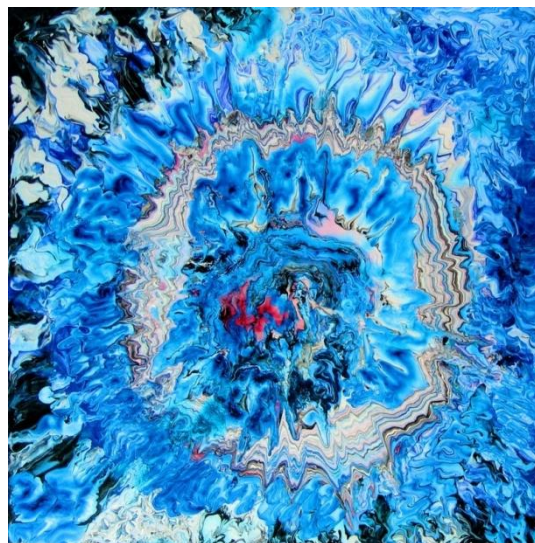


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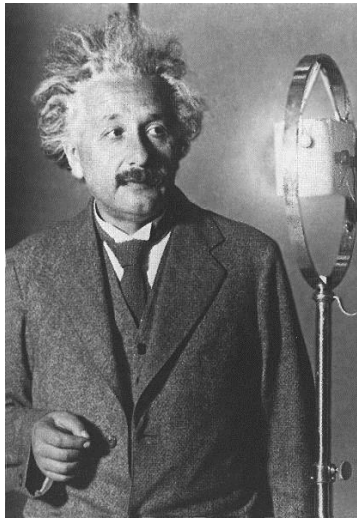
Etienne KLEIN

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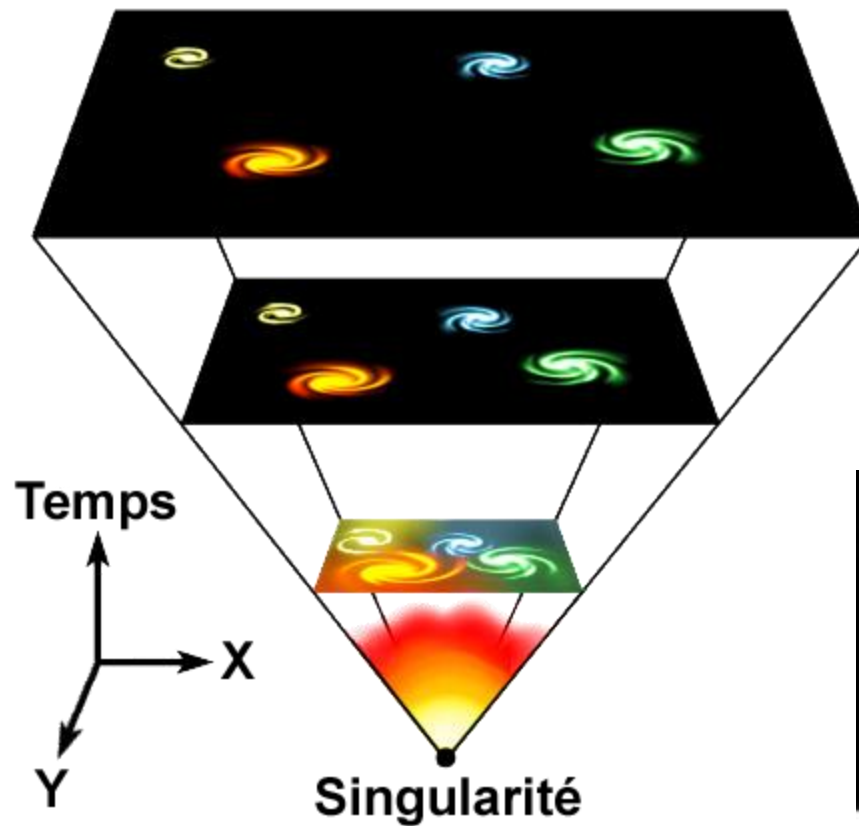
QUEL LIEN ENTRE L'ORIGINE D'UNE CHOSE ET CETTE CHOSE ?



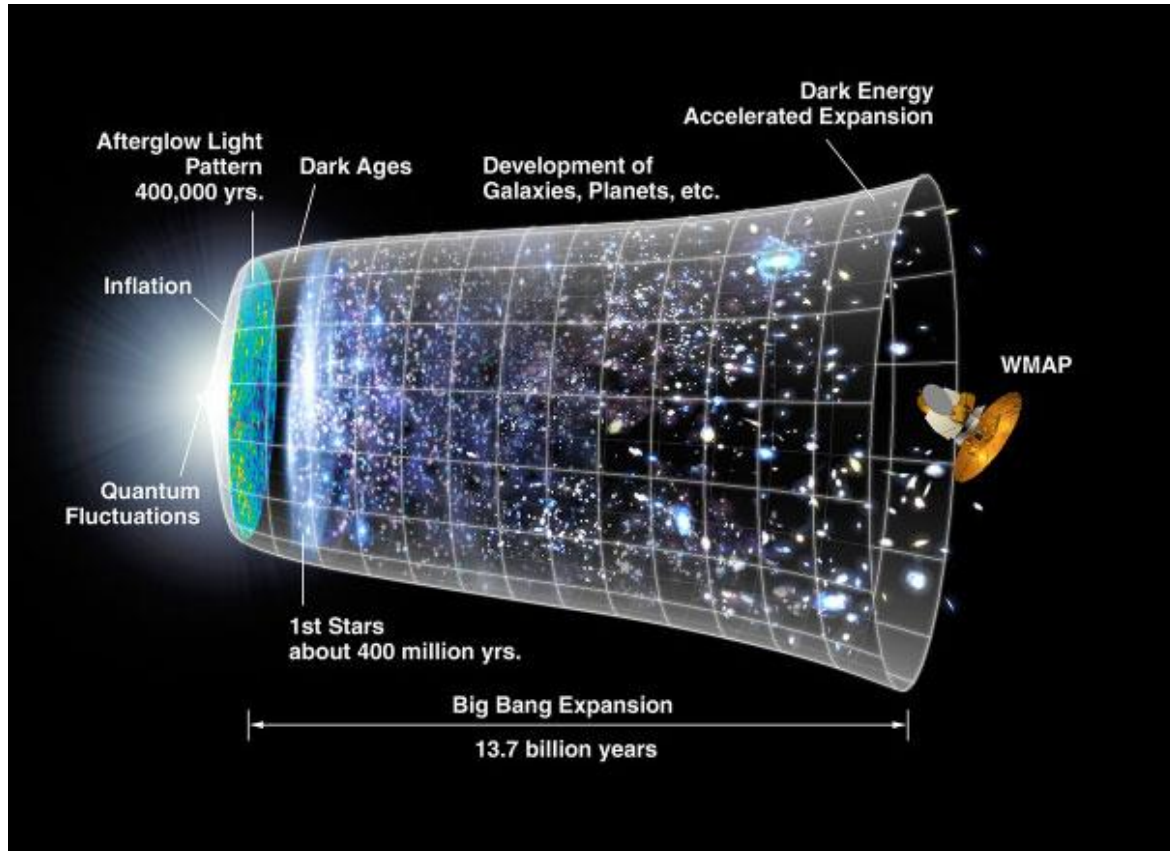
EN ROUTE VERS LE « BIG BANG » (1)



EN ROUTE VERS LE BIG BANG (2)



MAIS N'Y A-T-IL PAS UN MAIS ?



COMMENT ESCALADER LE MUR DE PLANCK ?

Etant donné un mur, qu'y a-t-il derrière ?

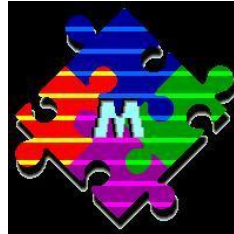
Jean Tardieu



(Gilbert Garcin)



QUE DEVIENT LA COSMOLOGIE EN AMONT DU MUR DE PLANCK ?

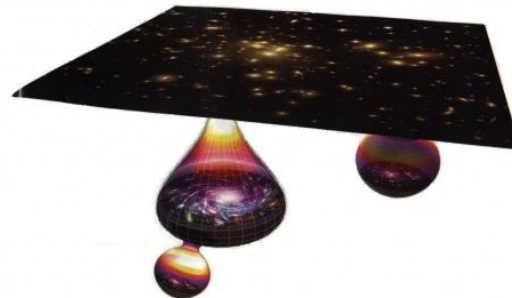
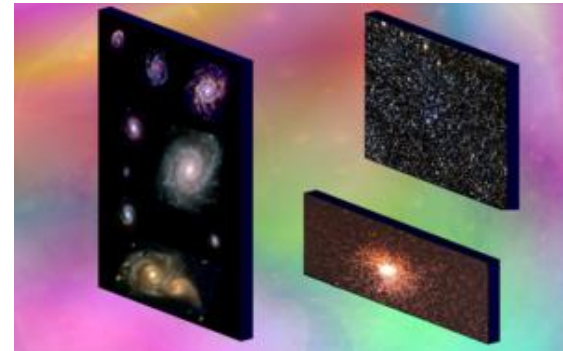


Two Views of the Beginning

In our expanding universe, galaxies rush away from one another like a dispersing mob. Any two galaxies recede at a speed proportional to the distance between them: a pair 500 million light-years apart separates twice as fast as one 250 million light-years apart. Therefore, all the galaxies we see must have started from the same place at the same time—the big bang. The conclusion holds even though cosmic expansion has gone through periods of acceleration and deceleration; in spacetime diagrams (below), galaxies follow sinuous paths that take them in and out of the observable region of space (yellow wedge). The situation became uncertain, however, at the precise moment when the galaxies (or their ancestors) began their outward motion.

In standard big bang cosmology, which is based on Einstein's general theory of relativity, the distance between any two galaxies was zero a finite time ago. Before that moment, time loses meaning.

In more sophisticated models, which include quantum effects, any pair of galaxies must have started off a certain minimum distance apart. These models open up the possibility of a pre-bang universe.



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