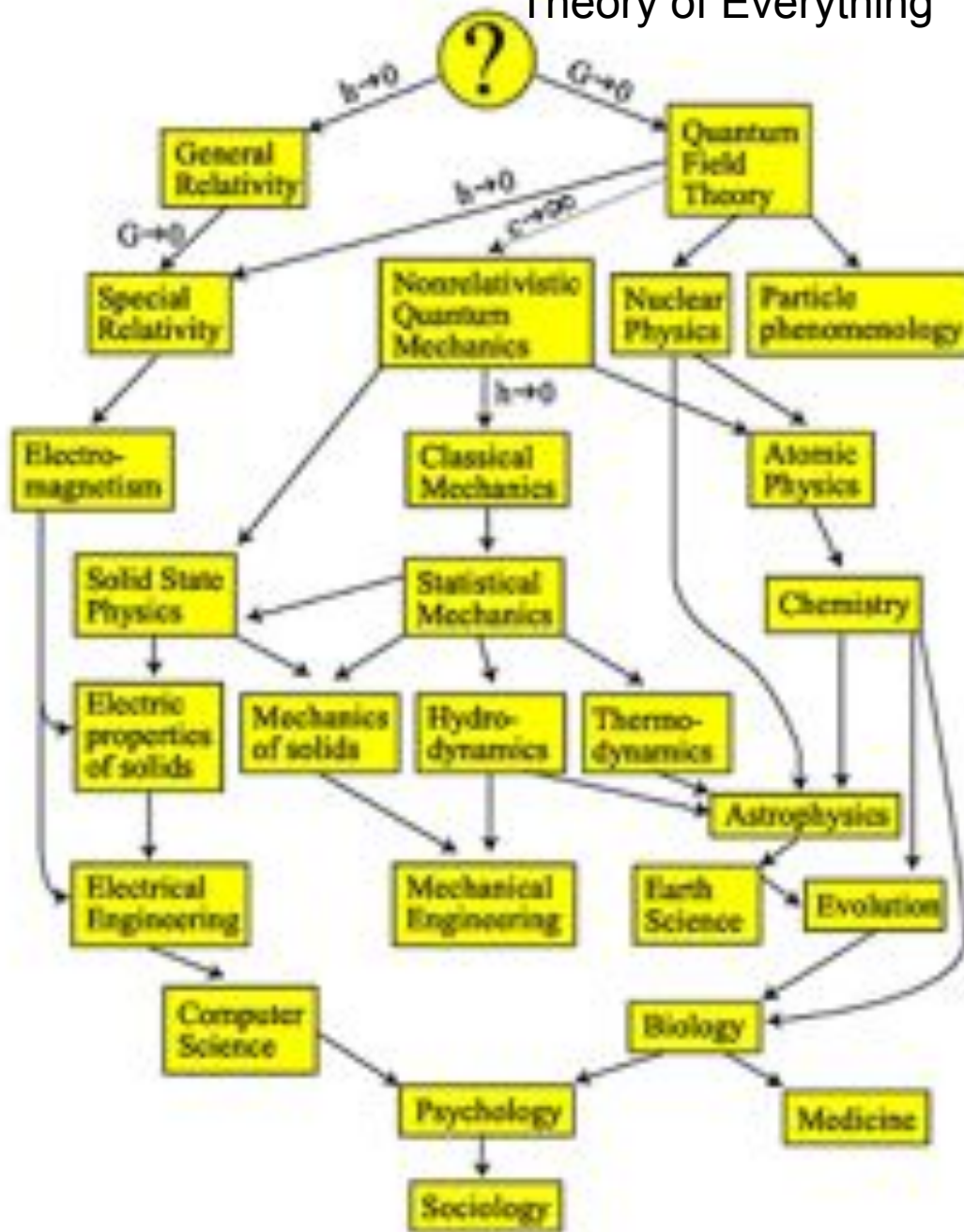


Costas Efthimiou

PHYSICS-INSPIRED
PAINTING

Theory of Everything



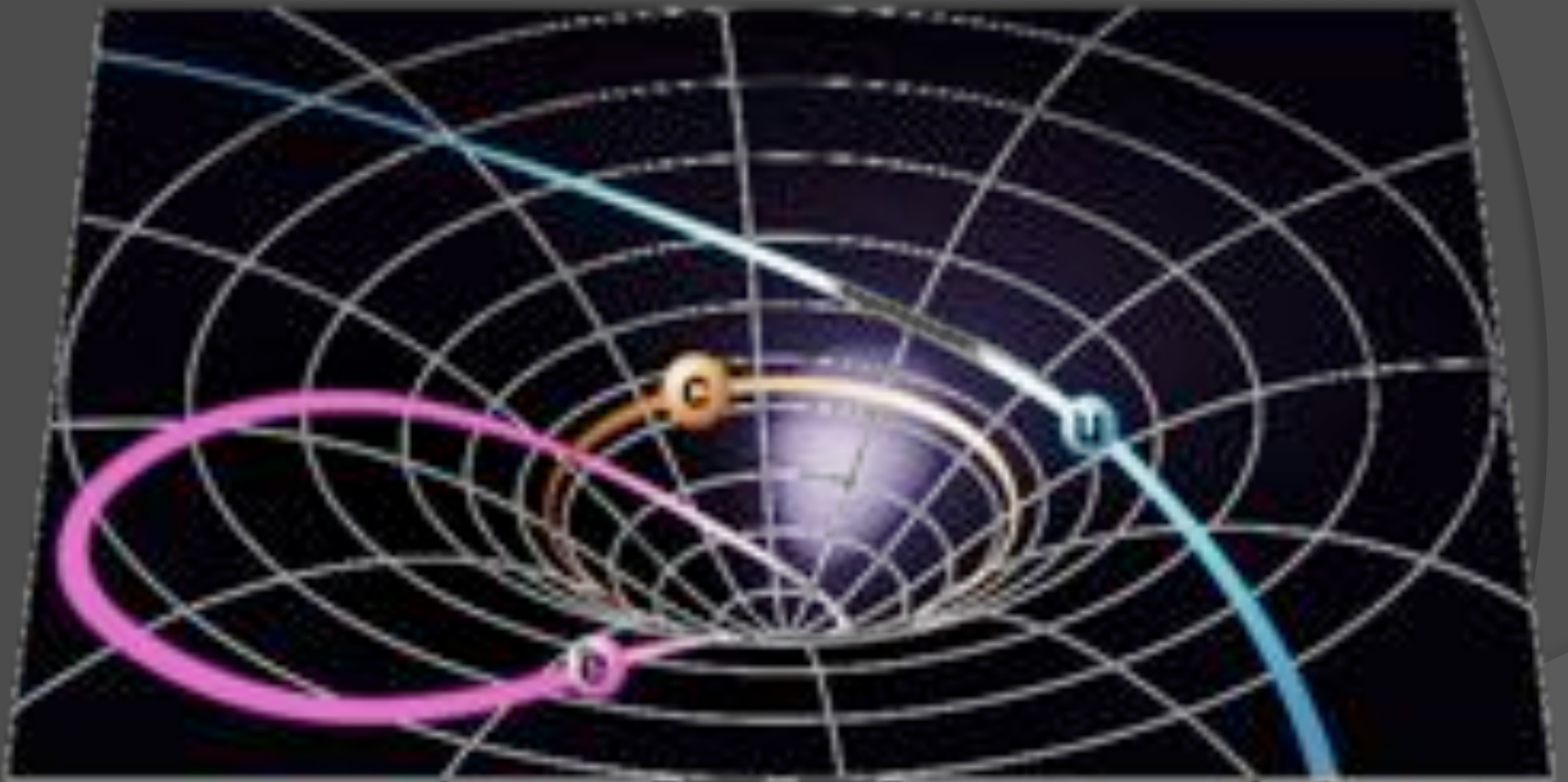
... DIGITALLY REMASTERED
... PLAZA COLLECTION EDITION

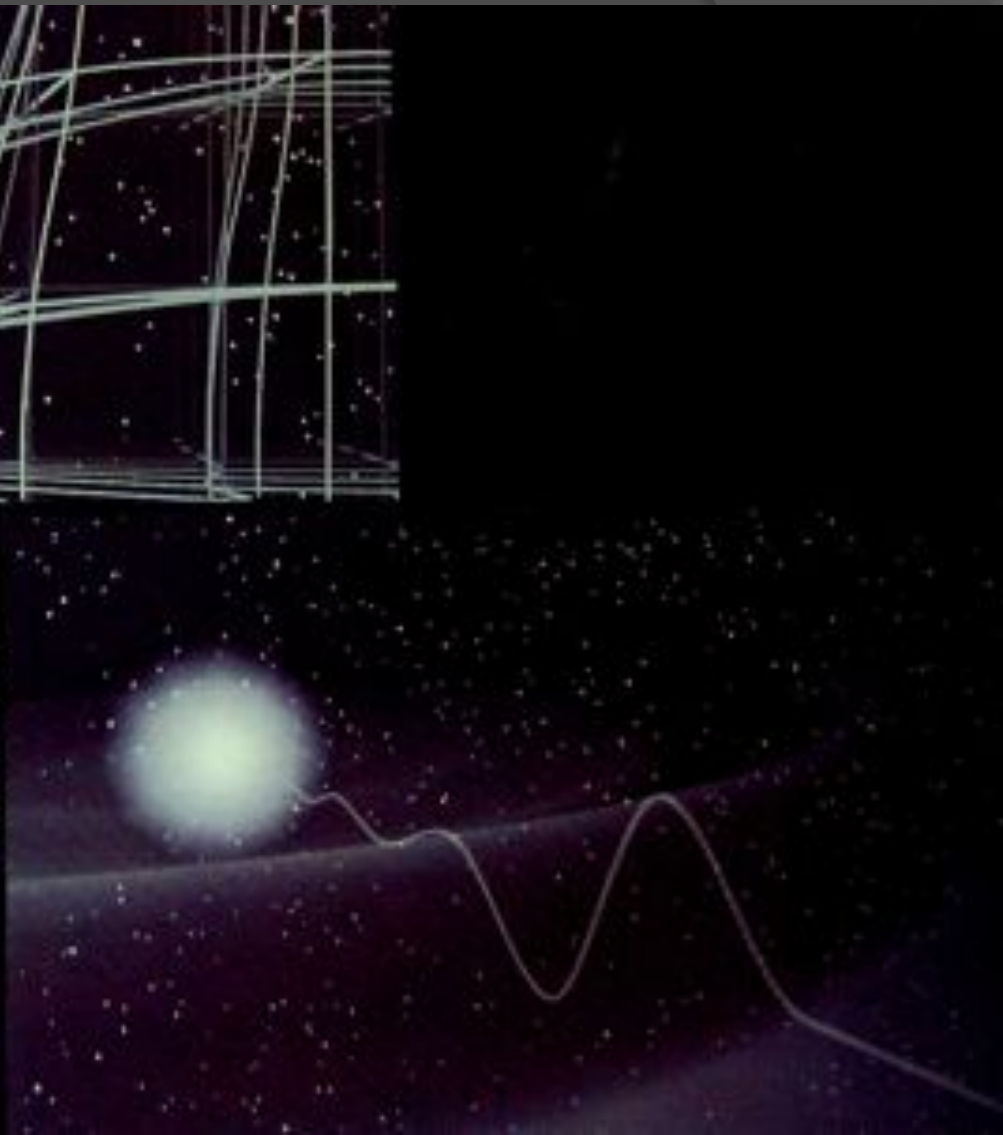
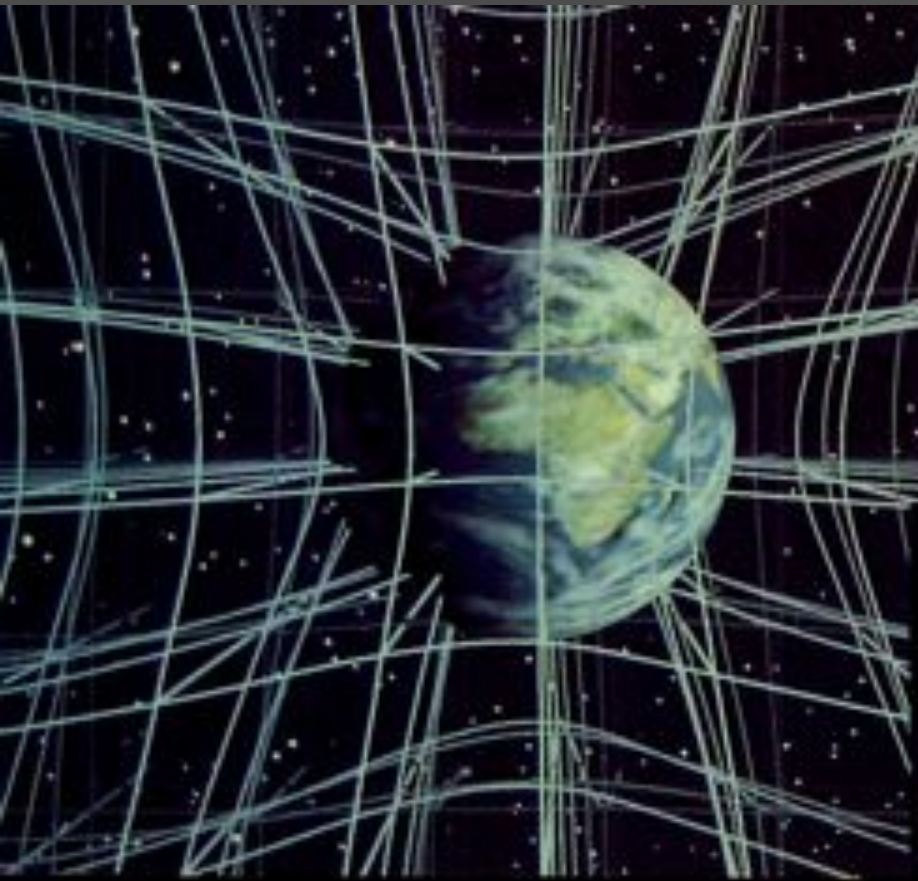


COSMOS
CARL SAGAN

THE SAGAN AND PLAZA COLLECTOR'S EDITION

[From Volume 8: Relativity](#)







Cosmos



Romeo Niram

$$\Delta x \Delta p \geq \frac{\hbar}{2}$$

If you know where you are, you do not know where you go.

And

If you know where you go, you do not know where you are.



Uncertainty

Patience Welch



The Disintegration of Memory
c. 1952-1954



Salvador Dalí

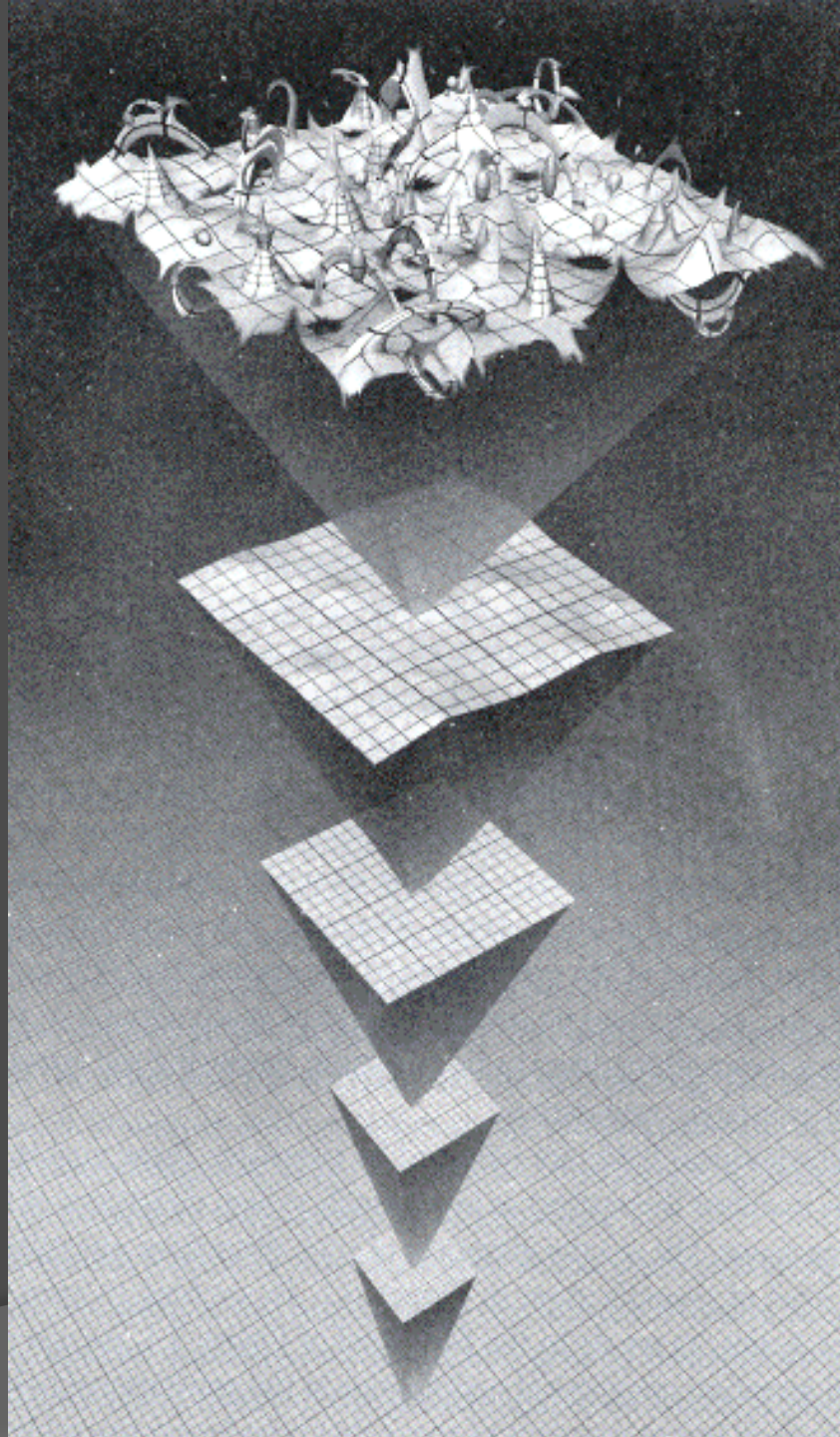
$$\Delta p \Delta x \geq \frac{1}{2} \hbar$$

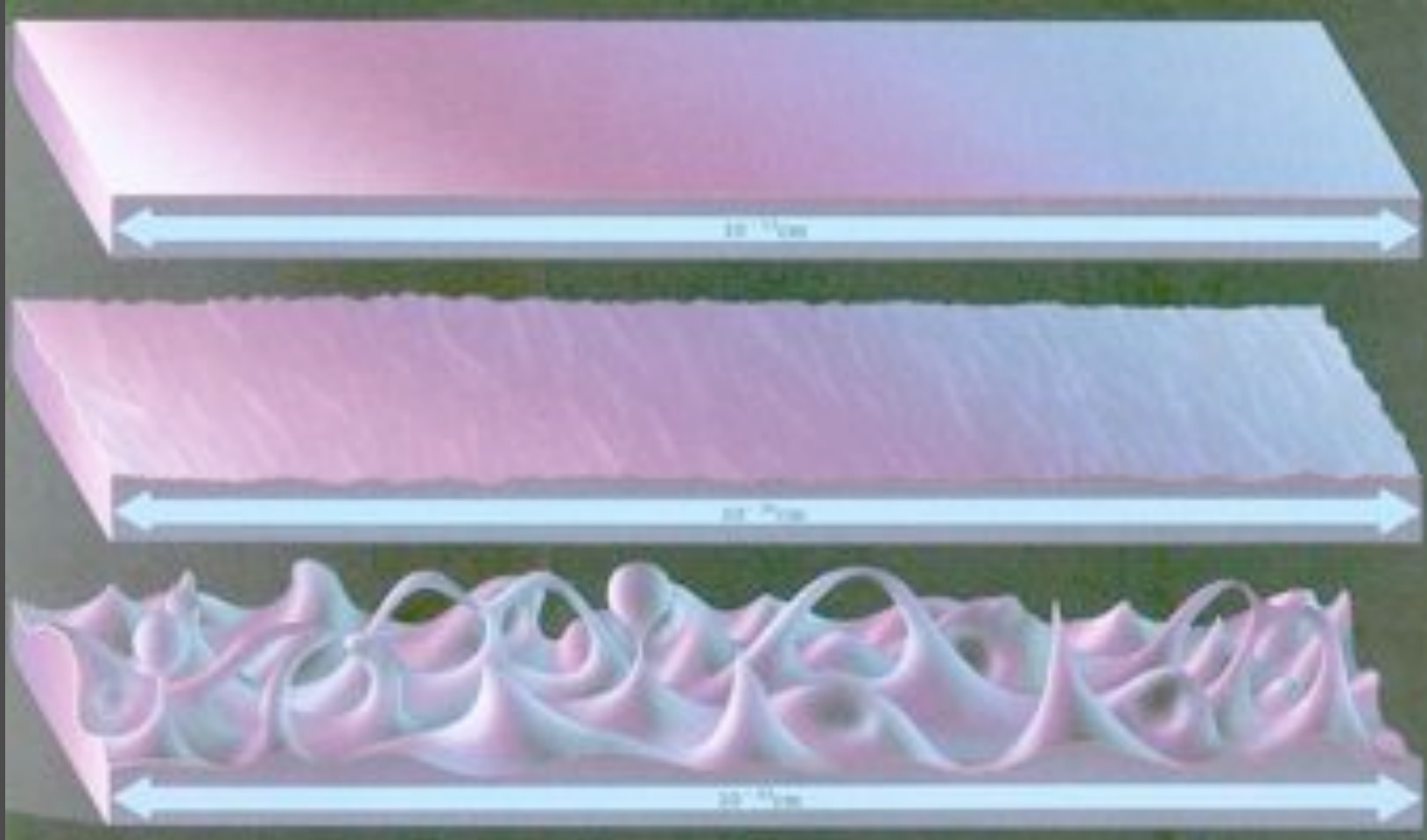
$$\Delta E \Delta t \geq \frac{1}{2} \hbar$$

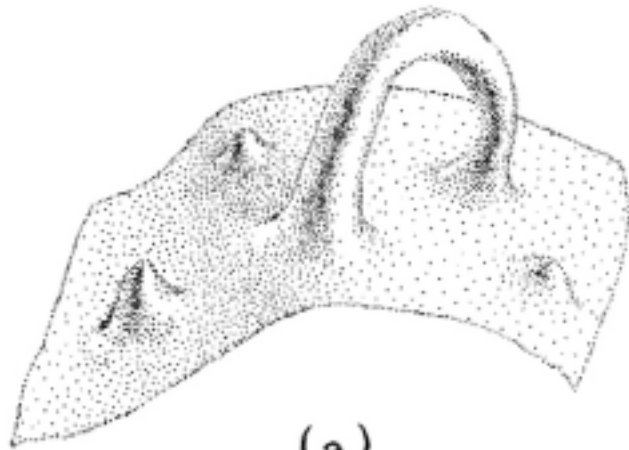
Heisenberg's Uncertainty Principle says that if we focus our attention on smaller regions of space, the uncertainties in space and time (known as spacetime quantum fluctuations) get quite severe.

QUANTUM FOAM

Quantum fluctuations manifest themselves as increasingly violent distortions of spacetime. At the quantum level, spacetime is turbulent and violent warpings occur continuously.



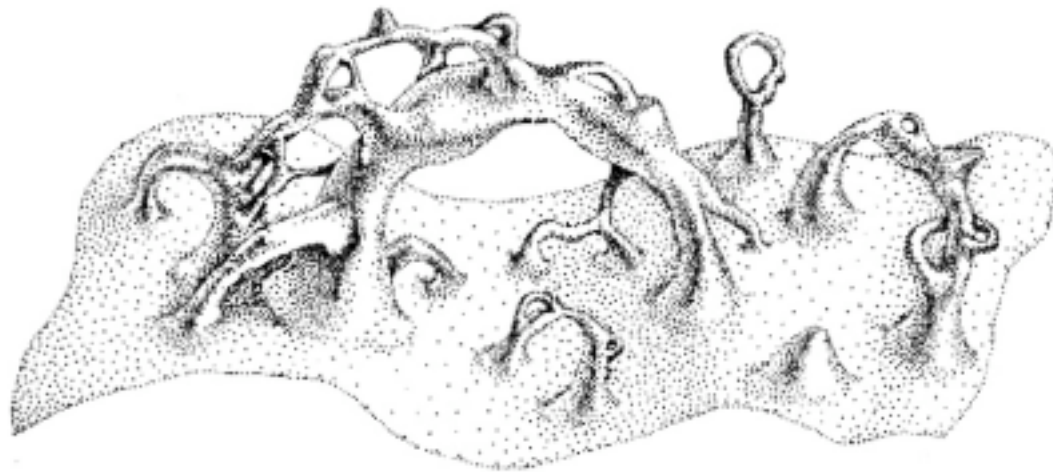




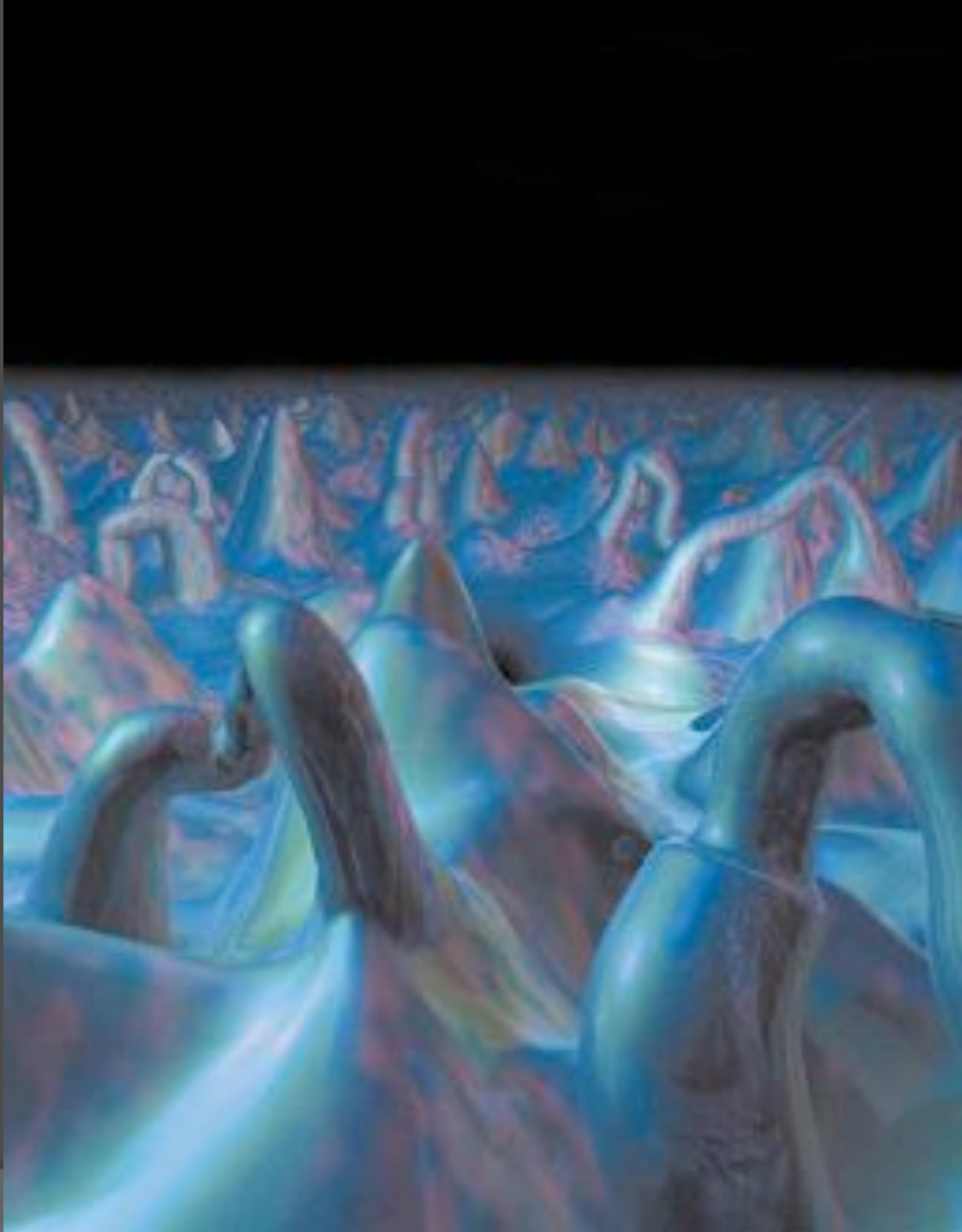
(a)



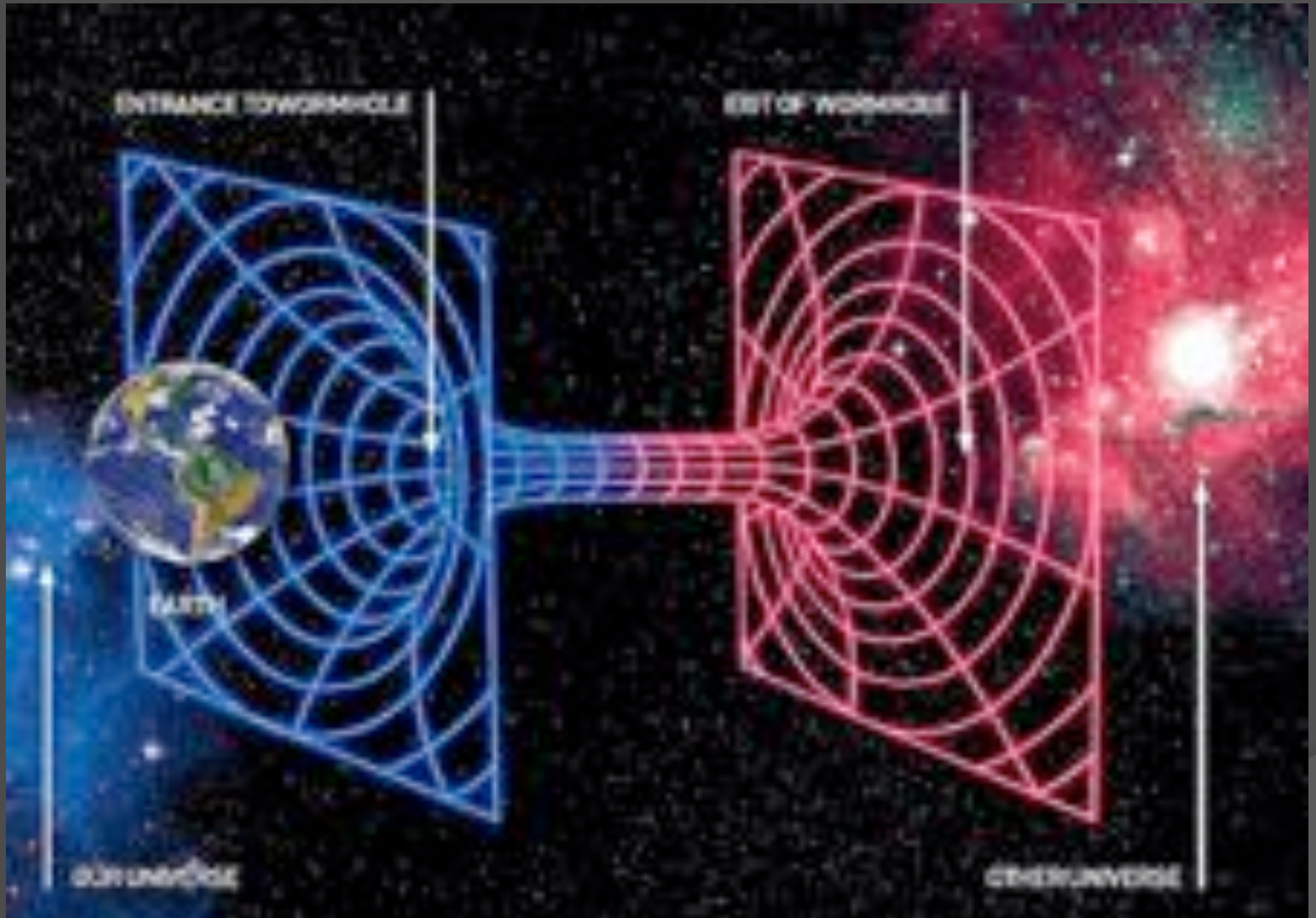
(b)



(c)

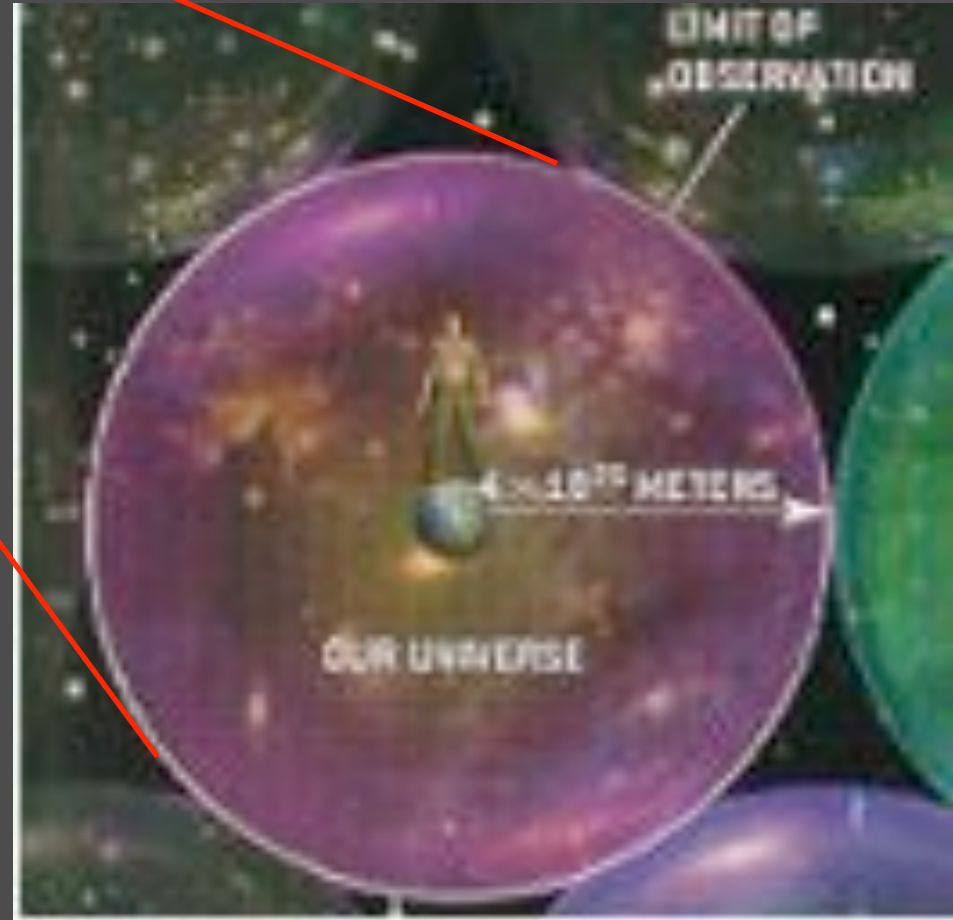






our universe

Our universe is everything we **can** observe. Since light travels with finite speed, it has traveled only a given distance since the birth of the **cosmos**; outside this distance we cannot see.

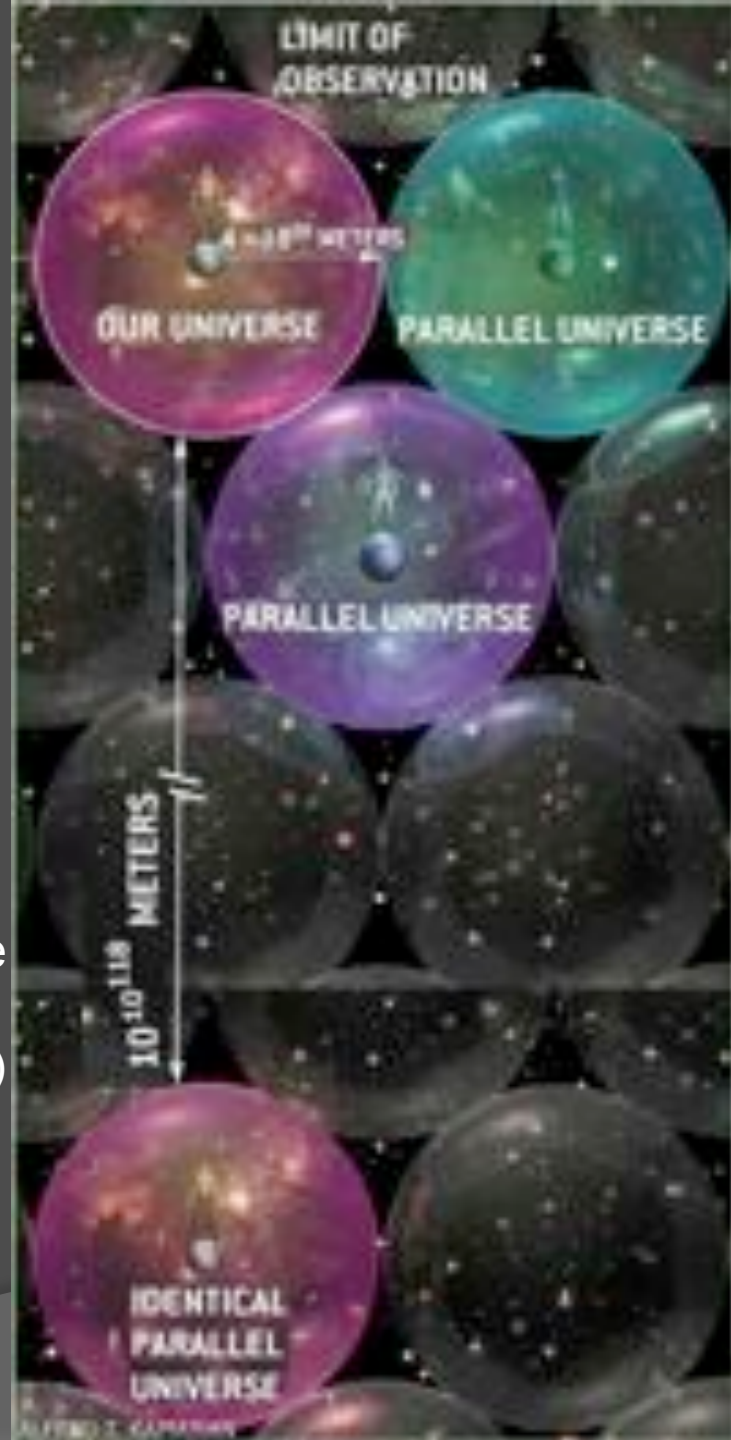


But if this idea is valid, then the cosmos looks like a set of bubbles, each bubble being a separate universe.

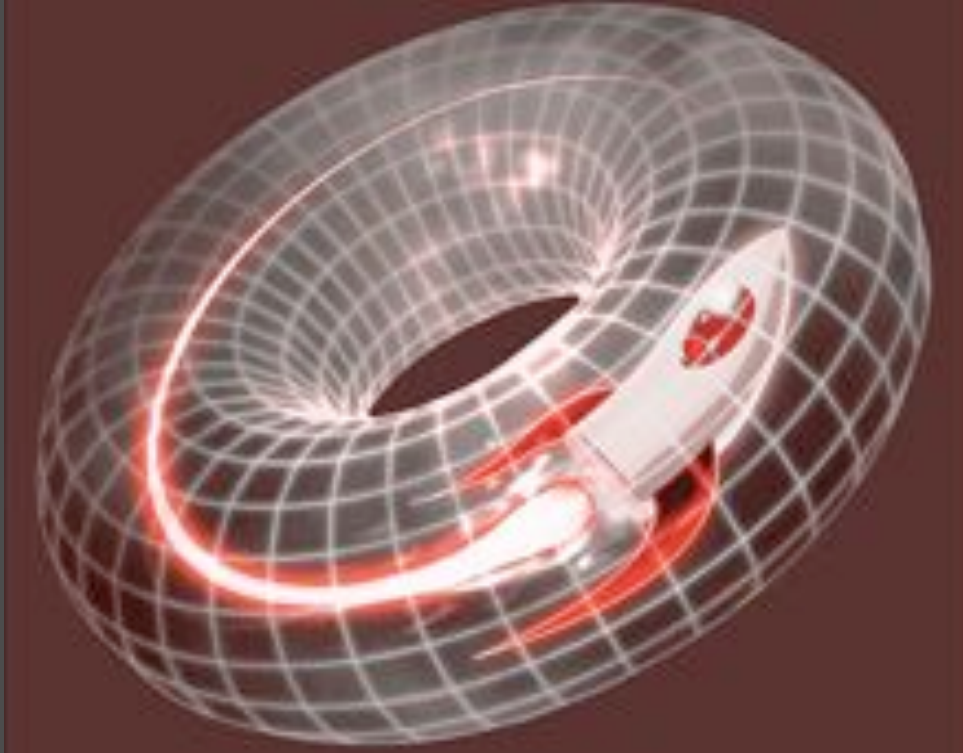
If the cosmos is infinite, then there are infinite bubbles (universes).

But if there are infinite universes, one can show with mathematics that for each of them there is at least another identical universe. Moreover, one can compute the maximum possible distance between them!

In fact, one can show that all kinds of possibilities are possible (e.g. two universes with the exact same history up to 2000 AD and different history thereafter) and find the distance between such universes!







1. What is time?
2. Why is it directional?
3. Is time finite? (It seems to have a beginning. Does it have an end?)
4. Could time be cyclic?
5. Is there more than one time direction?
6. Can we travel to the past?
7. Can we resolve the time paradoxes?
8. If time travel is allowed, where are the time travelers?

The Grandfather Paradox

Costas travels back in time to January 1, 1920.



if **Constantinos is killed by Costas**,
Constantin is never born,
Costas is never born,

Constantinos is not killed,
Constantin is born,
Costas is born,

Constantinos is killed by Costas,
Constantin is never born,
Costas is never born,

Constantinos is not killed,
Constantin is born,
Costas is born,
Constantinos is killed by Costas,

...





... the universe is not only queerer than we suppose, it is queerer than we *can* suppose.

J.B.S. Haldane