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(jyu@phya.snu.ac.kr)

http://phya.snu.ac.kr/~mi_ma/



Time Machine

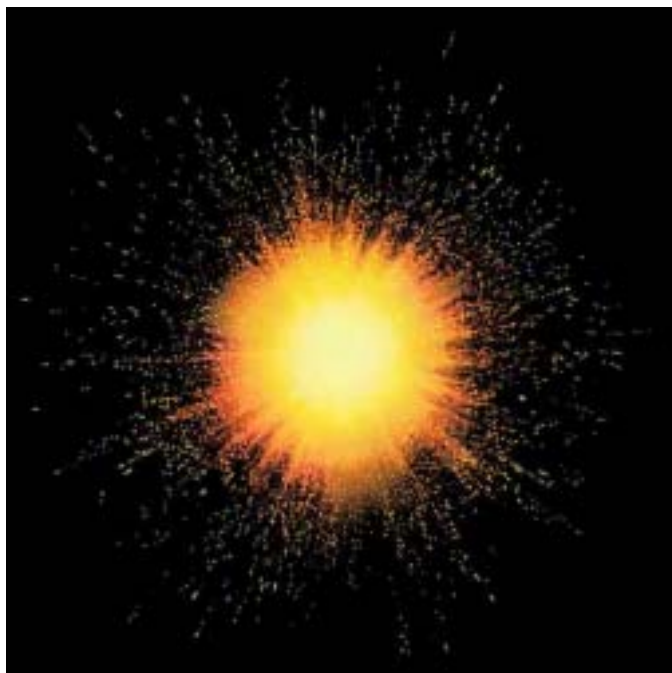


Lessons from the Past



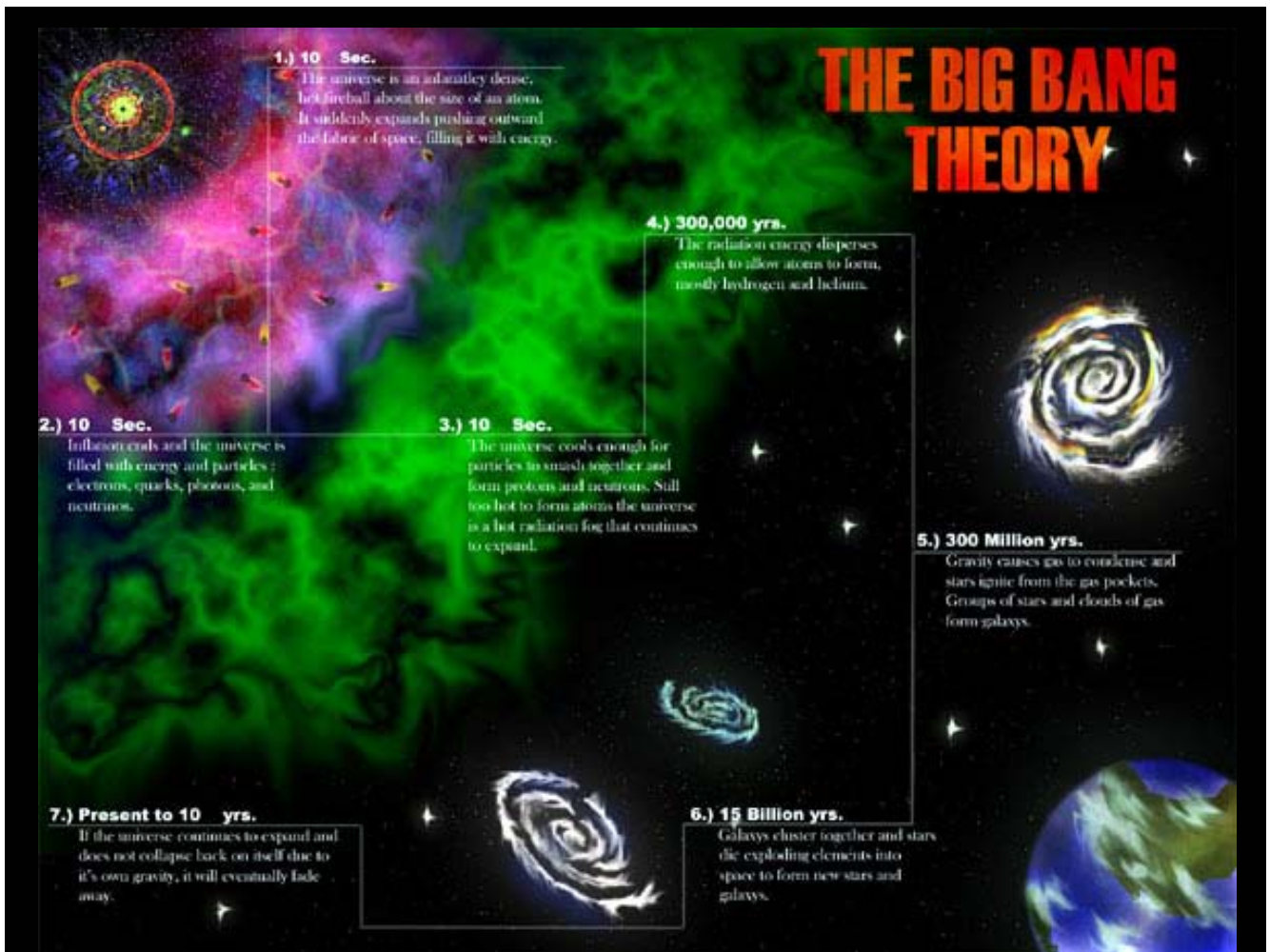
The Persistence of Memory, S. Dali (1931)

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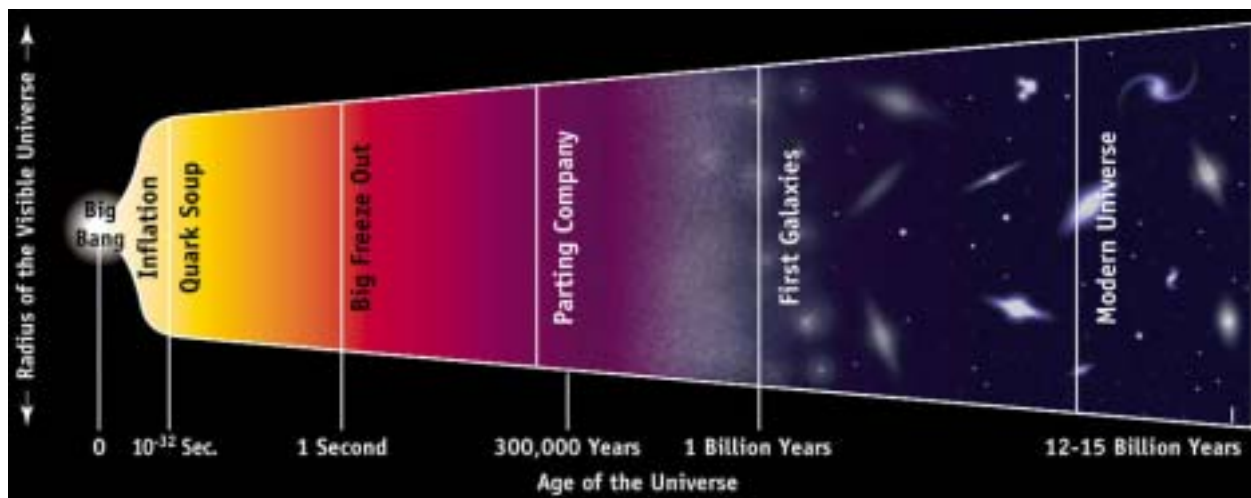


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A Brief History of the Universe



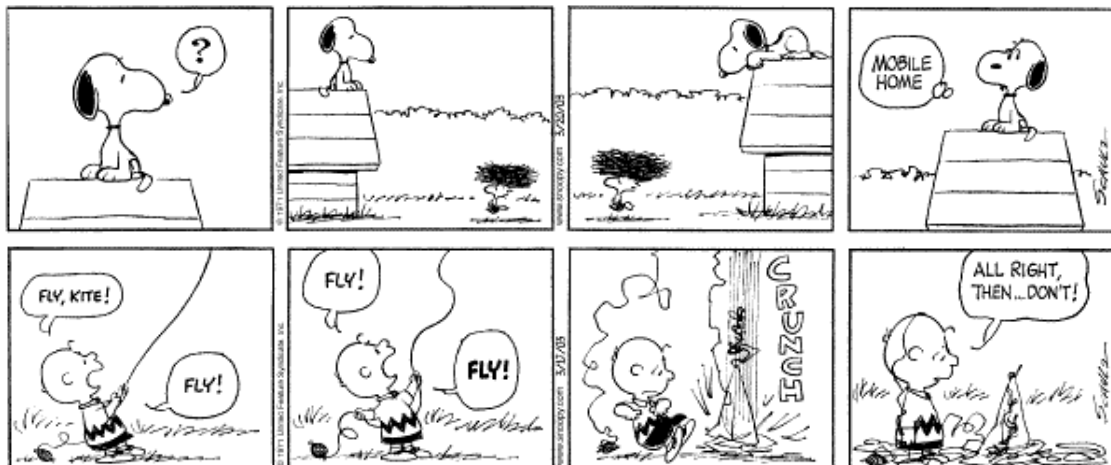
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A walk through time: <http://physics.nist.gov/GenInt/Time/time.html>

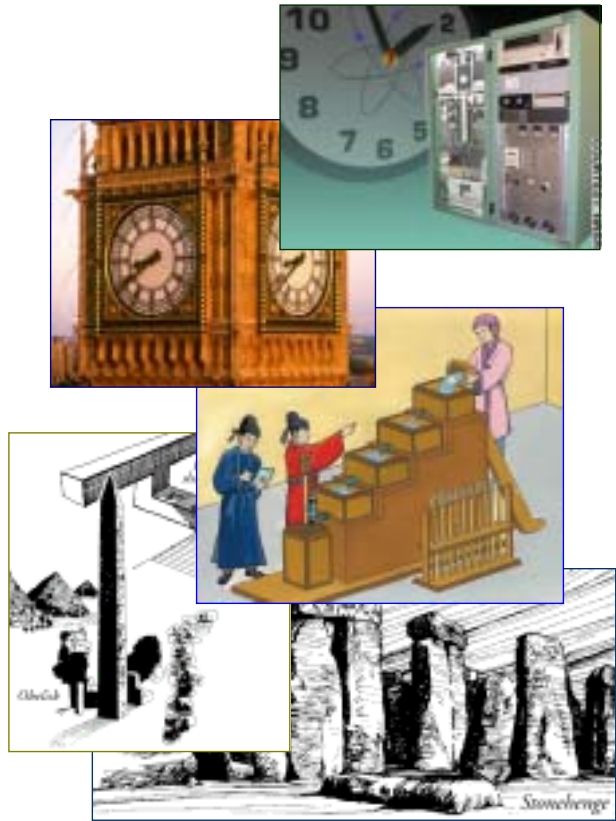
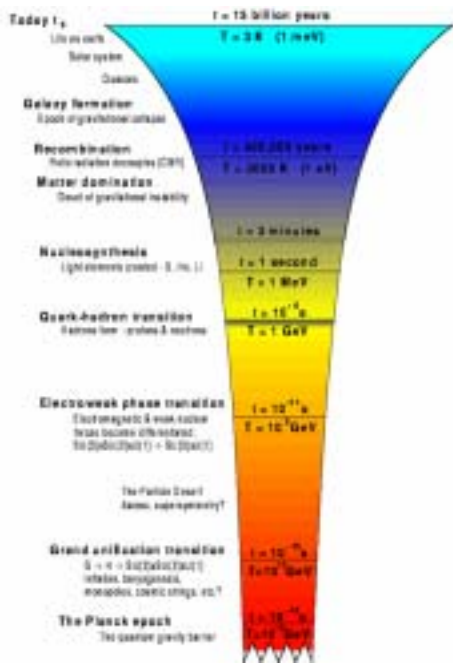
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 → (c) : 30 km
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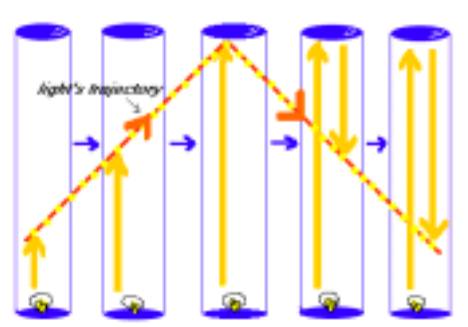


$$c^2 R^2 = v^2 R^2 + W^2$$

$$R^2 (c^2 - v^2) = W^2$$

$$R(1 - v^2/c^2) = W/c$$

$$t = 2W/c \cdot 1/\sqrt{1 - v^2/c^2}$$

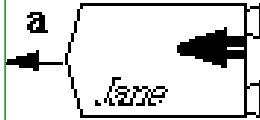
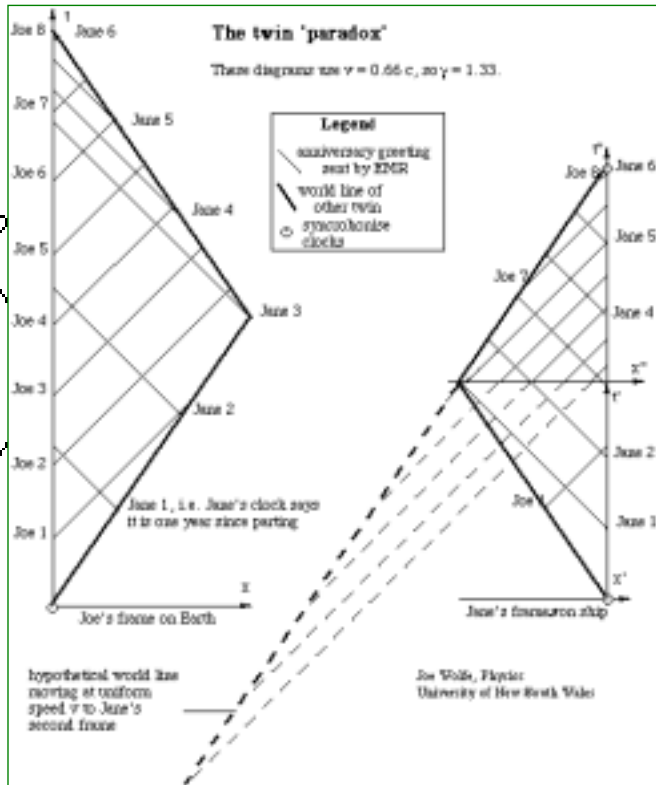
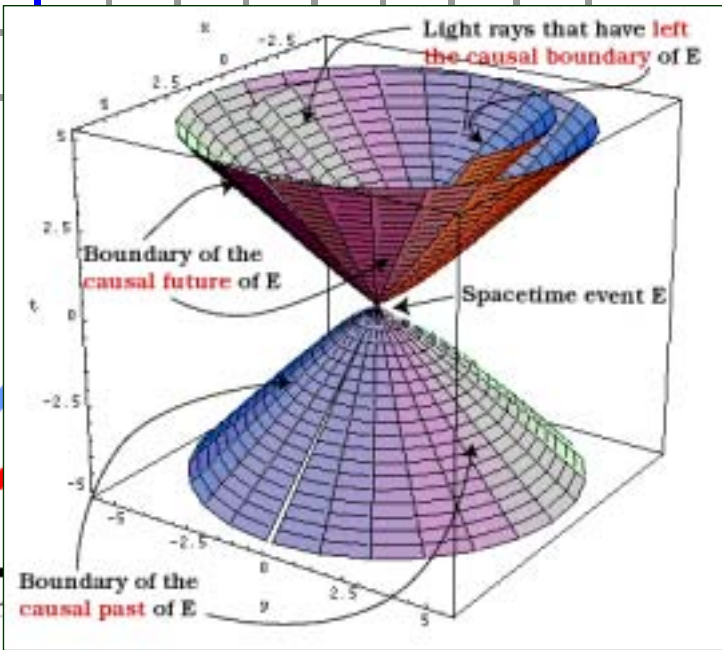
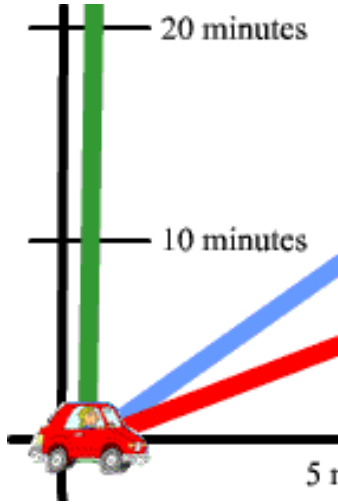


<http://www.cco.caltech.edu/~phys1/java/phys1/Einstein/Einstein.html>

Space-time: <http://info.hartwick.edu/physics/spacetime.html>



$$L_{12}^2 = (X_2 - X_1)^2 + (Y_2 - Y_1)^2$$



Ref: Twin paradox -- http://math.ucr.edu/home/baez/physics/Relativity/SR/TwinParadox/twin_paradox.html

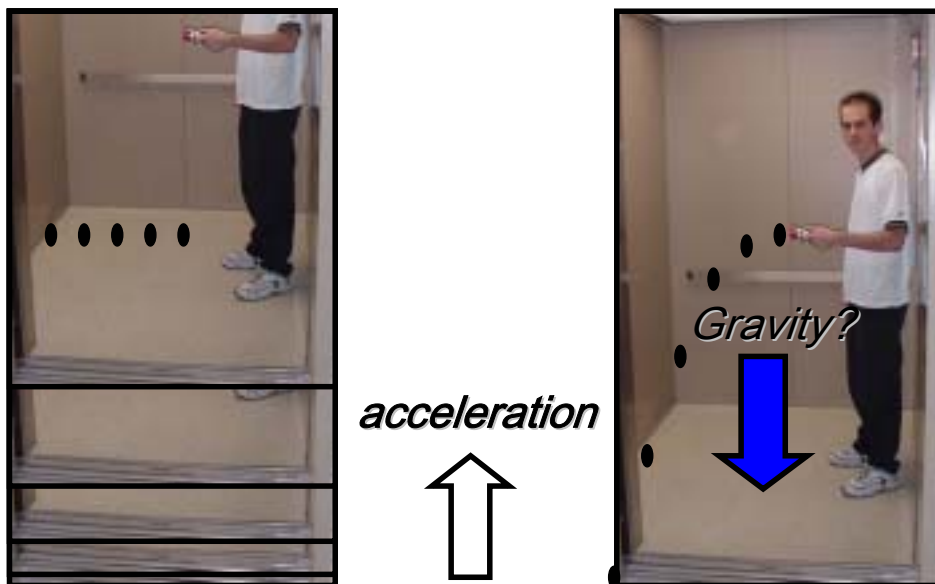
가 (Principle of Equivalence)

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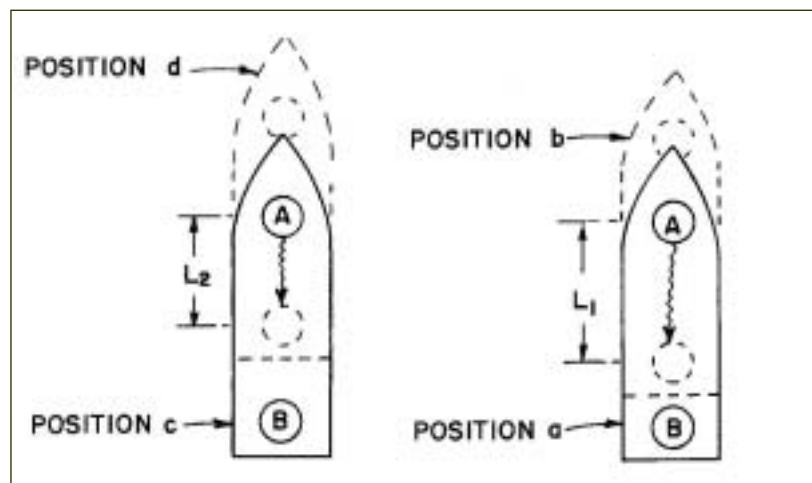
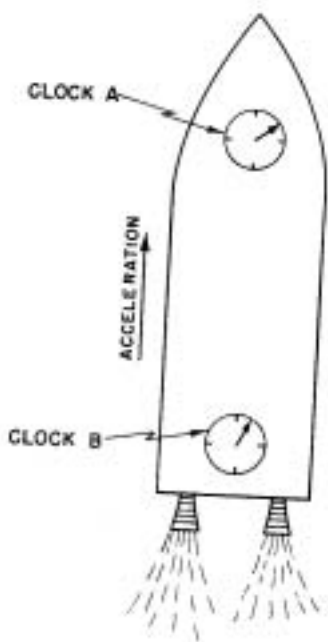
Ref: Relativity -- <http://zebu.uoregon.edu/~js/ast122/lectures/lec17.html>
* : http://quarknet.fnal.gov/talks/QNet_overview.ppt

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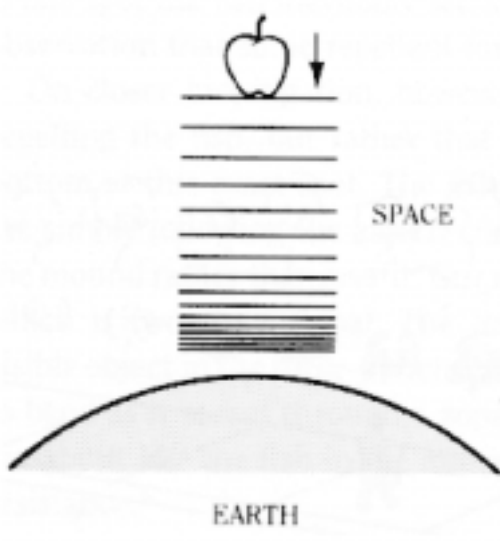
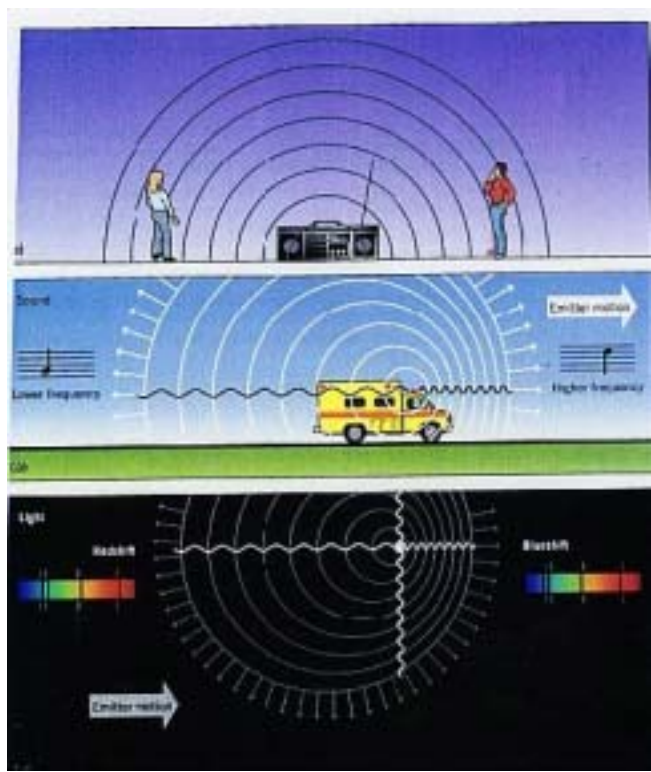




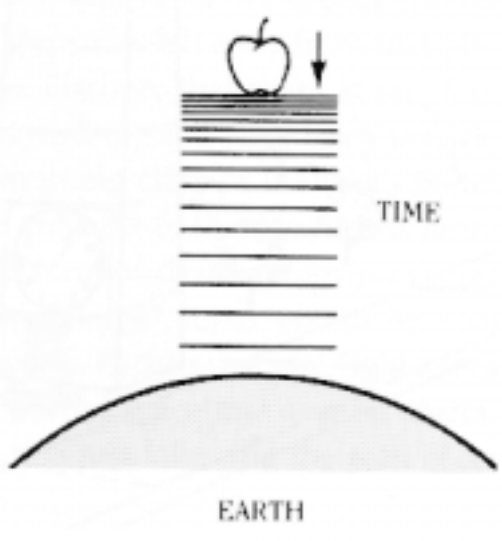
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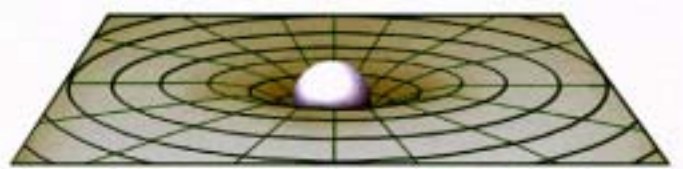
$$\Delta t_B = \left(1 - \frac{gh}{c^2}\right) \Delta t_A = \left(1 - \frac{\Delta\phi}{c^2}\right) \Delta t_A$$



Space contracts near mass and dilates away from it.



Time dilates near mass and contracts away from it.



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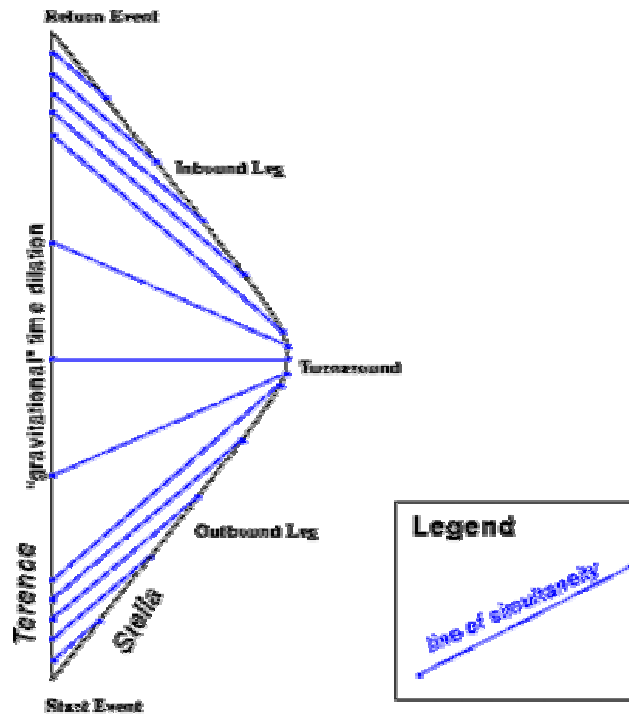


Figure 3: The "GR" explanation

Ref: Twin paradox -- http://math.ucr.edu/home/baez/physics/Relativity/SR/TwinParadox/twin_paradox.html

