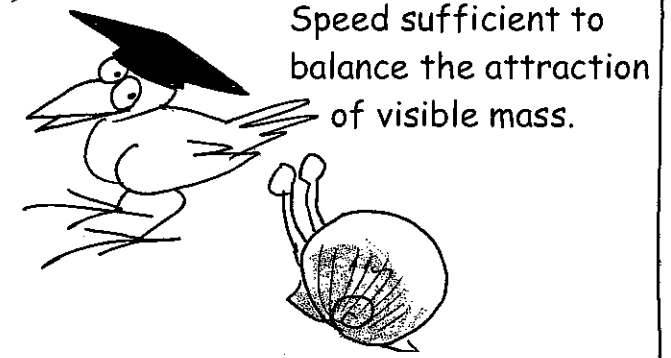
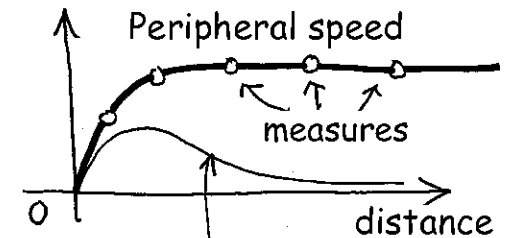
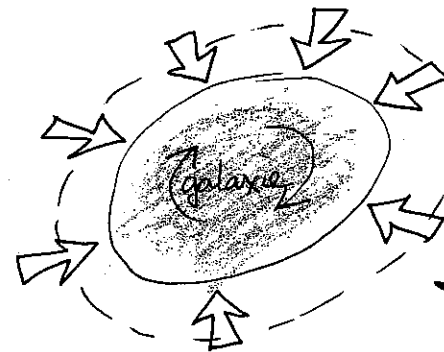


# GALAXY CONFINEMENT

Currently galaxies are distant from each other, like peas a metre apart. But at the time of their birth the young galaxies were close, like grapes in a bunch. They formed a COLLISIONAL SYSTEM and it was their interactions that gave them their rotation movements (\*). Then, as expansion separated them, collisions, while still exciting, became far more rare.



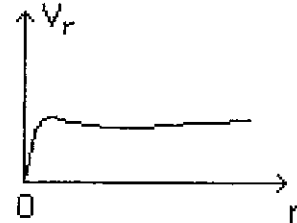
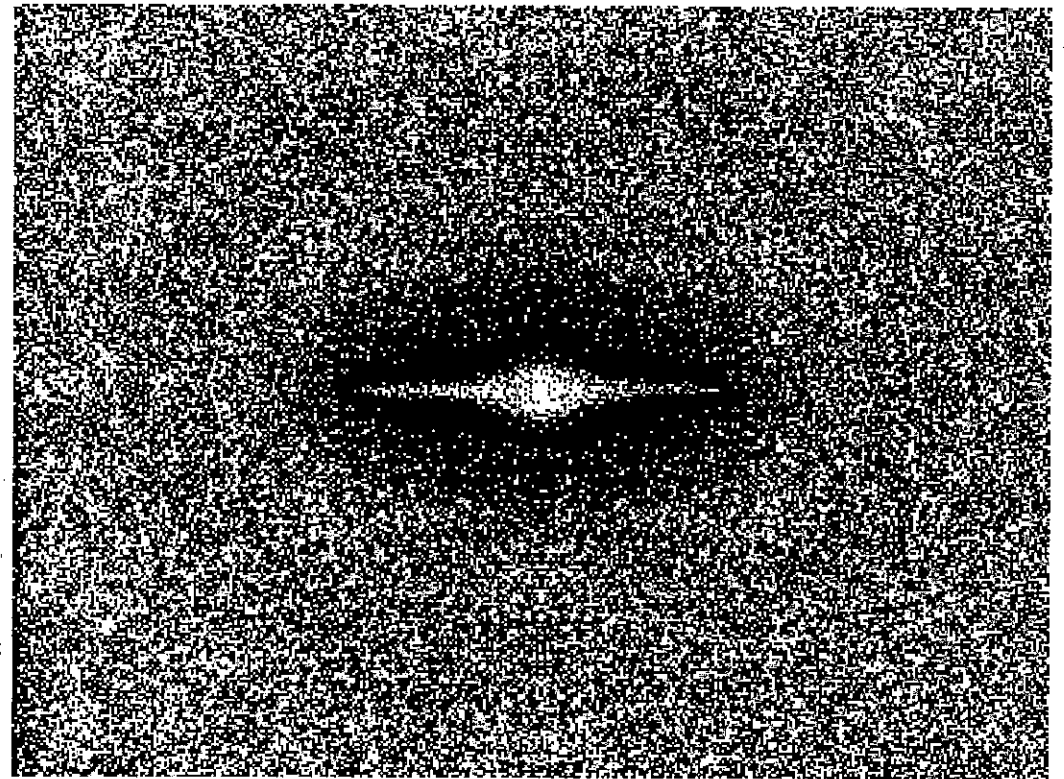
Matter with a negative mass isn't concentrated in agglomerations. It forms a gaseous ambience which exerts a COUNTER-PRESSURE on our own matter and, infiltrating between galaxies, it CONFINES them. Its presence at the frontiers of galaxies explains the peripheral superspeeds measured in interstellar gas.



Speed sufficient to balance the attraction of visible mass.

(\*) In a gas collisions send molecules into rotation.

OK. Let's try to summarise this whirlpool of new ideas, which are totally different from those of the MAINSTREAM. If I understand it correctly, for you dark matter and dark energy are nonsense. Matter with negative mass is sufficient to explain everything. Its agglomerations fix and stabilise the LARGE SCALE LACUNAR STRUCTURE OF THE UNIVERSE, in the fashion of "nails". That gives an original plan for galaxy formation. The negative matter, by infiltrating between them, ensures their CONFINEMENT. It's as if they are nestled in the holes of Gruyère cheese.



I think I'm going to take an aspirin.

The result of digital simulations (1992). At the bottom, the rotation curve deduced from that and which agrees perfectly with observation.

Just as the mini effects of gravitational lensing allow the New Astronomers to map the dark matter in the Universe, so people like Albert Bosma, opposite, adapt dark matter distributions that allow the rotation curves to be established. In the absence of new theoretical models everything comes down to Newton's law and adjustment techniques in order to fit in with observation

$$F = \frac{Gmm'}{d^2}$$



During the 17th century Toricelli understood that it is **ATMOSPHERIC PRESSURE** that makes mercury rise in the barometer he invented. Otherwise scientists would still be measuring the **ABHORRENCE OF A VACUUM**.

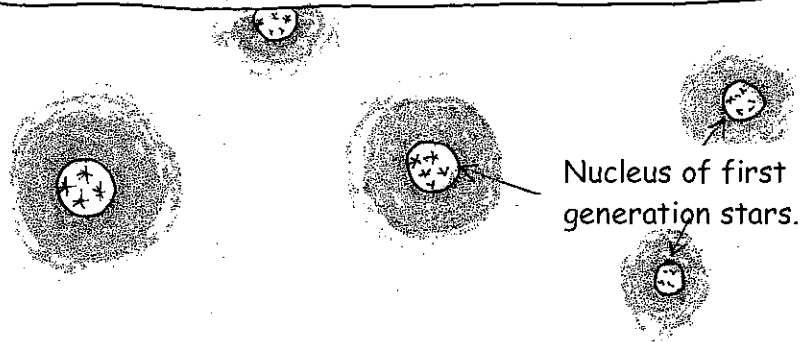
It's a great discovery = the abhorrence of a vacuum diminishes with altitude.



Why are light galaxies made of gas and massive ones not?



But as it is question of a galaxy ten times lighter, the heat communicated to the residual gas will be insufficient to allow it to escape from the gas. It will dilate therefore and form a sort of atmosphere. Young galaxies, still in very close proximity, will "rub against" each other which will make the gaseous auras rotate (but not the central nucleus, made of stars).

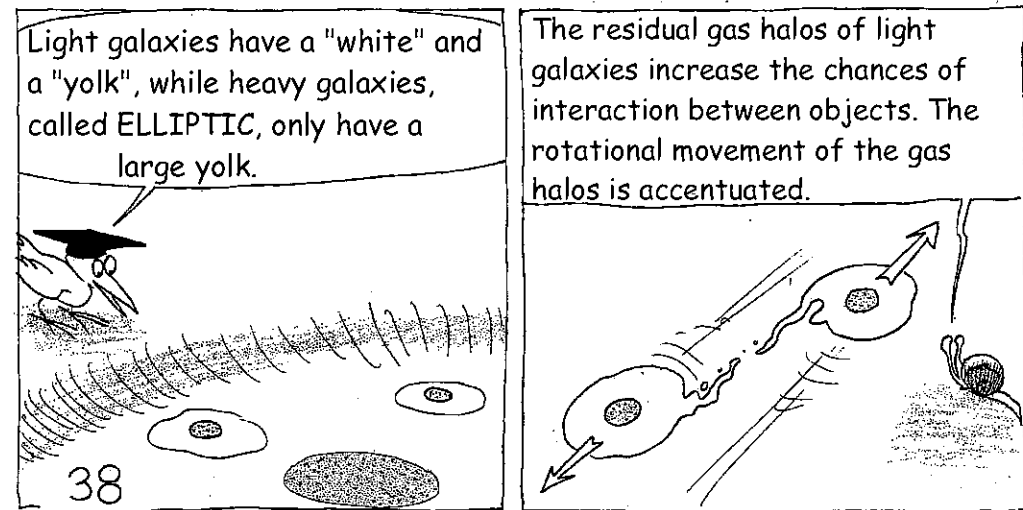


The "first generation" stars form immediately and carry the residual gas at a high ambient temperature. For massive galaxies this heating is so powerful that the thermal agitation velocity

$$v = \sqrt{\frac{3kT}{m}}$$

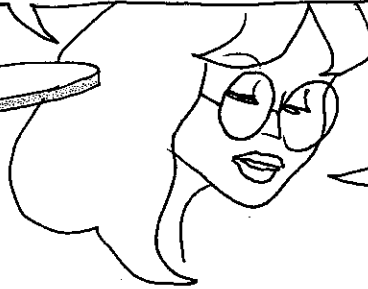
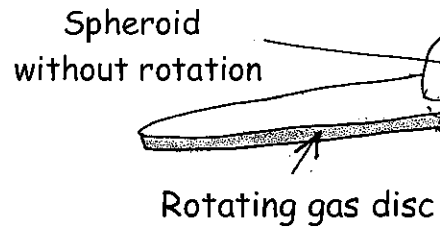
will surpass the LIBERATION VELOCITY (\*) of the galaxy - Therefore this gas will be lost in space and become so rarefied that collisions between atoms can only bring about its RADIATIVE COOLING.

As was already described in 1968 in a THOUSAND MILLION SUNS : page 38 :



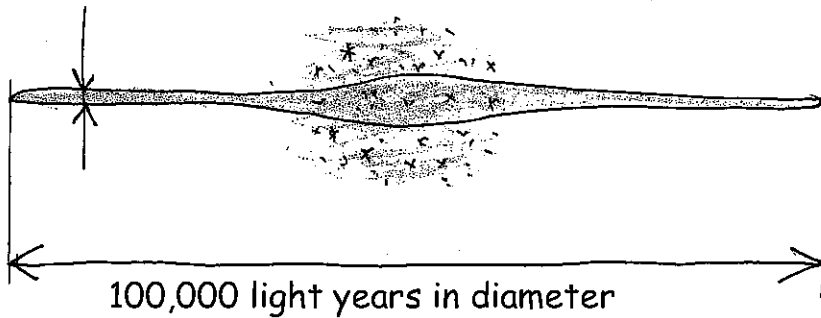
(\*) This liberation velocity is of the order of 1000 km/s. By applying  $\frac{1}{2} mV^2 = \frac{3}{2} kT$  (annex) we find that galaxies should be bathing in a gas at a temperature of tens of millions of degrees, as was shown.

Expansion distances galaxies from each other - The gaseous auras conserved by light galaxies, which form collisional groups of atoms, cool down by emitting radiation. Conserving the **ANGULAR MOMENTUM** it has acquired during its encounters, the gaseous mass mutates into a very flat disc, associated with the spheroid constituted of first generation stars which **DO NOT ROTATE** and which will give rise to hundreds of globular clusters, of 100,000 stars, constituting the "fossil galaxy".



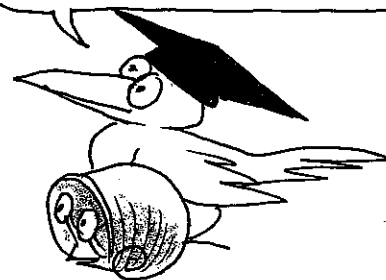
The radiative cooling destabilises the gaseous mass and brings about the birth of second generation stars through gravitational instability.

300 light years thick



The thickness of the gas disc remains constant because the UV radiation emitted by the young stars reheats it and stops it from flattening completely. Nevertheless, we could compare the geometry of a galaxy that has it, to that of a CD-Rom.

In other words, these galaxies function like a flushing cistern. When the temperature of the gas drops, new stars are created which reheat it.

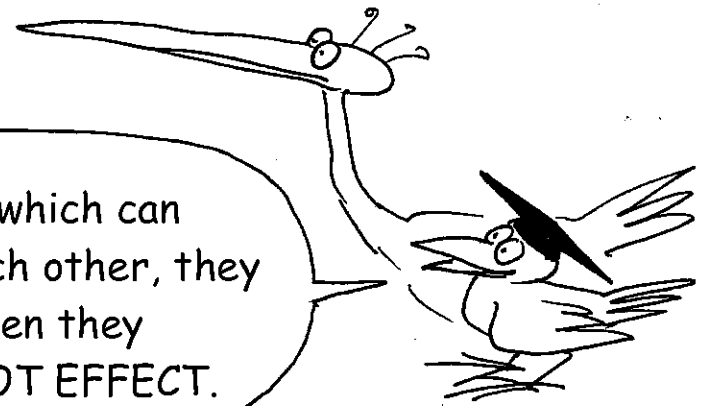


There's one thing I don't get : spiral galaxies, when we see them sideways on, don't seem that flat - and we can barely distinguish the frontiers between the two star populations, that of the halo and that of the disc.

Interstellar gas is fragmented into clouds of very varied mass which can represent 100,000 solar masses. Stars do not interact with each other, they ignore each other's existence (\*) but they leave the disc if, when they encounter a stellar mass, they are accelerated by a SLINGSHOT EFFECT.

The interstellar milieu is as impermanent as a cumulus on a sunny day. Supernovae explosions (one per century, or a million for the entire galaxy) disperse them constantly over a radius of more than one hundred million light years, creating a disorder in the fashion of bangers exploding in an eiderdown. One storm passes, another will develop further away because of gravitational instability.

Calm, the Milky Way? Are you kidding !...



(\*) Close encounters between stars are about as frequent as would be those of two ants moving around the whole of France.

# SPIRAL STRUCTURE

Where are we with that by the way?

If we consider galaxies in isolation the spiral arms wouldn't hold, they'd dissipate in one turn.

When I throw in cold hydrogen it spirals, but not for long, but as we observe with spiral galaxies, they must necessarily be fed by an abundant and constant flow of cold hydrogen.

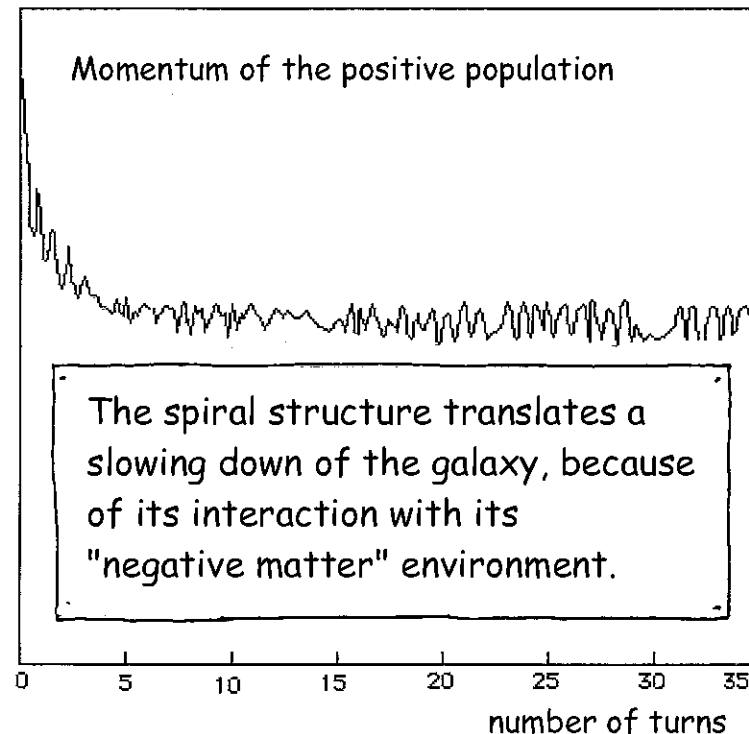
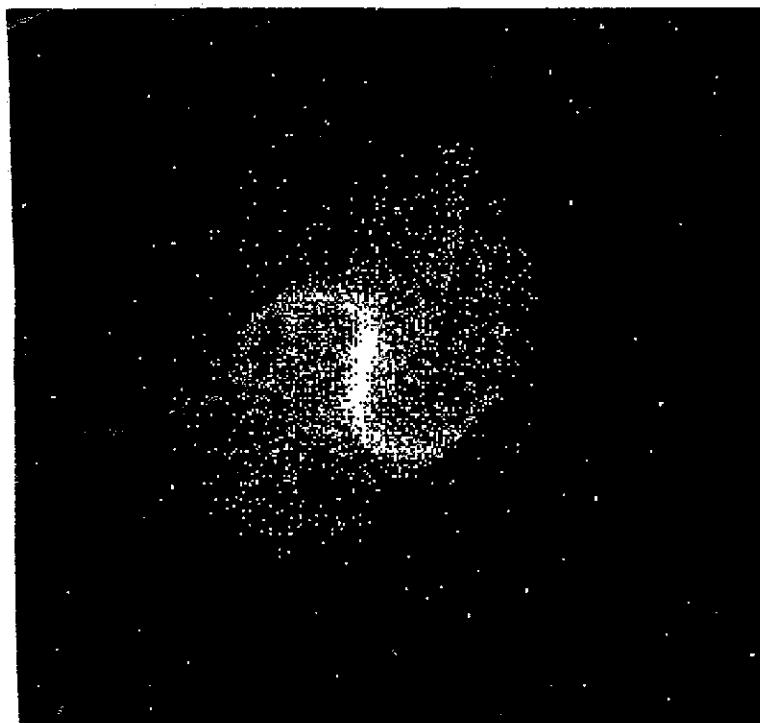
The cold matter is **NECESSARILY** present in galaxy clusters **BECAUSE** there are spiral galaxies

It's a point of view...

Can you see this cold matter?

It's amazing the number of things that are **NECESSARY** these days to keep the shop going.

In 2002, while making a lump of matter of positive mass interact, in rotation in a hole arranged in a distribution of negative masses, there was an immediate creation of a barred spiral, stable during 30 rotations. But let's abandon this theme of research in the face of the hostility of competitors.



There the idea is very simple = the galaxy, confined in its Gruyère cheese "hole" and revolving inside it, is subjected to the effect of the DYNAMIC FRICTION phenomenon.

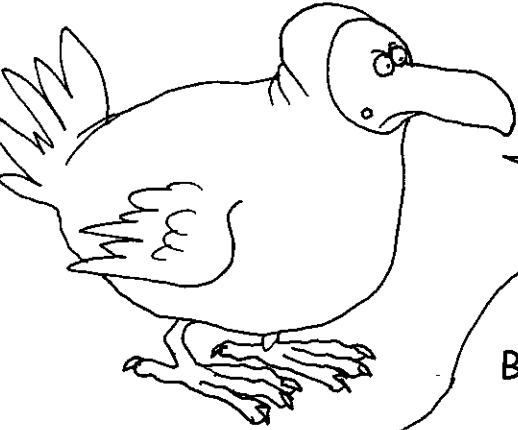


Like when we stir our cappuccino in a cup with a spoon.






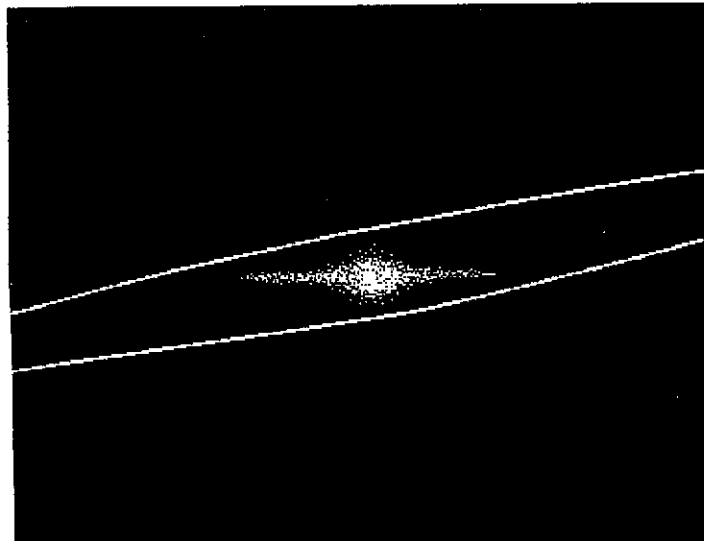
# MYTHICAL DARK MATTER



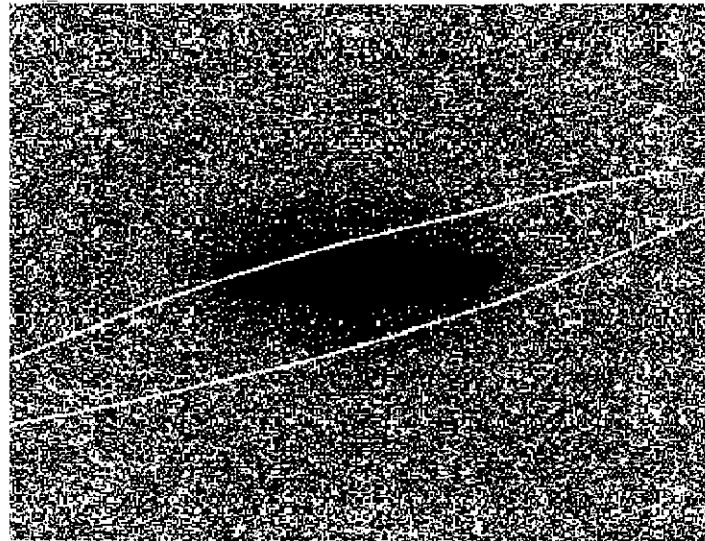
That's all very nice but what do you do with the strong effects of gravitational lensing which PROVE the existence of dark matter?



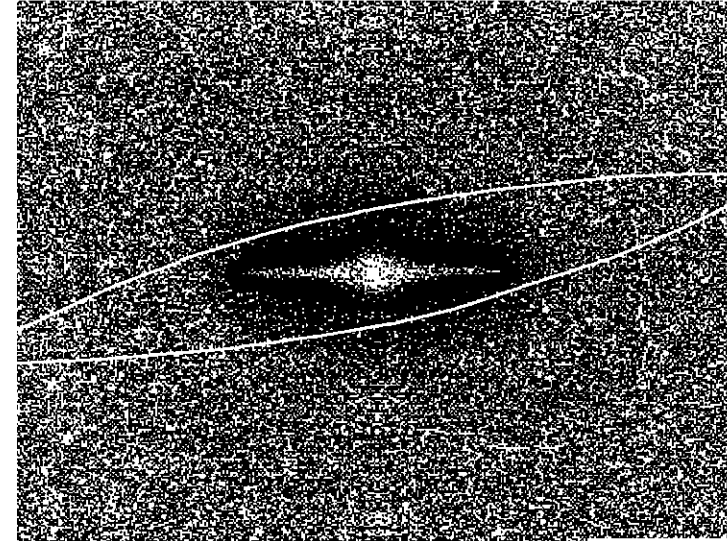
The galaxy, considered in isolation, would produce a first effect of gravitational lensing, due to its mass (left image). But the surrounding negative mass, which confines it, would also act on the trajectories of the photons and create a FOCALISATION EFFECT (centre image), which produces a globally reinforced effect (right image). You impute that to a halo of invisible dark matter which...doesn't exist.



Gravitational lensing effect, lone galaxy

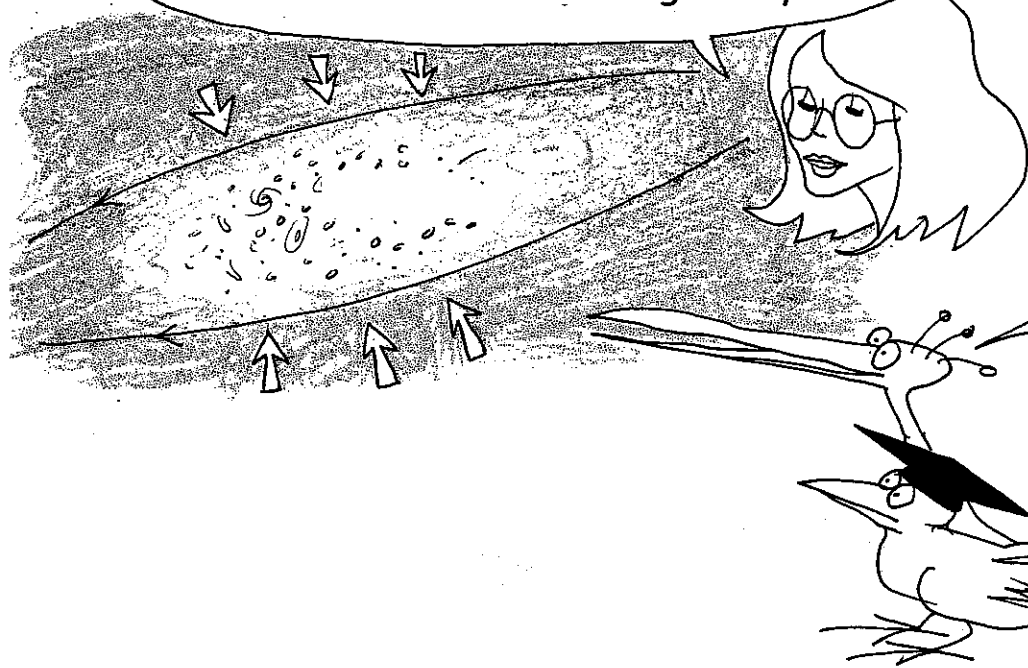


Focalisation due to the action of the negative mass



The two effects combined

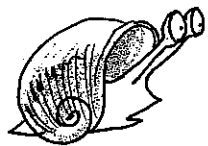
For GALAXY CLUSTERS, the same cause, the same effects = reinforcing of the focalisation of light rays.

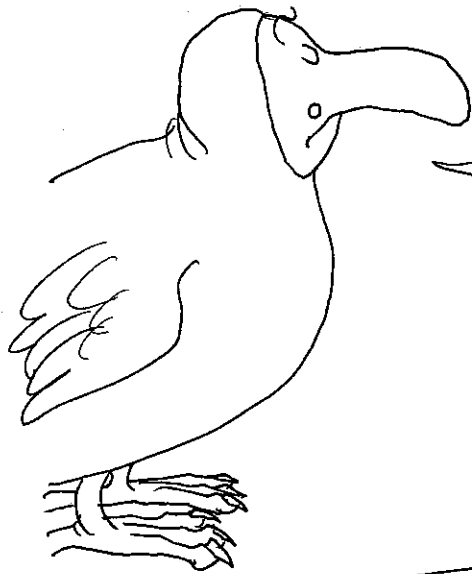


If I understand it correctly, this matter with negative mass exercises a counter-pressure at different levels. First it ensures a perennity for the large-scale structure of the lacunar Universe - Then it maintains the galaxies in the cluster - On a lesser scale it confines the galaxies. But couldn't it infiltrate into the interior of galaxies ?

Yes, and we find it, with very low densities between stars.

That's funny ! At very large scale, it's matter which is structured like a Gruyère cheese, the agglomerations of negative mass are localised at the centre of the "holes". At lesser scales it's the contrary. It the negative mass matter that becomes lacunar. Galaxies, and on a smaller scale stars, lodge in the "holes".





OK...you've found an ALTERNATIVE interpretation of this phenomenon. Personally, I prefer the one based on DARK MATTER.

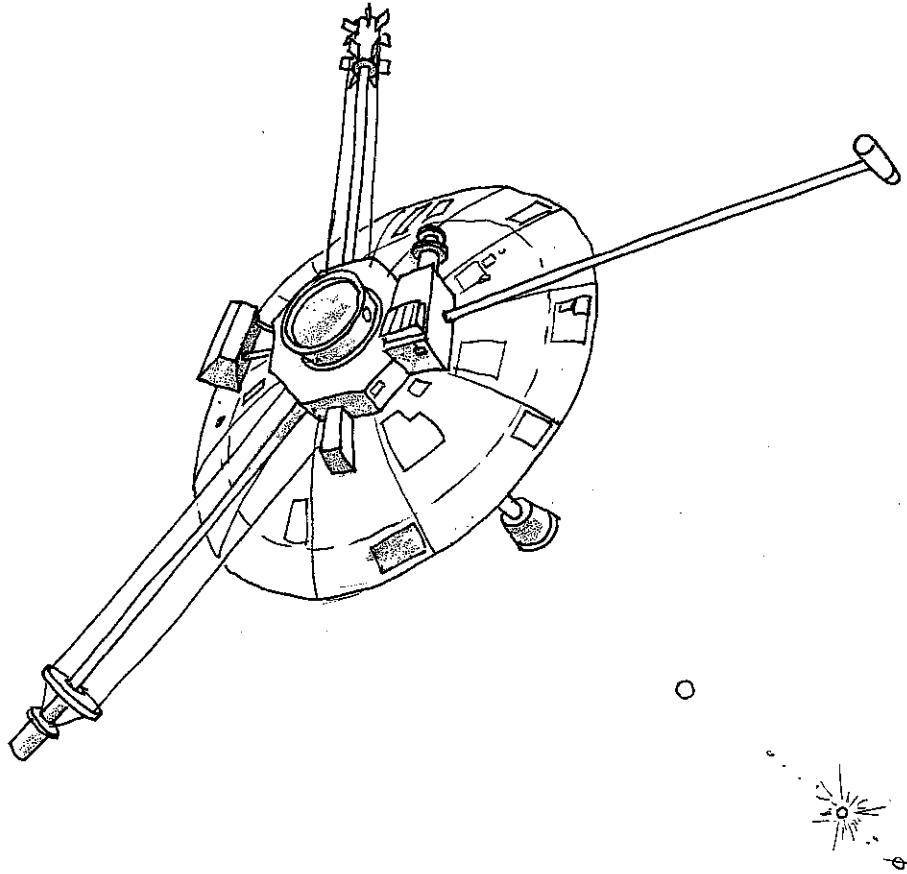
Do you mean that it would be impossible to opt for one or the other of these theories?

It should be remembered that with this theory where we have two matters with opposing masses, we kill two birds with one stone because it avoids the need for another ingredient = DARK ENERGY.

The ideal would be to consider an observation that could be accounted for by the negative mass and not dark matter.



# THE PIONEER EFFECT



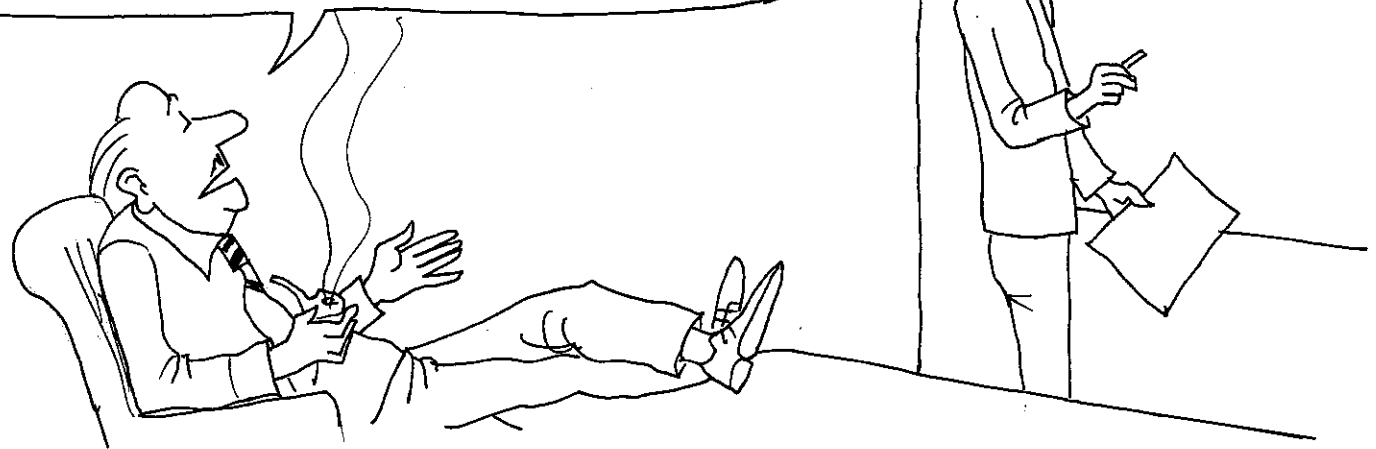
In 1972-73 NASA launched two identical probes: PIONEER X and PIONEER XI. Benefiting from the SLING EFFECT as it passed Jupiter, they were able to attain a speed that allowed them to escape the Sun's attraction and leave the solar system in (??). Fuelled by a nuclear generator they were able to send back signals until (??) and an unusual phenomenon was noticed. The probes were subject to a deceleration, extremely small but perfectly measurable (\*). Everything was tried to account for this phenomenon including the fact that the solar system, near the Sun, holds a certain quantity of DARK MATTER.

But for the first time the cover-all explanation didn't work...



The solar system functions like precision mechanics, governed by Newton's law. As time has passed, the computer has allowed us to position the near planets to within 20 metres at any moment. Such precision precludes all modification of the central mass, which governs the movement of planets with a mass of more than a hundred thousandth that of the Sun. However, in order to be able to account for the acceleration observed, the quantity of dark matter to be added to the classic model would largely exceed this value. We are obliged to look elsewhere for the cause of this phenomenon therefore. Currently (2008) the effort is being put into a (empirical) modification of Newton's Law (MOND or Modified Newton Dynamics) (\*). This brings about a re-examination of the fundamental principles of General Relativity. But, beyond that, the adjustments required to make this distant deceleration appear no longer fit in with the low distance dynamic of the Sun (telluric planets).

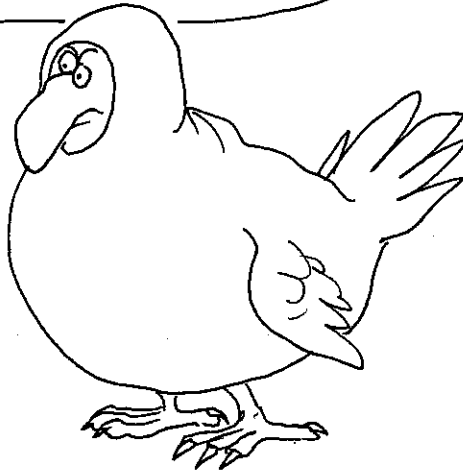
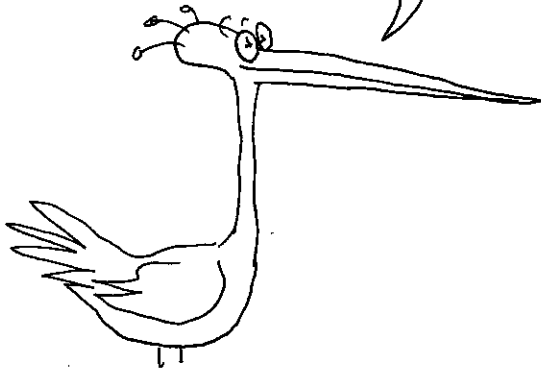
I am willing to recognise that your modified Newton's Law accounts for the deceleration of the probes, but if I use your law to send a probe to Mars I'll miss my target and by quite a way. The dates of solar and lunar eclipses will no longer fit in with the EPHEMERIDS. What should we do ?



(\*) All other causes of physical or technical character have been registered and eliminated.

Therefore the "Dark Matter" hypothesis is not able to resolve the unavoidable enigma brought up by this INCONTESTABLE phenomenon and shown by the space probes PIONEER X and PIONEER XI.

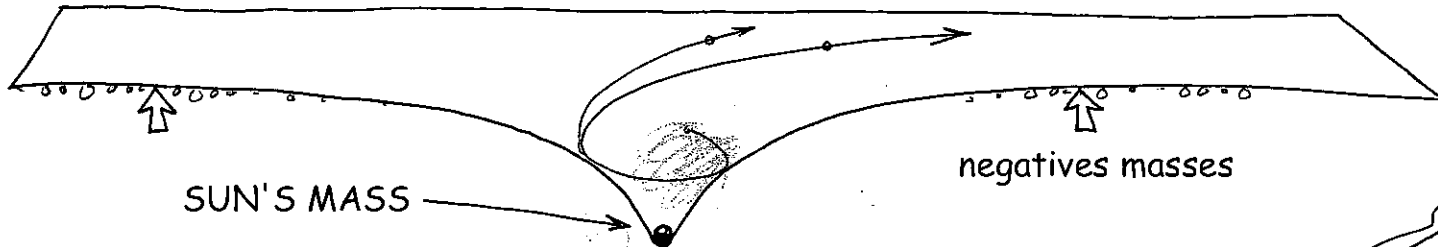
All that remains is to impute this phenomenon to the REPULSIVE action of the tiny quantity of negative mass present near the sun.



So what's it about then.



The "ping pong balls" then lift up very slightly, from a distance, the surface on which the probes move. The "uphill side" is simply slightly more steep.



It's the ONLY explanation that has any sense at all.



# Bi-METRIC UNIVERSE

see my papers :

J.P.Petit : The missing mass problem. *Il Nuovo Cimento B*, July 1994 Vol 109, pp. 697-708

J.P.Petit : Twin Universe Cosmology. *Astronomy and Sp. Sc.* 1995 , 226 , pp. 273-307

Bigravity as an interpretation of cosmic acceleration. J.P.Petit & G.D'Agostini Dec. 2007 <http://arxiv.org/abs/0712.0067>

Bigravity : A bimetric model of the universe. Exact nonlinear solutions. Positive and negative gravitational lensings  
J.P.Petit & G.D'Agostini Jan.10 , 2008 <http://arxiv.org/abs/0801.1477>

Bigravity : A bimetric model of the Universe with variable constants, including the speed of light. J.P.Petit & G. D'Agostini  
May 9th 2008 <http://arxiv.org/abs/0803.1362>

Five-dimensional bigravity : New topological description of the Universe. J.P.Petit & G. D'Agostini  
May 9 th 2008 <http://arxiv.org/abs/0805.1423>

And :

## A Bi-Metric Theory with Exchange Symmetry

S. Hossenfelder\*

*Perimeter Institute for Theoretical Physics  
31 Caroline St. N, Waterloo Ontario, N2L 2Y5, Canada  
(Dated: July 17, 2008)*

Physical Review July 2008

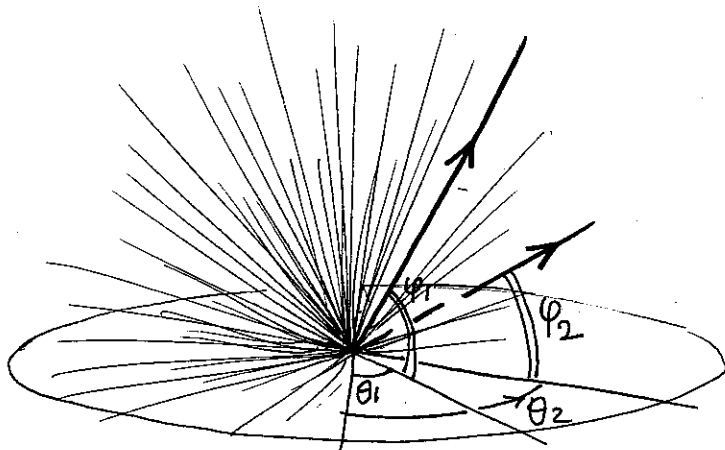
We propose an extension of General Relativity with two different metrics. To each metric we define a Levi-Civita connection and a curvature tensor. We then consider two types of fields, each of which moves according to one of the metrics and its connection. To obtain the field equations for the second metric we impose an exchange symmetry on the action. As a consequence of this ansatz, additional source terms for Einstein's field equations are generated. We discuss the properties of these additional fields, and consider the examples of the Schwarzschild solution, and the Friedmann-Robertson-Walker metric.

The world of Science is paved with stories like this.  
This parenthesis closed, let's continue...



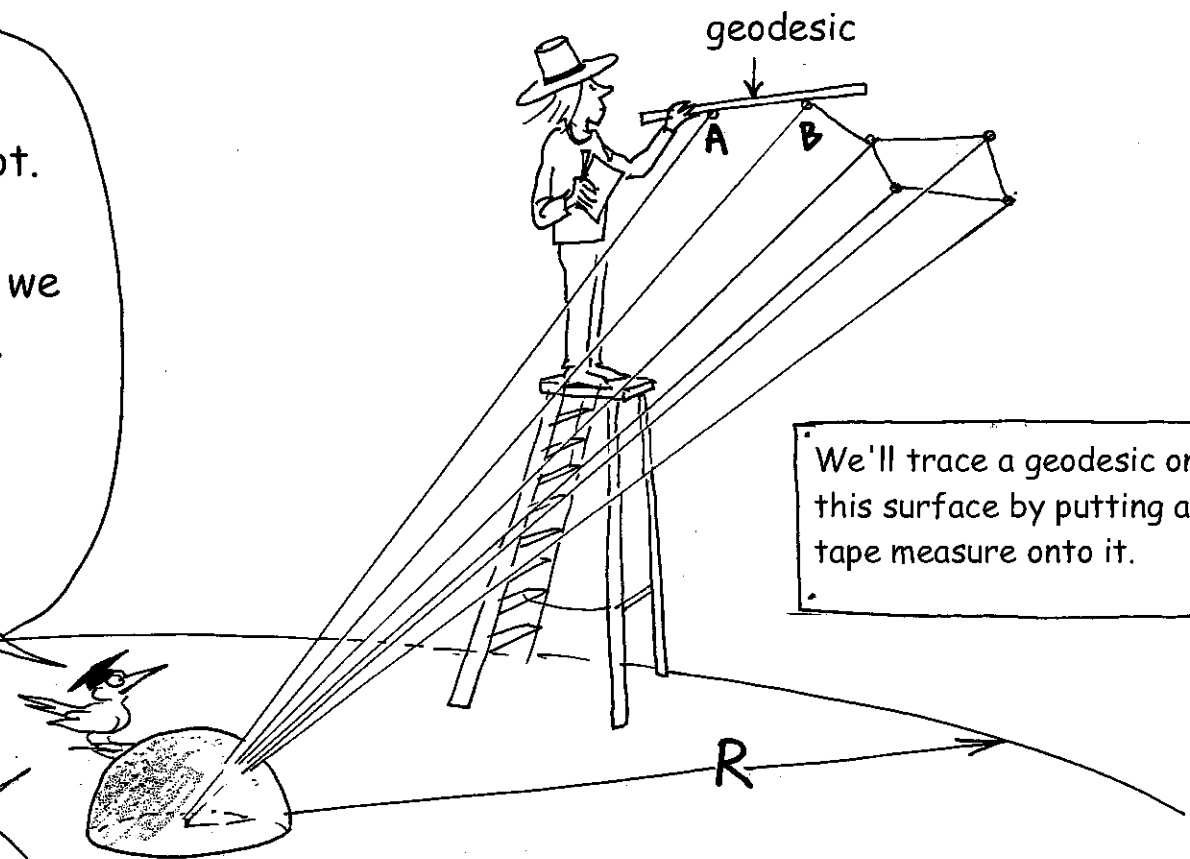
# THE MYTH OF THE CAVE

During the 4th century BC the Greek philosopher Plato developed the idea in which the perception that man could have of the world was comparable with the observation of dancing shadows projected from outside onto the wall of the cave where he lived, shut in and unaware of the true nature of the things surrounding him. With the coming of the Theory of Relativity, the myth returned. In effect, we have said that the revolution of this beginning of the century consisted of restituting the phenomena on a SPACE-TIME HYPERSURFACE. We are going to introduce an image. Everyone knows those lights made up of a bunch of fibre-optics strands, which just point in a direction which can be described with two ANGLES, the azimuth  $\theta$  and the site  $\varphi$ . It's an image of a PRE-METRIC SPACE where the concept of distance is void of all meaning as two fibres are only separated by ANGULAR DIVERGENCES.



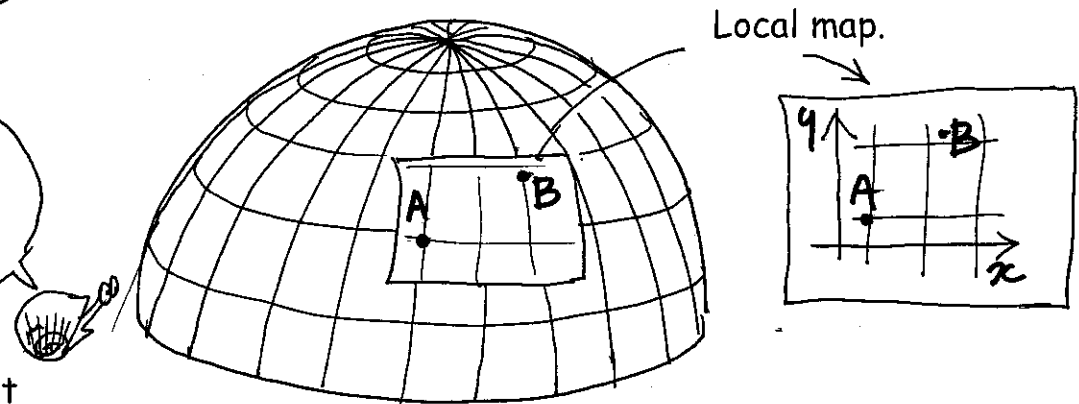


Imagine a bundle of such fibre-optics, infinitely tight. Some emit light, others not. By projecting these lights, eventually of different colours, onto a spherical screen we would be making a classic PLANETARIUM. We could also measure the DISTANCE SEPARATING TWO OF THE IMAGES on the screen by using a GEODESIC.



The length of the geodesic arc  $\widehat{AB}$  will be proportional to the radius  $R$  of the spherical screen of our planetarium. We will call this magnitude  $R$  "space scale factor" or "gauge" (\*)

After that we can MAP the screen with a grid using two families of curves that we'll call COORDINATES.



(\*) The terminologies used vary according to different authors : space scale factor, gauge, warp, factor etc.

# BIMETRIC

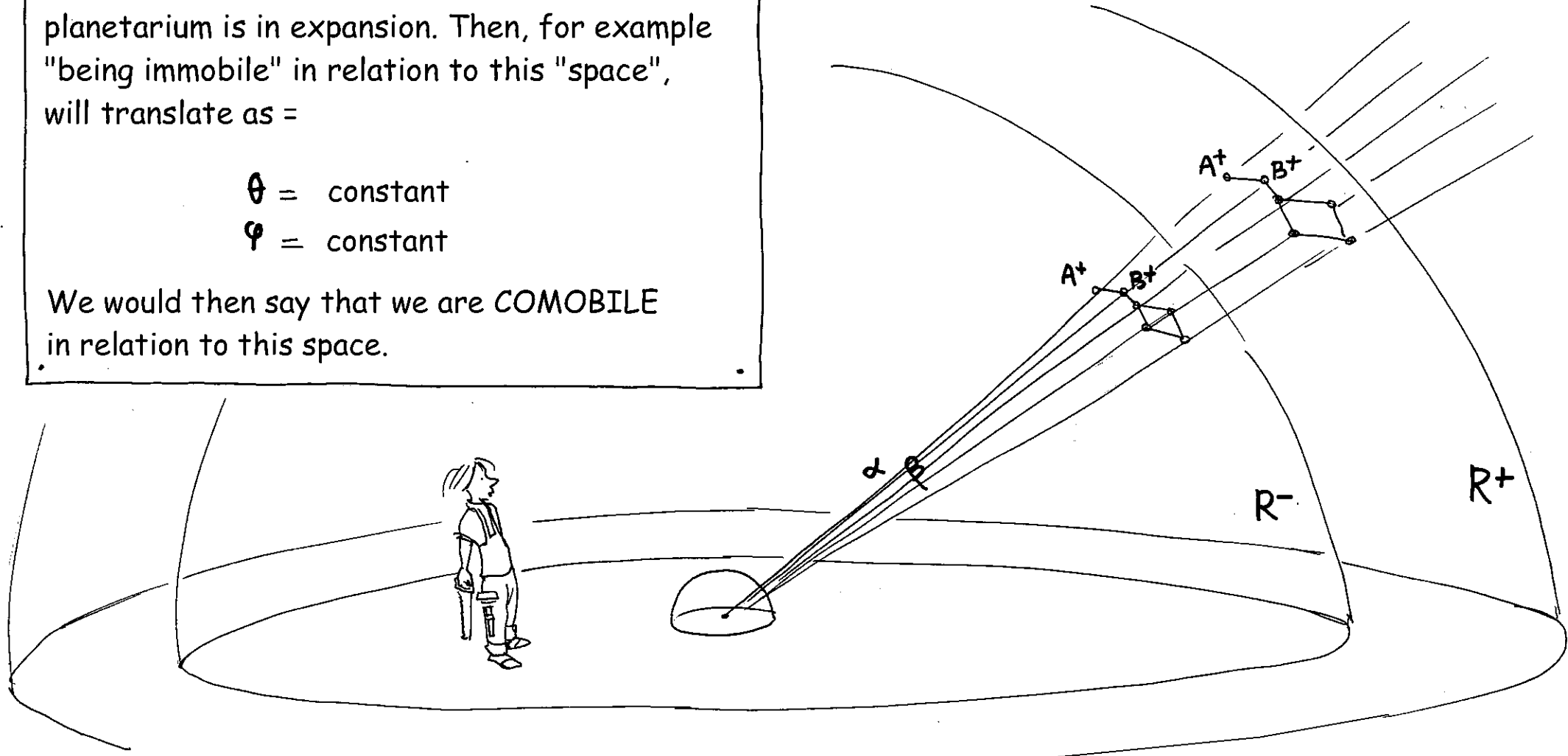
It is clear that the true way to establish a POSITION in this space isn't the group of two lengths  $(x, y)$  but the angles  $(\theta, \varphi)$ . This will be even more true if the screen...inflates, if our planetarium is in expansion. Then, for example "being immobile" in relation to this "space", will translate as =

$$\theta = \text{constant}$$

$$\varphi = \text{constant}$$

We would then say that we are COMOBILE in relation to this space.

Let us now imagine that this ensemble of "positions", of "places"  $(\theta, \varphi)$  can be projected not onto ONE screen but onto TWO.



We would have two different ways of MEASURING the distance separating the points  $\widehat{A^+ B^+}$   $\widehat{A^- B^-}$  of the image of the same "light rays"  $\alpha$  and  $\beta$  according to the screen chosen.

# (PLATO)<sup>2</sup> or THE TWIN UNIVERSE

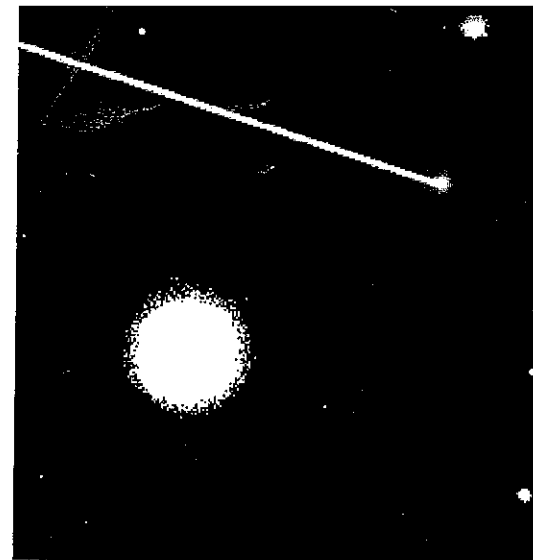
This BIMETRIC conception of the Universe represents a PARADIGM CHANGE extremely difficult to conceive of. It means accepting Plato to the letter, with a NON-METRIC underlying structure, where the different places  $\alpha$  and  $\beta$  (the "fibre optics") are located with the help of ANGLES  $(\theta_\alpha, \varphi_\alpha)$  and  $(\theta_\beta, \varphi_\beta)$  - This "projection system" (the planetarium) is projected onto two surfaces (leaves, branches, anything) whose scale factors  $R^+$  and  $R^-$  can be very different, including "from one place to another". For a mathematician surveyor it is something completely "natural" to give an underlying structure, where the positions are located using angles called MANIFOLDS, several sheets whose WARP FACTORS  $R^+$  and  $R^-$  can be totally different - if these 4D HYPERSURFACES are MINKOWSKI SPACES the objects cannot move faster than the speed of light of the space under consideration. But these velocities can be very different (for example  $C^- \gg C^+$ ) - of course we envisage that objects of mass  $m^+$  (previously called  $m$ ), and the objects of mass  $m^-$  and energy  $E^-$  (previously designated by  $\bar{m}$  and  $\bar{E}$ ) taking the route  $\widehat{A^+B^+}$  and  $\widehat{A^-B^-}$  inscribed in different SHEETS or BRANES, that we could consider to be TWIN UNIVERSES  $U^+$  and  $U^-$ , which in fact constitute just one single TWIN UNIVERSE  $U$ . This SECOND UNIVERSE isn't elsewhere, just as the particles with negative energy aren't ELSEWHERE. Objects of opposed mass and energy are immersed in the same universe and where

THEY CAN ONLY INTERACT THROUGH GRAVITATION

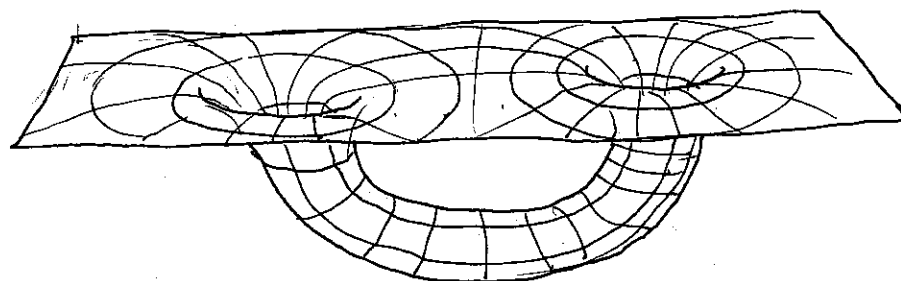
INTERSTELLAR TRAVEL would therefore be non-impossible and could be effected by using the "corridors" of a TWIN UNIVERSE having a higher luminic speed  $C^-$ . A vehicle whose mass was inverted would be :

- invisible
- repulsed by the mass of Earth

By alternating its presence through a phenomenon of a quantum nature in the two twin universes, it will fall in one of these worlds and rise in the other, the rapid alternation of these two sequences giving an impression of immobility, so of ANTIGRAVITATION, to an observer made of positive mass.



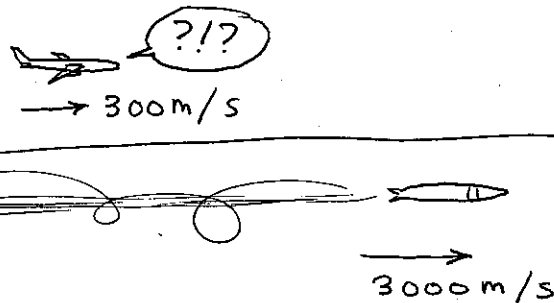
Until now, when they accepted to consider them as "non-impossible", scientists imagined that interstellar travel could be effected by using "hyperspheric tunnels", or "wormholes". But nothing very convincing came out of it.



Yep!

# INTERSTELLAR TRAVEL

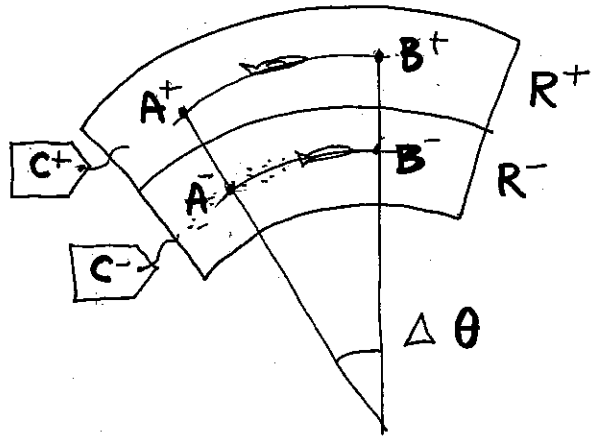
Over time, astronomical observations have begun to confirm that not everything in the Universe is optically observable and intangible - The idea thus came about, very speculative (in science lots of questions are handled by creating simple words), that there could exist hypothetical particles that "only interact very weakly with our own matter" (\*). After that one could envisage particles that only interact with our matter THROUGH THE FORCE OF GRAVITY. A spaceship made of negative masses, moving at just a few dozen km/s, could cross our planet from side to side, and even the Sun, without being incommodated (if the speed is sufficient to avoid it becoming prisoner of the sun's gravitational field). As it is a question of travel at apparently supraluminic speeds, we can give the following image : In a "double" world supersonic displacement is impossible. But to go from one place to another, two methods are possible: by air, at less than 340 m/s and - underwater, at less than the speed of sound in this environment, which this time is ten times higher.



(\* ) We called them WIMPS (weakly interacting massive particles)

# THE GULLIVER EFFECT

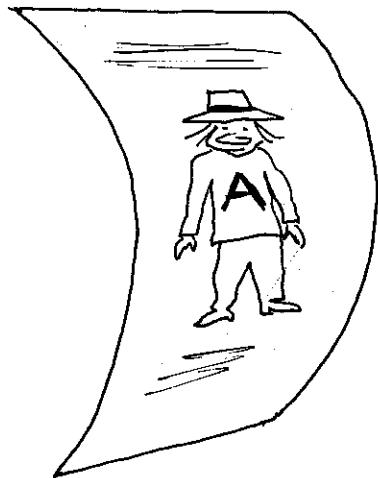
As it is a question of shortening the distance to cover we can imagine that the displacement is only ANGULAR and lends itself to two different types of REPRESENTATION linked to very different space scale factors (WARP FACTORS),  $R^+$  and  $R^-$ , these spatial representations being themselves linked to the very different speeds of light  $C^+$  and  $C^-$  :



$$\begin{cases} R^+ \gg R^- \\ C^+ \ll C^- \end{cases}$$

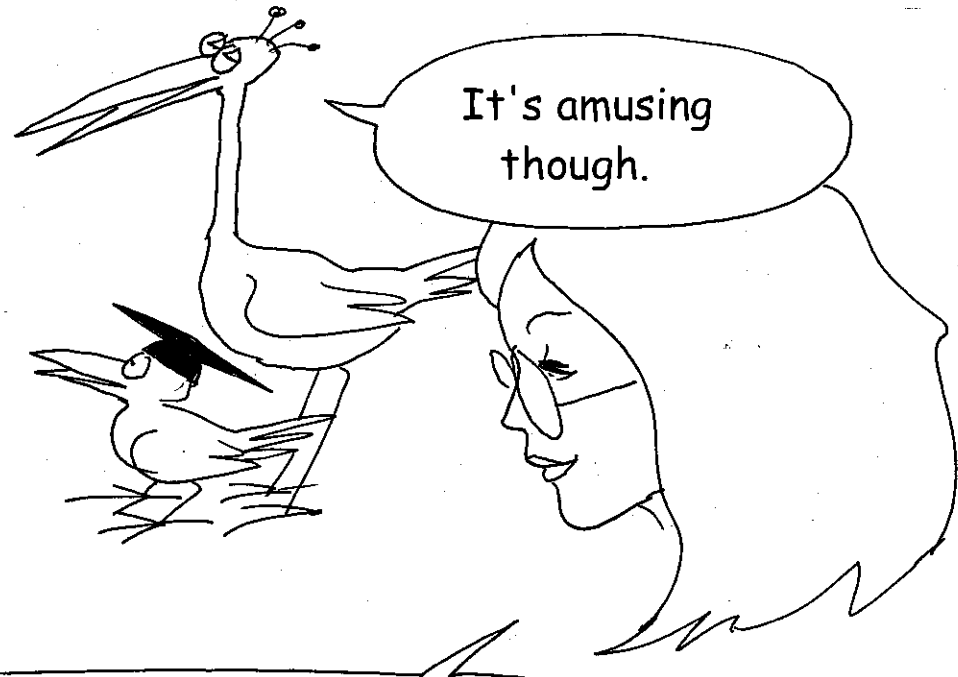
We thus win both ways: in the "negative world" ("twin" Universe) : less distance to cover, faster.

The distances to cover are also shorter behind a concave mirror. All it needs is for me to "cross to the other side of the mirror".



This story is getting lost, and it's starting to seem more and more like ALICE THROUGH THE LOOKING GLASS. We're wallowing in complete fiction.

But today's science is yesterday's fiction - A century earlier the direct transformation of matter into energy according to the law  $E=MC^2$  was complete fiction.




It's amusing though.

We would have said it was impossible because it violated the LAW OF CONSERVATION OF MATTER.


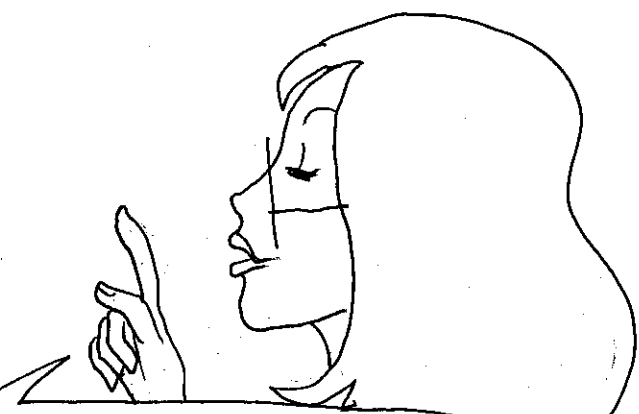
This law is nothing other than the PRINCIPLE OF CONSERVATION OF ENERGY MATTER.

For this "gemellary" vision I propose a new principle: from one sheet to another ENERGY-MATTER IS CONSERVED.

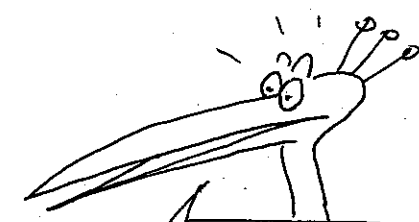





Ah my dear Tiresias, we are we are playing a game:  
**ATTENTION, ONE PRINCIPLE CAN HIDE  
ANOTHER**, and in this game you fear no one.




Be careful, **QUANTUM MECHANICS** hasn't finished surprising us, it handles the **PROBABILITIES OF PRESENCE**. Two researchers **FABRICE PETIT** and **MICHAEL SARRAZIN** have just published a work in the **PHYSICAL REVIEW D** with a **TWO SHEET REPRESENTATION** where a particle can pass from one sheet to another, by also bringing into play the principle of the conservation of energy-matter, the **TIRESIAS PRINCIPLE**.



And they are even thinking of undertaking experiments with rather modest energies.



The **LUMINIC BARRIER** is the Berlin Wall of today's science, physics west of the Pecos.



But then fiction is on our doorstep - Can you imagine all that that implies?



# PHYSICS WEST OF THE PECOS

## Plausible "faster-than-light" displacements in a two-sheeted spacetime

Fabrice Petit<sup>1,\*</sup> and Michaël Sarrazin<sup>2,†</sup>

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*4 avenue du gouverneur Cornez, B-7000 Mons, Belgium*

<sup>2</sup>*Laboratoire de Physique du Solide, Facultés Universitaires Notre-Dame de la Paix,  
61 rue de Bruxelles, B-5000 Namur, Belgium*

In this paper, we explore the implications of a two-point discretization of an extra-dimension in a five-dimensional quantum setup. We adopt a pragmatic attitude by considering the dynamics of spin-half particles through the simplest possible extension of the existing Dirac and Pauli equations. It is shown that the benefit of this approach is to predict new physical phenomena while maintaining the number of constitutive hypothesis at minimum. As the most striking feature of the model, we demonstrate the possibility of fermionic matter oscillations between the two four-dimensional sections and hyper-fast displacements in case of asymmetric warping (without conflicting special relativity). This result, similar to previous reported ones in brane-world theories, is completely original as it is derived by using quantum mechanics only without recourse to general relativity and bulk geodesics calculation. The model allows causal contact between normally disconnected regions. If it proves to be physically founded, its practical aspects could have deep implications for the search of extra-dimensions.

PACS numbers: 11.10.Kk, 04.62.+v, 11.25.Wx



1. arXiv:0809.2060 [ps, pdf, other]

## **Probing braneworlds through artificial matter exchange between branes: experimental setups for neutron and helium-3 disappearance**

Michael Sarrazin, Fabrice Petit, submitted

2. arXiv:0706.4025 [ps, pdf, other]

## **Plausible "faster-than-light" displacements in a two-sheeted spacetime**

Fabrice Petit, Michael Sarrazin. Accepted for publication in Phys. Rev. D76,(2007)  
Journal-ref: Phys. Rev. D 76, 085005 (2007)

3. arXiv:hep-th/0603194 [ps, pdf, other]

## **Matter localization and resonant deconfinement in a two-sheeted spacetime**

Michael Sarrazin, Fabrice Petit. Accepted for publication in Int. J. of Modern Physics A 22 (2007) 2629-2641

4. arXiv:hep-th/0505014 [ps, pdf, other]

## **Artificially induced positronium oscillations in a two-sheeted spacetime: consequences on the observed decay processes**

Michael Sarrazin, Fabrice Petit. Accepted for publication in Int. J. of Modern Physics A 21 (2006) 6303-6314

5. arXiv:hep-th/0409084 [ps, pdf, other]

## **Quantum dynamics of massive particles in a non-commutative two-sheeted space-time**

Fabrice Petit, Michael Sarrazin. Accepted for publication in Physics Letters B 612

6. arXiv:hep-th/0409083 [ps, pdf, other]

## **Quantum dynamics of particles in a discrete two-branes world model: Can matter particles exchange occur between branes?**

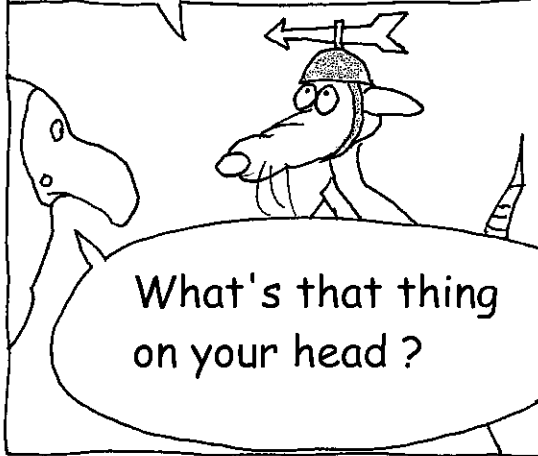
Michael Sarrazin, Fabrice Petit. Published in Acta Physica Polonica B (2005)  
Journal-ref: Acta Phys. Polon. B36 (2005) 1933-1950

Kiss, what do you think of these tales of particles which jump from one sheet to another?



It all depends on the consensus my dear Handshic. If a large consensus appears, Main Stream will follow the movement.

When the weather changes, we change with it.



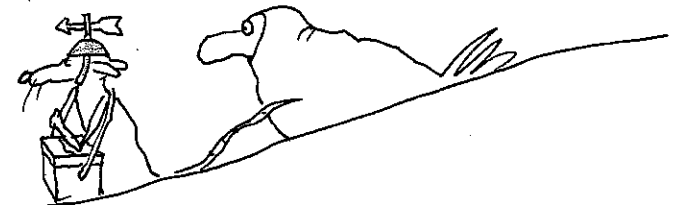
What's that thing on your head?

It allows us to know in which direction the wind of science is blowing.



But... don't you have an opinion?

An opinion!? And what next? As if life wasn't already complicated enough!



Ah sorry. I can just see Professor Nostradamour over there coming out of the Institute. He's an uncontested specialist in superstrings. I'm off to interview him. Do you understand, I'm in favour of anything that helps sales.



Good old Harvey Kiss, with his review Main Stream under his arm, his shoe shine equipment and now the hat, he'll make me die laughing!



OK, let's recapitulate. We live in a double world filled with particles of opposed masses and energies. The Group Master says: it's normal. It's because they travel backwards in time. And in addition, the distances covered between one point of this universe and another, differ according to whether it is constituted of positive or negative masses.  
I admit, I'm lost!

How do we make the regions with opposed time arrows interact and where the methods for measuring lengths are also different?!?



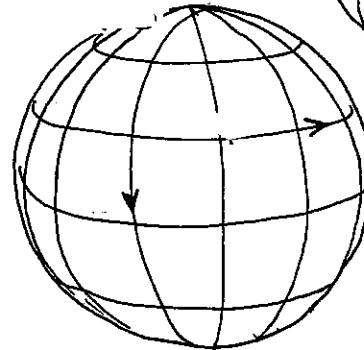
Ahem...

# SPACE-TIME TOPOLOGY

You just need to fold the Universe on itself.

Start with a space-time model with a BIG BANG, a BIG CRUNCH and a situation of maximum extension, that you could represent in 2D with the help of a simple sphere.

What is this madman's story?



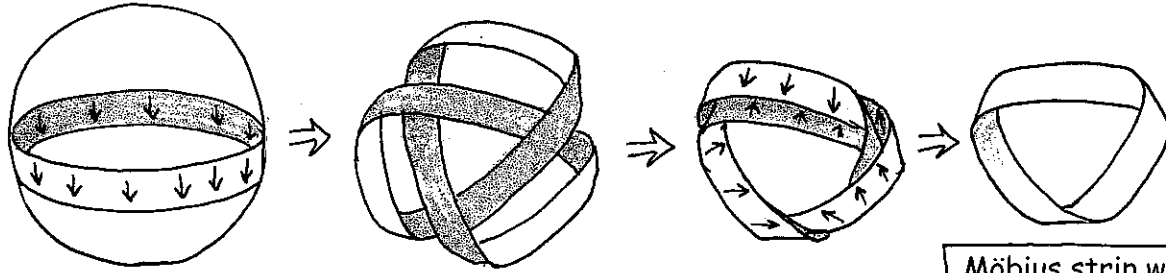
You know that you can bring every point of this space-time into coincidence with its SPATIO-TEMPORAL ANTIPODE (the antipodal point on the sphere  $S^2$ ) and the result is a Boy surface. That's all explained in the album TOPO THE WORLD (\*).

Yes, time follows the meridians and space, which has just one dimension, is shown by a parallel circle which starts at zero, at the "BIG BANG pole", grows until it becomes the sphere's equator then collapses according to the "BIG CRUNCH pole".



(\*) Have a look there, we can't go over it all again here.

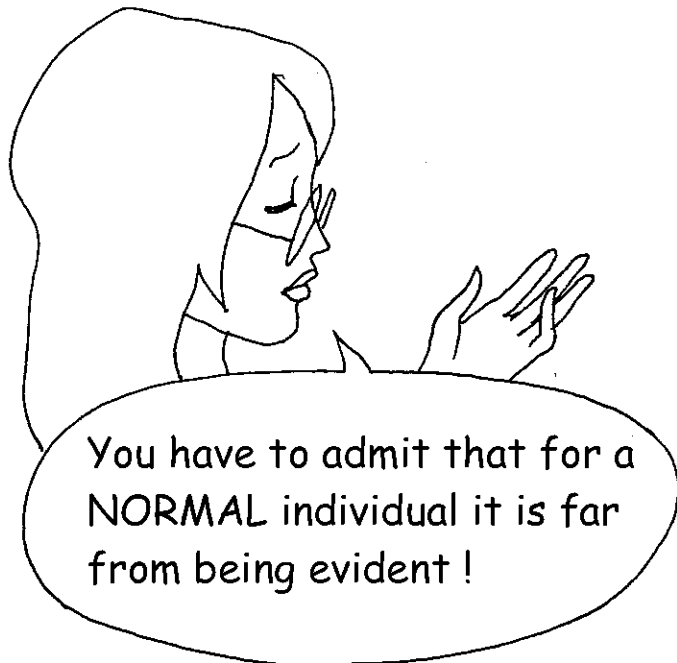
In flicking backwards through pages 71 to 43 four animations allow us to follow the folding near the equator which, by bringing the antipodal points into coincidence, shows how the regions with opposed time arrows form a TWO SHEET SPACE-TIME.



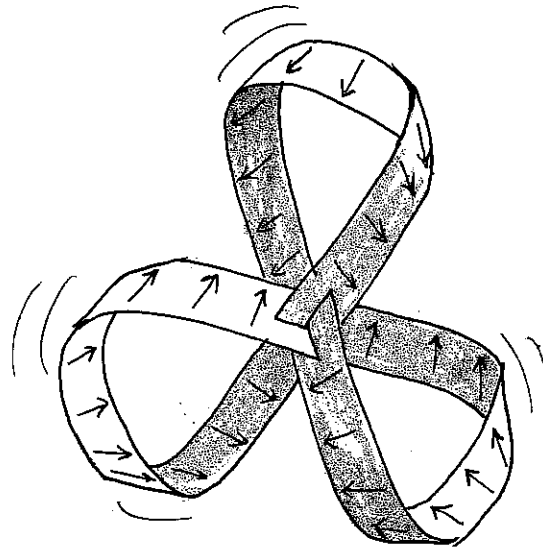
neighbourhood of the space-time sphere's equator

Möbius strip with three half turns.

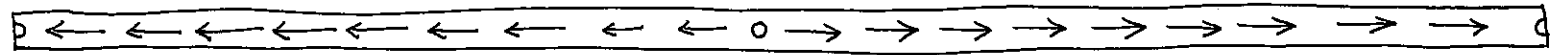
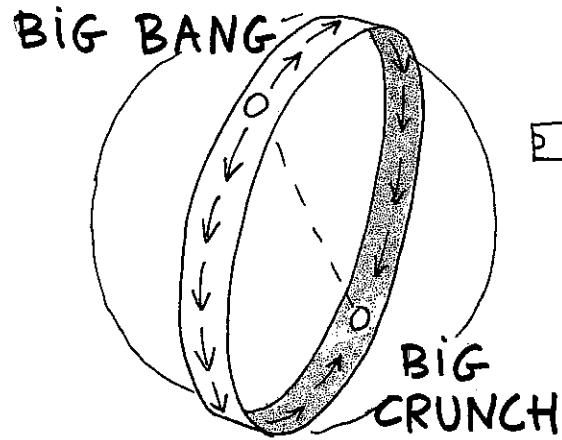
The area near the equator is configured according to the COATING of a Möbius strip with three half turns. But this operation is hard to do yourself, three layers need to be crossed, as shown in the figure on page 59:



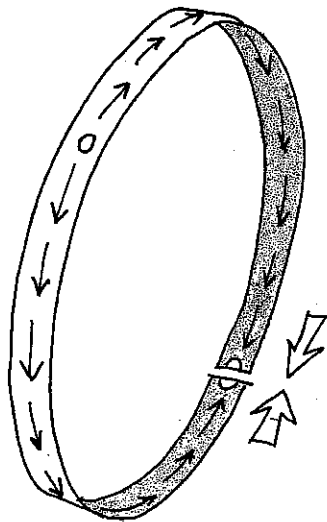
You have to admit that for a NORMAL individual it is far from being evident !



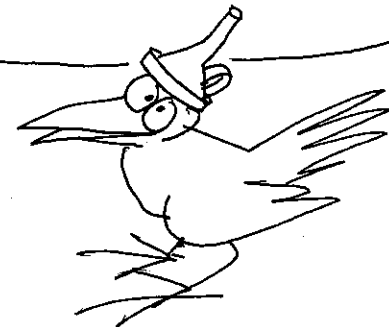
To show you how the space-time sphere folds onto itself, bringing the points into coincidence with their antipodes and at the same time bringing two regions with opposed time arrows "face to face", we'll proceed differently. This time we'll start near a MERIDIAN of our two dimensional space-time sphere - Make a long strip of paper, 2cm wide and just over 80cm long - In the middle draw a circle which represents the BIG BANG and from one end to the other the time arrows. At the end of the strip draw two small half-circles.



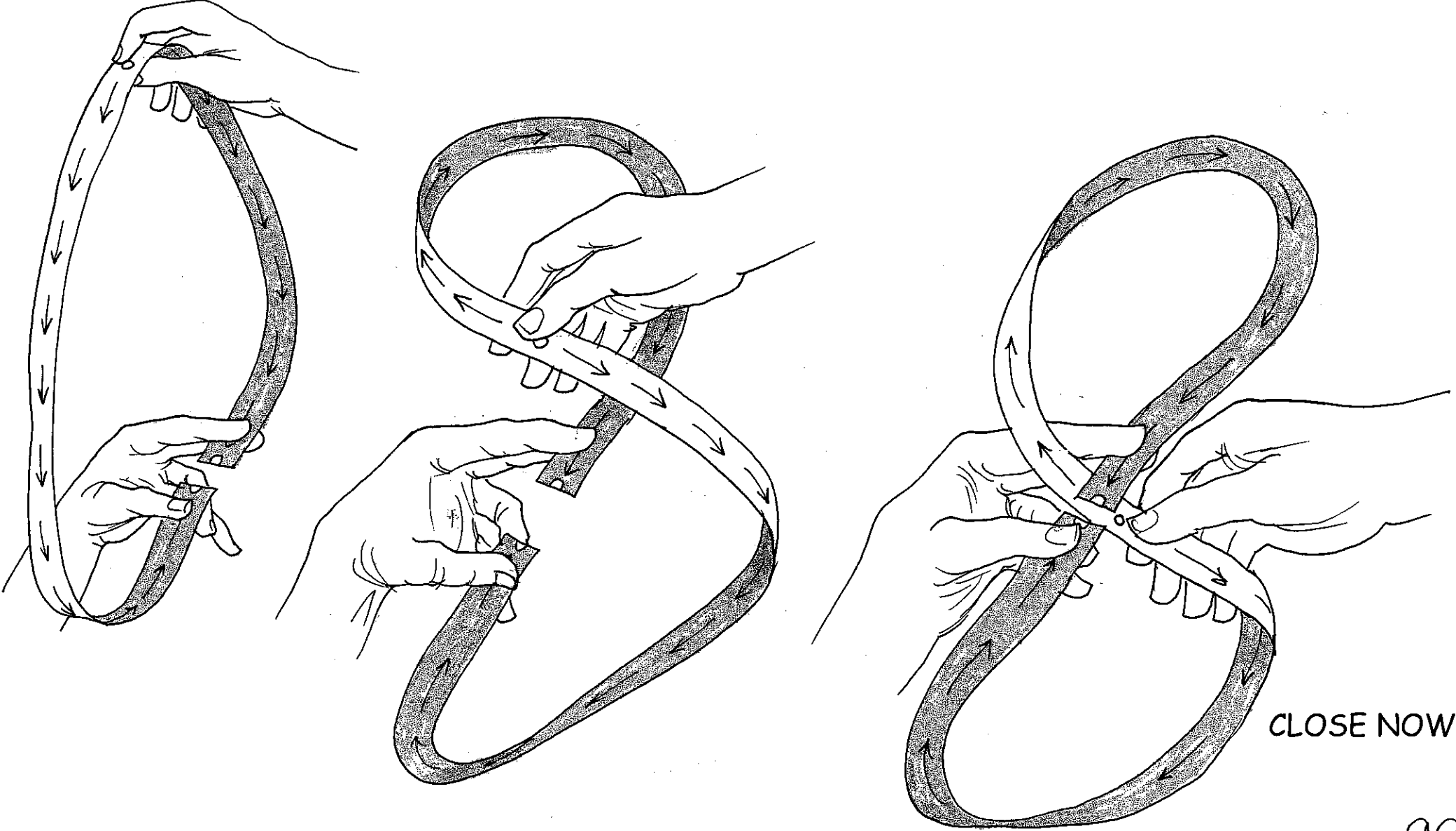
Make identical marks on the other side of the strip. It's ready when the two extremities are joined, to be done near a time line, which we'll call UNIVERSE LINE.



Careful, there is still time to abandon the experiment which will create irreversible synaptic connections in your brain

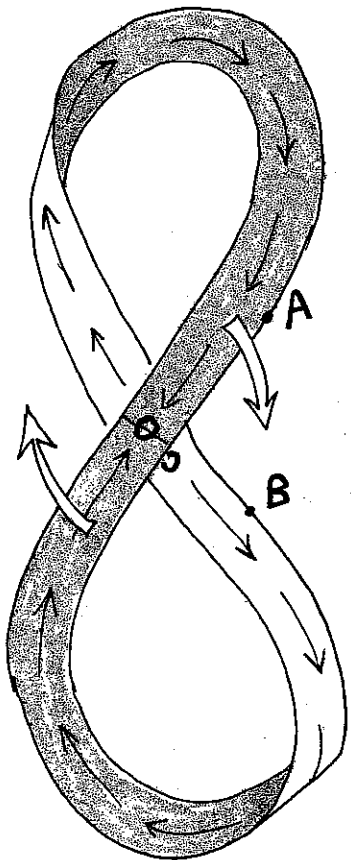


The folding of the sphere according to the covering of two sheets of a Boy surface (\*) can't be done without the surface cutting itself. Therefore we will operate A crossing before closing the BILATERAL band with adhesive tape then continuing as follows:

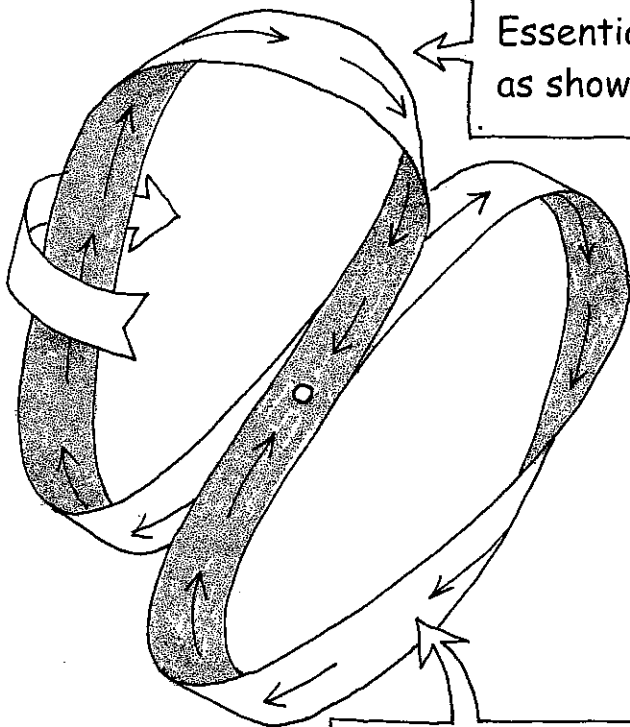


(\*) Look at "TOPO THE WORLD"

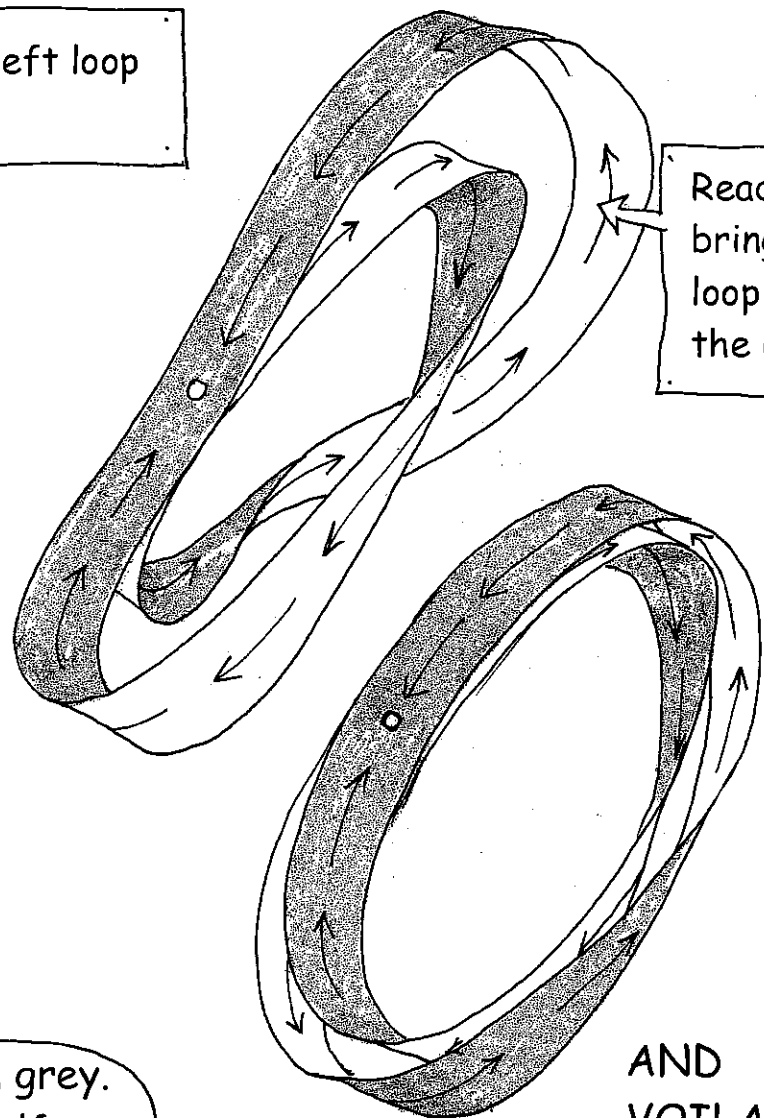
Hold that the two "poles", the BIG BANG and the BIG CRUNCH one on the other between your thumb and index finger. Then you effect a "scissor" rotation bringing point A onto point B.



Essential: turn the left loop as shown.



Ready to bring one loop onto the other.



You can see that this loop is a Möbius strip with half a turn.

AND VOILA !

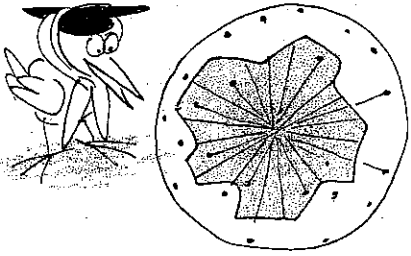
This band is BILATERAL.

To keep that clear in your head pencil one of the two faces in grey.

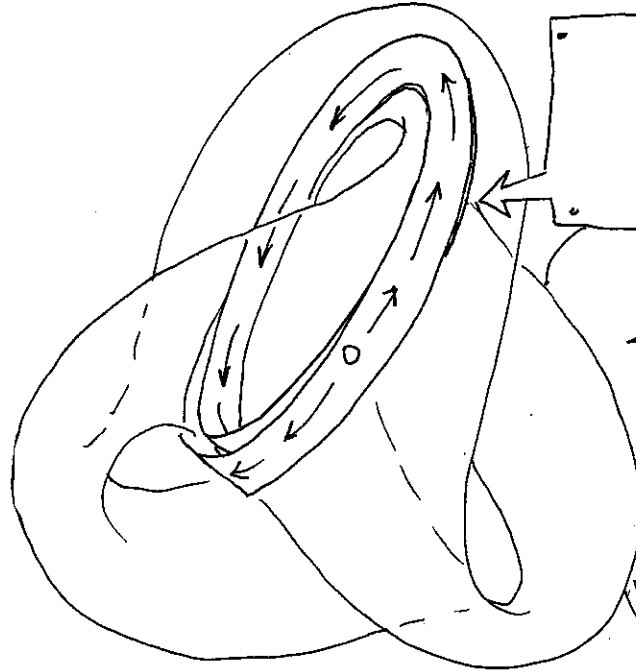
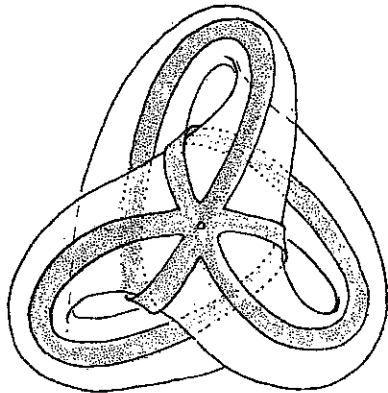
You'll see that this operation puts the white side against...itself.

This done, find the gesture that will, in a trice, make the grey side disappear this time, without cutting anything!





We largely developed the theme of coinciding the points of a sphere with their antipodal counterparts in TOPO THE WORLD thirteen years ago. There the meridians of the sphere, the UNIVERSE LINES of a spherical space-time  $S^2$ , "folded" according to the two sheet covering of a Möbius strip with three half-turns. Here are three of these folded meridians:



Then the object that we've just created shows the inversion of the time arrow.



What we do with an  $S^2$  sphere can also be done with an  $S^4$  sphere (\*)



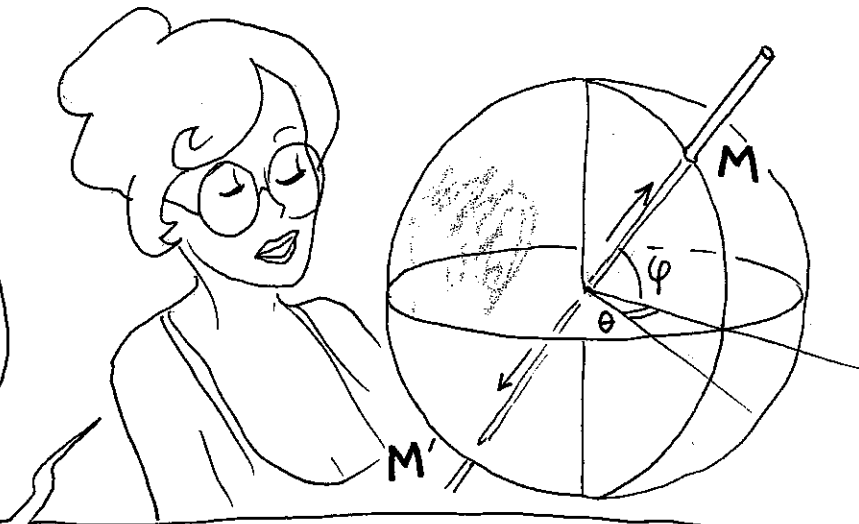
In other words, this interplay between positive and negative masses is a consequence of the topological configuration of the Universe.

NOTE : If, instead of putting the "pole BIG BANG" up against the "pole BIG CRUNCH", we envisaged a tubular passage, by eliminating the SINGULARITY our space-time now becomes toric and "folds" according to the two sheet covering of a Klein bottle, with an unusual aspect.

(\*) A hyperspherical space-time, firm, "compact".

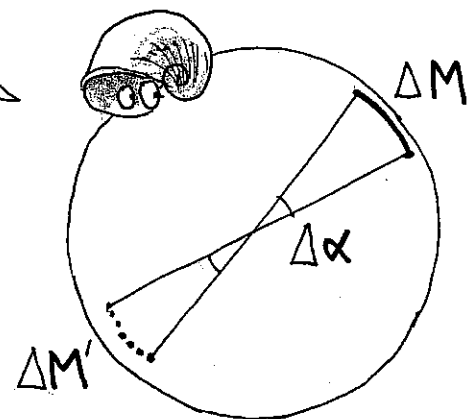


Ok, I can conceive that this inversion of time (so of mass) is another case of a geometric practical joke, one more. But what about DISTANCES?



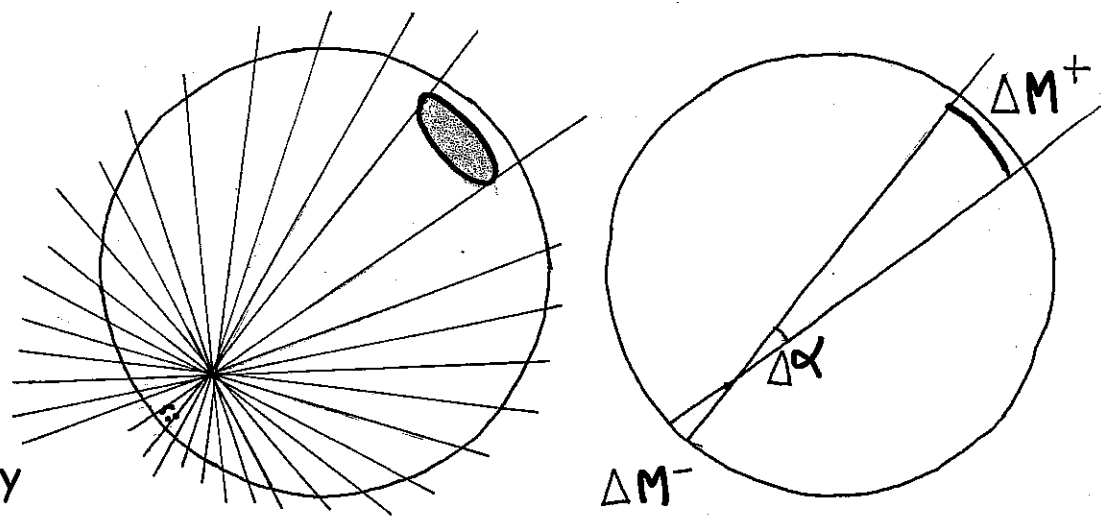
When you associated the antipodal regions of your sphere it's as if you used fibre optics and made them emit light at both ends. Each fibre is situated by ANGULAR coordinates  $(\theta, \phi)$ . It doesn't design one point of the sphere but two, antipodal,  $M$  and  $M'$ .

displacement corresponding to an ANGULAR VARIATION  $\Delta\alpha$  with which are associated two TRAJECTORIES  $\Delta M$  and  $\Delta M'$ , which being  $\Delta M = R\Delta\alpha = \Delta M'$  will be equal if the screen projection system is at the centre of the sphere.

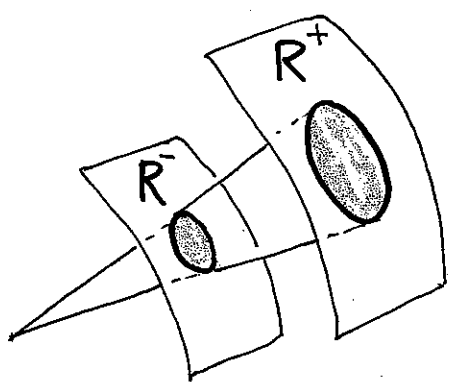


If the "projection system" is "off centre" then the same displacement  $\Delta\alpha$  (a "place" defined by angles) will not correspond to the same distance covered if it is inscribed on the "negative mass screen". The phenomenon perceived as expansion is, in fact, the variation of the warp factor  $R$  according to time. This isn't "lived", that is to say MEASURED in the same way by the two sub-groups. The system is UNSTABLE. If the warp factor  $R^+$  of the positive masses increases more quickly than the warp factor  $R^-$  of the negative masses then this movement accelerates. However, beings who lived in this NEGAWORLD would be subjected to a deceleration (curves). It is this phenomenon that is wrongly attributed to the REPULSIVE POWER OF THE VOID or to DARK ENERGY

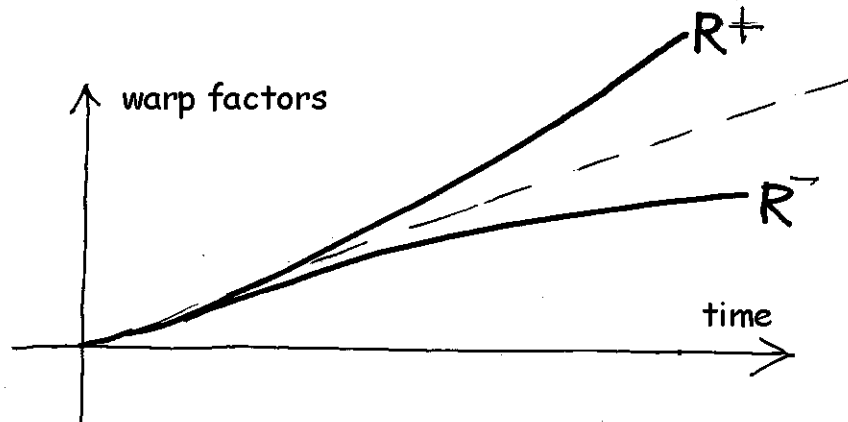
(see annex)



$$\Delta M^+ = R^+ \Delta \alpha > \Delta M^- = R^- \Delta \alpha$$



$$\left\{ \begin{array}{l} \rho^+ \sim \frac{1}{R^{+3}} \\ \rho^- \sim \frac{1}{R^{-3}} \end{array} \right. \text{(density)}$$



# THE FAILURE OF COSMOLOGICAL HYPOTHESES

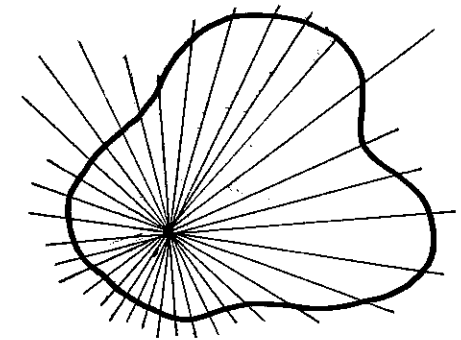
The STANDARD COSMOLOGICAL MODEL is based on a certain number of FUNDAMENTAL HYPOTHESES that no one would dream of calling into question :

- THE UNIVERSE IS A CONTINUUM (which more and more people are questioning).
- THE UNIVERSE IS HOMOGENOUS (false: its structure is LACUNAR) (\*)
- THE UNIVERSE IS ISOTROPIC (increasingly contradicted by observation).
- THE CONSTANTS OF PHYSICS ARE ABSOLUTE CONSTANTS (\*)

The shadow of things cannot be projected into the cave on just one wall but two: the shadows interact. The projection system isn't at the centre and, to finish, it is likely that these "walls" oscillate, warp, the phenomenon showing itself through ANISOTROPIES.

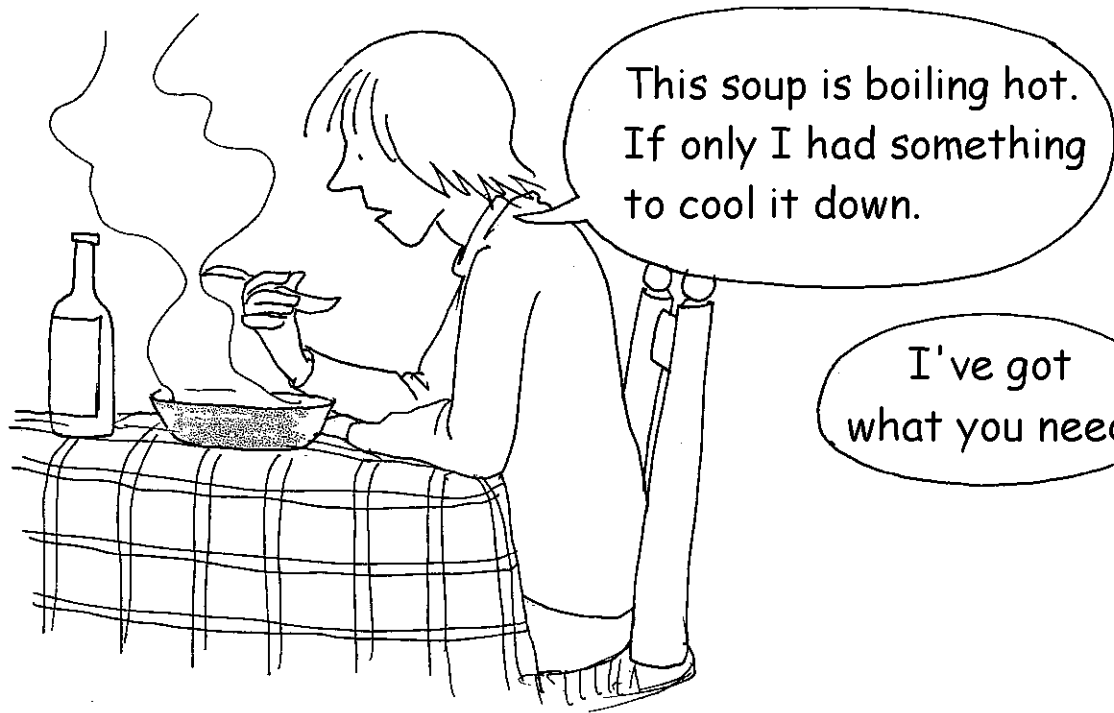


In short,  
it's all screwed up.

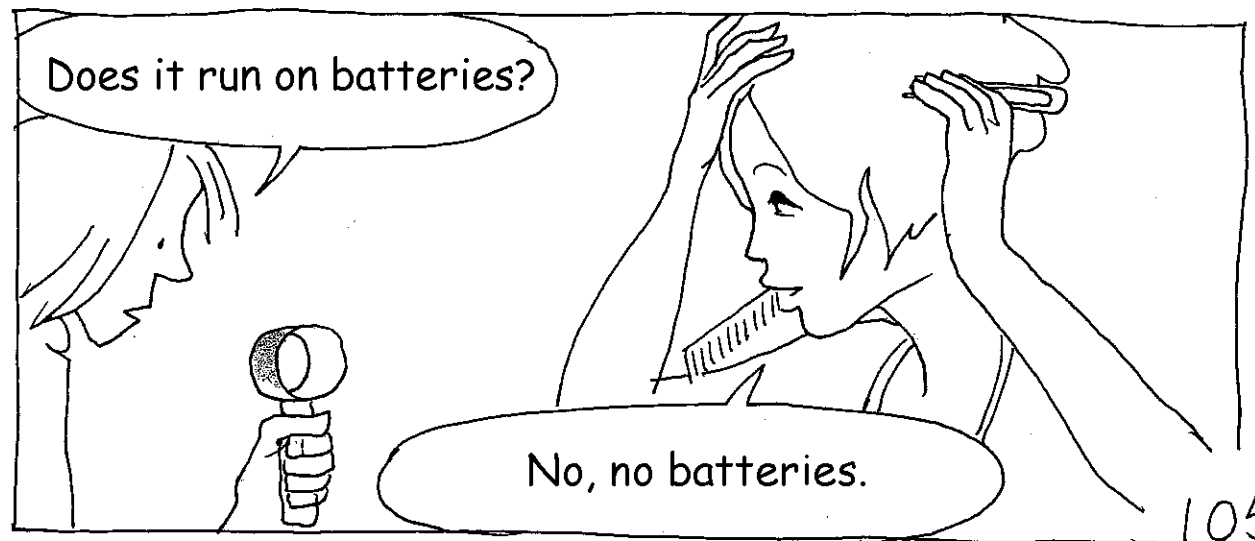


(\*) On this matter see FASTER THAN LIGHT

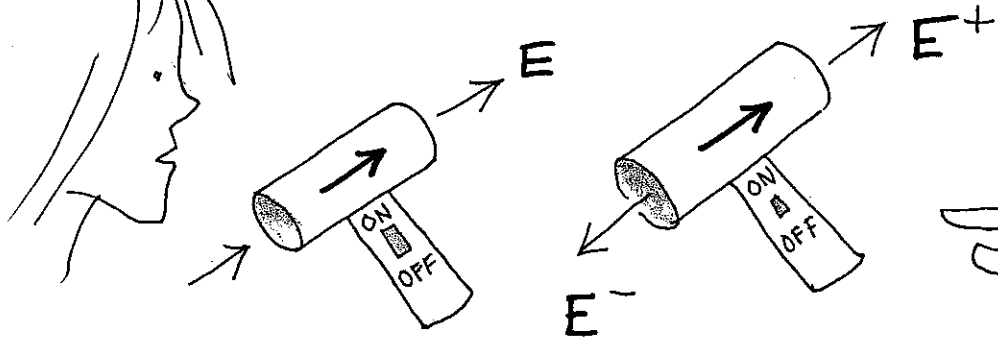
# CONJOINED GEOMETRIES (\*)



I've got  
what you need.

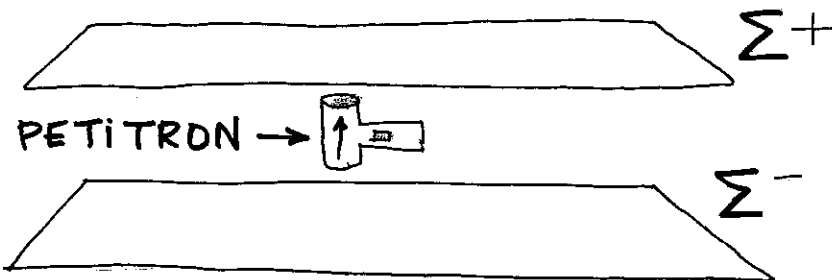
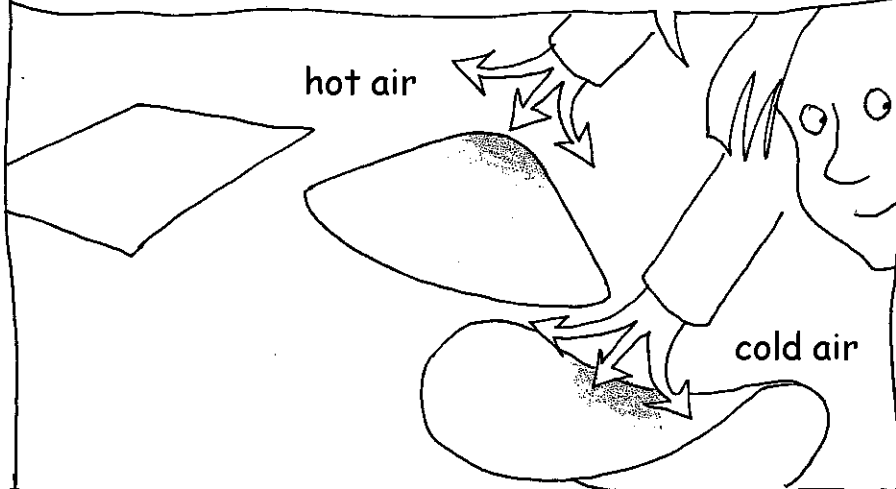


It was invented in 1994 by a Frenchman, it's called a PETITRON(\*)



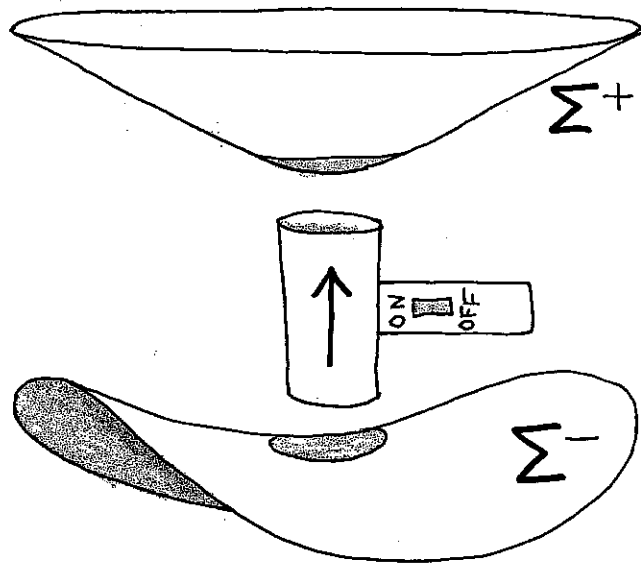
It takes energy from one side and sends it out of the other, in equal quantity - in that way I can dry my hair and chill your soup at the same time.

Wait, that gives me an idea. Do you remember that when blowing either cold air or hot air onto a metal sheet we created NEGATIVE or POSITIVE curves?



We'll put this PETITRON between two surfaces  $\Sigma^+$  and  $\Sigma^-$ . If I start it I'll heat the  $\Sigma^-$  and we'll see what happens.

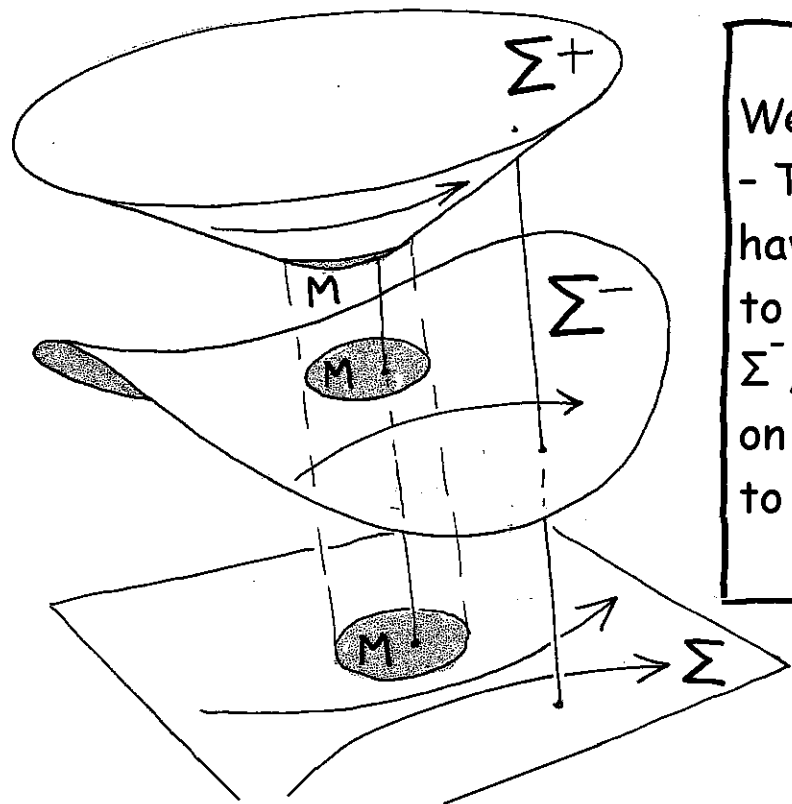




Simple, you create a BLUNTED POSICONE on the surface that receives POSITIVE ENERGY and a BLUNTED NEGACONE on the surface that receives NEGATIVE ENERGY. And as CURVATURE equals ENERGY we will have two regions, face to face, containing equal CURVATURE QUANTITIES but with OPPOSED SIGNS.



We call that CONJOINED GEOMETRIES.

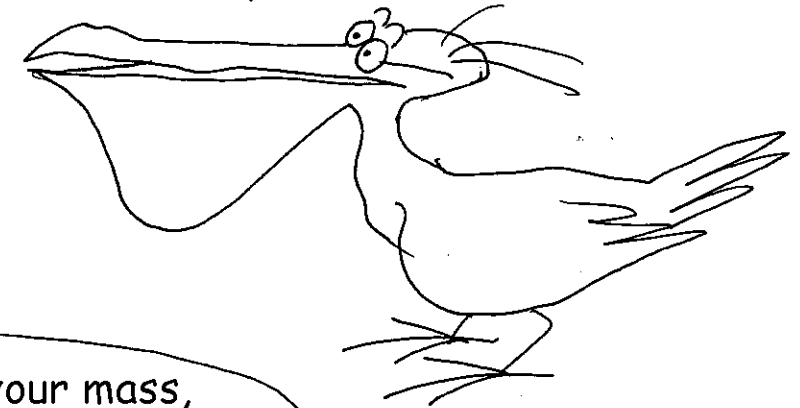


We can associate the points  $M^+$  and  $M^-$  of the two surfaces - The grey regions have opposed curvatures. The white regions have nil curvatures - That is two points  $M_1^+$  and  $M_2^+$  belonging to  $\Sigma^+$  and  $(M_1^-, M_2^-)$  their COMBINED POINTS, on the surface  $\Sigma^-$ , the GEODESIC ARCS  $M_1^+M_2^+$  and  $M_1^-M_2^-$  are not projected on to the plane  $\Sigma$ , a EUCLIDEAN representation according to the SAME CURVES.

The two surfaces  $\Sigma^+$  and  $\Sigma^-$  are the two "caves" of Plato<sup>2</sup>. The plane  $\Sigma$  is the EUCLIDEAN REPRESENTATION that we make of the world - Observers made of opposing masses SEE things totally differently - What is PRESENCE for one is ABSENCE for the other (\*).

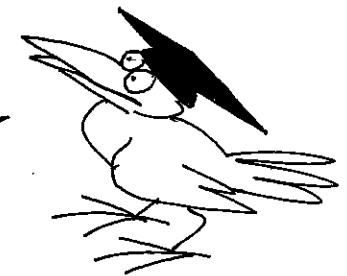


So what is REAL ?



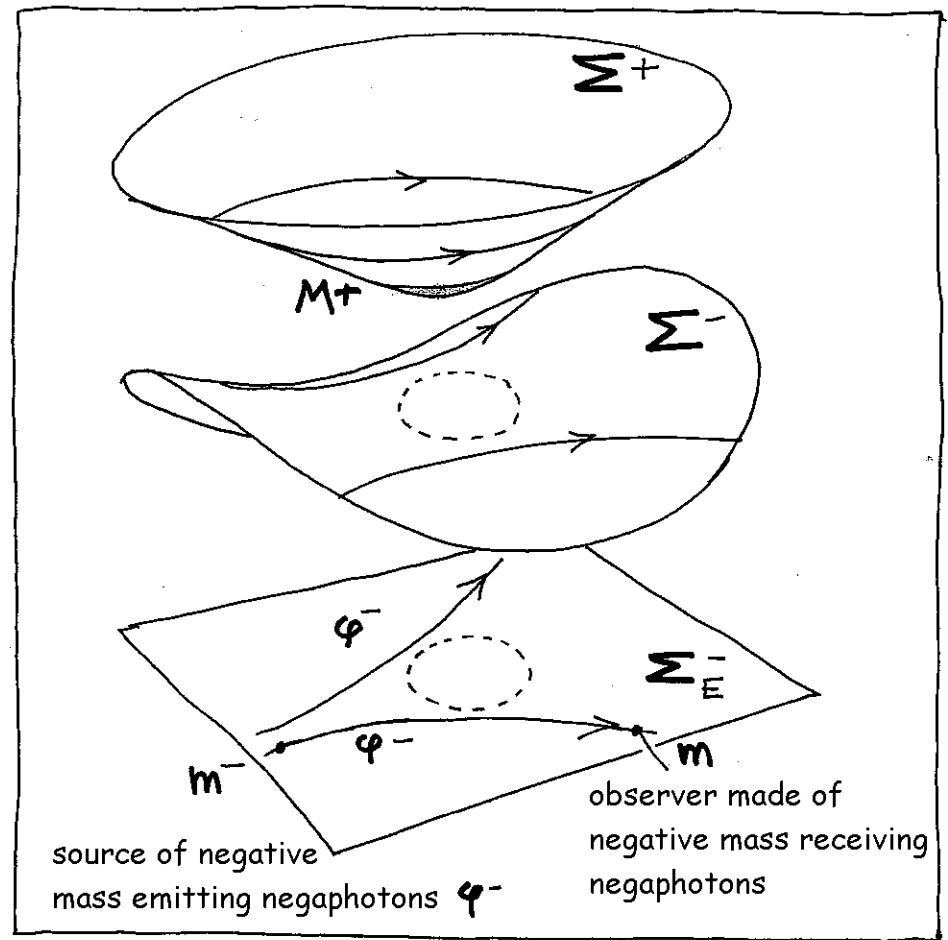
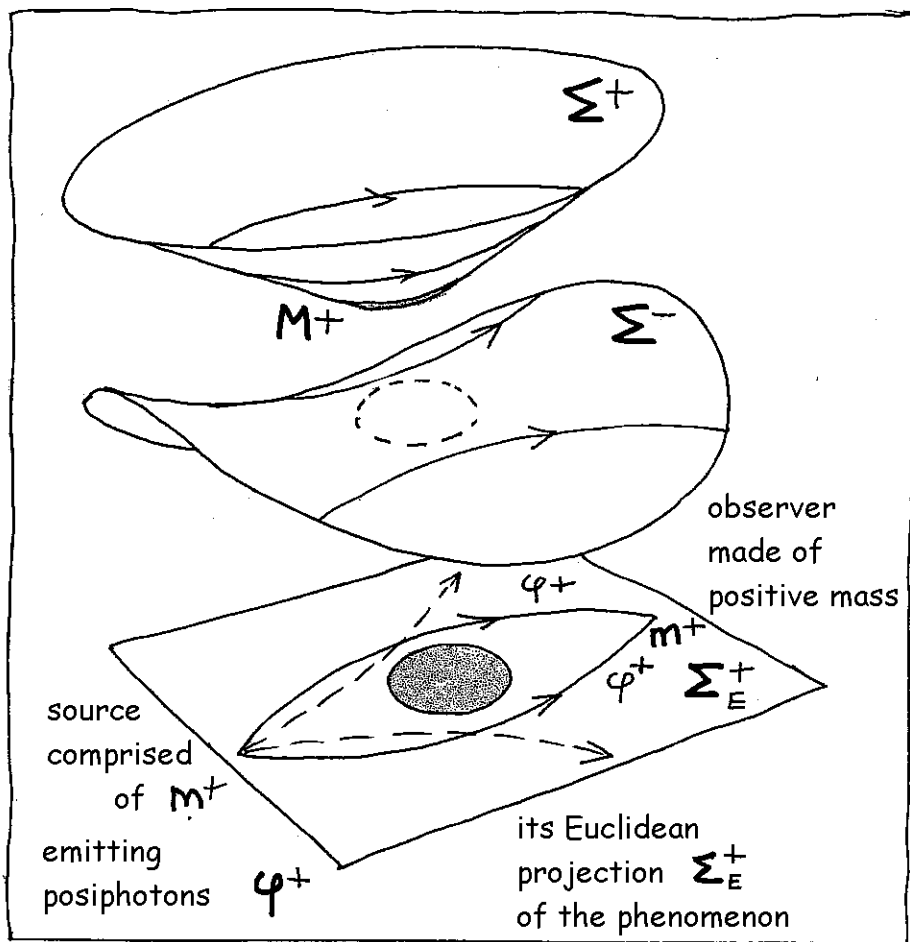
It depends on the sign of your mass,  
the way in which you project the phenomena  
in YOUR world.

Let's go back to the previous figure. Suppose that you are made of positive mass. You will only perceive the projections of the sheet  $\Sigma^+$  on your Euclidian representation  $\Sigma$ . You will only perceive positive energy photons which follow  $\Sigma^+$  geodesics in this  
BIMETRIC MODEL ( $\Sigma^+, \Sigma^-$ )



(\*) from the QUANTUM point of view is a POSSIBILITY OF PRESENCE for an observer  
\* made of positive mass will become a PROBABILITY OF ABSENCE in our NEGAWORLD.





An observer made of positive mass  $m^+$  will observe a **POSITIVE GRAVITATIONAL LENSING EFFECT** which affects the **POSIPHOTONS**, which alone that can make their retina and measuring instruments react.

An observer made of negative mass  $m^-$  will observe a **NEGATIVE GRAVITATIONAL LENSING EFFECT** affecting **NEGAPHOTONS** which alone that can make their retina and measuring instruments react.

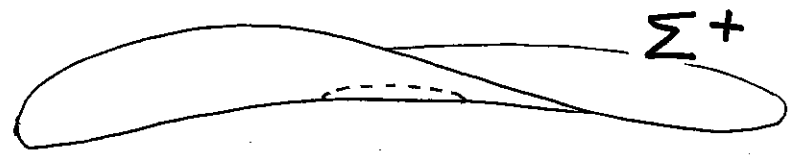
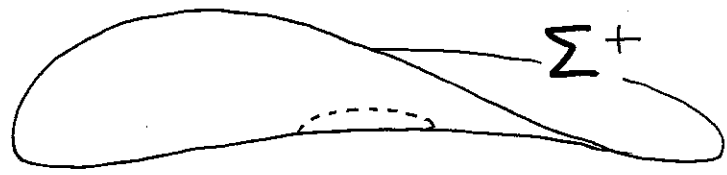
And what if we are dealing with a negative mass  $M^-$  ?



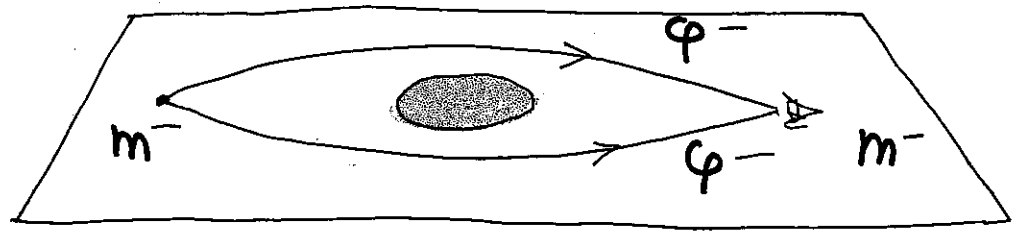
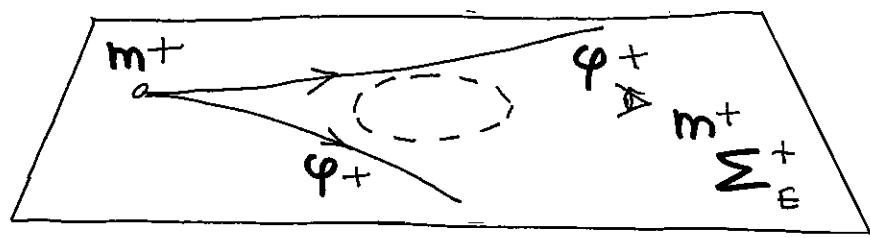
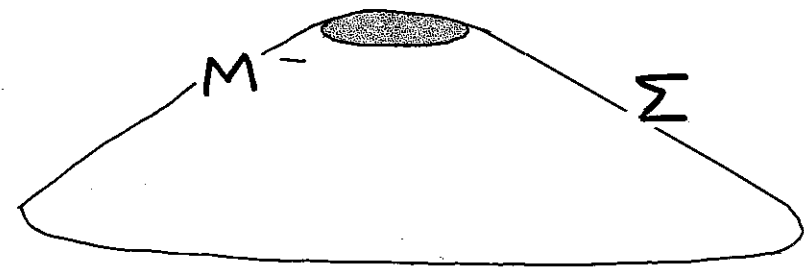
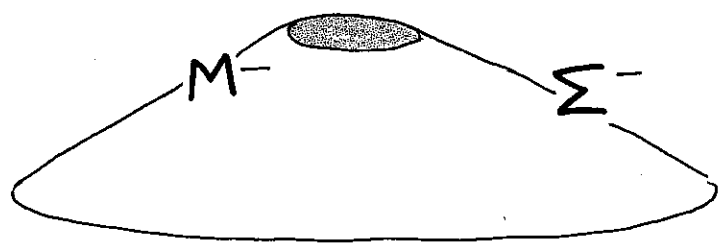
Simple = you just need to invert the figures.



# CONCEPT OF APPARENT MASS



negative mass



observer made of positive mass :  
negative gravitational lensing effect

observer made of negative mass :  
positive gravitational lensing effect

To summarise, masses of the same sign as that of the observer are perceived by him as being **ATTRACTIVE** if not it is the opposite.

That you can discover with a quick look into Newton's law =

$$F = \frac{Gmm}{d^2}$$



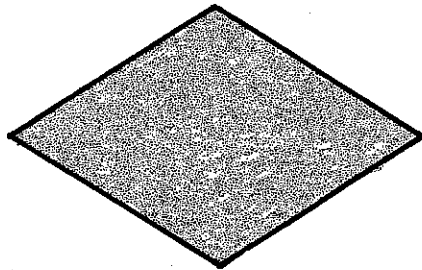
I didn't follow it all.

Nor me...

That's physics, by Jove!

# EPILOGUE

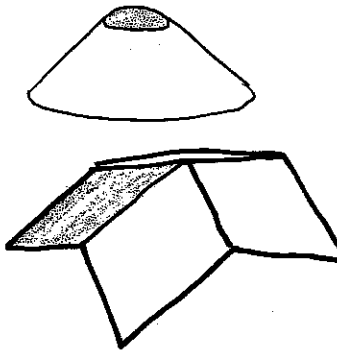
To finish we are going to propose a little exercise to illustrate that what is a positive curvature for one, is a negative curvature for another - For this we are going to imagine a world filled with people of positive and negative masses forming a regular paving. You just need to assemble the lozenges in cardboard to form an alternation of POSICORNERS and NEGACORNERS.



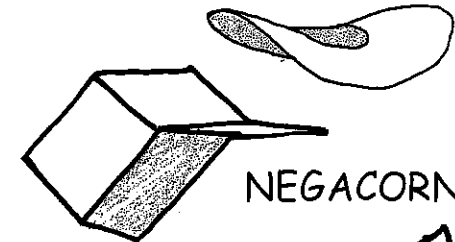
You will be constructing the POLYHEDRIC REPRESENTATION opposite.

*The Management*

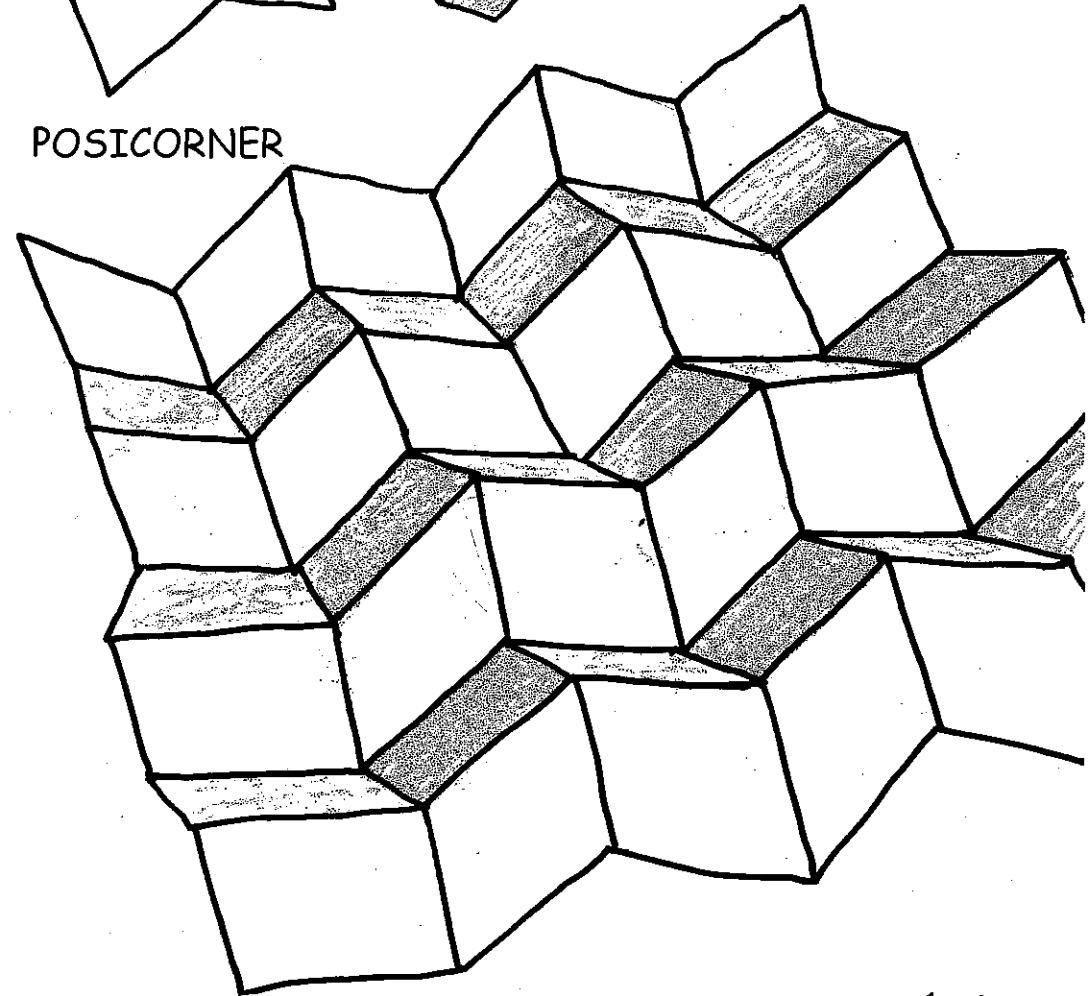
POSIKONE

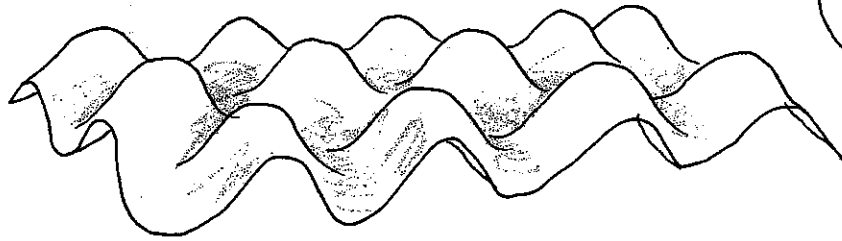


NEGACONE



POSICORNER

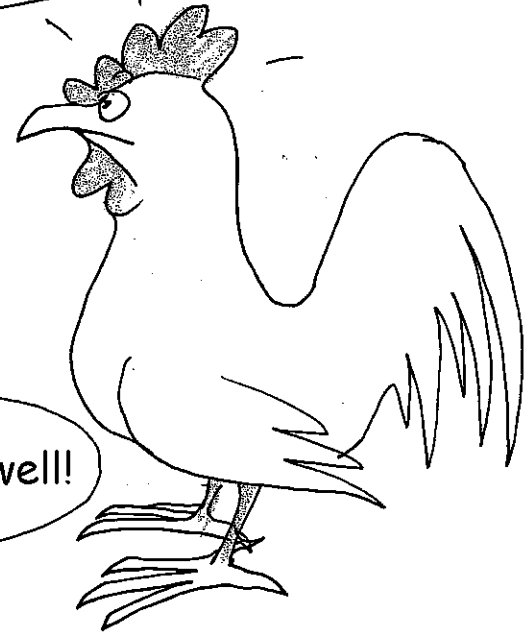
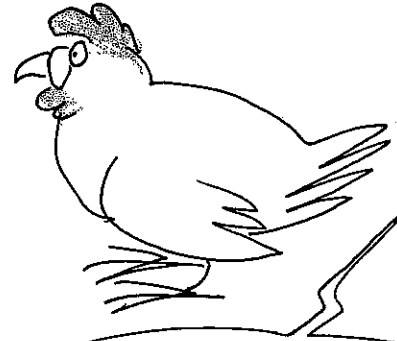




By moving two of these structures you will be putting the posicorners and negacorners face to face.

There are plenty of other things to tell you, for example on DISCRETIZING the caves (of PLATO)<sup>2</sup> but, as Kipling said...

It's like racks designed for putting eggs laid by POSICHICKENS and NEGACHICKENS.



Oh no, don't you start as well!

That's another story



# THE END