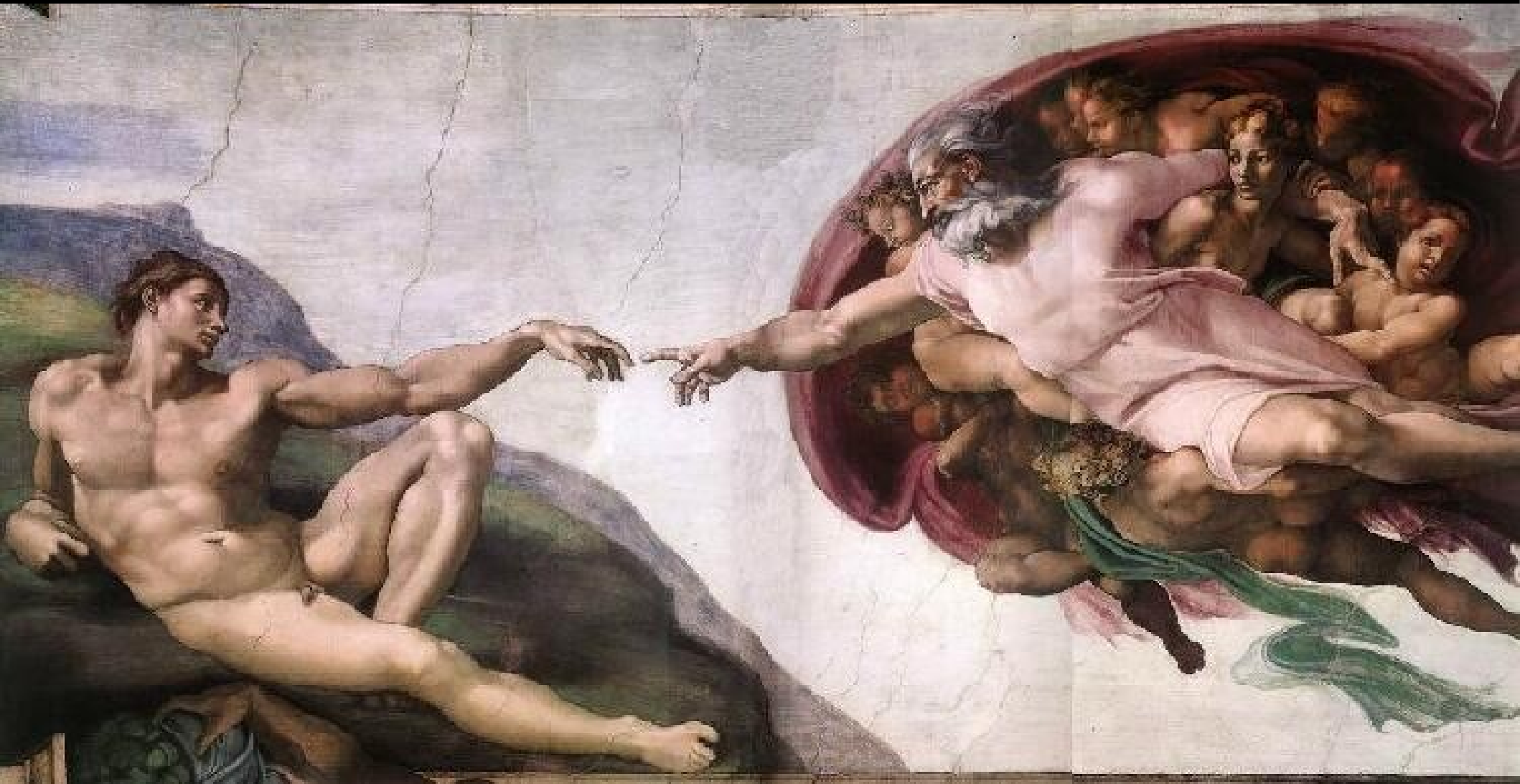


Physics & Faith

Faith & Physics



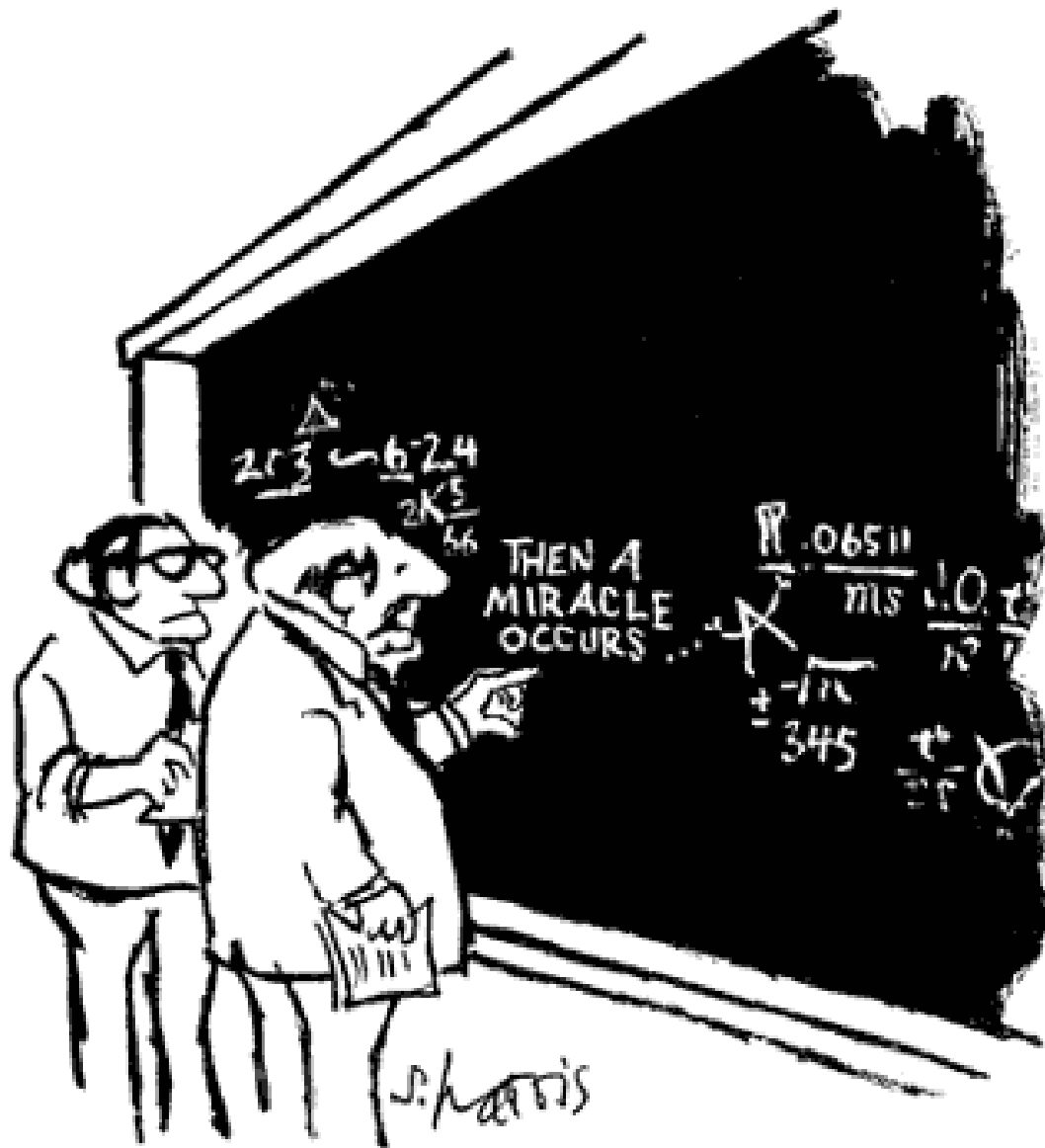
Evangelical Lutheran Church of Geneva

2009-05-31

Physics is not about finding 'truths' ...
...but about discovering how nature works.



The Problem with Terminology or why some have trouble with Physics



"I think you should be more explicit here in step two."

Physicists' fundamentals:

What, When, Why, How (exactly)...



Physicists' fundamentals:

What, When, Why, How (exactly)...

How did the universe begin?

What is gravity and are there additional dimensions?

Elementary particles – did we find 'em all?

Supernovae? Black-Holes?

Why do elementary particles have a mass? Why is their mass specific?

Why do Neutrinos have a mass?
Are the Anti-Neutrinos?

Are protons unstable?

Why does glass behave like a liquid?

How does nature behave on very low
and very large energy scales?

Do magnetic monopoles exist?

Why is the Universe expanding?

Why is there more matter than
anti-matter in the universe?

What is Dark Energy?

What is Dark Matter?

Why can time not be reversed?

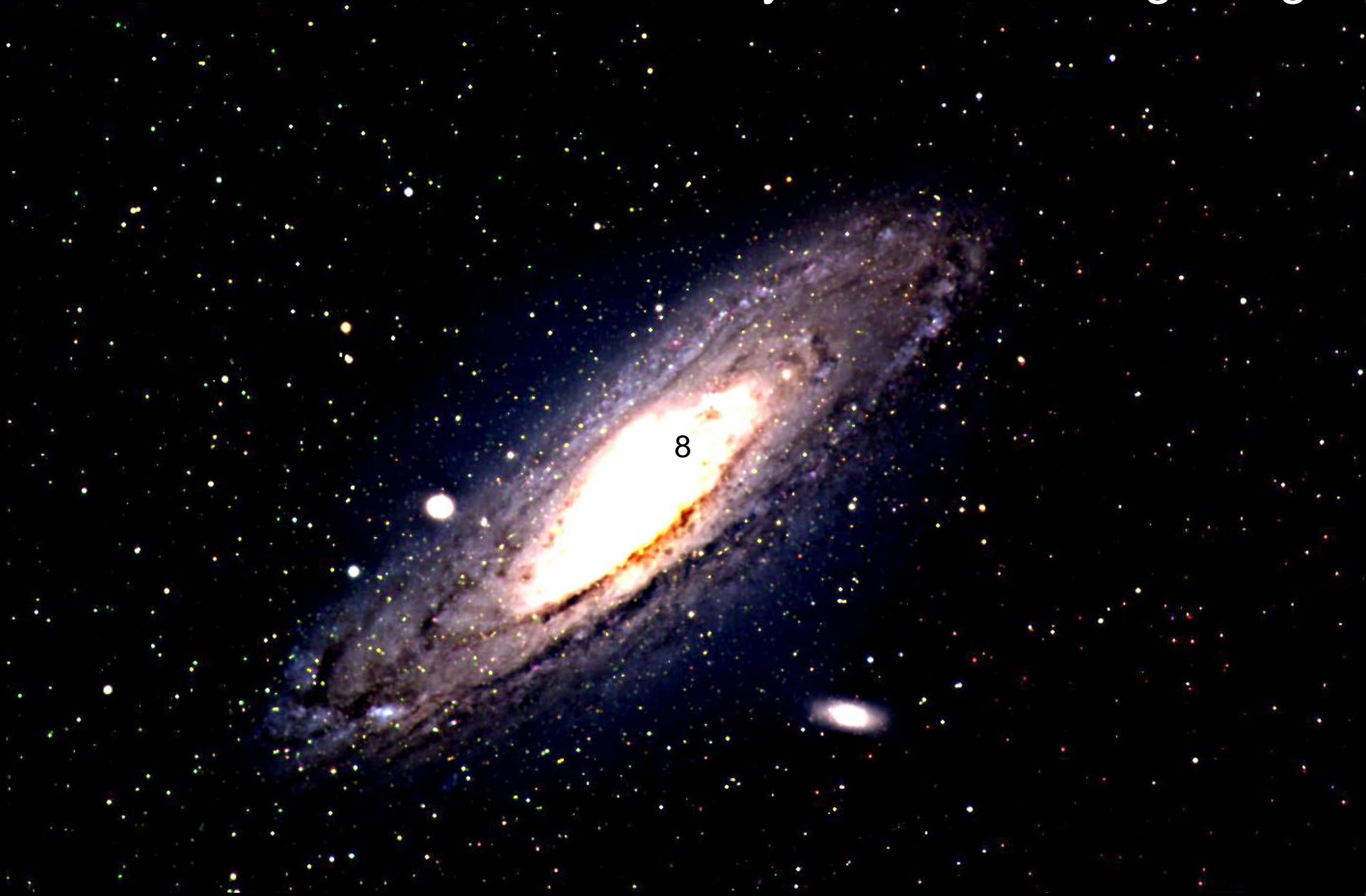
What is the origin of the proton spin?

Are there states of matter
we do not yet know about?

What is the mechanism to explain
high-temperature superconductivity?

Dark Matter, Age of the Universe, ...

... and why there was a “Big Bang”



Anti-Matter does exist ...

... but why is it so rare in the Universe?



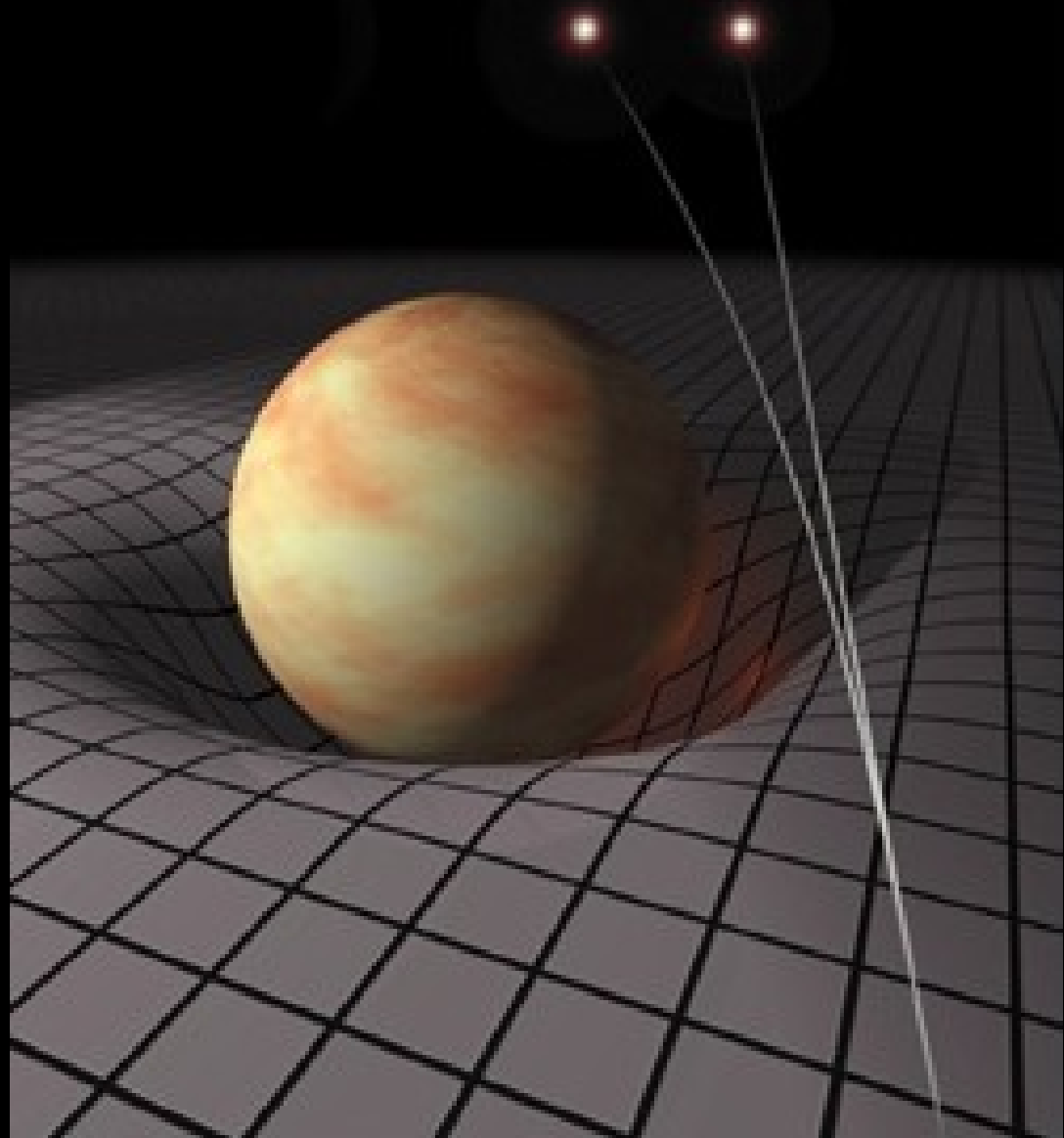
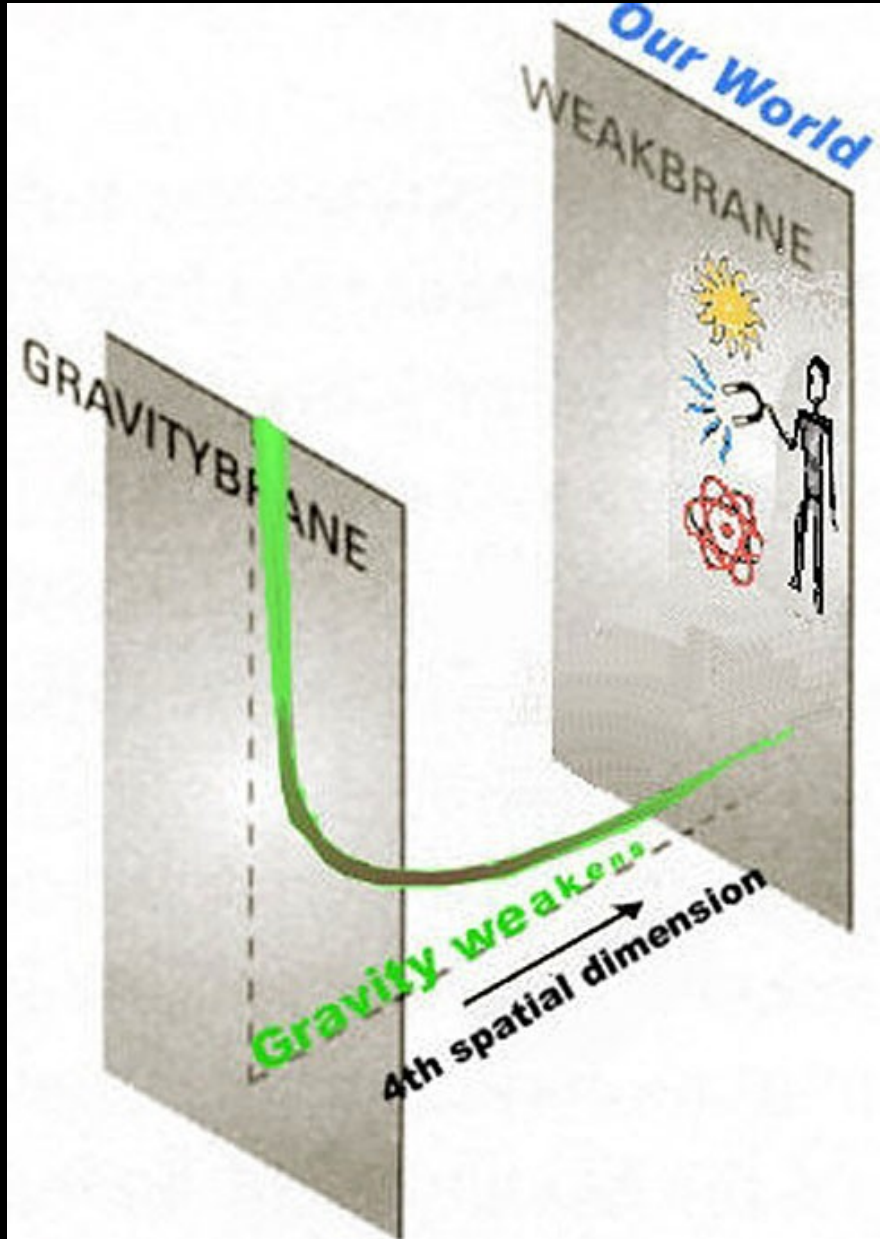
Why do elementary particles have a mass? ... what's behind the 'GOD[®]' particle?



Does our world have more than 3+1 dimensions?

How does gravity work? or:

What the ... are "micro-black-holes" and why we are excited about (even worse) unstable ones?

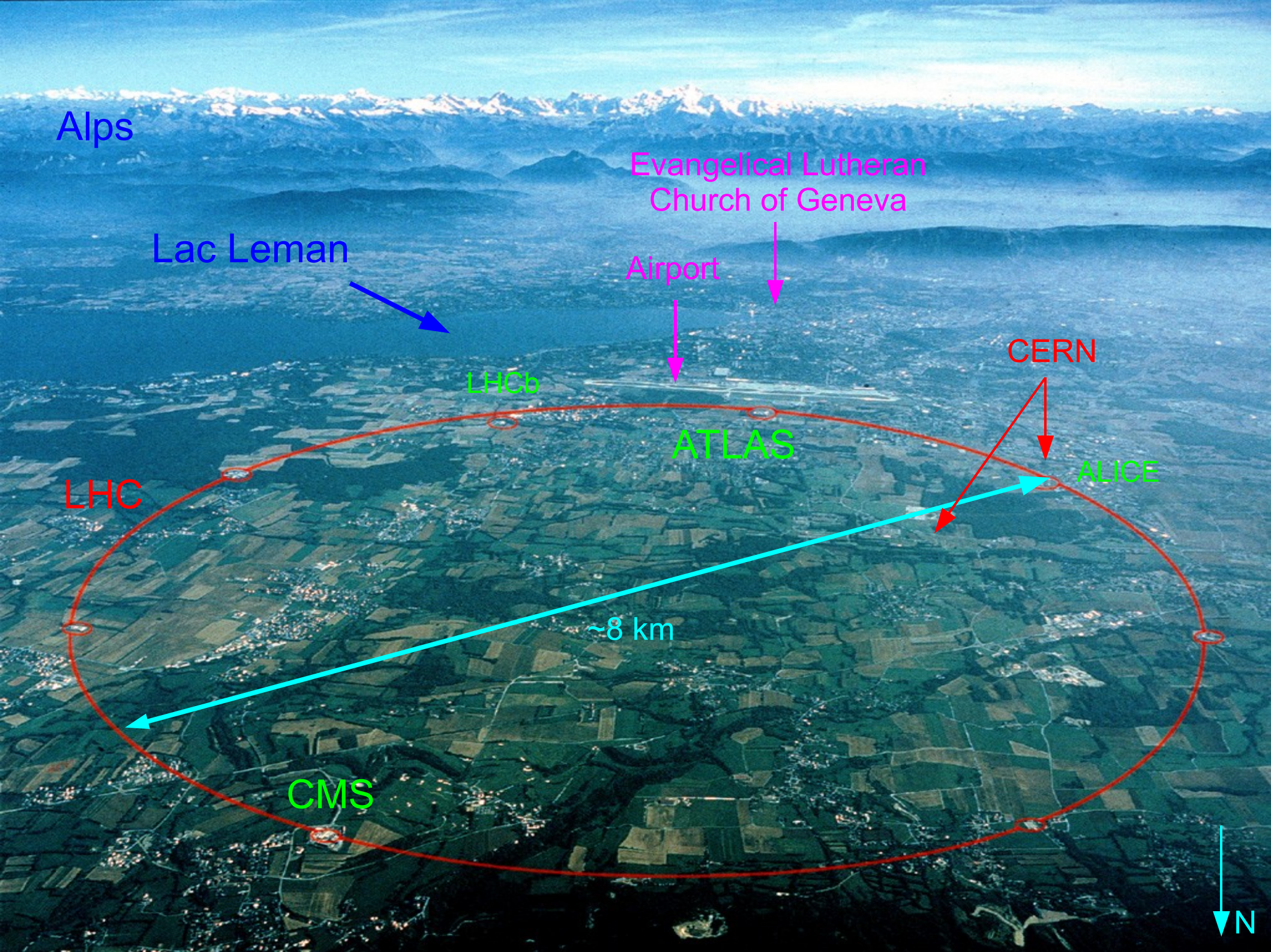




CERN - Conseil Européen pour la Recherche Nucléaire Today: European Organization for Nuclear Research

- 1951: CERN's mission:
 - provide resources and common infra-structure related to pure scientific and fundamental character
 - Promote peace and collaboration platform, education and sharing of scientific results among nations
- 20 member states + some observers: India, Israel, Japan, Russian Federation, USA, Turkey, European Commission and UNESCO
- One of Geneva's largest organisations:
~ 2500 full-time employers, > 9000 visiting scientists
- A small world of its own → extraterritorial (neither CH/FR)
- Cradle of the World-Wide-Web: <http://www.cern.ch>
- GRID - One of the world's most power-full data processing networks
- World's home of High-Energy Physics, Nobel-Prize Winners and ELCG members
- More info:





Alps

Lac Lemman

Evangelical Lutheran
Church of Geneva

Airport

CERN

LHCb

ATLAS

ALICE

LHC

~8 km

CMS

N

What are long-, medium- and short-term benefits? ... why we must spend money for science?

Long-Term - World is becoming a Knowledge-based Society/Economy

- Research: Seeking and finding answers to questions about the Universe
- Technology: Advancing the frontiers of technology
- Collaborating: Bringing nations together through science
- Education: Training the scientists of tomorrow



Medium-Term: Fundamental Research enables applied Science, e.g.

- Quantum-Mechanics → Semi-Conductor → Transistors → Computer
- General Theory of Relativity (Einstein) → Satellites → Global Position System

Short-Term: Advancements in industry....

- Accelerator, Magnet, Cryogenics, Detectors & Instrumentation, Electronics, ...
→ Biology and Medicine: NMR & PET scanners, Ion therapy/cancer treatment
- Information Technology: WWW, GRID, Genome Analysis, ...



What we do today will probably impact and be in your life in 10-20 years...