

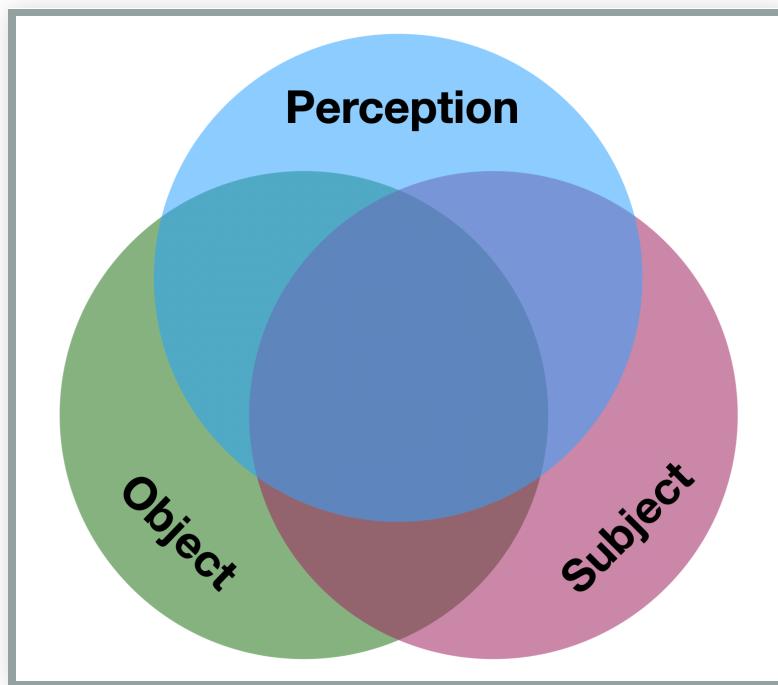
GUIDING QUESTION

How real is reality?

- true nature of phenomena

Is the world the way we perceive it?

THE BIG PICTURE



Any perception requires all three

OPPOSITES OF REAL

- dreams
- hallucinations
- deceptions
- projections

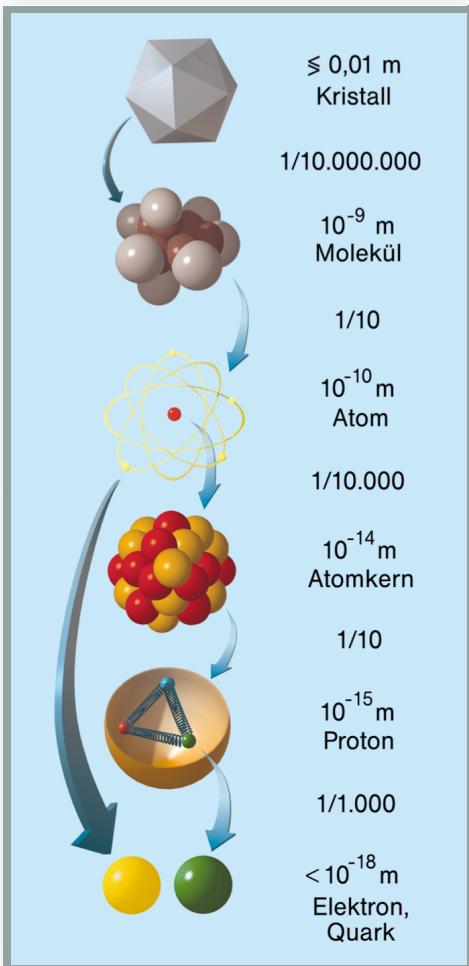


WHAT MEANS 'REALITY'?

All we perceive, the way we perceive it

- size
- weight
- color / taste / smell ...
- solidity
- age
- consistency
 - lastingness
 - causality
 - nature = appearance
- independence
- objectivity
- individuality
- variety

THE BRICKS OF THE CASTLE OF REALITY

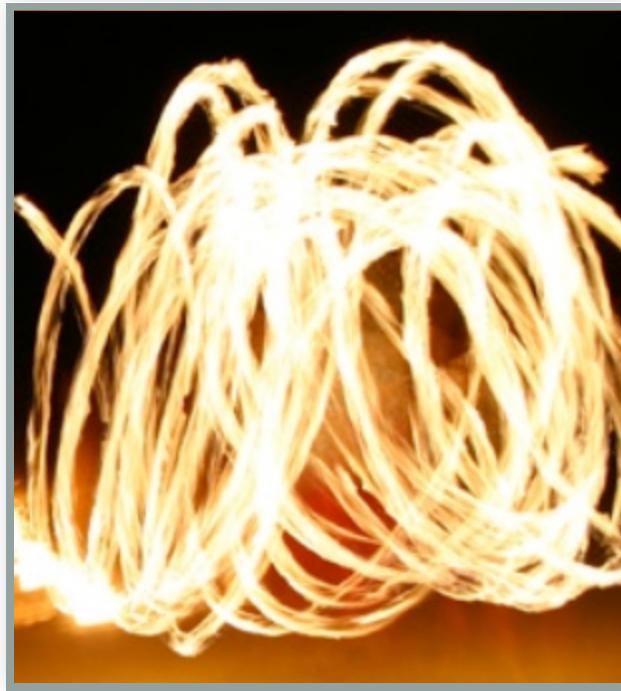


Reality is not the way we perceive it

"nature \neq appearance"

q,e have no size

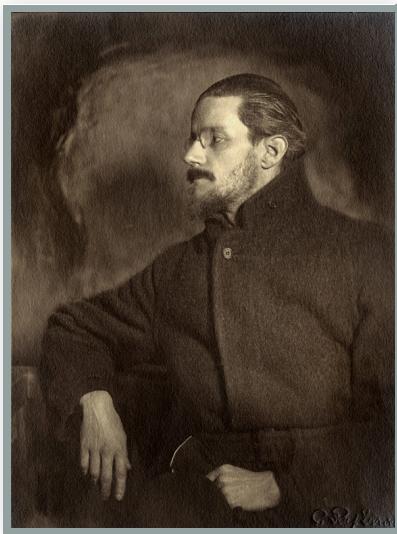
PUFFING UP



Solidity and permanence result from our time-window

QUARK UND ELEKTRONEN

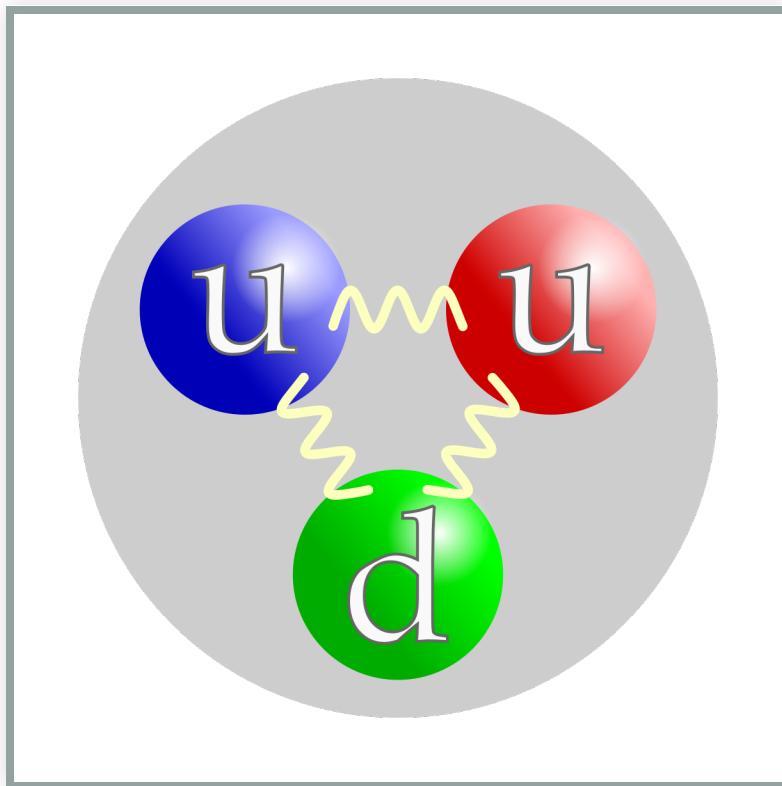
James Joyce 1882 - 1941



Finnegans Wake: "Three quarks for muster mark"

TOGETHER FOREVER

Quarks cannot exist alone



COLLAPSING VARIETY

ALL objects consists of mainly

- electrons
- up and down quarks
- exchange particles = forces

PERFECT EQUALITY

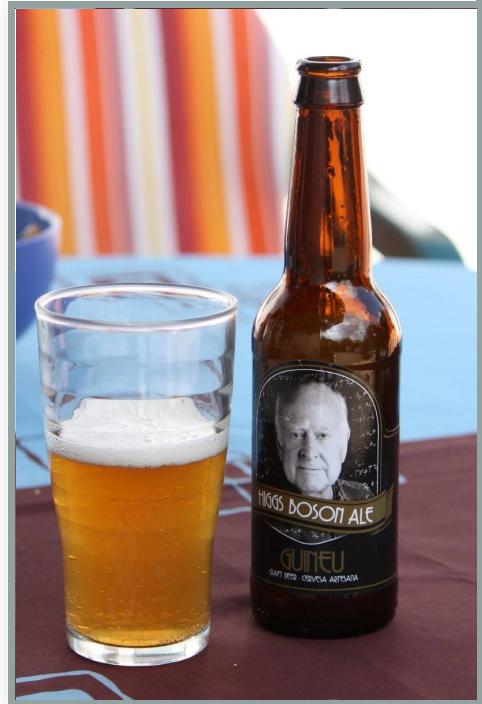
Absolutely no differences in the microcosmos



Thus there is no such thing as age

THE GREAT MISUNDERSTANDING

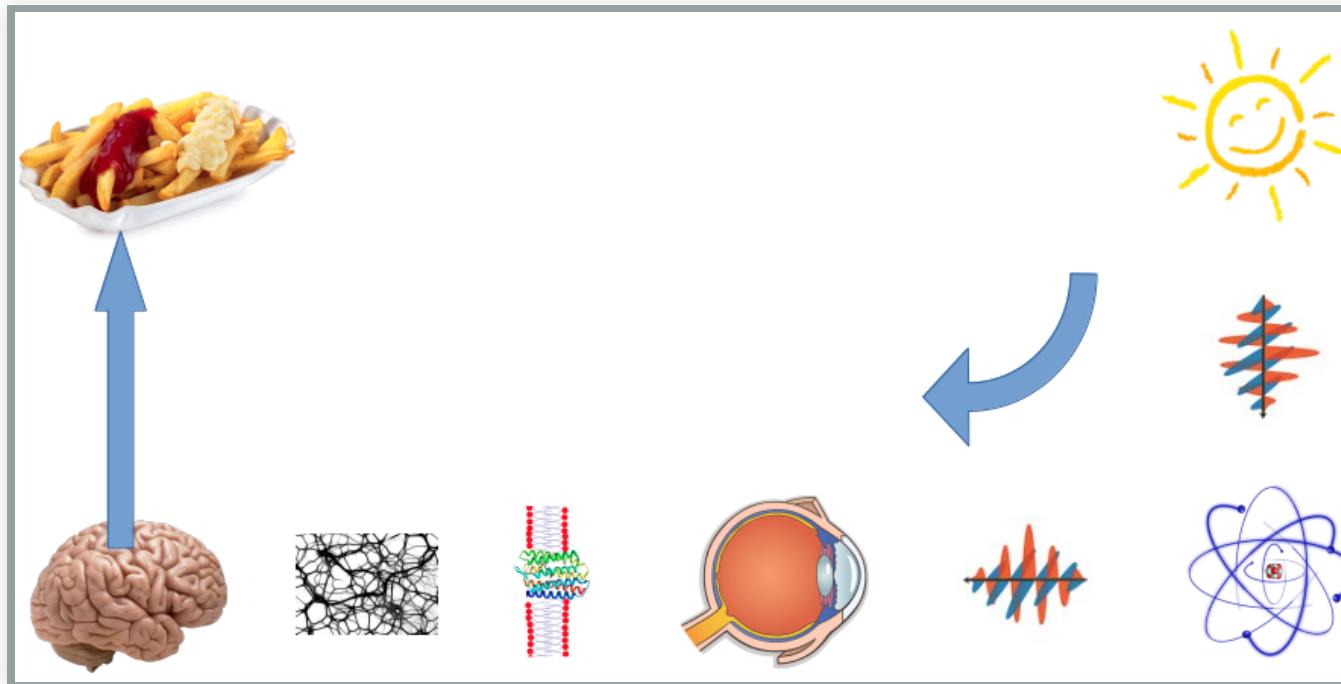
Particles do not have mass, they receive it
from interacting with the all-pervading Higgs field



Higgs and ... god

SENSUAL QUALITIES

- color / taste / smell / sound / touch



Any perception is a product of our brain!

GOOD BYE 'REALITY'

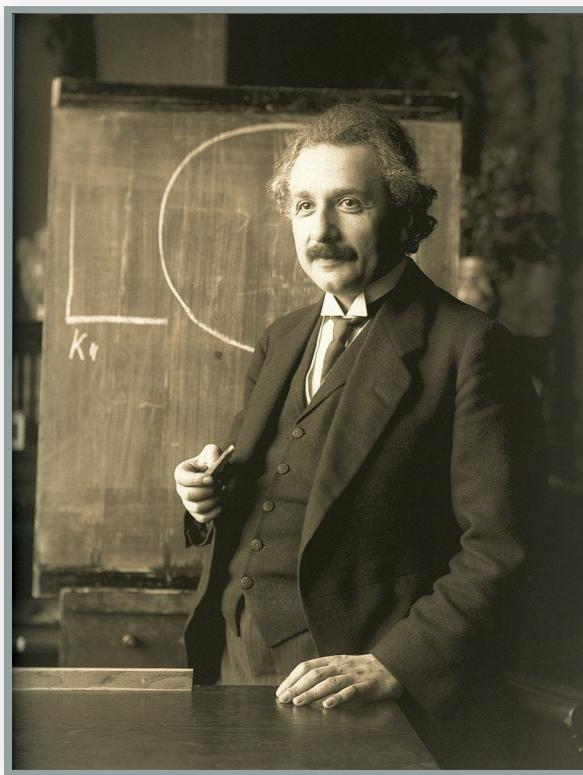
- size
- weight
- color / taste / smell ...
- solidity
- age
- consistency
 - lastingness
 - causality
 - nature = appearance
- independence
- objectivity
- individuality
- variety

THE MAGIC

- total transformability
- no separation

THE MAGICIAN

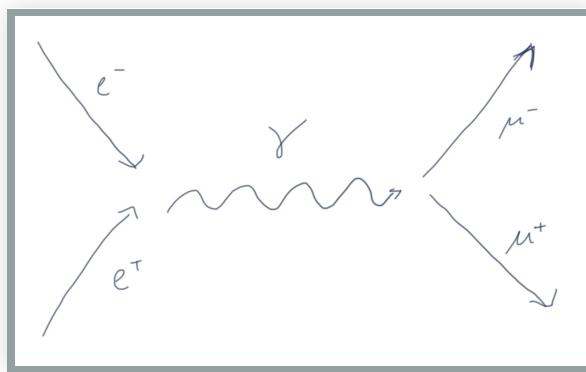
Albert Einstein 1879 - 1955



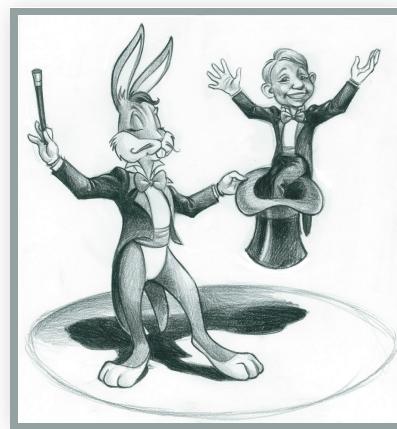
THE FORMULA OF MAGIC

$$E = m \cdot c^2$$

"NO" LIMITS



Any particle can be transformed into any other kind



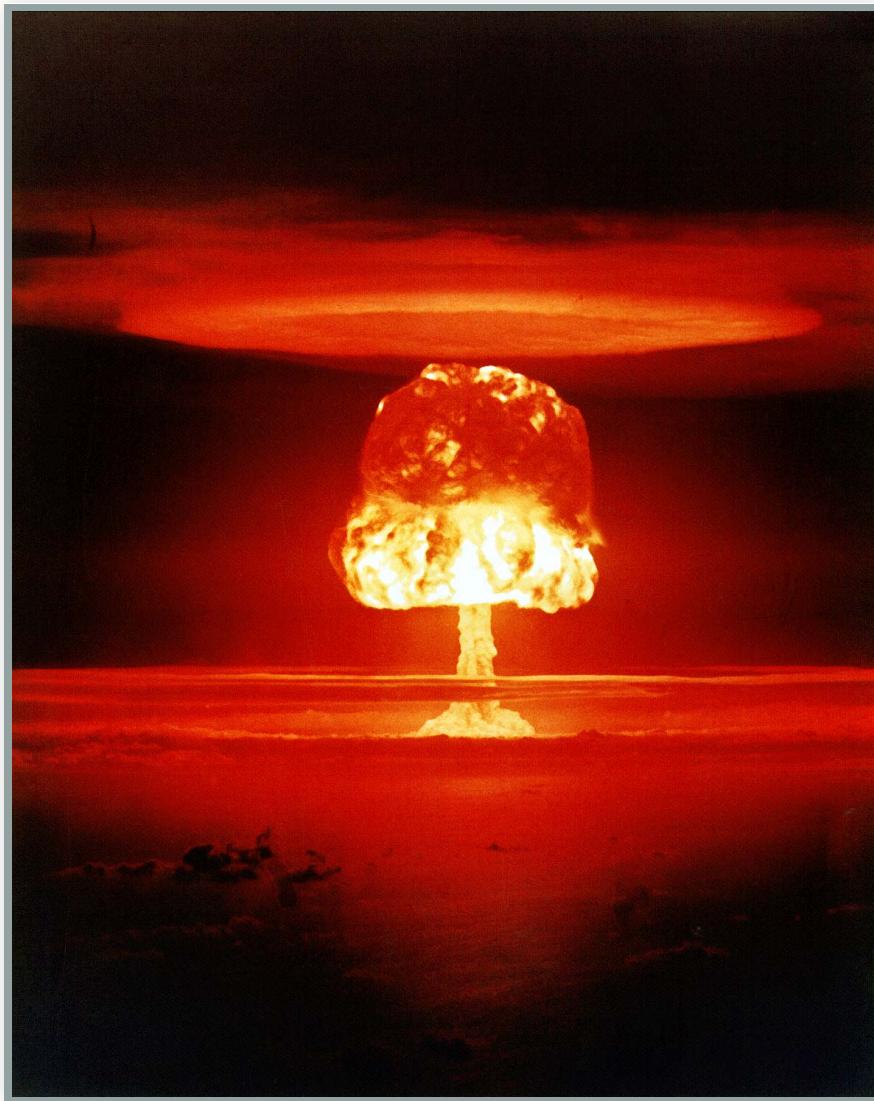
THE NEXT LEVEL

Read this with kinetic energy:

$$E = m \cdot c^2$$

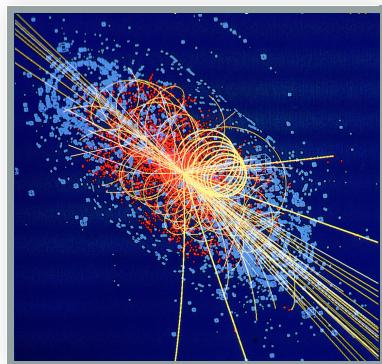
"Mass is motion, motion is mass"

MASS TO MOTION



MOTION TO MASS

Elastic e^- , e^+ scattering events at CERN



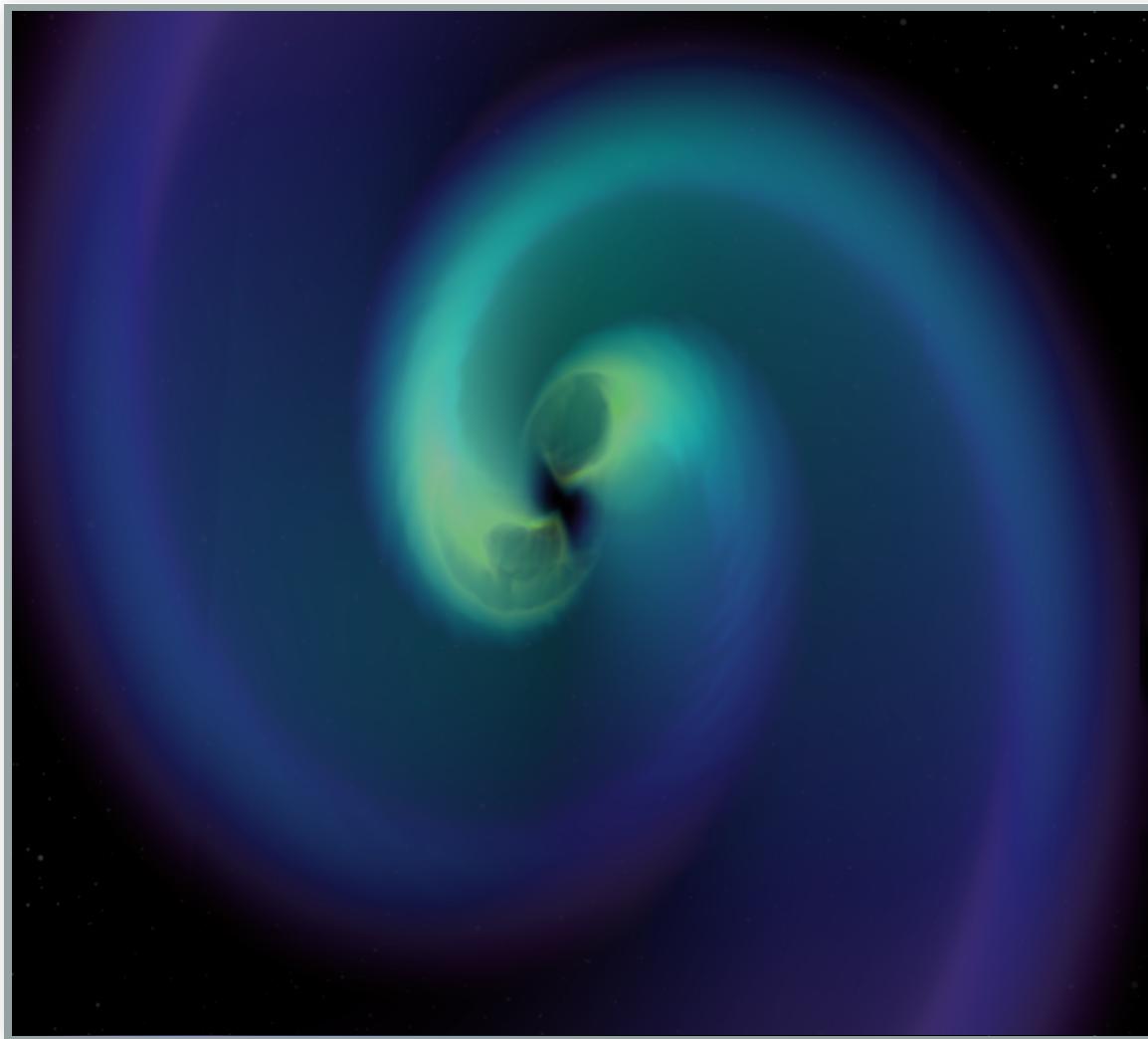
IN:

- e^- , e^+

OUT:

- e^- , e^+
- particle jets

LARGE INSANE SCALE TRANSFORMATIONS

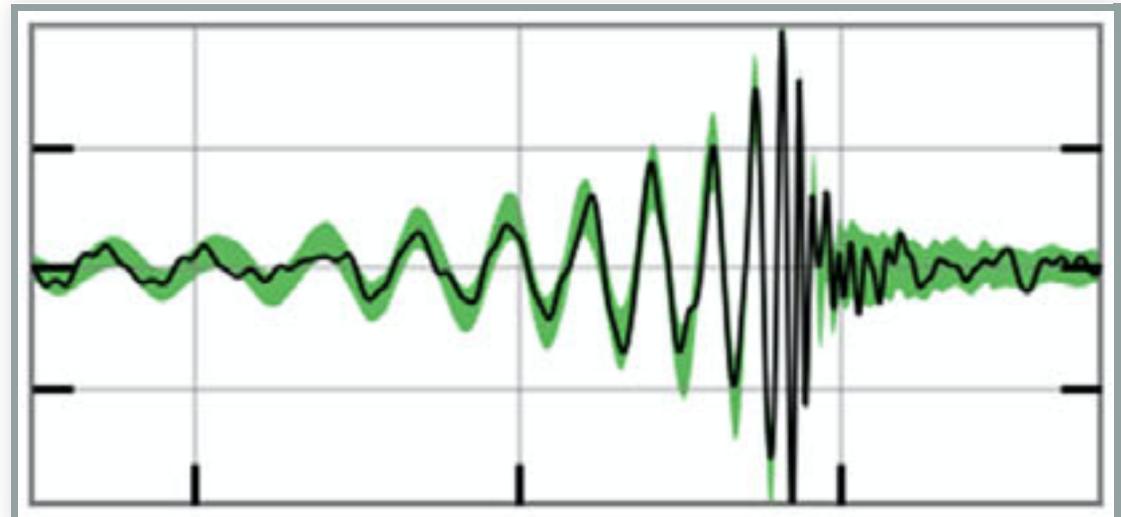


INSANE PRECISION



Ligo: $\Delta x < \frac{\emptyset_{proton}}{10000}$

INSANE PROPORTIONS



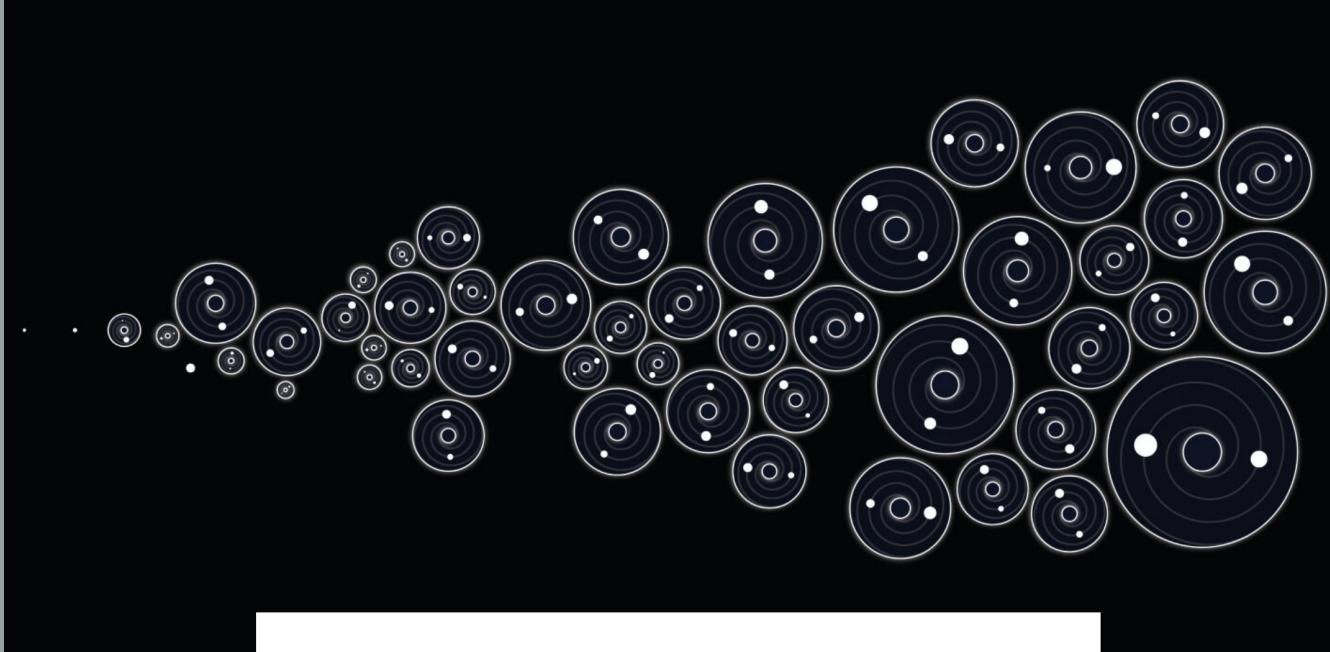
- $35 & 30 \times m_{sun}$, 1 bil. years ago
- $3 \times m_{sun}$ 'disappeared'
- $1 \text{ mio} \times m_{earth}$ transformed into gravitational waves
- 2 kg in biggest explosion on earth



A SCIENTIFIC SINGULARITY?

ScienceNews
INDEPENDENT JOURNALISM SINCE 1921

ALL TOPICS LIFE HUMANS EARTH SPACE PHYSICS CORONAVIRUS



PHYSICS

Explore every gravitational wave event spotted so far

Fifty events reveal the similarities and differences in these cosmic smashups

Gravitational waves, produced when behemoths like black holes and neutron stars spiral inward and merge, have been spotted 50 times (each event represented with a large circle above).

NADIEH BREMER/
VISUALCINNAMON.COM

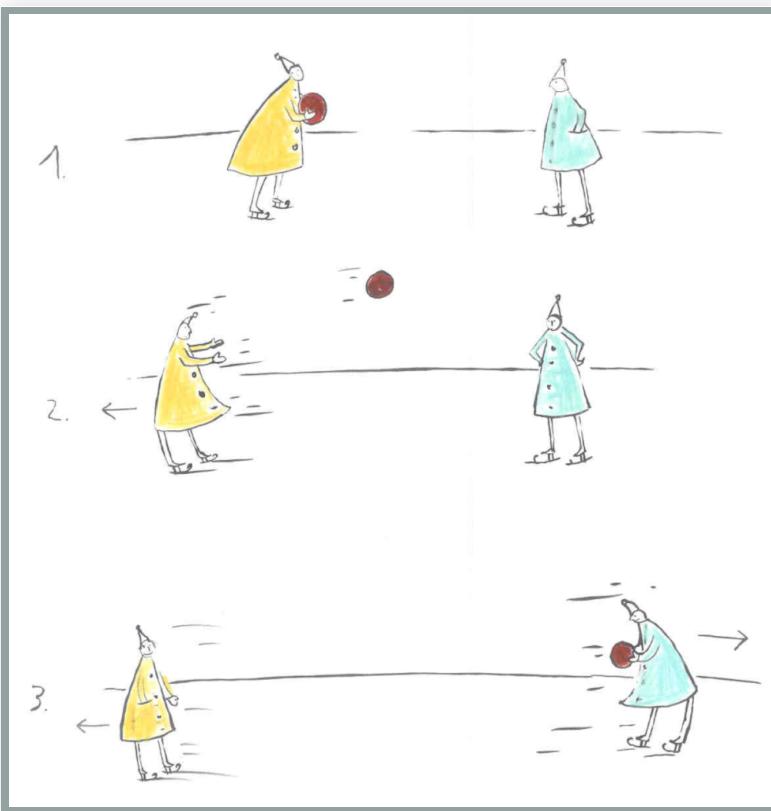
THE ILLUSION OF SEPARATION

Albert Einstein: "God doesn't throw dice"



He was wrong ... but opened the door to true magic in physics.

HOW DO PARTICLES INTERACT?

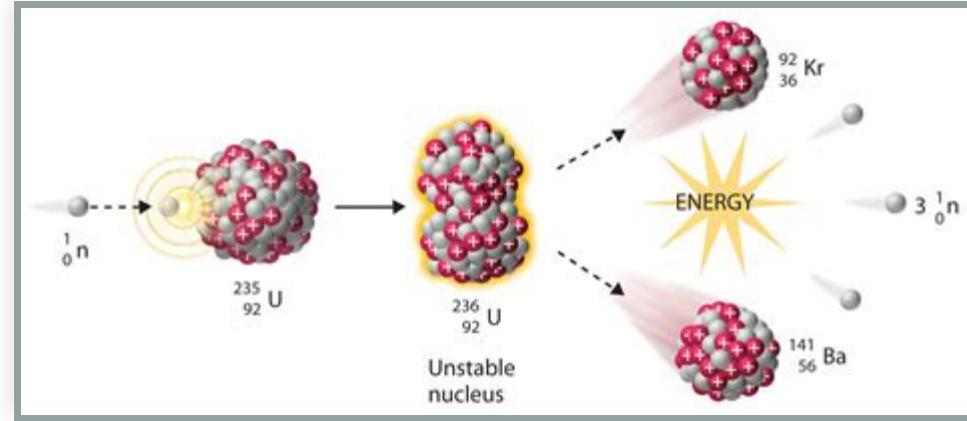


Exchange of particles causes force

THE EPR GEDANKENEXPERIMENT

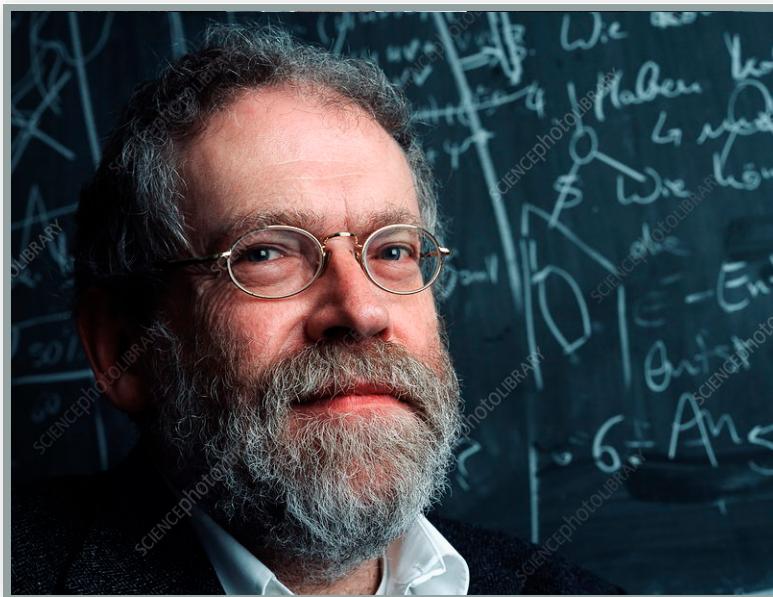
$$\Delta p \cdot \Delta q \geq \frac{1}{2} \hbar$$

Werner Heisenberg



IF quantummechanics is right,
THEN there would be an instantaneous 'ghost'
interaction
THUS quantum mechanics must be wrong ...

ENTANGLED PARTICLES



Anton Zeilinger

The successor of the 'big magician'

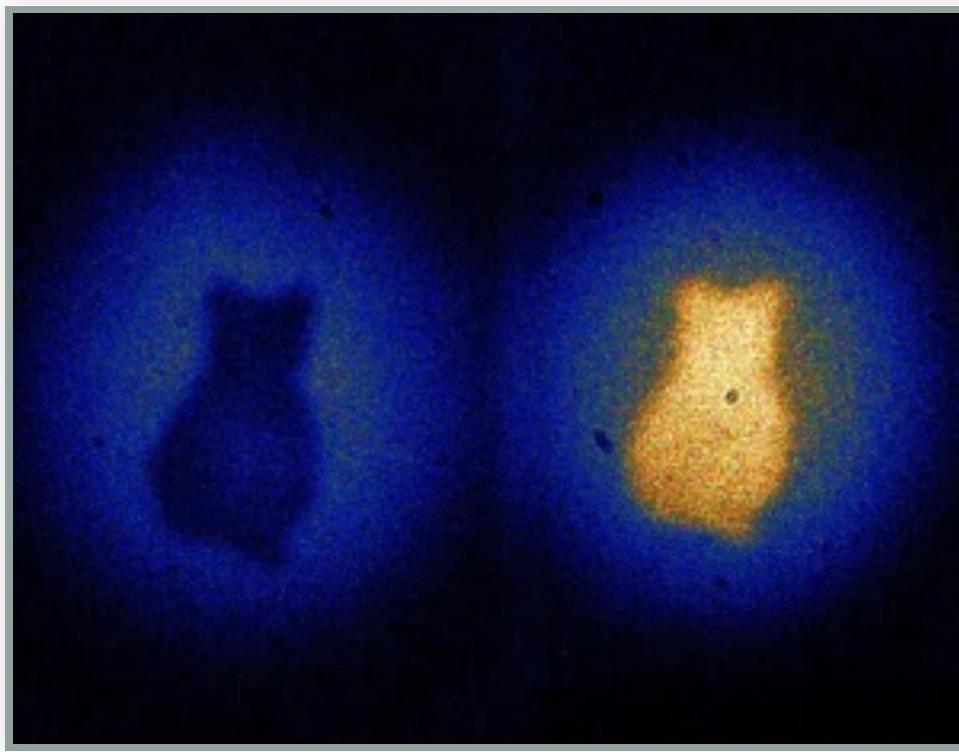
THE REAL GHOST INTERACTION

Zeilinger: between canary islands

China: 1200km via Micius satelites



THE CAT THAT WAS NEVER THERE



Picture taken with entangled photons,
that never interacted with Zeilinger's cat

THE COSMIC JOKE

- zoom in
 - *reality* fades
 - *magic* appears
- zoom out
 - *magic* hides
 - *reality* unfolds
- do it again

DUAL REALITY

Relative

- things appear as real
 - complex interplay
 - projection

Absolute

- the nature of all appearances
 - nothing truly exists

simultaneous & inseparable

SAME INSIGHT



without giant devices

**THANK YOU VERY MUCH FOR LISTENING
WITHOUT TURNING INTO A RUBBERDUCK!**

SOURCES OF IMAGES

- slide 5: desy.de
- slide 6, : wikipedia.org
- slide : ligo.org
- slide : sciencenews.org
- slide : cern.ch

<https://tattoopiercing.de>

<https://barbaranascimbeni.com>