Einstein's field equation:

$$R_{\mu\nu} - \frac{1}{2} R . g_{\mu\nu} - \Lambda . g_{\mu\nu} = \frac{8\pi g}{c^4} . T_{\mu\nu}$$

Ricci tensor (slope scalar, e-t.)

Metric tensor (metric matrix) (scalar: l, α , V) (scalar)

energy tensor-momentum

Cnt . Cosmological (∝1/(Gravity))

(Newton (TER), Einstein (TGR)

It involves an accelerated expansion where Λ(called **the cosmological constant**) is a factor that counteracts the **force of gravity** .

the Universe, when expanding, lowers the density (therefore the Dark Mass).

In contrast, Dark Energy remains constant →because of thisΛ ∃.

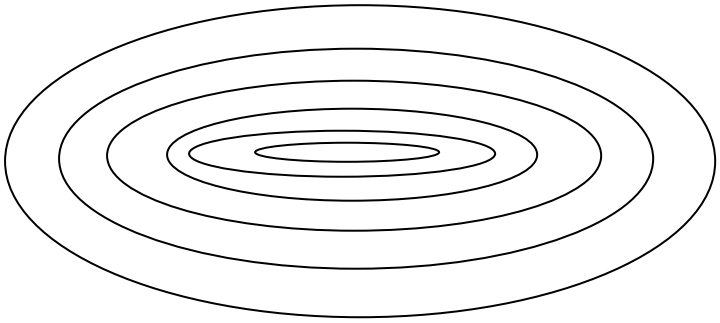
Moreover, to avoid acceleration and to achieve a static model... we add Λ.

The Ricci Tensor (also known as the Riemann Tensor or Curvature Tensor) is an indicator of slope; it represents sectional curvature similar to the equipotential lines of chemistry-physics; each line value is a scalar product:

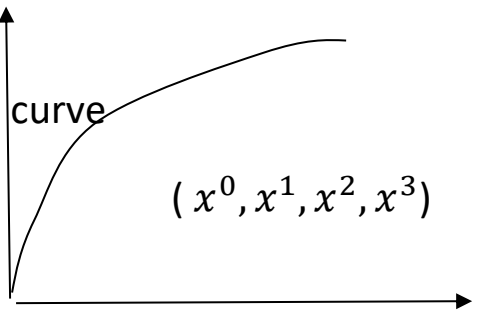
$a^{\mu}.\, b_{\mu}$= $a^0 b_0$+ $a^1 b_1$+...+ $a^n b_n$= number

Rich= R_{ij}.d $x^i \otimes$dx^j

Let's look at the equipotential lines.



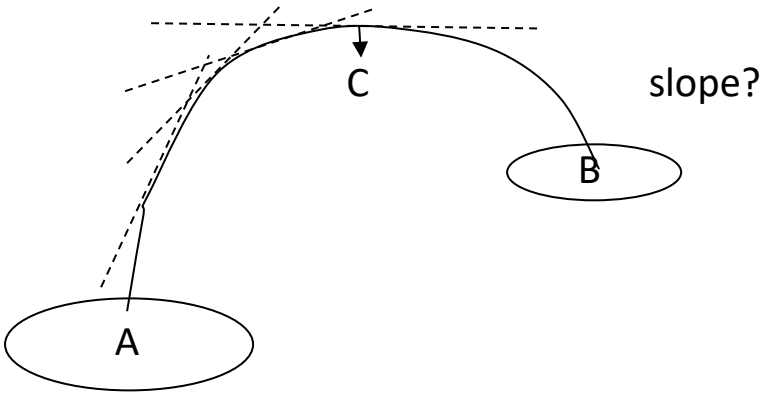
and space-time curve



By operating these four vectors between them (vector product, scalar) we find their personal and non-transferable description.

Each vector consists of its numerical value and its unit value (with a circumflex accent): $\vec{u}$=$u^{\alpha}.\, \widehat{e_{\alpha}}$

According to Ricci :



at “C” ∄gravitational interaction of A on B.

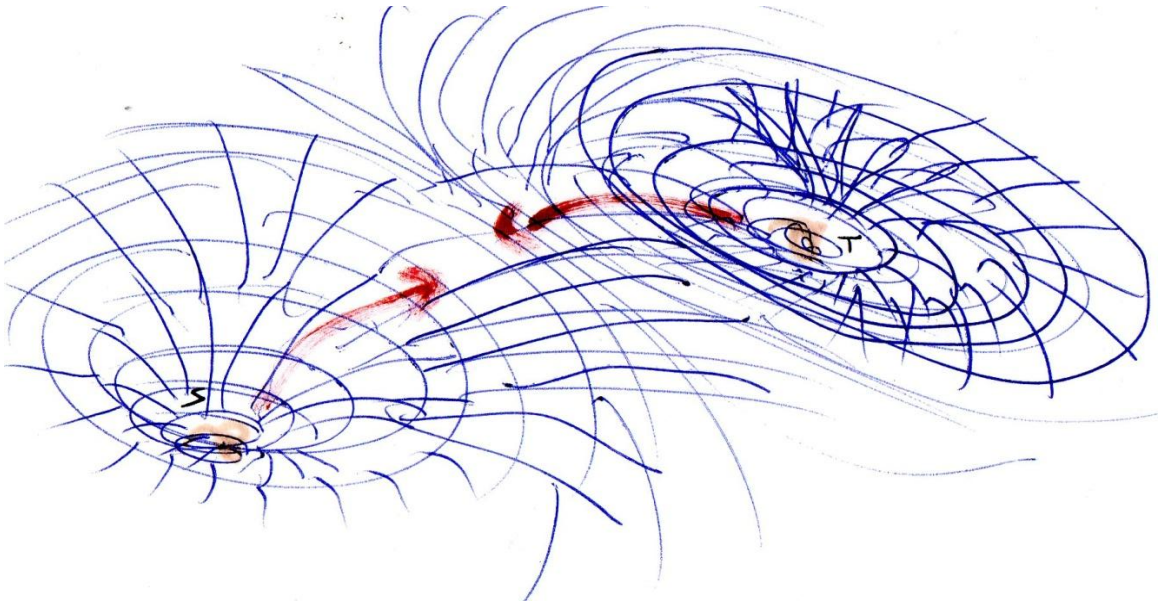


Figure “a”

Curvature e-t:

$$R_{\mu\nu} - \frac{1}{2} g_{\mu\nu} - \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

From the drawing “a” on “space-time” gravitation we can understand vectors and matrices (otherwise understood as tensors) as a set of numbers ordered in a certain way. The operations between them can give scalars.

While the terms that define the Metric Tensor expression can be used to isolate quantities such as angles, lengths, and volumes

(and maybe also too much, burden...).

$g_{\mu\nu}$: g=$\sum_{i,j=1}^{n} g_{ij}.\, dx^i \otimes dx^j$

(we can compare the expression with that of the de Sitter Universe)

Length: L=$\int_a^b \sqrt{g_{ij}.\, \dot{x^i}.\, \dot{x^j}}\, dt$

$g_{ij}$is the coefficient of each term: example:

$$\begin{pmatrix} g_{11} & g_{12} \\ g_{21} & g_{22} \end{pmatrix}$$

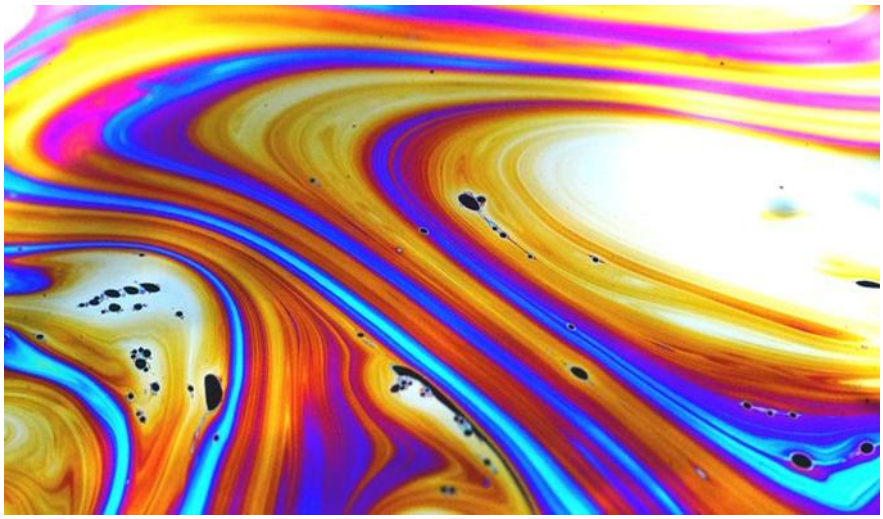
knowing that the **length** l=$\int_a^b \sqrt{1 + f'(x)^2}.\, dx$

Angle: $\cos\theta = \frac{g_{ij.u^i.v^j}}{\sqrt{\left|g_{ij.u^i.v^j}\right|\left|g_{ij.u^j.v^i}\right|}}$

Volume: $V_R = \int_R \sqrt{|g|}dx^1 \wedge dx^2 \wedge \ldots \wedge dx^n$

(Riemann integral).





Maxwell needed an absolute reference system in which his equations were valid, but unfortunately they varied depending on the moving observer.

we know that multiplying a matrix by its inverse gives the identity matrix.

where the overwritten are columns and the underwritten indices are files.

Inciso: black holes manipulate gravity; if a ripple between two of them ends up collapsing... the question arises: could it be that all the movement of the planets in the solar system is due to black holes that drive us? Will they make us collide one day?

Energy-Momentum Tensor (or Energy-Momentum Tensor):

T(x)=$T_{\alpha\beta}.\, e^{\alpha} e^{\beta}$

They comply with the law of conservation of energy and momentum. Although “the system” cannot avoid ANISOTROPY.



ANISOTROPIC UNIVERSE

They comply with the law of conservation of energy (for example, $_{total}$ E = T+V, as well as p= mv)

T(x)= $T_{\mu\nu}(x).e^{\mu}e^{\nu}$allow us to determine the curvature “e- t” from the masses and energies that move

Such a scalar product of tensors is:

$(a_i \otimes a_j).(a_k \otimes a_m)$=$g_{ik}.g_{jm}$

where g $_{nn}$ = the metric i $a_i \otimes a_i$=are the tensors.

Ricci expressions (= $g_{\mu\nu}.dx^{\mu}dx^{\nu}$).

I will take this opportunity to define something about **supersymmetry** : symmetry of infinitesimal particles where each particle has its companion.

Supergravity : its “quantum” is the graviton . It behaves as a “variable” of gauge theory (which is taken and presented as the force of gravity and, as is necessary, also complies with local invariance).

Obviously, and knowing that quarks or superparticles are differentiated between those with integer "spin" (bosons) and those with half-integer spin (fermions); in the case of gravitons (which correspond to the bosonic type) it is understood that they unite with the particles in order to transport the forces considered within field theory (in this case, of the 4 existing ones, it would be the gravitational force).

Now it's time to talk about the THEORY OF GENERAL RELATIVITY and THE THEORY OF SPECIAL RELATIVITY:

The first one is gives a series of guidelines about **black holes** (where if there they fight infinite masses , densities and gravity), inertia (I=mx ^{2} which does not affect the environment since it is proportional to mass and works as a kind of resistance to a change in speed or acceleration) or P= mg or F= ma …



VIEWS ACCORDING TO THE REFERENCE SYSTEM

And where is the time? imaginary it is ≠in real time.

The second (special relativity) is a particular case of the first (i.e. a particular case of Newton and his particle dynamics): it is necessary to know that force (F= ma) and gravity (F= GMm $/r^2$) do not propagate to infinity . Neither exists none speed greater than that of LIGHT in a vacuum in all the bodies , regardless of which be the reference system . The **speed of light** it is constant , contrary to Galileo's conclusions .