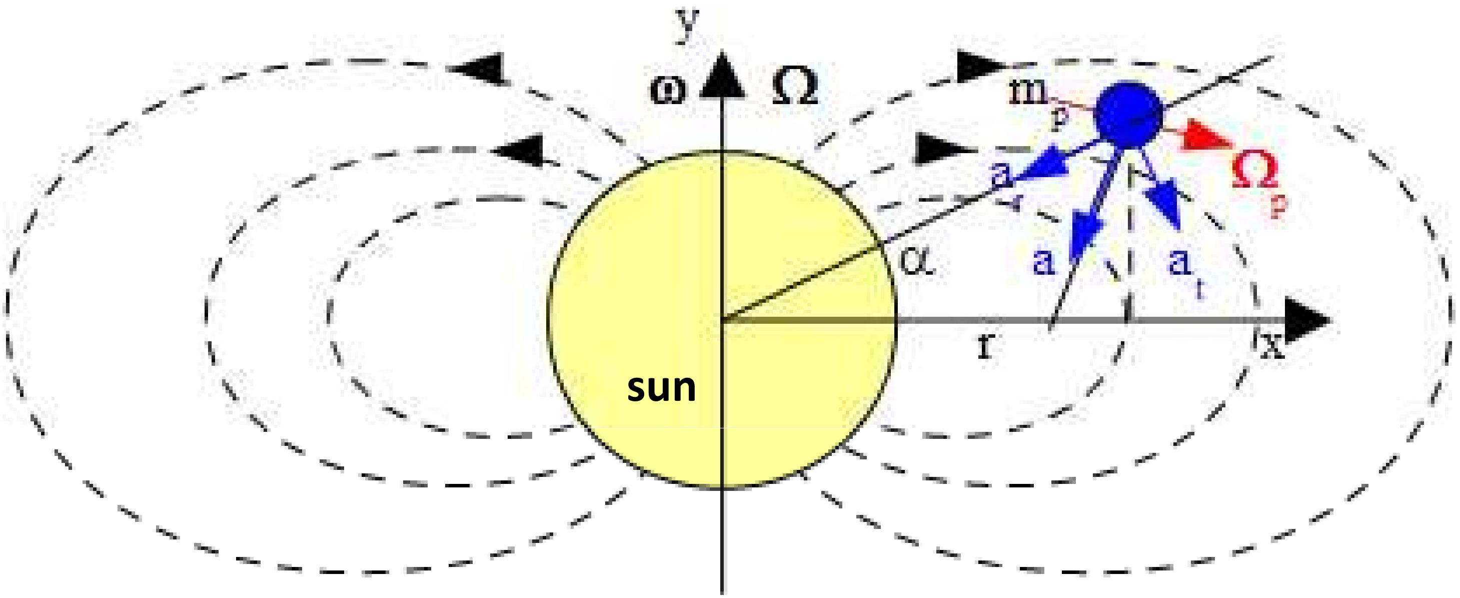
The own gravity field defines the zero velocity

⇩

The “local absolute velocity” of the mass is defined by the own gravity field

First effect of Gyrotation

What happens to an inclined orbit of a planet ?



Lorentz- Heaviside acceleration:

$$\vec{a}_{\mathrm{p}} = \vec{g}_{\mathrm{sun}} + \vec{v}_{\mathrm{p}} \times \vec{\Omega}_{\mathrm{sun}}$$

Every planet's orbit swivels to the Sun's equator plane.

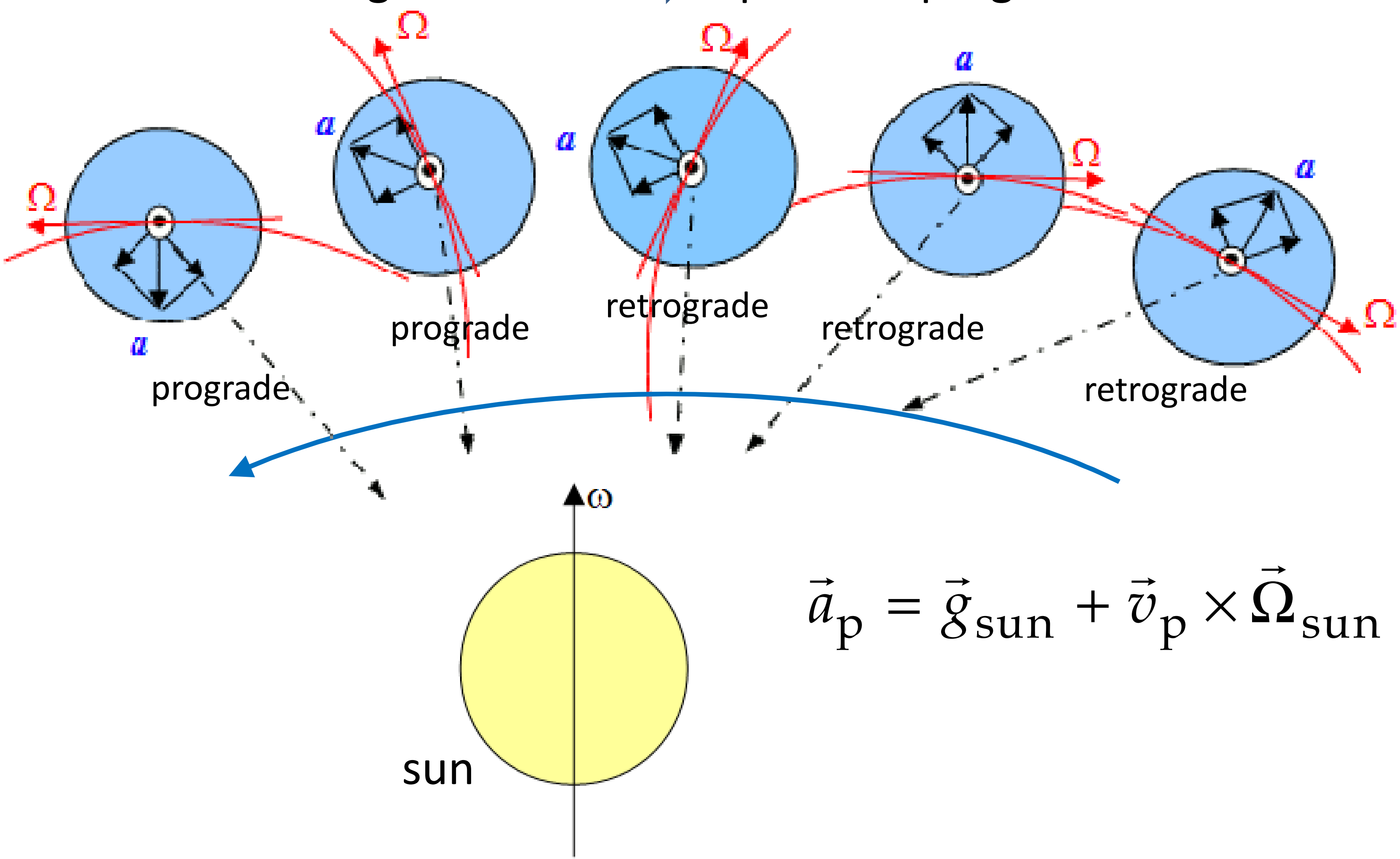
Same occurs for : Saturn rings, disk galaxies.

⇓

Gyrotation transmits angular momentum at a distance by gravity.

Examples: Swiveling to prograde orbits

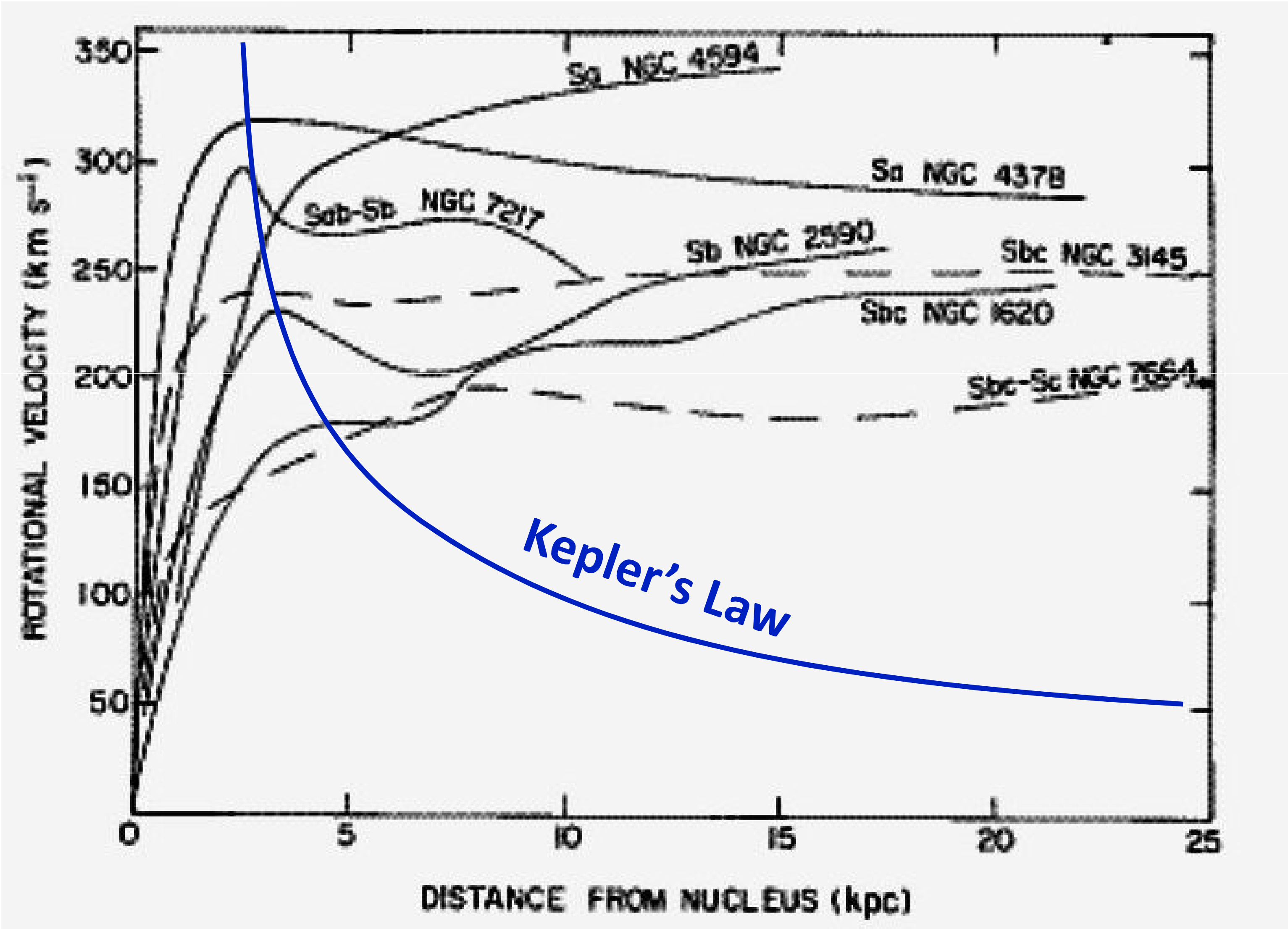
Inclined retrograde orbit ➡ equatorial prograde orbit



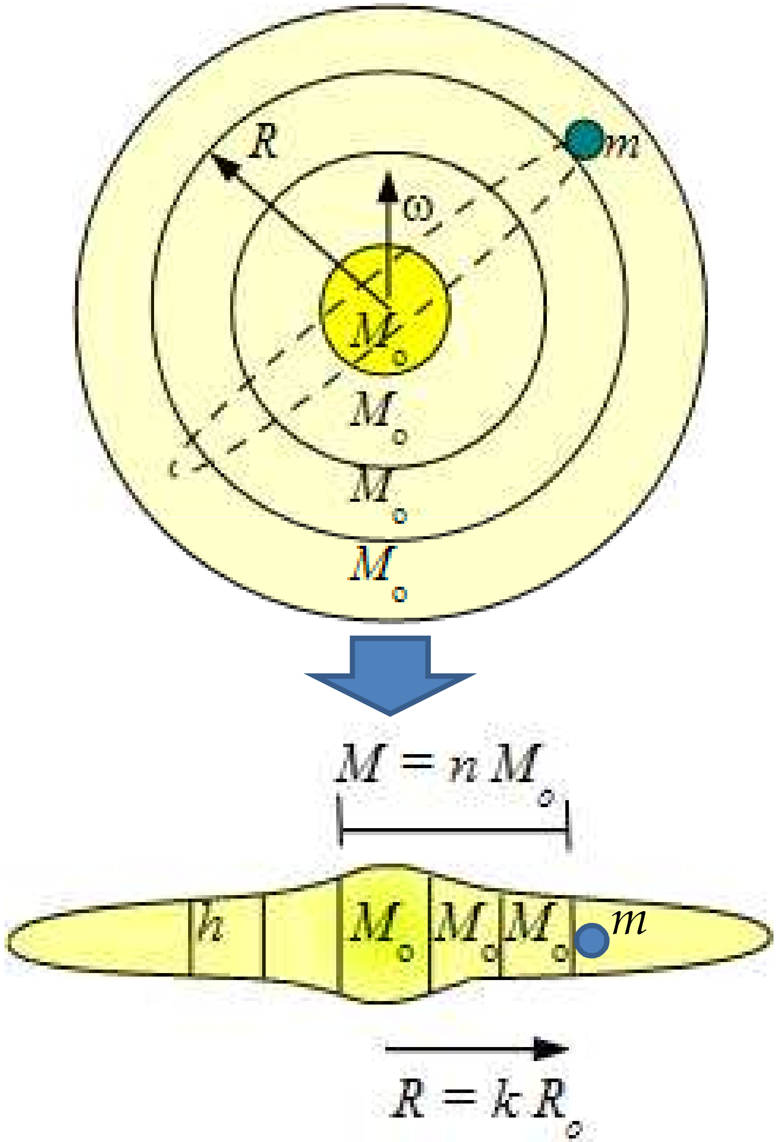
$$\vec{a}_{\rm p} = \vec{g}_{\rm sun} + \vec{v}_{\rm p} \times \vec{\Omega}_{\rm sun}$$

Consequence:

Star's velocity in disc galaxies



Simplified explanation without dark matter



Spherical galaxy with a spinning center

Consider nucleus with mass M_0 and a mass distribution with concentrical shells, each with a mass M_0 :

$$v_{\mathrm{sphere}}^2 = \frac{G\,M_0}{R} \qquad \text{(Kepler)}$$

Swiveled galaxy

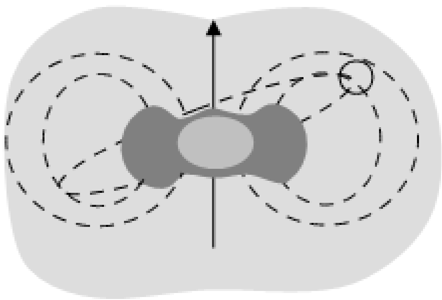
The nucleus' mass has totally changed :

$$v_{\mathrm{disc}}^2 = \frac{G\,n\,M_0}{k\,R_0} = \text{constant}$$

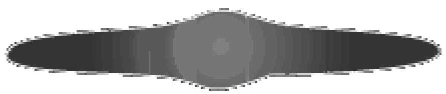
Milky Way : *v* = 235 km/s

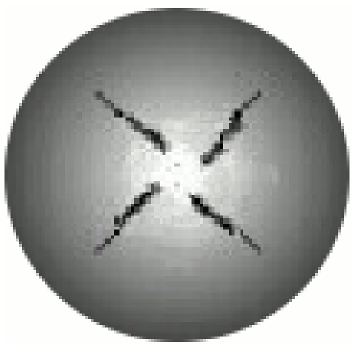
Further consequence:

Spiral disc galaxies



side view





top view

Total life time

=

Swivelling time

Swivelling of the orbits

↓

Gyrotational pressure upon orbits

↓

High density of disc

↙ ↘

Local grouping   Local voids

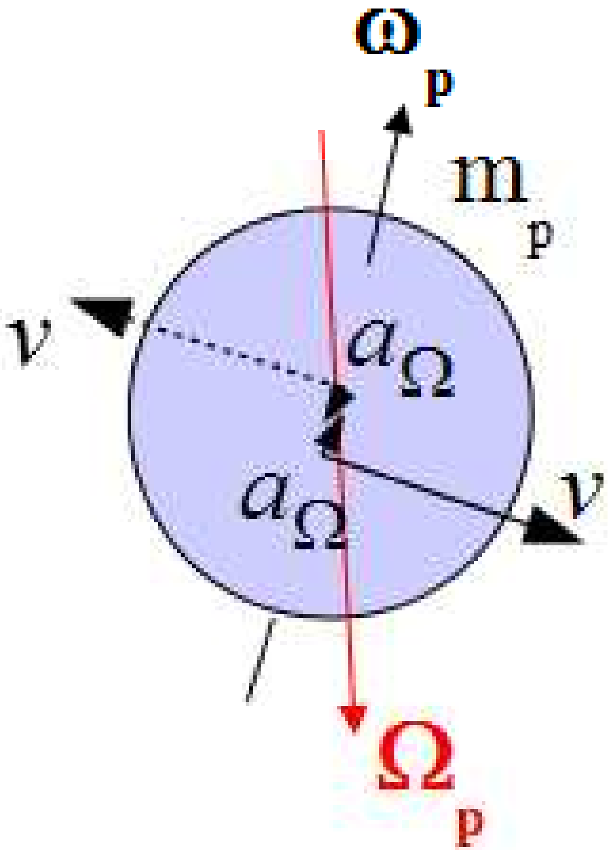
+

Winding time

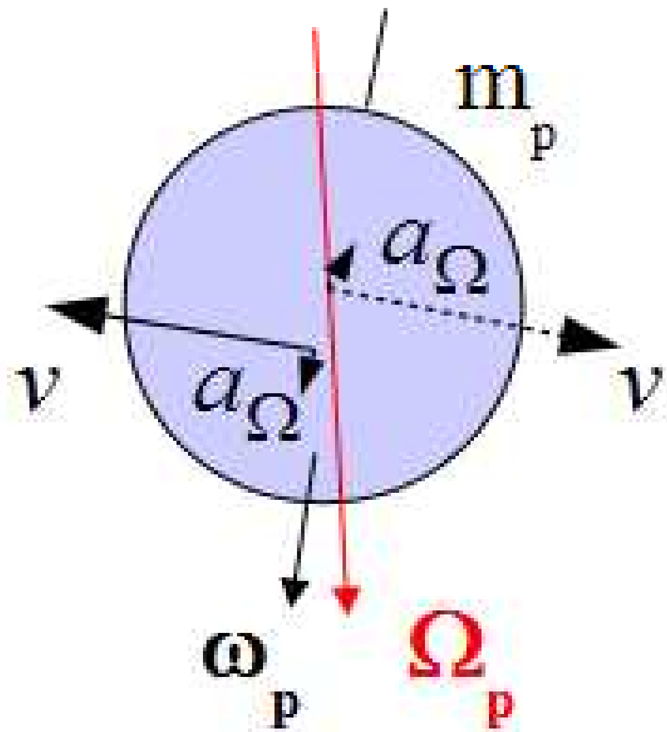
Second effect of Gyrotation

Lorentz-Heaviside acceleration : $\vec{a}_{\mathrm{p}} = \vec{g} + \vec{v} \times \vec{\Omega}_{\mathrm{p}}$

Like-spinning planets with Sun
= unstable momentum



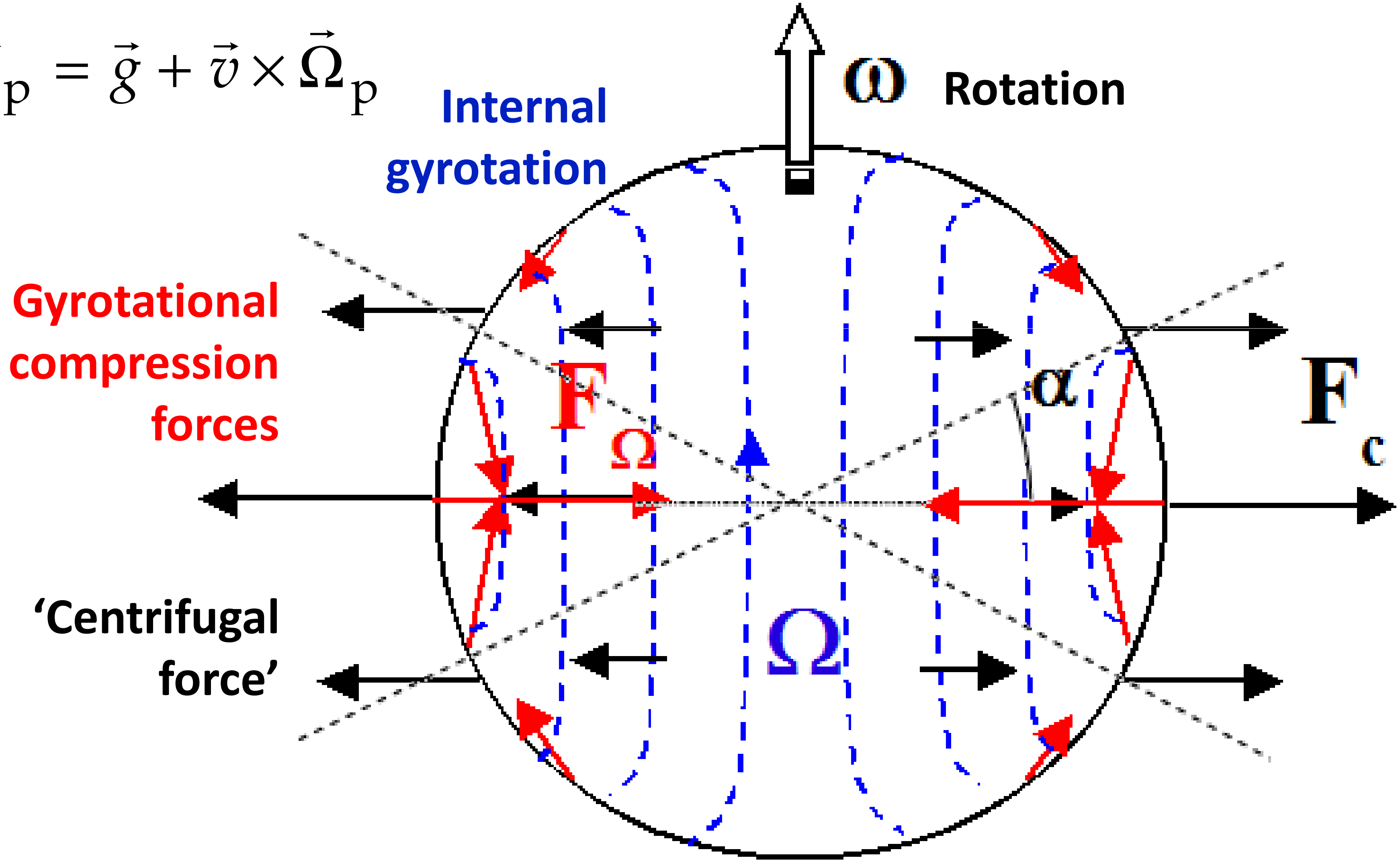
Opposite spinning planets
than Sun = stable momentum



Third effect of Gyrotation

Gyrotation surface-compression forces

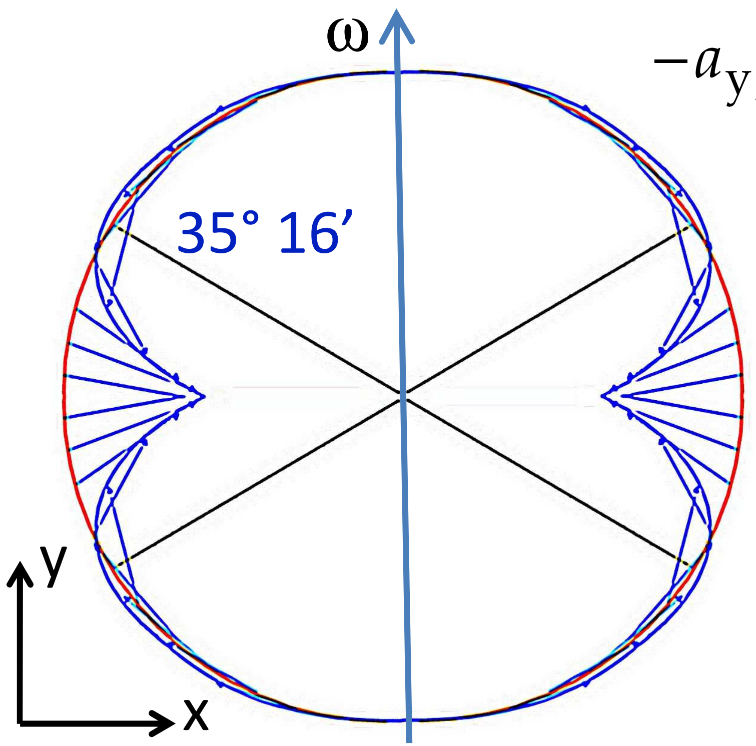
$$\vec{a}_p = \vec{g} + \vec{v} \times \vec{\Omega}_p$$



0° < surface compression < 35°16°

$$a_{x,tot} = \underbrace{R\omega^2 \cos\alpha}_{\text{'centrifugal'}} \left(\underbrace{1}_{} - \underbrace{\frac{Gm\left(1 - 3\sin^2\alpha\right)}{5Rc^2}}_{\text{gyrotation}} \right) - \underbrace{\frac{Gm\cos\alpha}{R^2}}_{\text{gravitation}}$$

$$-a_{y,tot} = \underbrace{\frac{3Gm\omega^2\cos^2\alpha\sin\alpha}{c^2}}_{\text{gyrotation}} + \underbrace{\frac{Gm\sin\alpha}{R^2}}_{\text{gravitation}}$$



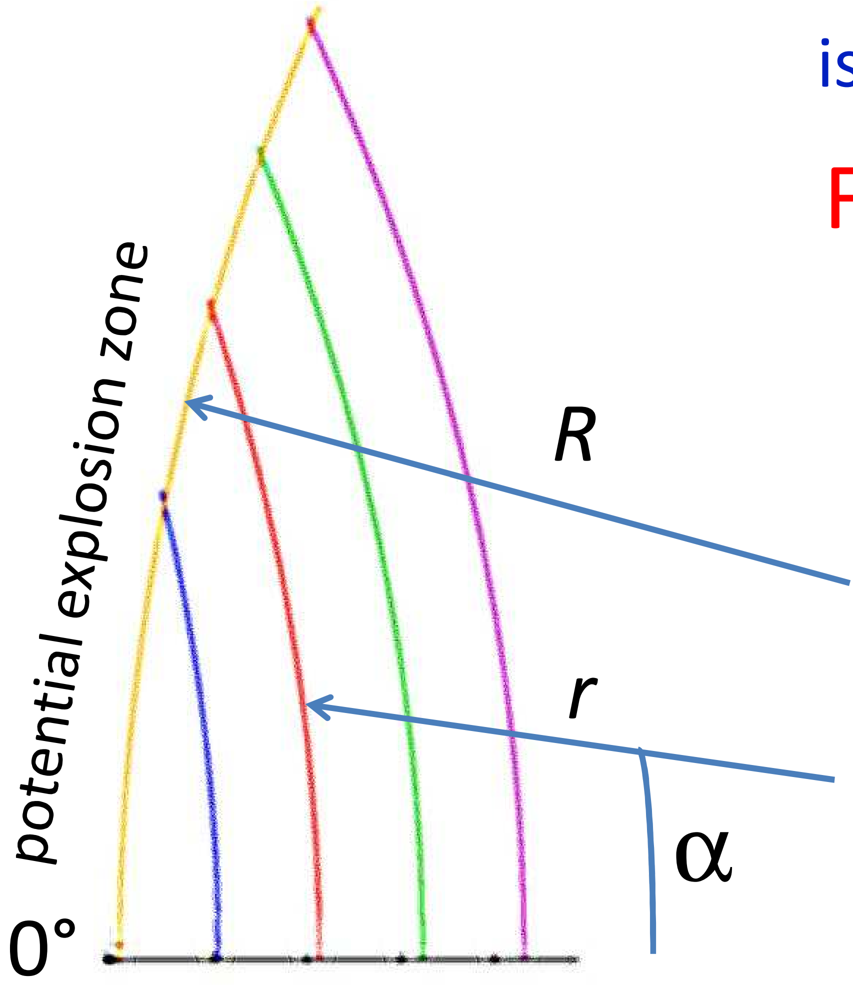
Gyrotational compression forces

$F_\Omega > F_c$

Internal gyrotation and centripetal forces

For a fast spinning sphere (the equation is then almost spin-independent) :

$F_\Omega < F_c$ for given values of α



$$r \le R\sqrt{\frac{1+5R_C/R}{\left(6-3\sin^2\alpha\right)R_C/R}}$$

wherein

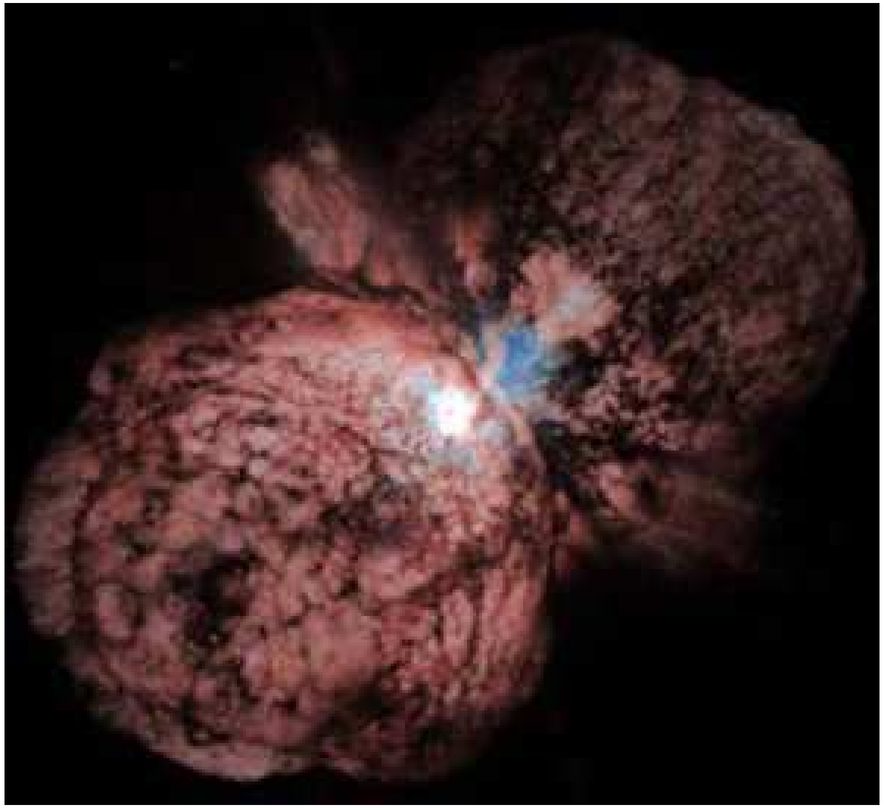
$$R_C = Gm\Big/\left(5c^2\right)$$

= “critical compression radius”

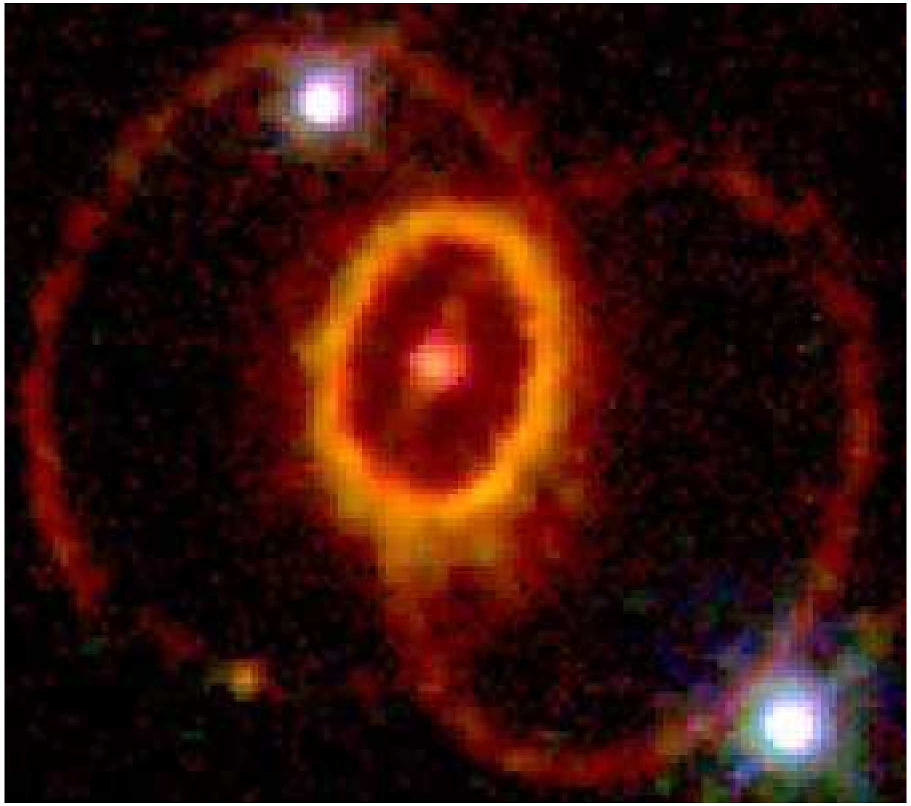
For large masses, small radii : $r \le R\sqrt{5\Big/\left(6-3\sin^2\alpha\right)}$

Supernovae examples

η – Caterinae

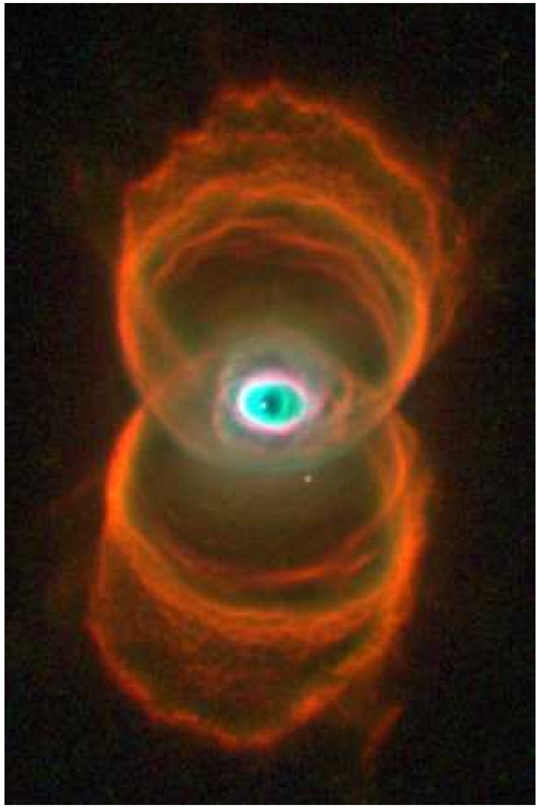


SN 1987 - a

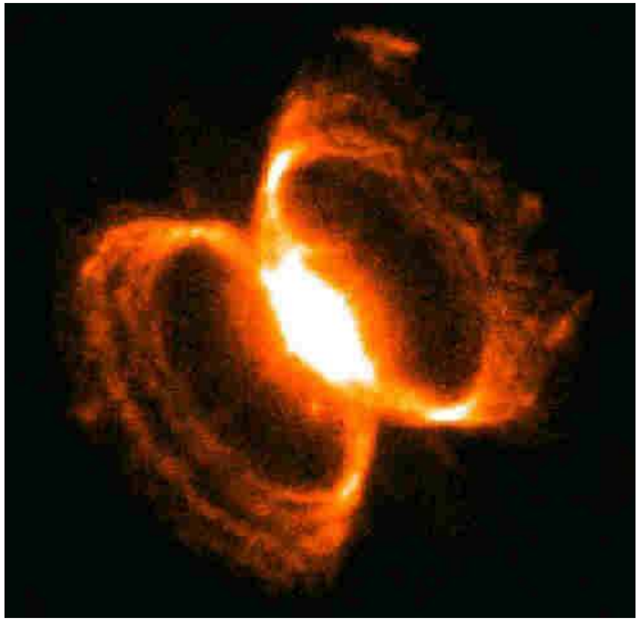


More supernovae examples

‘hourglass’ nebula



hs-1999-32-a



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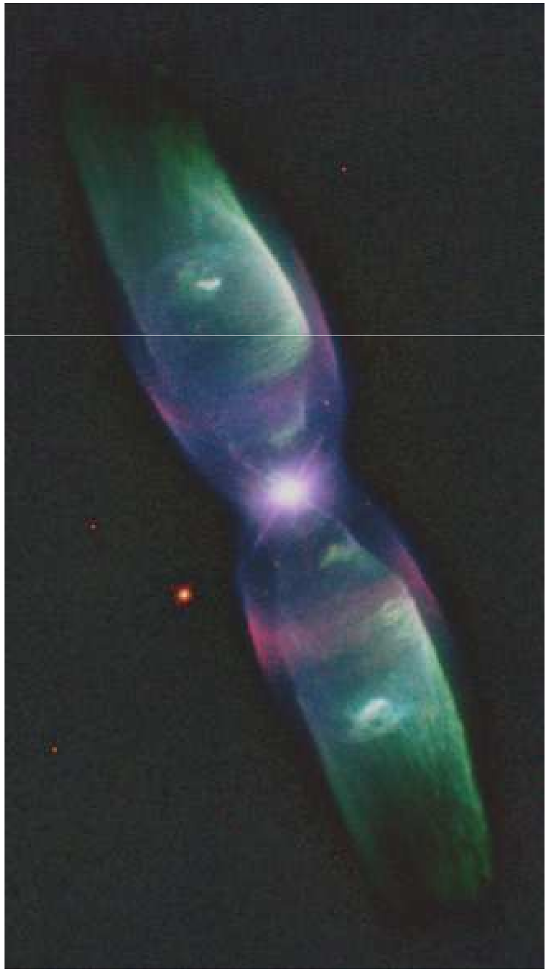
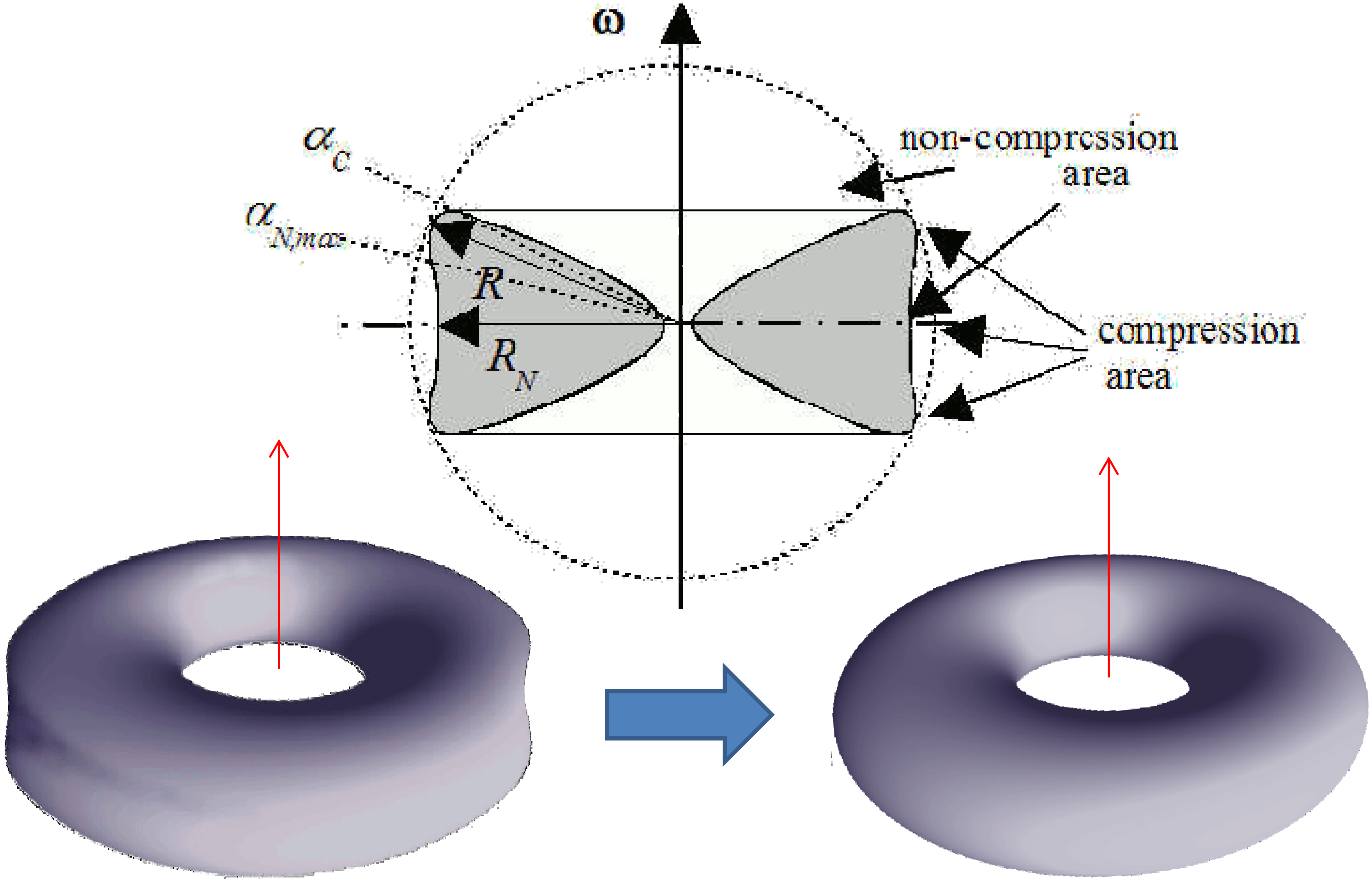


Prediction attempt : the shape of supernova stars

After the explosion of the sphere:



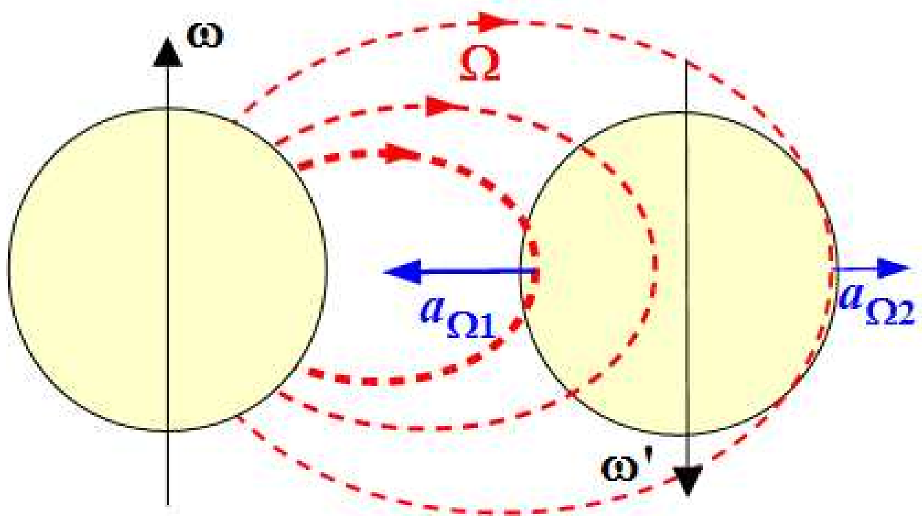
Fourth effect of Gyrotation

Attraction and repelling between molecules

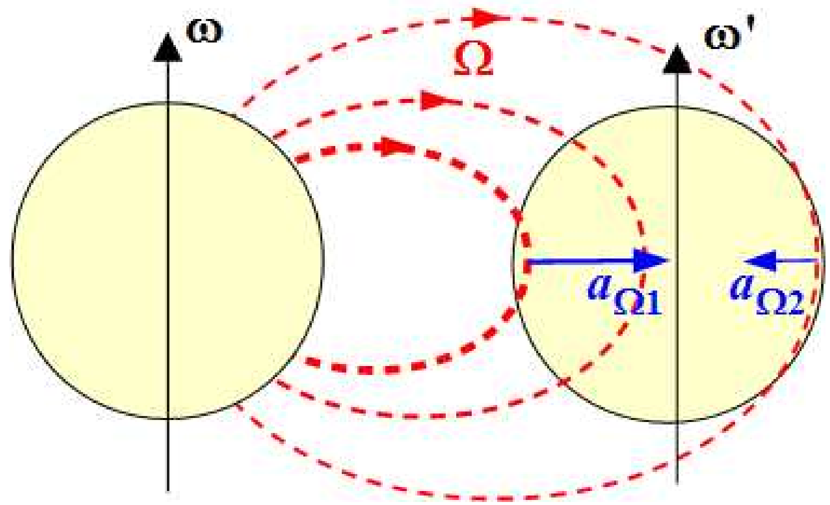
$$\vec{a}_{\mathrm{H}} = \vec{g} + \vec{v} \times \vec{\Omega}$$

Horizontal reciprocity

Opposite spins attract



Like spins repel

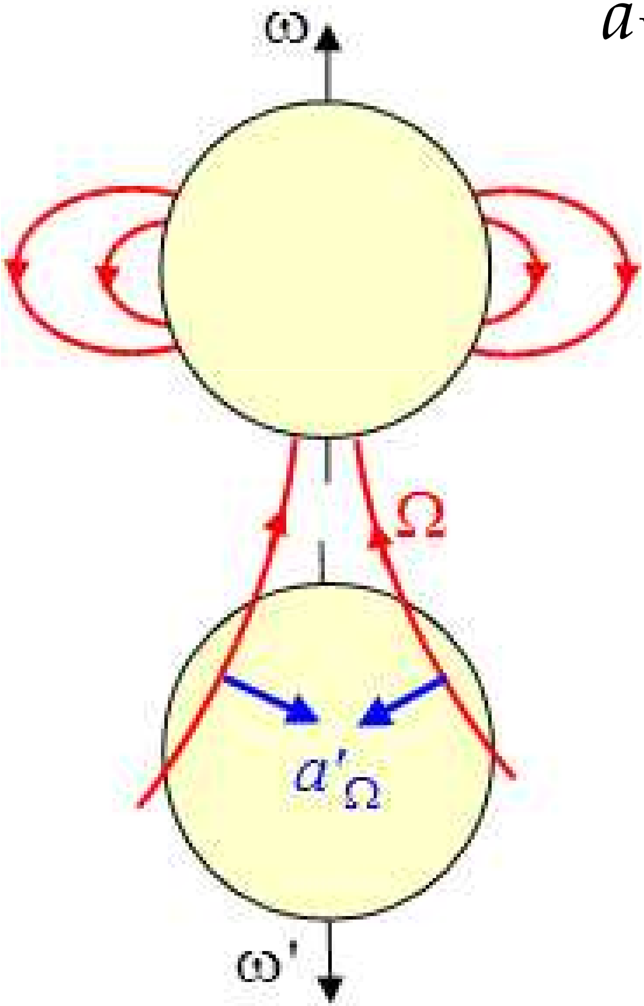


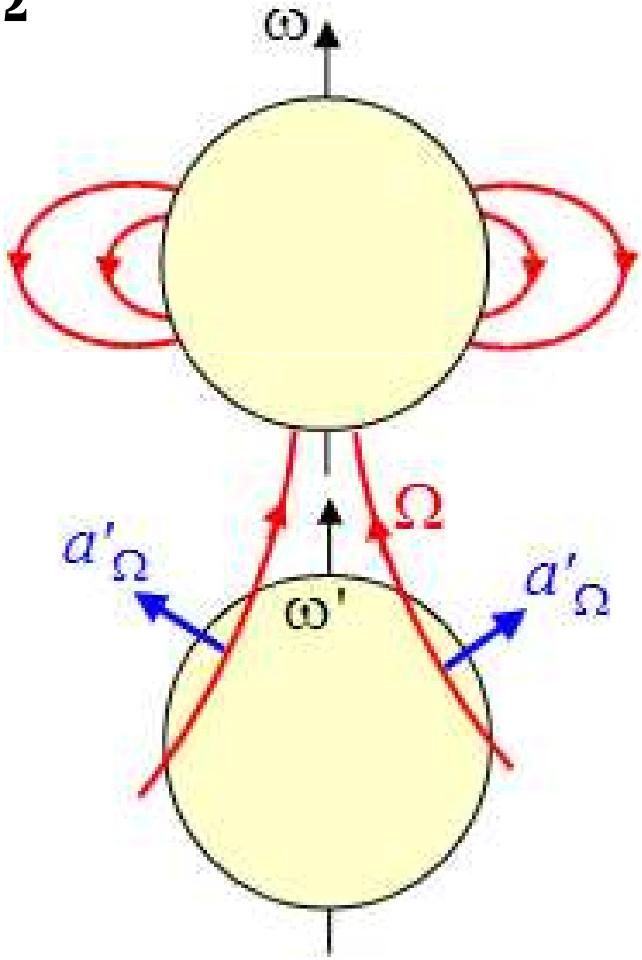
Vertical reciprocity

Opposite spins repel

Like spins attract

$$\vec{a}_{\mathrm{V}} = \vec{g} + \vec{v} \times \vec{\Omega}$$





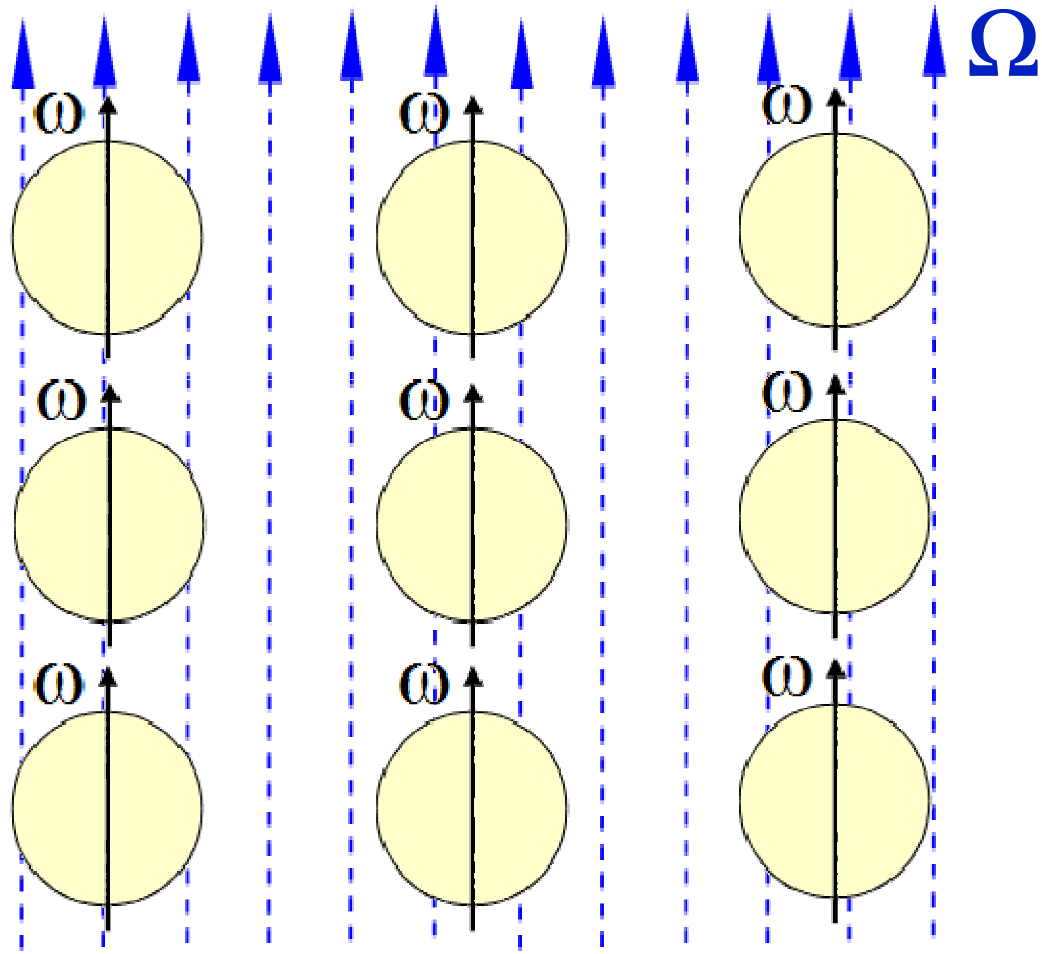
Application: the expanding Earth

Natural preferential ordering inside the Earth:

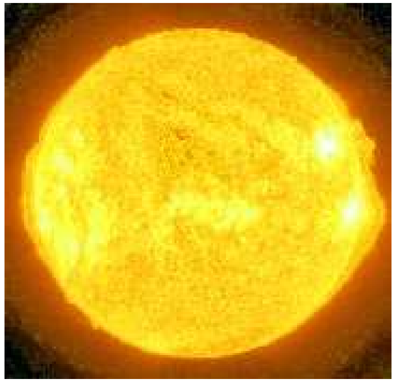
- ω aligns with Ω

- vertical attraction

- horizontal repel



Star’s life cycle



Sun

EXPANSION

Red Giant

COLLAPSE

White Dwarf

Probable process to a white dwarf

The star expands and becomes a red giant ⇨

- Photosphere-matter gets continuously lost
- Star's nuclear activity decreases dramatically
- Spin speed decreases dramatically

⇨ Expansion stops

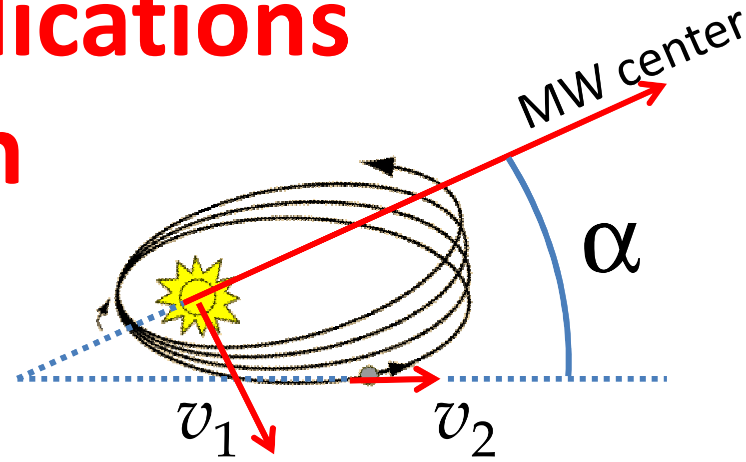
⇨ Molecules' spin vector becomes less oriented

⇨ Again compression

⇨ Spin accelerates again

⇨ Collapse with matter release

Other succesful applications of Gyrotation



- The Mercury perihelion advance

$$-F_\alpha = \underbrace{G\frac{m\,M}{r^2}}_{\text{Gravity}} + \underbrace{G\frac{m\,M}{2\,r^2\,c^2}v_1^2\cos^2\alpha}_{\text{Sun's motion in Milky Way}} + \underbrace{G\frac{m\,M\,R^2\omega}{5\,r^3\,c^2}v_1\cos\alpha}_{\text{Sun's rotation (negligible)}}$$

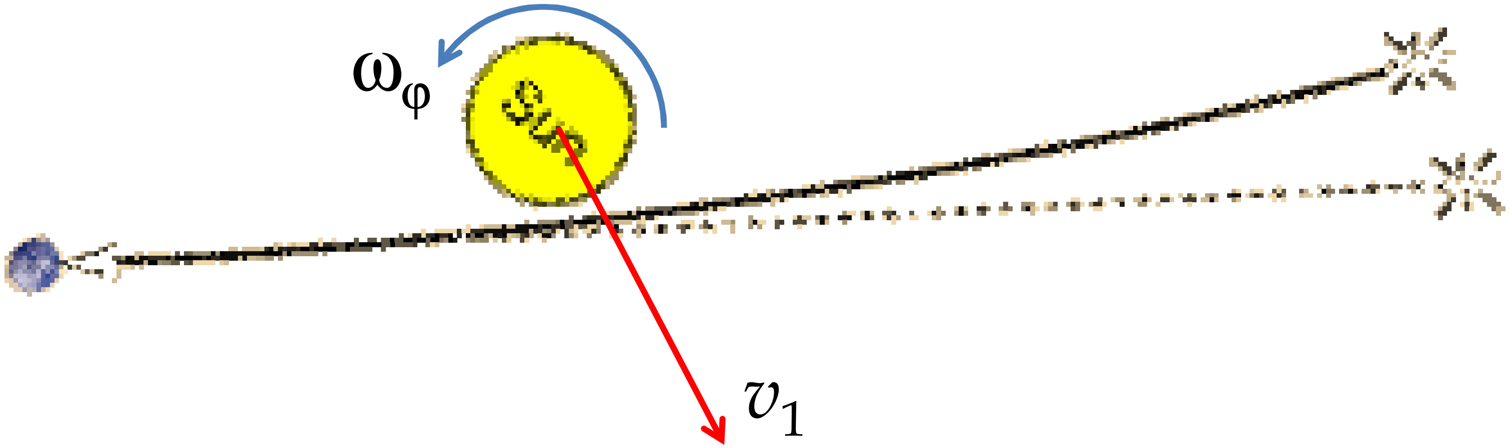
$$\left(\cos^2\alpha\right)_{\text{av}}\Big|_0^{\pi/2} = \frac{1}{2}$$

$$v_1^2 = 24\,v_2^2 \quad\Rightarrow\quad \delta = 6\,v_2^2/c^2$$

(excentricity neglected)

With v_1 the Sun's velocity in the Milky Way, v_2 Mercury's velocity and α is Mercury's angle to the Milky Way's centre.

- The bending of light grazing the Sun

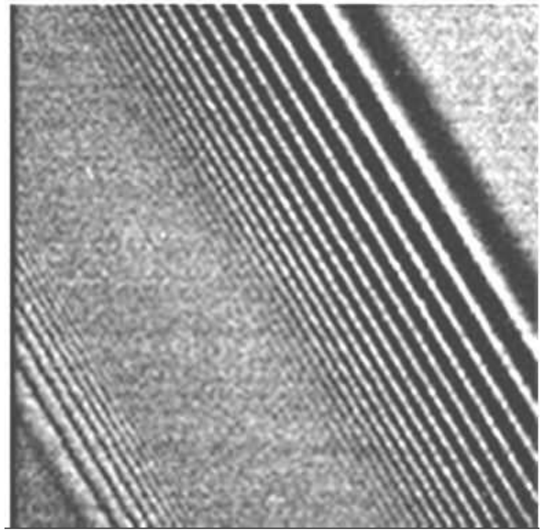


$$-\underline{F}_{\varphi,\alpha} = \underbrace{G\frac{2\,\underline{m}\,M}{r^2}}_{\text{Gravity and gyrotation}} + \underbrace{G\frac{\underline{m}\,M}{2\,r^2\,c^2}\,v_1^2\cos^2\alpha}_{\text{Sun's motion in Milky Way (neglectible)}} + \underbrace{G\frac{\underline{m}\,M\,R\,\omega_\varphi}{5\,r^2\,c}\cos\varphi}_{\text{Sun's rotation}}$$

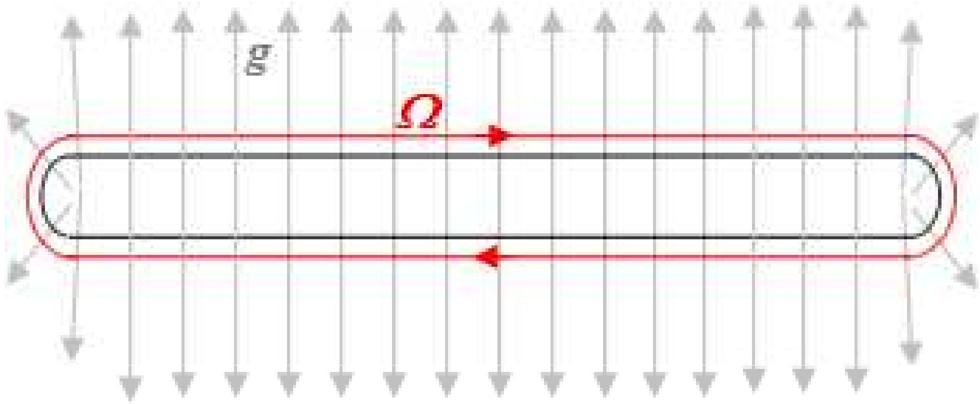
With v_1 the Sun's velocity in the Milky Way, α the angle between the ray and the Sun's orbit and φ the Sun's latitude where the ray passes.

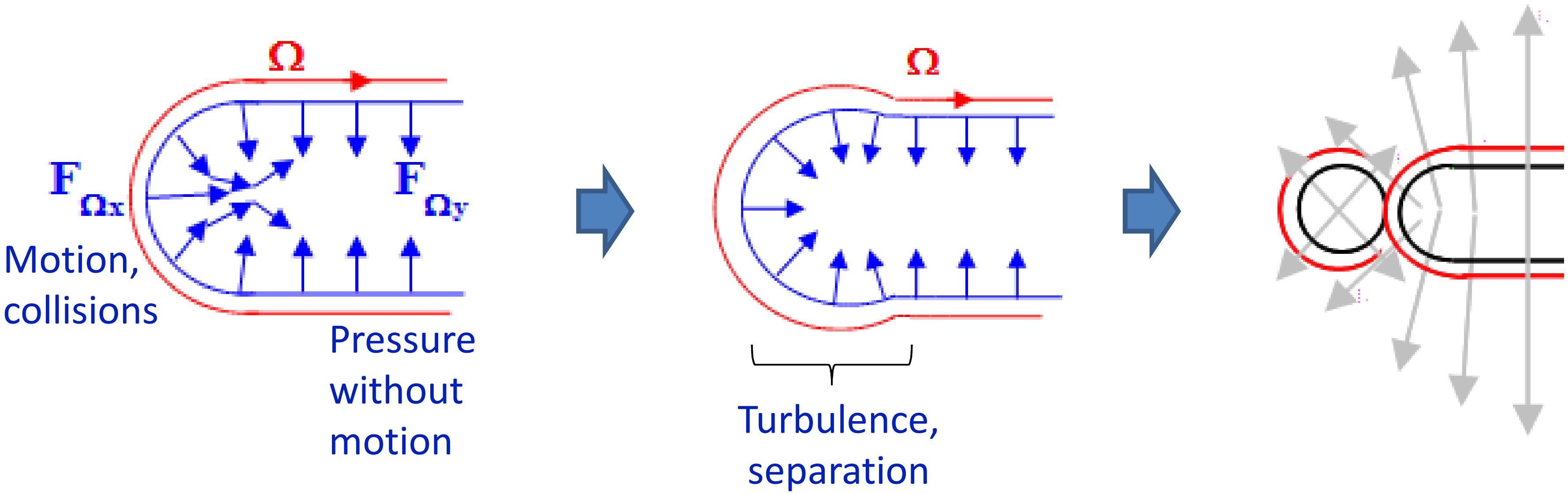
Other application:

The formation of a set of tiny rings about Saturn

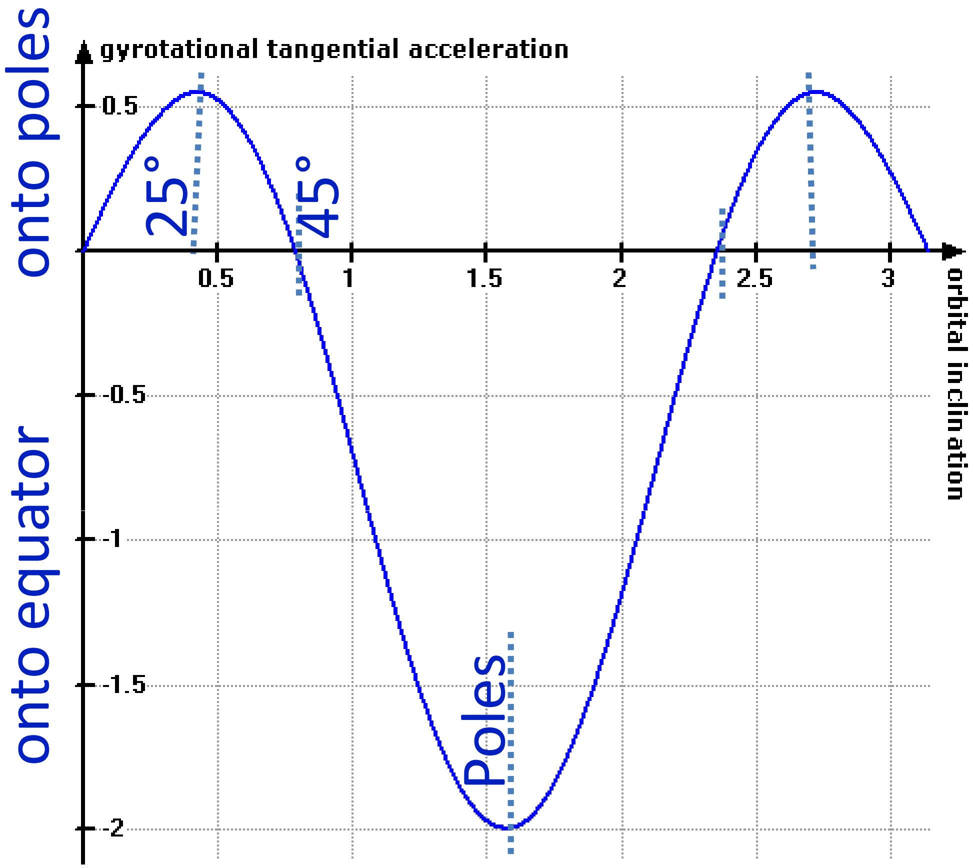


Ring section





- The fly-by anomaly



The acceleration is :

(0° is the equator)

-Strongly onto the equator when flying near the poles

-Weak onto the poles when flying under inclination of 25°

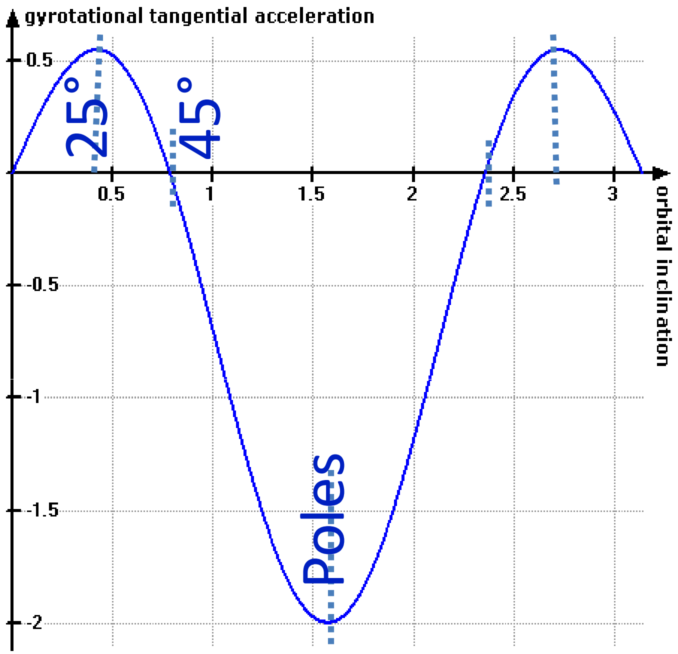
-Absent near 0° and near 45°

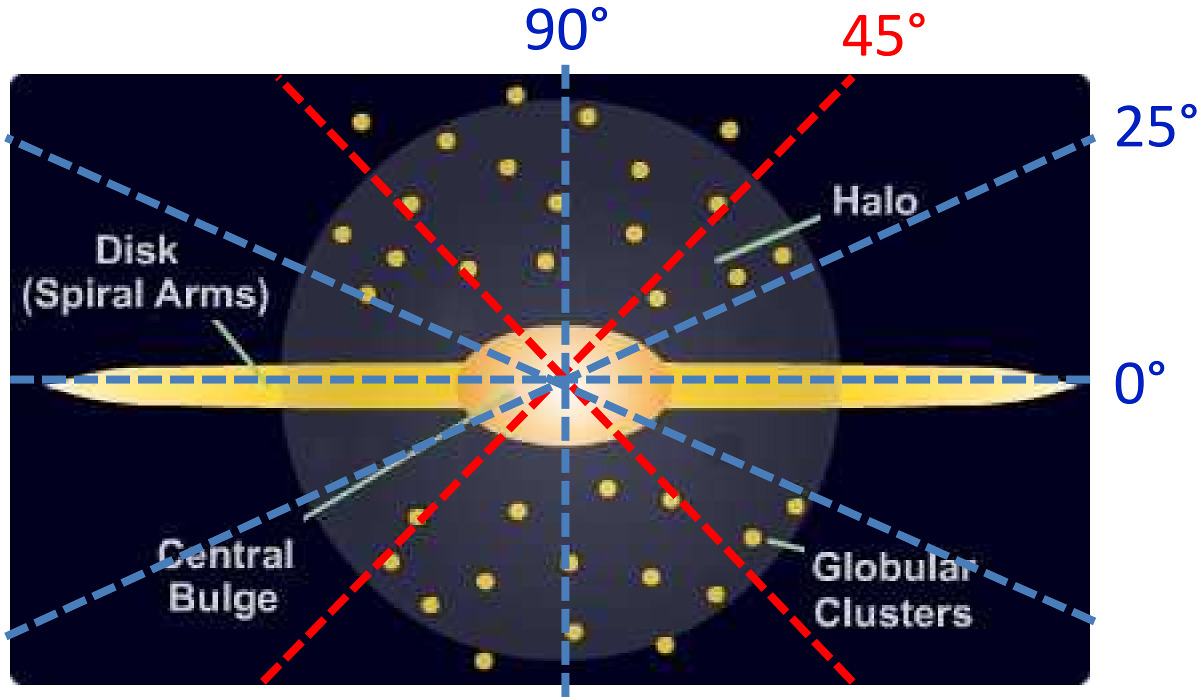
$$a_{t,\,\Omega} = -\frac{G\, I_E\, \omega_E\, \omega_S}{2\, r^2 c^2}\left(\sin\alpha \cos 2\alpha \left(1 - 3\sin^2\alpha\right) - \frac{3}{4}\sin 4\alpha \cos\alpha\right)$$

'E' for Earth, 'S' for satellite , α is the satellite's inclination to the Earth's equator.

- The halo of disc galaxies

Stars are vacillating in the halo of disc galaxies





- The motions of asteroids

Preferential orbit- and spin orientations and their instabilities.

- The orbital velocity about fast spinning stars

The velocity v can be found out of :

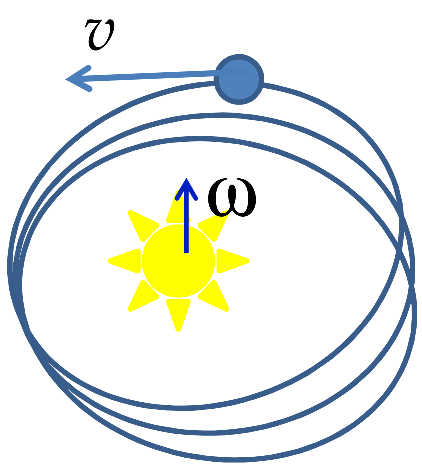
$$\underbrace{\frac{v^2}{r}}_{\text{Orbit motion (if circular)}} = \underbrace{\frac{G I \omega}{2 r^3 c^2} v}_{\text{Gyrotation of the star}} + \underbrace{\frac{G M}{r^2}}_{\text{Gravity of the star}}$$

Orbit motion (if circular)

Gyrotation of the star

Gravity of the star

Causes velocity-dependent orbit precession



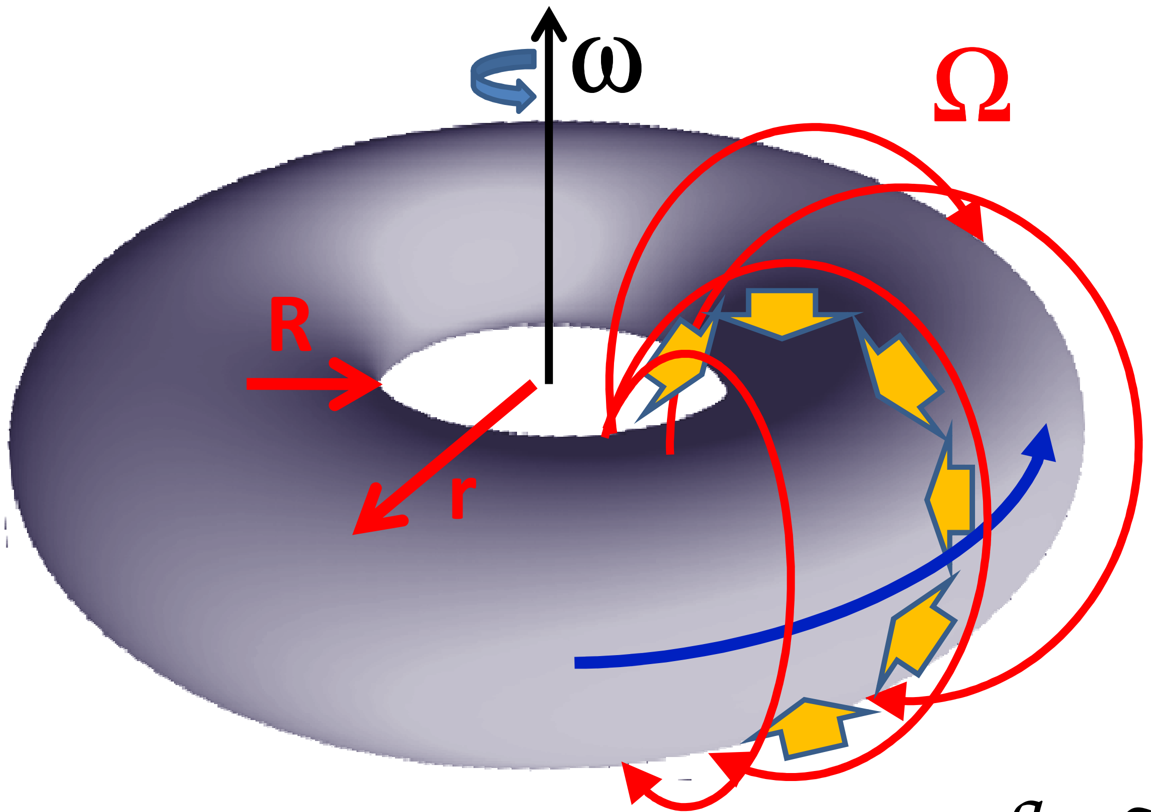
'I' is the star's inertia moment
ω is its angular velocity

Prediction attempt :

Explosion-free fast spinning stars and black holes

Tight compression by gyrotation forces

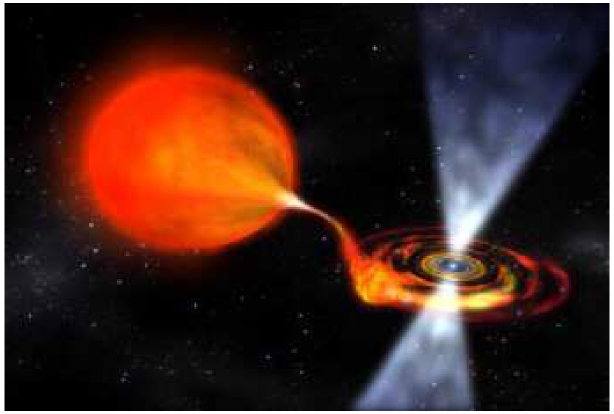
$$\vec{a}_\Omega = \vec{v} \times \vec{\Omega}$$



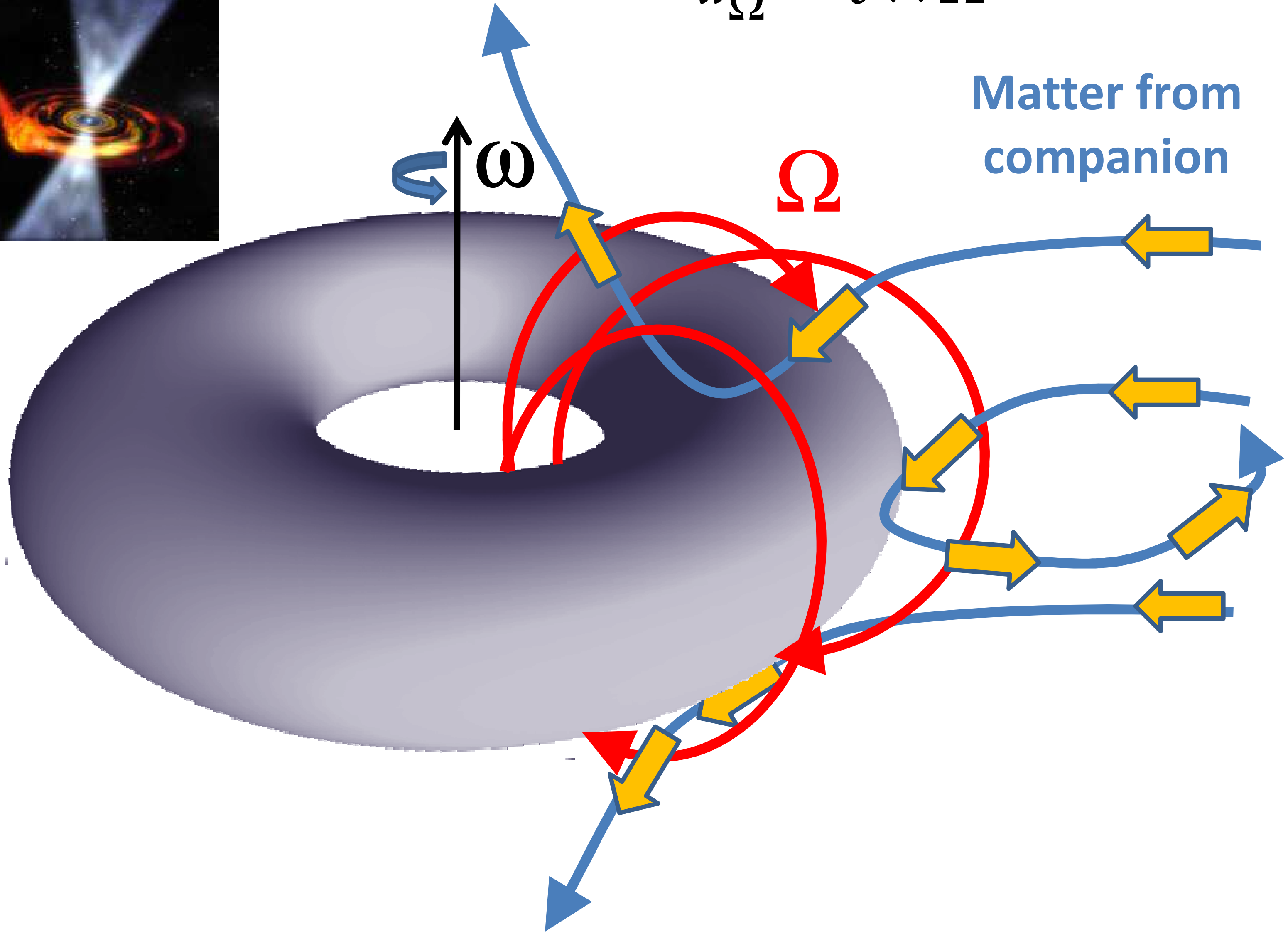
At the surface:

$$a_\Omega \approx G m r \omega^2 / \left(\pi R c^2 \right)$$

Prediction attempt : bursts of binaries

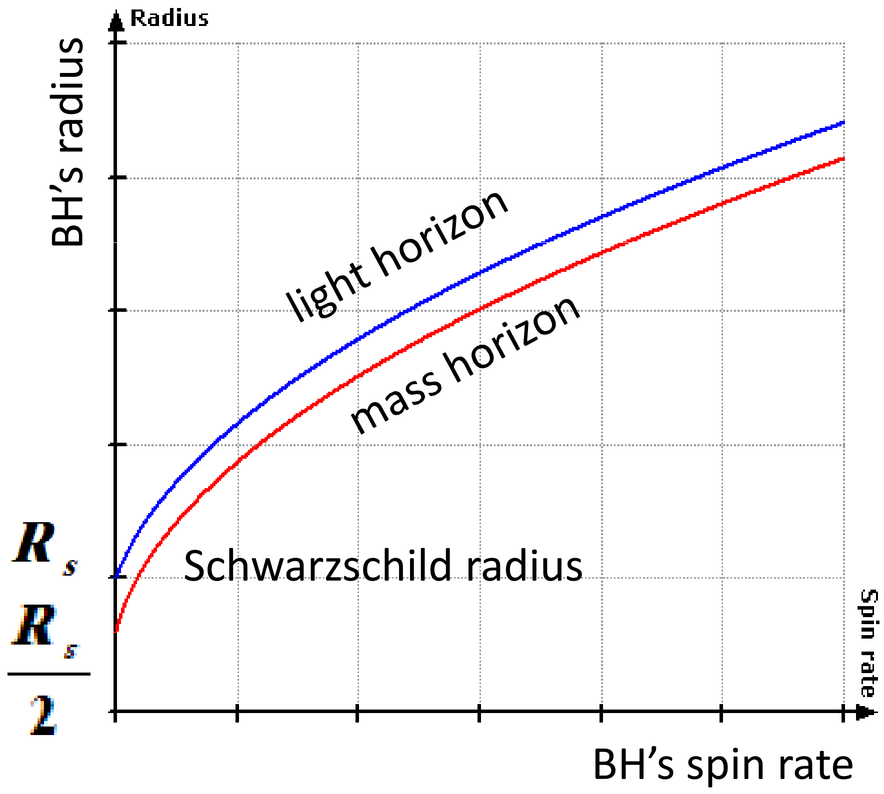


$$\vec{a}_{\Omega} = \vec{v} \times \vec{\Omega}$$



- Mass- and light horizons of (toroidal) black holes

The graphic for the black hole's horizons at its equator level is mass-independent !

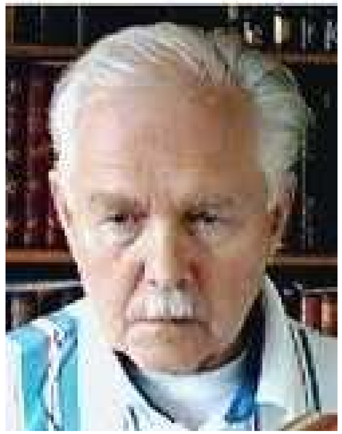


Light horizon : limit surrounding the black hole, where light remains trapped by the black hole.

Mass horizon : limit surrounding the black hole, where the orbits reach the speed of light, and matter disintegrate.

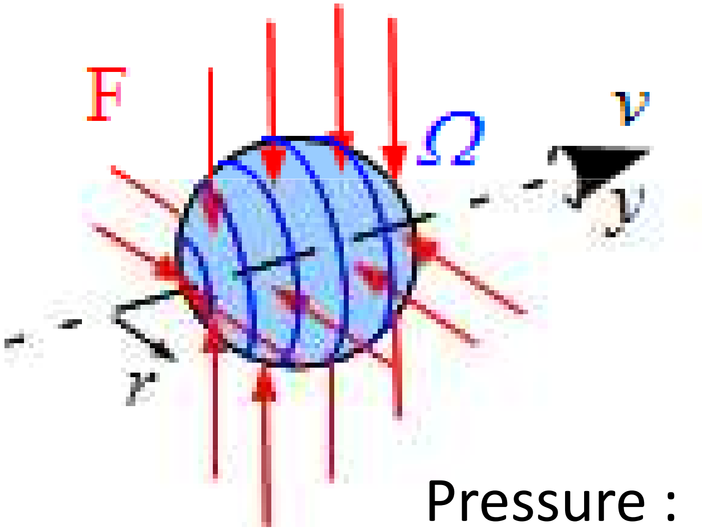
Orbiting incoming masses desintegrate but behind the light horizon.

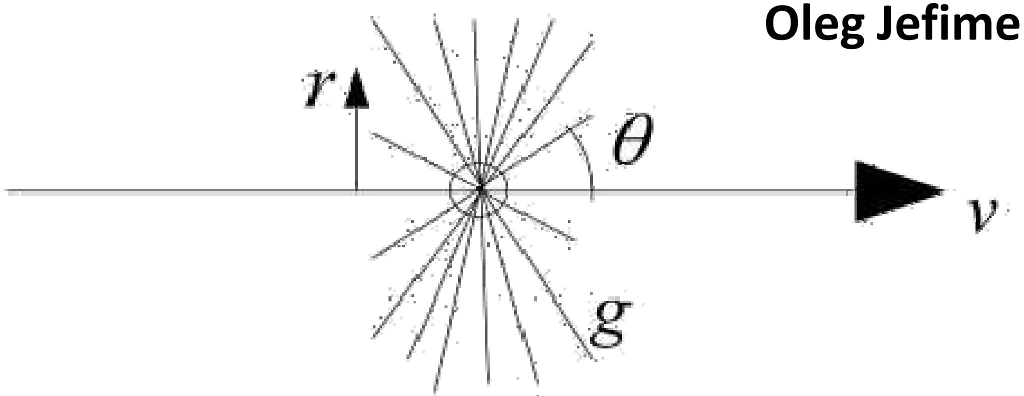
-Self-compression of fast moving particles by gyrotation



Oleg Jefimenko

Gravity field deformation due to the gravity's speed retardation effect





Pressure : $$p(r,\theta) = \frac{3\,G\,m\,v^2\left(1 - v^2/c^2\right)}{4\,r\,c^2\left(1 - \left(v^2/c^2\right)\sin^2\theta\right)^{3/2}}$$

Prediction attempt : the high-speed meson lifetime increase is caused by the gyrotation compression.

Between brackets

How to be accepted by Mainstream as a dissident?

Don't say : GRT is wrong;
I use Gravitomagnetism!

But say : I use the Linear Weak Field Approximation of the General Relativity Theory

And refer to:

M. Agop, C. Gh. Buzea, C. Buzea, B. Ciobanu and C. Ciubotariu of the Physics Department of the Technical University, Iasi, Romania. They wrote many papers this way, accepted by mainstream, and could boost their studies on superconductivity.

Conclusions of part one

- All these phenomena are explained in detail without any need of relativity, spites the high speeds used.

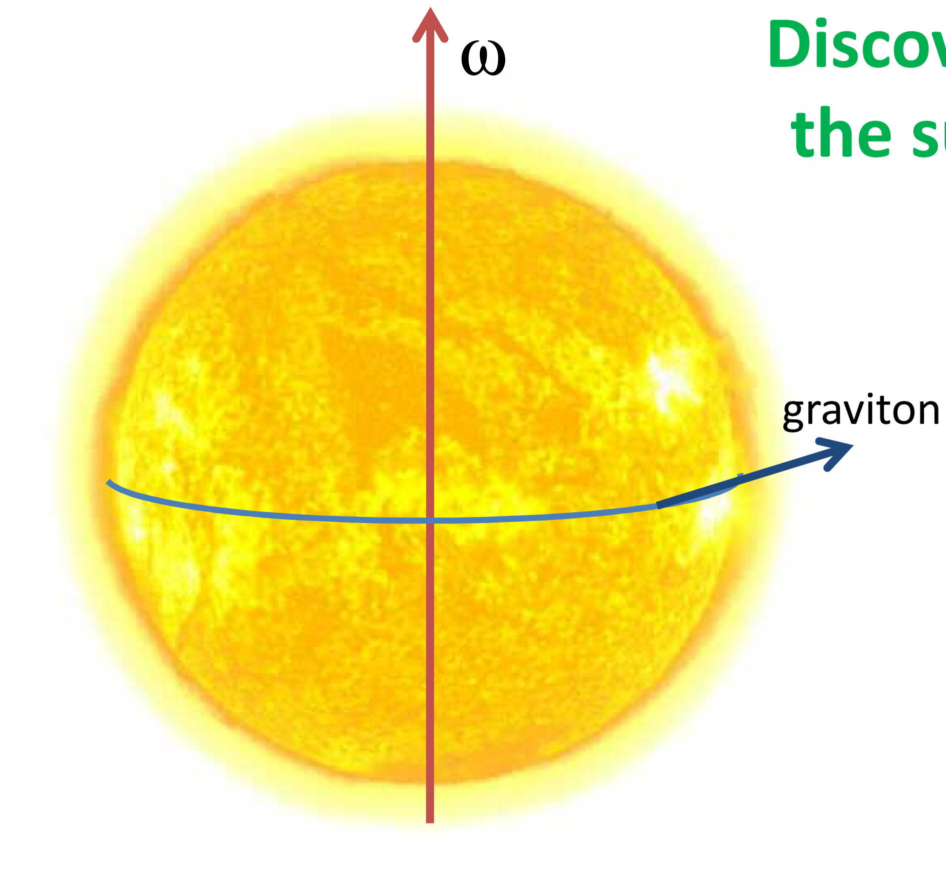
- No gauges are used, the theory is not semi-empiric as the relativity theory. Even the bending of the light and the Mercury issue are purely deduced.

- Most of the explained phenomena are steady systems and don’t need any correction for the retardation of gravity.

- Only the calculation of the position of orbiting objects or translating objects at high speed can be improved by including the retardation of gravity.

Current research

Coriolis Gravity and Dynamics Theory



Discovery : Relationship between the sun’s spin and its geometry:

I found :

Frequency:

$$\upsilon_{eq} = \frac{G\, m_{Sun}}{2\, c\, R_{eq}^{\;2}}$$

Velocity:

$$v_{eq} = \frac{\pi\, G\, m_{Sun}}{c\, R_{eq}}$$

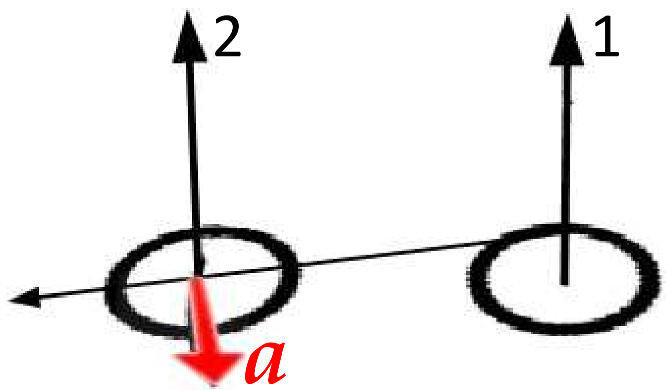
The possible meaning is : the rotational speed of a body is determined by its enclosed mass

What could be the physical mechanism?

Analysis

Let us consider particles as trapped ‘light’, that release ‘gravitons’:

1) A tangential graviton from particle 1 hits particle 2 directly



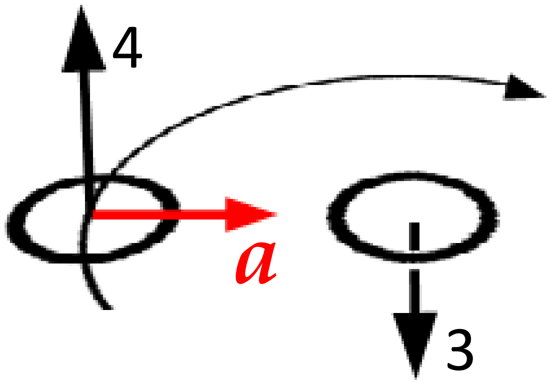
Coriolis : let $2\vec{c}\times\vec{\omega}_2 = -\vec{a}_2$

and let: $a_2 = -2\pi G m_1 / R^2$

$$\Rightarrow \quad \omega_2 = \frac{\pi G m_1}{c R^2} \quad \Rightarrow \quad \upsilon_2 = \frac{G m_1}{2 c R^2}$$

In the case of outgoing gravitons that are tangential to the trapped light, we get the case of the Sun’s spin rate explained.

2) A tangential graviton from particle 1 hits particle 2 indirectly



Coriolis : $2\vec{c}\times\vec{\omega}_4 = -\vec{a}_4$

$$= -\vec{a}_2/(2\pi)$$

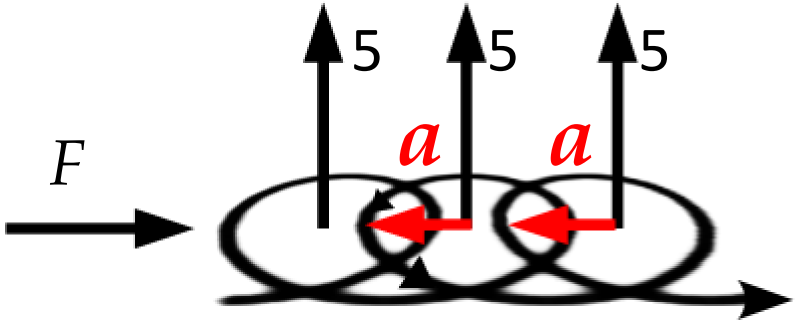
From 1) : $a_2 = -2\pi G m_1 / R^2$

Hence : $a_4 = -G m_1 / R^2$

In the case of outgoing gravitons that are spirally hitting the trapped light…

… we get Newton's gravity law !

3) A tangential graviton from particle 1 hits particle 1 indirectly



Coriolis : let $2\vec{c} \times \vec{\omega}_5 = -\vec{a}_5$

Newton : $\vec{F} = m_5 \, \vec{a}_5$

Are forces between particles just a Coriolis effect?

Conclusions of part two

- The relationship between the Suns' spin and the Suns' gravity is not a coincidence.

- The Coriolis effect on trapped light, and tested by the Sun's spin fits with the Newton gravity.