

# Welcome to Museum of Theoretical Physics

open 24 h.

Entrance : free of charge

Fomes toxicum  $\Rightarrow$  *poison bracket*



{ bra c ket }



Poisson Bracket

$$\{f, g\} = \sum_{i=1}^N \left( \frac{\partial f}{\partial p_i} \frac{\partial g}{\partial q_i} - \frac{\partial g}{\partial p_i} \frac{\partial f}{\partial q_i} \right)$$

Let's take a cup of Maxwell coffee



## Maxwell Equations

$$\epsilon_{kls} \mathbf{E}_{s,l} = -\frac{1}{c} \frac{\partial \mathbf{B}_k}{\partial t}$$

$$\epsilon_{kls} \mathbf{H}_{s,l} = -\frac{1}{c} \frac{\partial \mathbf{D}_k}{\partial t} + \frac{4\pi}{c} \mathbf{j}_k$$

$$\mathbf{B}_{k,k} = 0$$

$$\mathbf{D}_{k,k} = 4\pi \rho$$

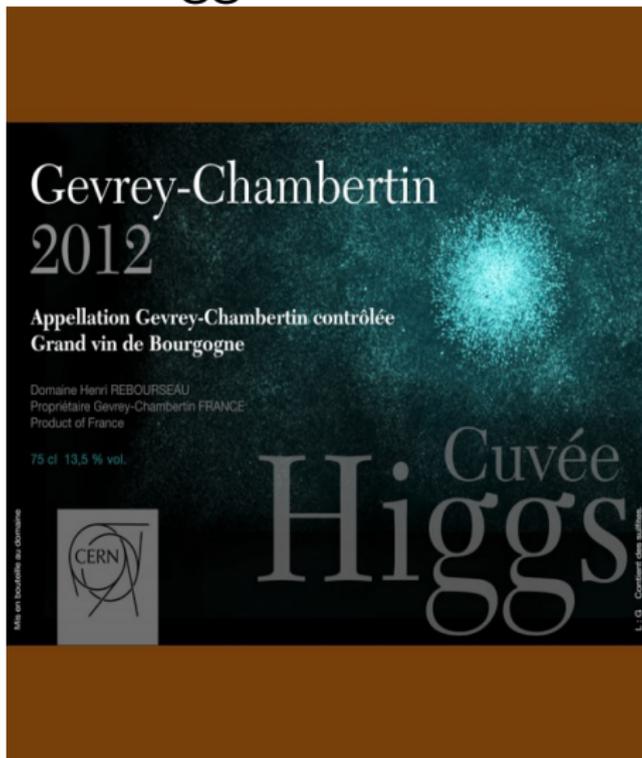
and a glass of Lagrange wine



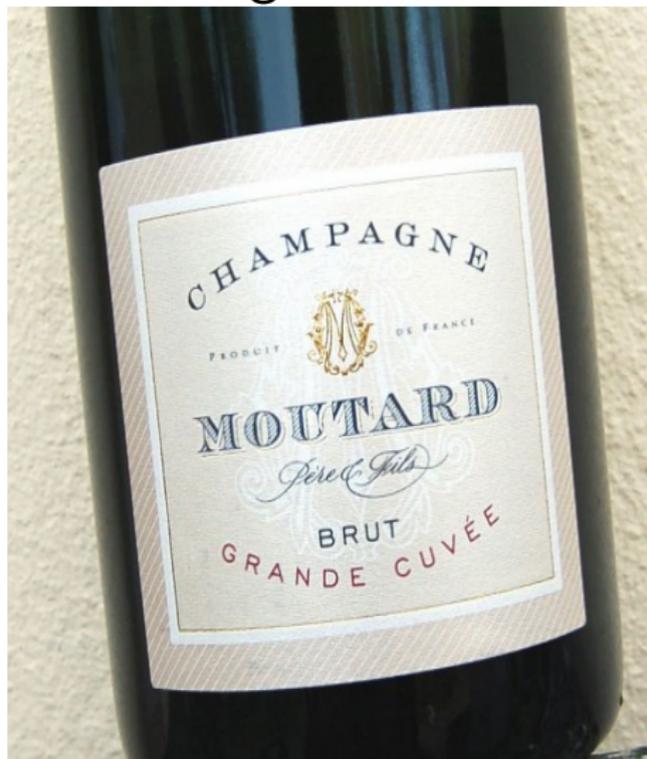
Lagrange Equation

$$\frac{d}{dt} \frac{\partial L}{\partial \dot{q}_i} - \frac{\partial L}{\partial q_i} = 0$$

and a glass of Higgs wine



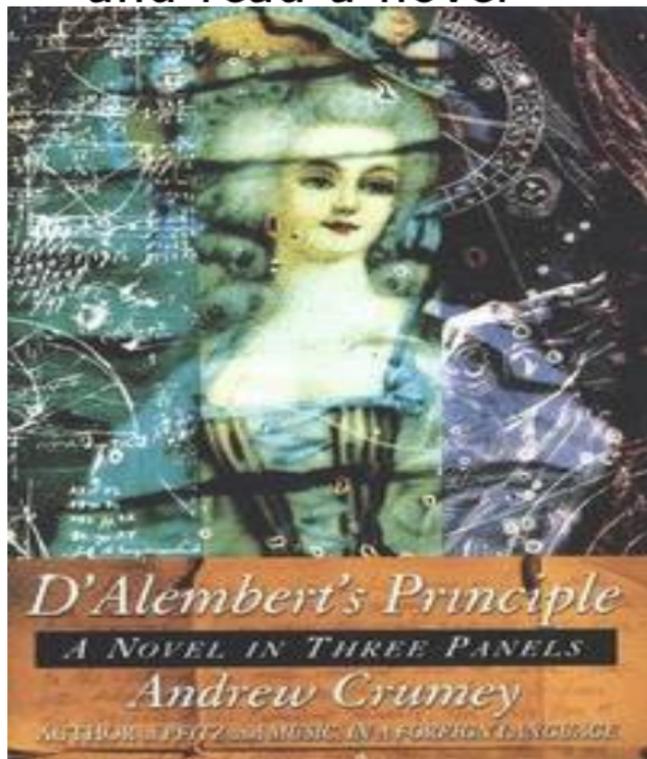
and a glass of Moutard Champagne



Pseudopotential via  
Moutard transformations

$$u_{x,y} = \lambda(x, y)u$$

and read a novel



D'Alembert's Principle -  
Andrew Crumey A Novel  
in Three Panels Picador,  
October 1999

$$\sum_i (F_i - m_i a_i) \delta r_i = 0$$

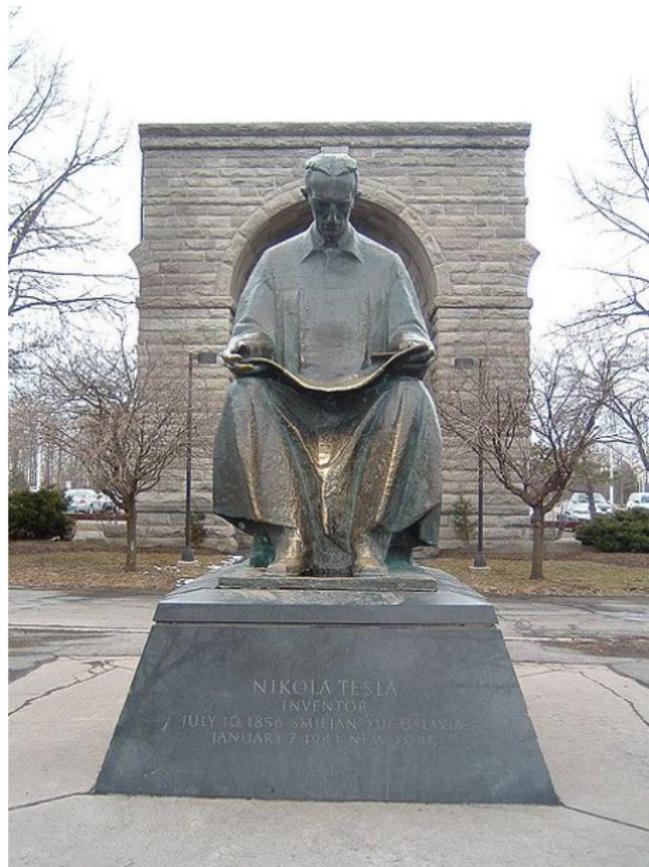
and finally pay a bill



Hamilton equation

$$\frac{\partial q_s}{\partial t} = \frac{\partial H}{\partial p_s}, \quad \frac{\partial p_s}{\partial t} = -\frac{\partial H}{\partial q_s}$$

# Nikola Tesla



# Albert Einstein, bronze fountain, Ulm



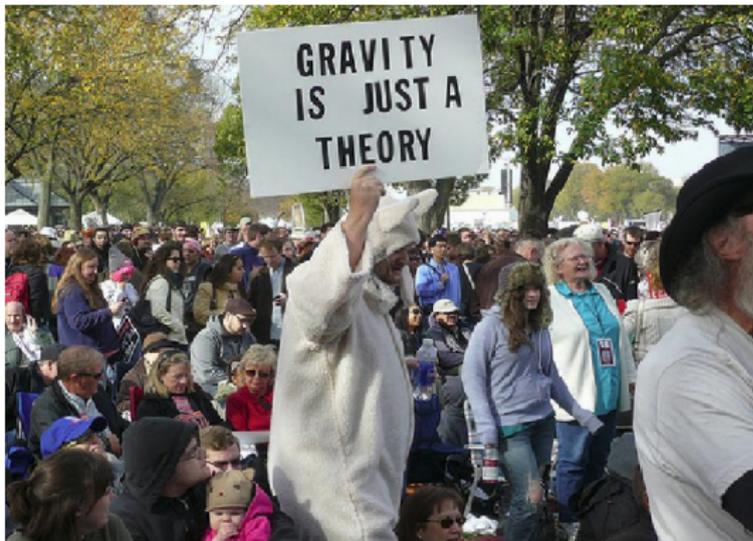


The geometry of **Faddeev-Popov** ghost

Let's check the Einstein formula



# Super Theory of Gravitation



## Quantum carpets made simple



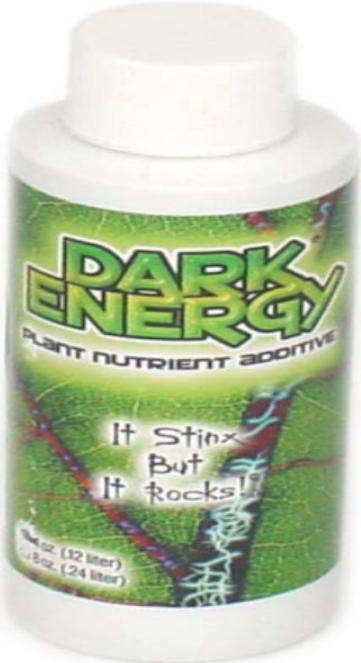
## Discovering Higgs boson



Powder for boson



# Cosmological Evolution with Dark Energy



# Toothpaste in Universe



## *The Hydrodynamic Behavior of Supernovae Explosions*

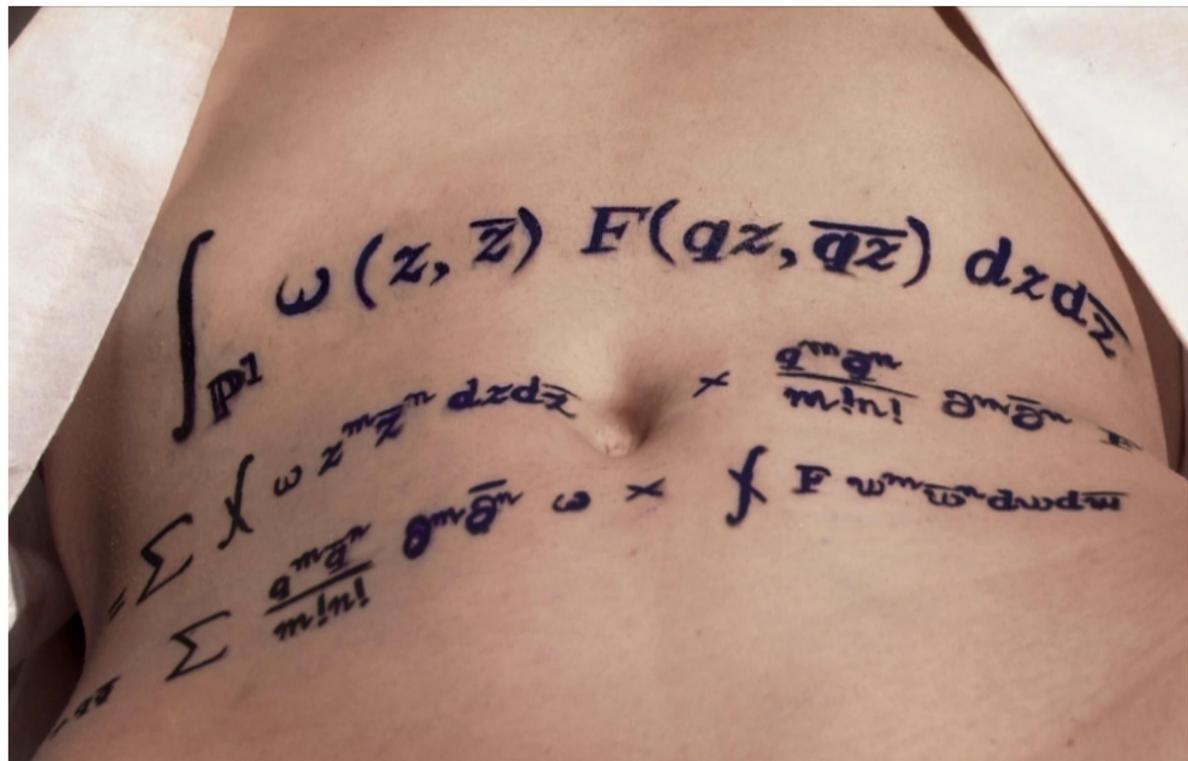
Colgate, Stirling A. White, Richard H.  
Astrophysical Journal, vol. 69, Issue 8 p.537  
(1964)

[https://en.wikipedia.org/wiki/Stirling\\_Colgate](https://en.wikipedia.org/wiki/Stirling_Colgate)

Follow to  $\Rightarrow$  Schrödinger Equation



Where is a **vortex**?



## The Quark cheese on the breakfast



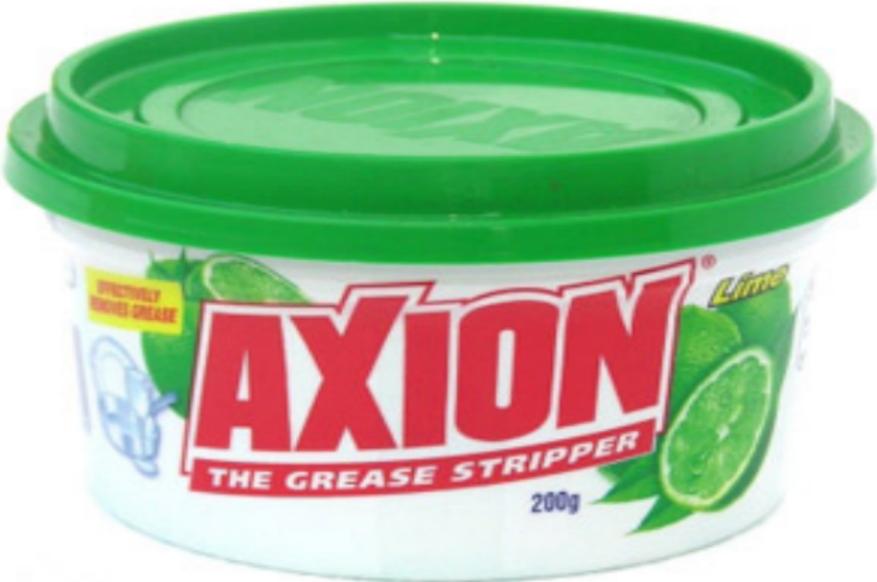
Quark is a smooth, fresh, unripened cheese with a flavor and texture . It is a common European cheese and is used in baking and cooking , and also as a fresh cheese.

You can eat it straight like cottage cheese, as a spread on bread, or a topping for foods either sweet or savory.

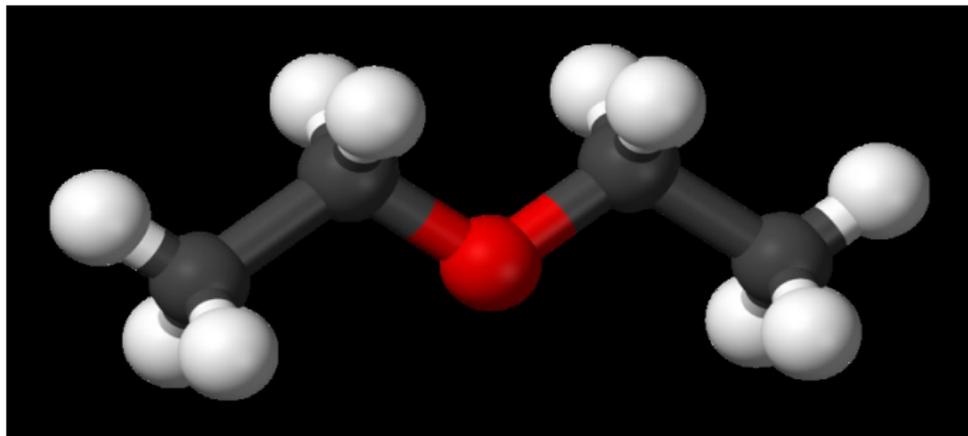
Quark in 2375    Star Trek



# Brane-Antibrane Backreaction in Axion Monodromy Inflation



Neutrinos as pseudo-acoustic **ether** phonons



The **horn** in the kaon to pion ratio



# Testing Inflation: A **Bootstrap** Approach

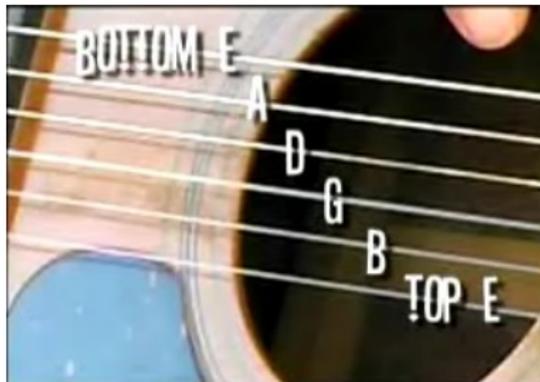


# Quantum echoes in Small Horseshoes

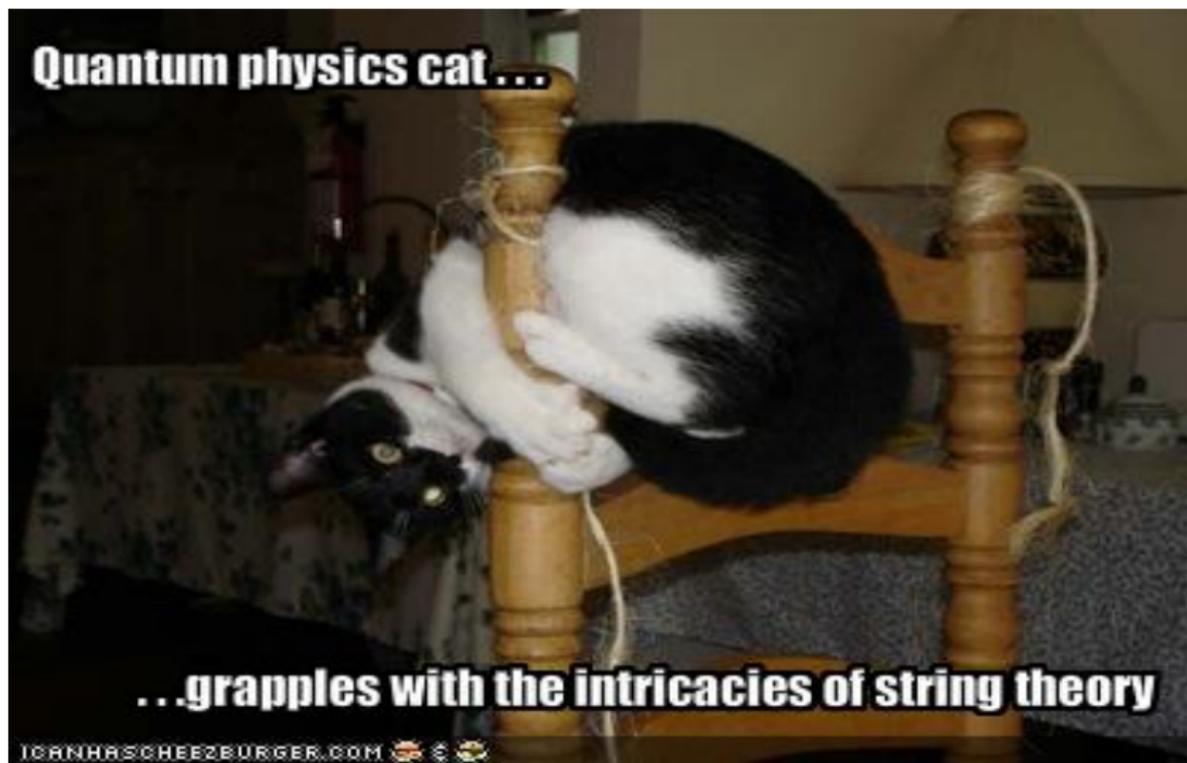


Using Horseshoes to Create Coherent Structures?

# String Theory - It is simple



# Quantum Cat - and String Theory



# Skyrme hedgehog



## Discrete - Time Goldfishing

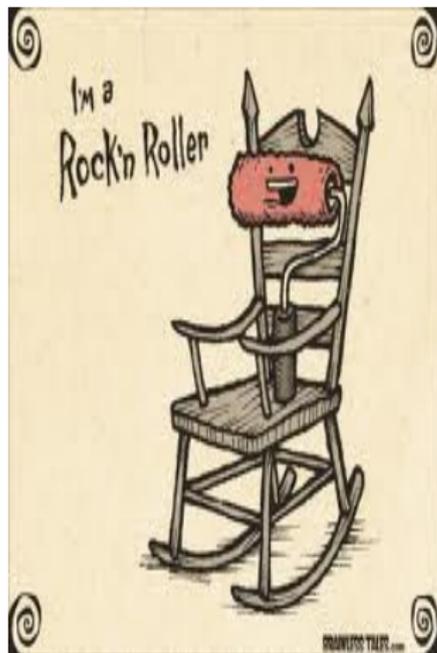


The goldfish dynamical system is characterized by two formulas, the first of which provides the  $N$  Newtonian equations of motion, while the second provides the solution of the corresponding initial-value problem.

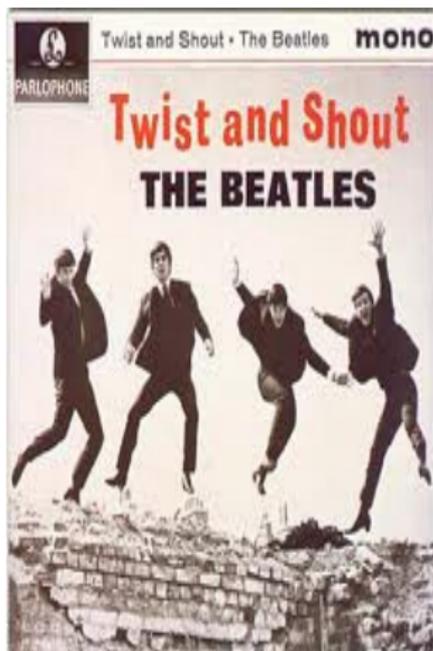
# Quaternion Solution for the

Rock'n'roller:

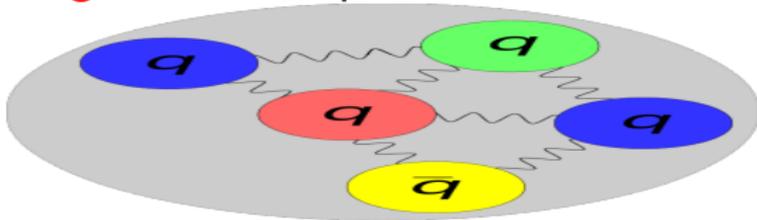
Box Orbits, Loop Orbits and Recession



A **twisted** spectral **quadruple**  
for quantum **SU(2)**



# Bag model of quark confinement



In **NICA** "Nuclotron-based Ion Collider fAcility" bags



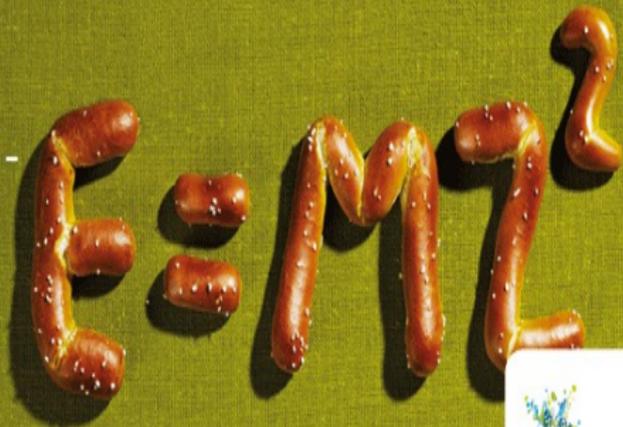
Do not open

Freedom for quarks

# ATLAS Detector



EINE STADT  
HAT WISSENS-  
HUNGER



STADT DER  
WISSENSCHAFT 2011

GEFÖRDERT DURCH DEN STÄDTESCHAFTSVERBAND

## BOSONS



### HIGGS BOSON

He's the one everyone wants to meet and now we've seen his signal from years of data at the experiments at Fermilab and CERN. You'd be willing to sit if everyone was looking to interview you.

### PHOTON

The messiest vlogger we know and love.

### GLUON

The "glue" of the strong nuclear force.

### W BOSON

As the carrier particles of the weak nuclear force, they are downright cute.

### Z BOSON

## QUARKS



### UP QUARK

A very little point inside the proton and neutron, it's friends forever with the down quark.

### CHARM QUARK

A charming second generation quark.

### TOP QUARK

This heavyweight champion doesn't live long enough to make friends with anyone.

### DOWN QUARK

A big little point inside the proton and neutron, it's friends forever with the up quark.

### STRANGE QUARK

What's so strange about this second generation quark?

### BOTTOM QUARK

This third generation quark is partner on the pounds.

## THEORETICALS

### TACHYON

Can this devious and clever particle really travel faster than light?



### GRAVITON

Still unobserved, yet theoretically everywhere, he's got big ego for jumping bones.



### DARK MATTER

The mysterious missing mass, difficult to see because he's so Jolt.

## NUCLEONS



### PROTON

We would not be here without her positivity.



### NEUTRON

He holds an remaining record.

## LEPTONS

### ELECTRON-NEUTRINO

This minuscule handi is so light, he is practically massless.



### MUON-NEUTRINO

Like the other 2 neutrinos, he's got an identity crisis from oscillation.



### TAU-NEUTRINO

He's a tau rook, but what type of neutrino will be next?



### ELECTRON

A familiar friend, this negatively charged, busy fella lives to bond.



### MUON

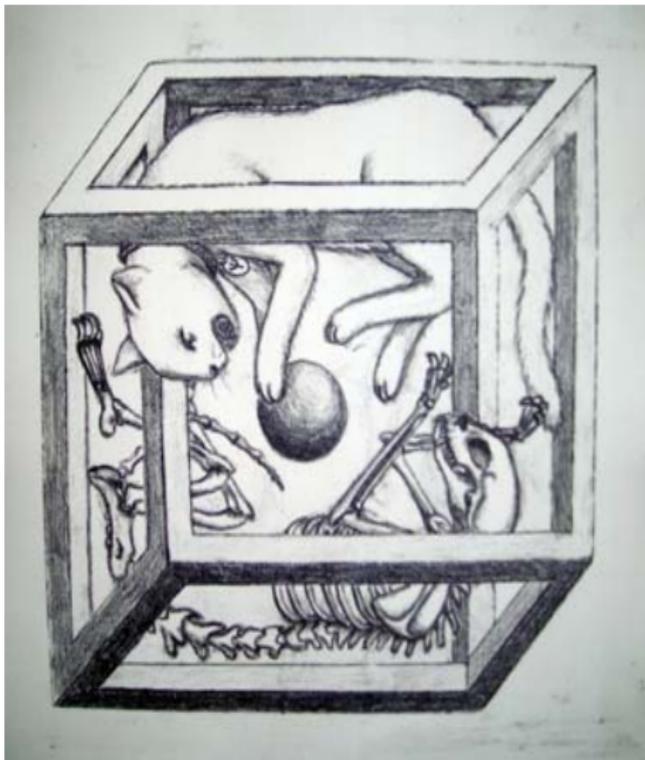
A "heavy electron" who lives fast and dies young.



### TAU

A "heavy muon" who could stand to lose a little weight.

We are looking for Schrödinger's cat



Thanks very much for visting the

## Museum of Theoretical Physics

All persons are invited to send to the Museum the photo of some objects which are funily connected with the Theoretical Physics  
We would like to thanks B. Broda, A. Crumey, T. Fischer and M. Kopisch, for sending photos to the Museum

Director of the Museum  
Ziemowit Popowicz