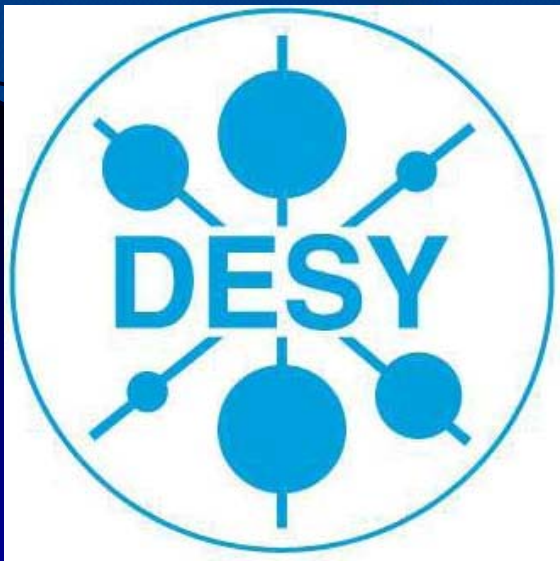




Hamburg & DESY

(**D**eutsches **E**lektronen-**S**ynchrotron)



Akceleratori, čestice i astronomija





Gde je DESY?







Standardni model

ELEMENTARY PARTICLES

Quarks

u
up

c
charm

t
top

d
down

s
strange

b
bottom

Force Carriers

ν_e
electron neutrino

ν_μ
muon neutrino

ν_τ
tau neutrino

e
electron

μ
muon

τ
tau

γ
photon

g
gluon

Z
Z boson

W
W boson

I II III

Three Generations of Matter

Fermilab 95-759

First Generation Fermions

Particle	Symbol	Spin	Charge	Mass (GeV)
Electron Neutrino	ν_e	1/2	0	$< 7.2 \times 10^{-9}$
Electron	e	1/2	-1	0.51×10^{-3}
Up Quark	u	1/2	2/3	$\sim 5 \times 10^{-3}$
Down Quark	d	1/2	-1/3	$\sim 9 \times 10^{-3}$

Second Generation Fermions

Particle	Symbol	Spin	Charge	Mass (GeV)
Muon Neutrino	ν_μ	1/2	0	$< 2.7 \times 10^{-4}$
Muon	μ	1/2	-1	0.106
Charm Quark	c	1/2	2/3	~ 1.35
Strange Quark	s	1/2	-1/3	~ 0.175

Third Generation Fermions

Particle	Symbol	Spin	Charge	Mass (GeV)
Tau Neutrino	ν_τ	1/2	0	$< 3 \times 10^{-2}$
Tau Lepton	t	1/2	-1	1.78
Top Quark	t	1/2	2/3	174 ± 17
Bottom Quark	b	1/2	-1/3	~ 4.5

Gauge Bosons

Particle	Symbol	Spin	Charge	Mass (GeV)
Photon	γ	1	0	0
W Boson	W	1	± 1	80.22
Z Boson	Z	1	0	91.19
Gluons	g	1	0	0

Higgs Boson

Particle	Symbol	Spin	Charge	Mass (GeV)
Higgs Boson	H	0	0	$63 < M_H < 800$



Quarks. Neutrinos. Mesons. All those damn particles you can't see. That's what drove me to drink. But now I can see them.

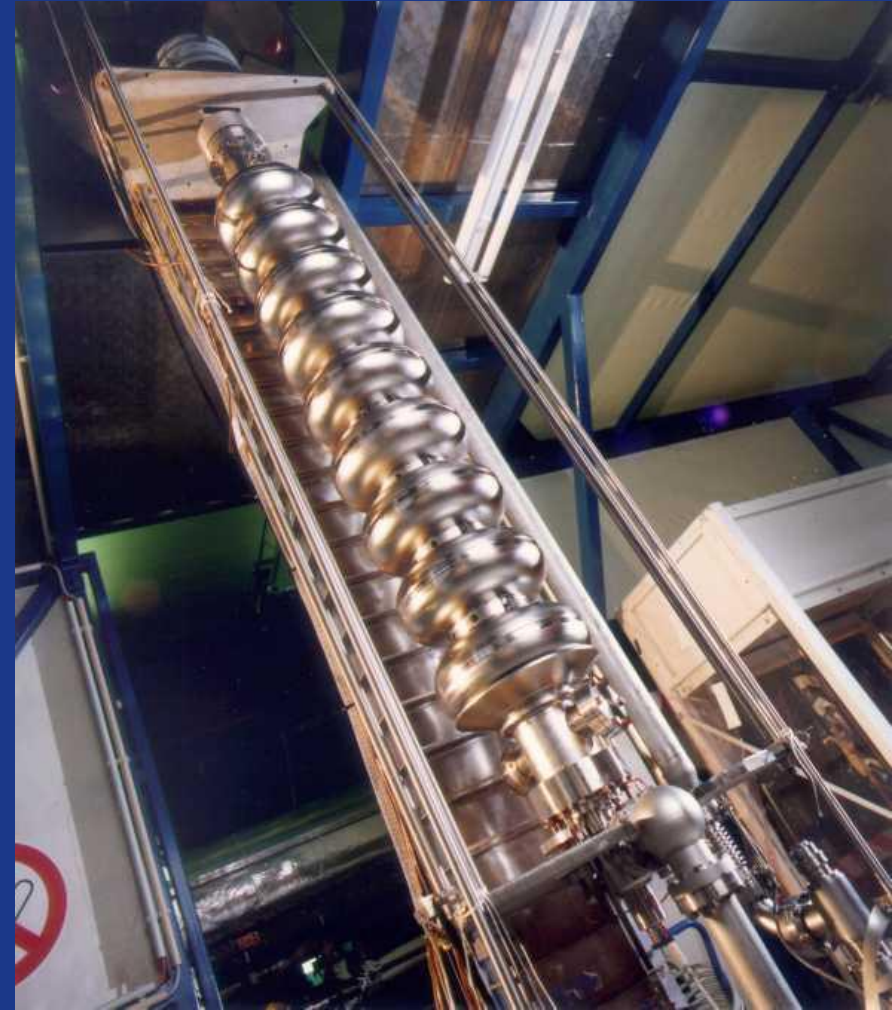
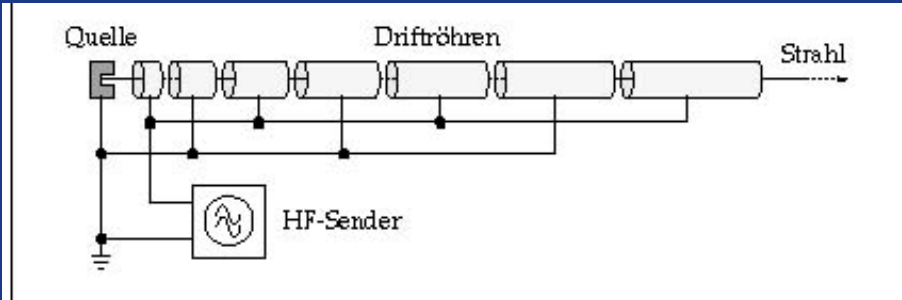


Vrste akceleratora

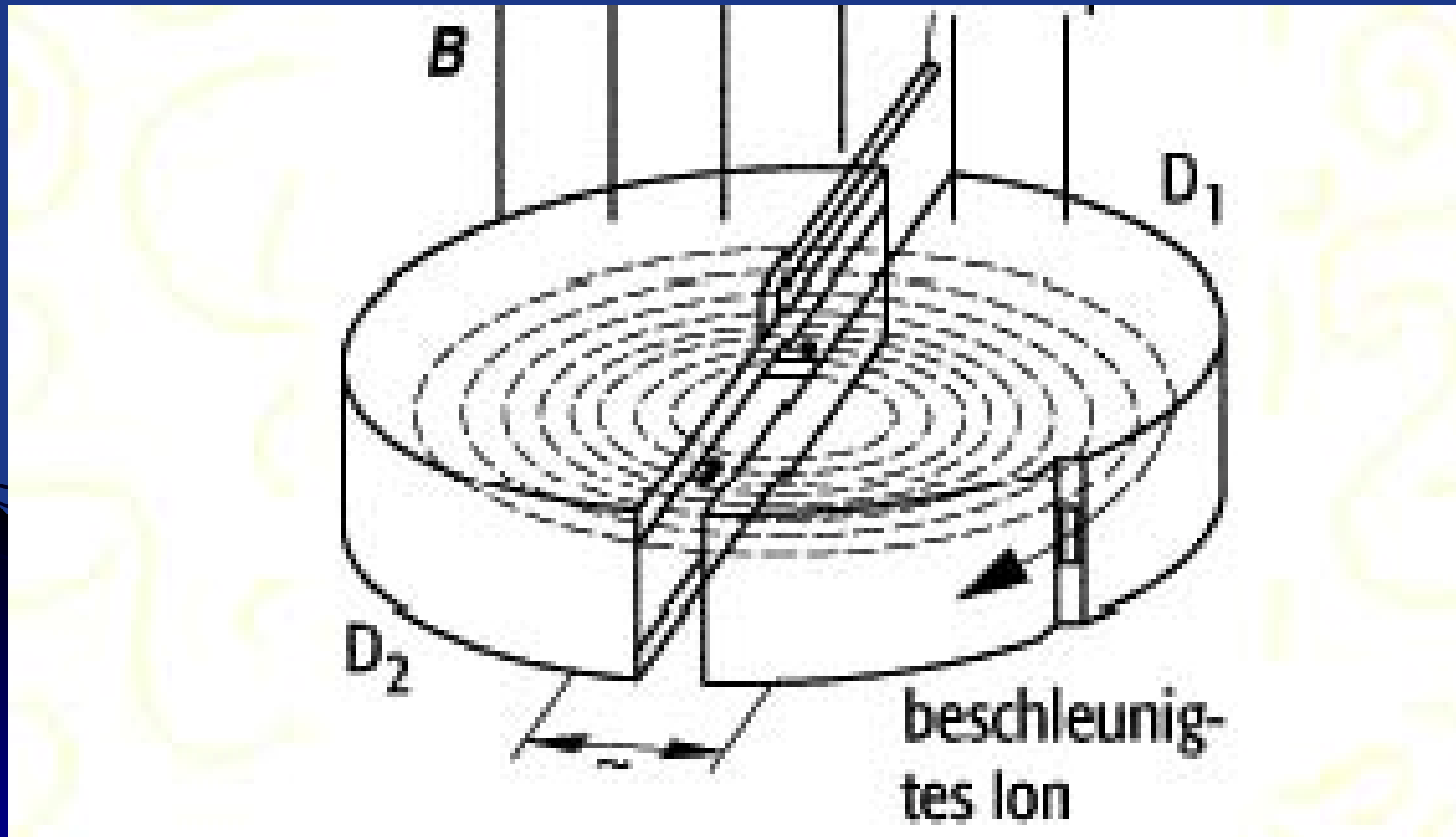
- Linearan - TESLA
- Ciklotron
- Sinhrotron - HERA



Linearni akceleratori



Ciklotron



Sinhrotron - HERA

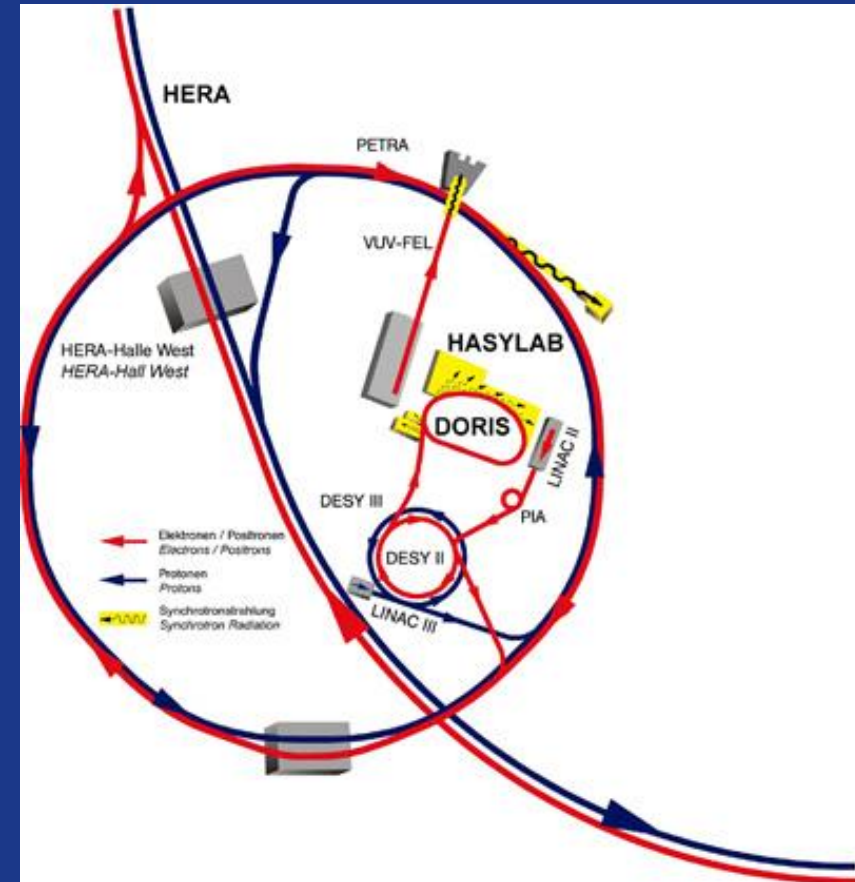
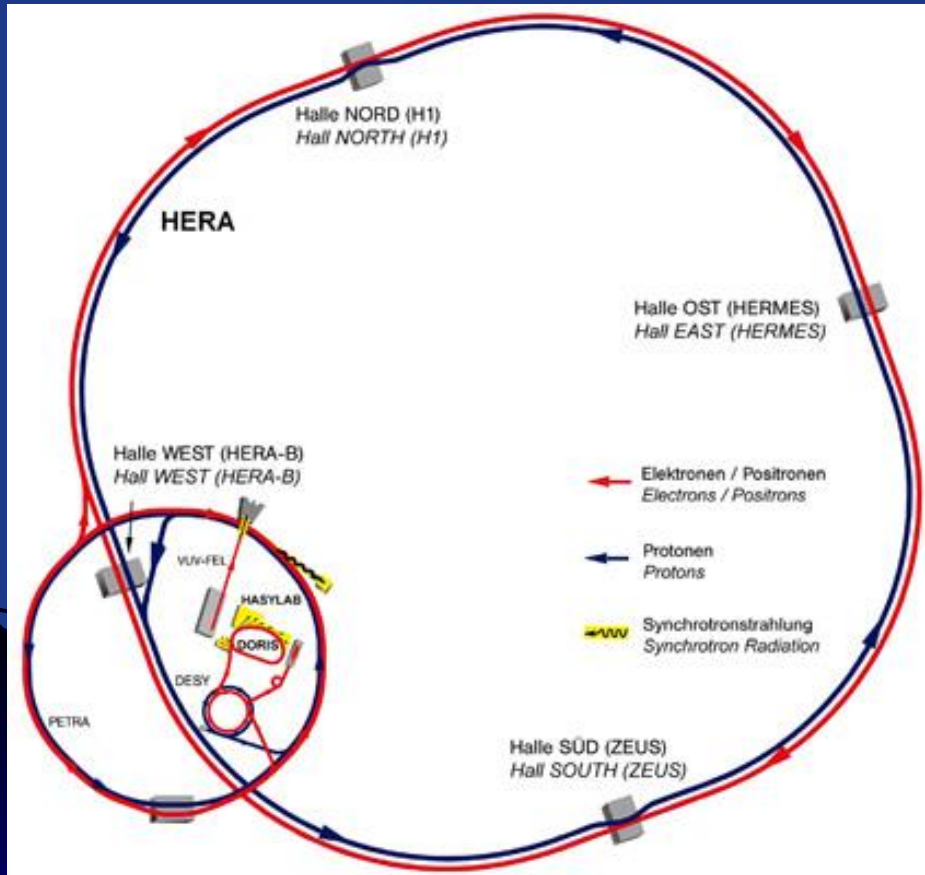


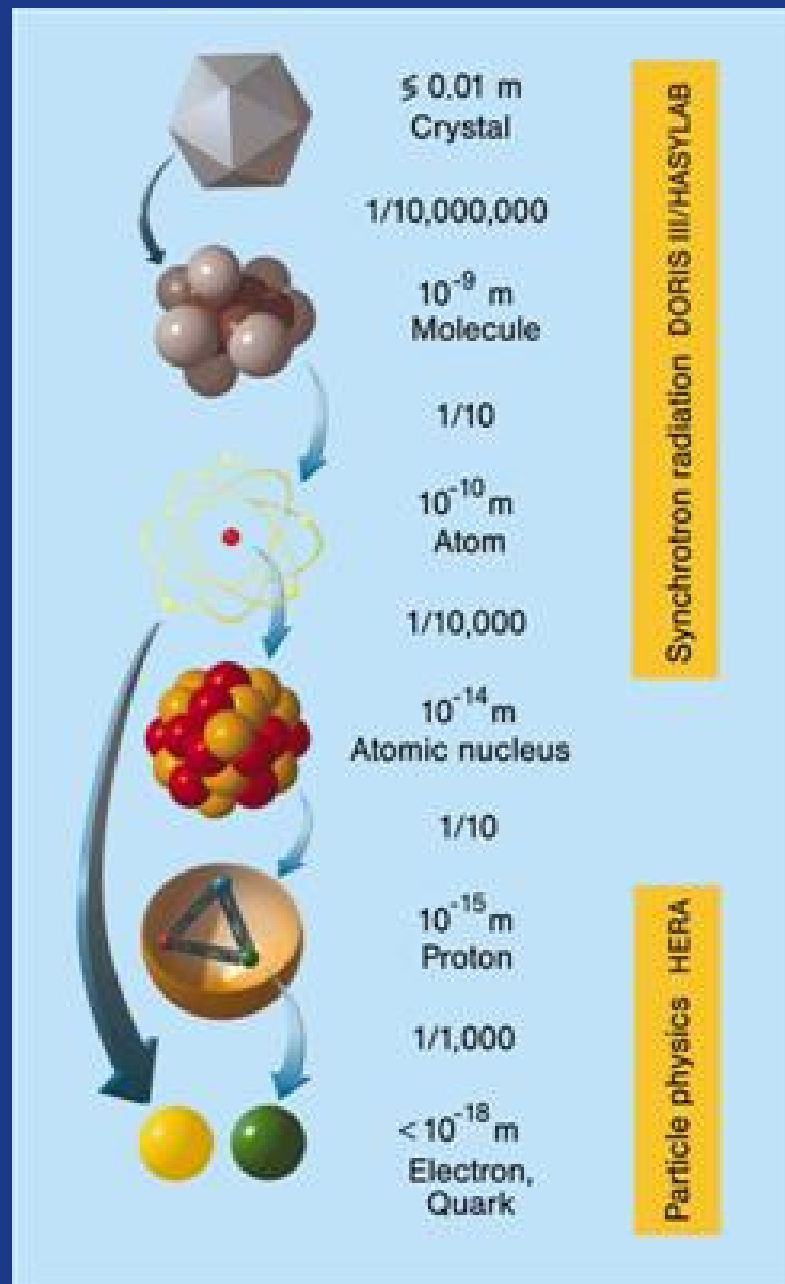
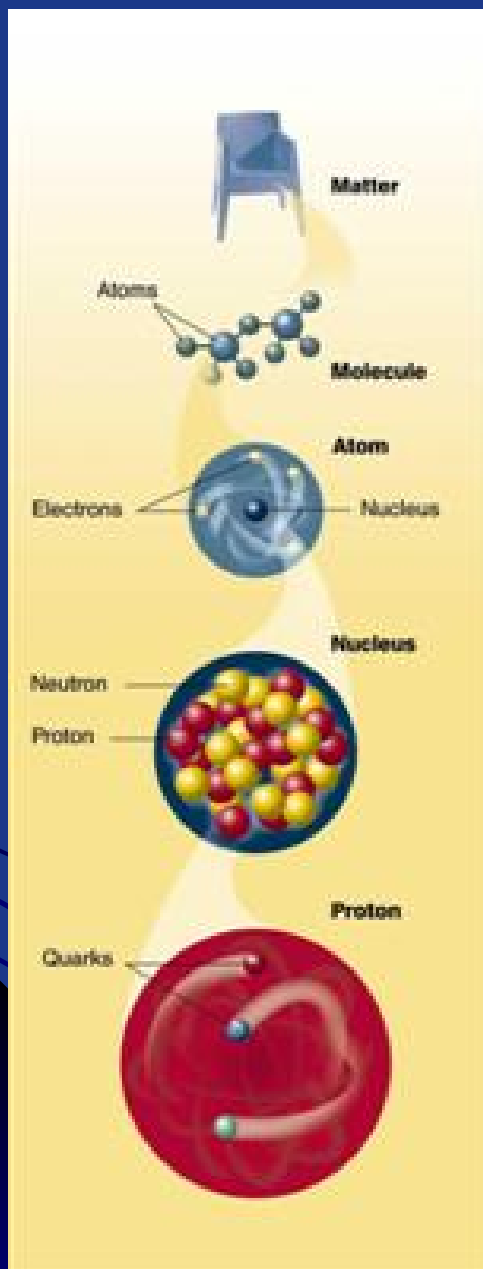
Hamburg

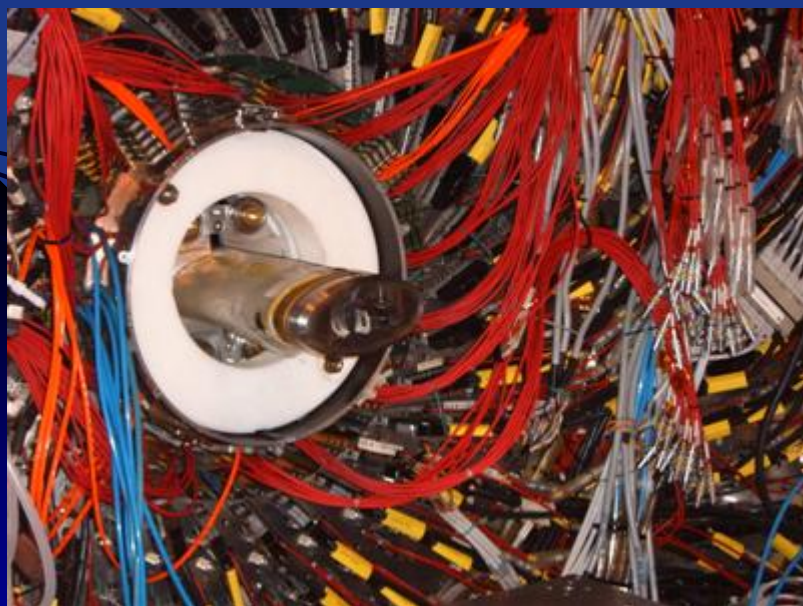
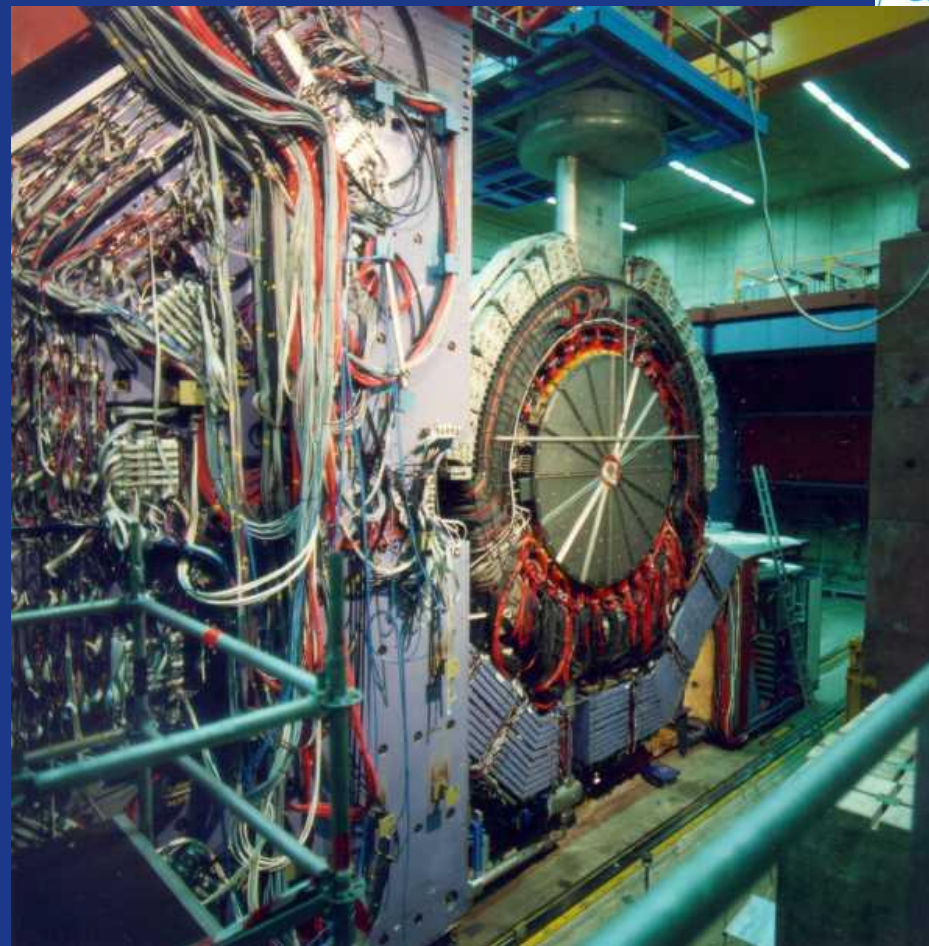
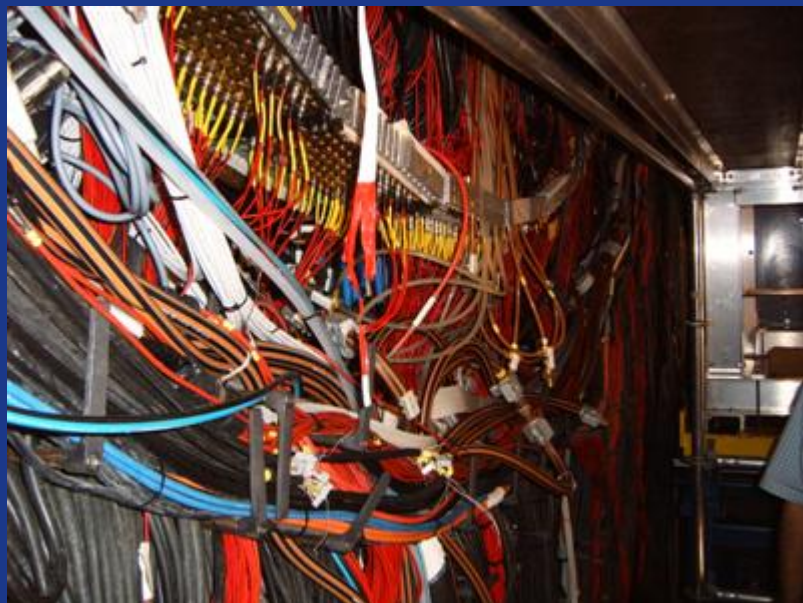






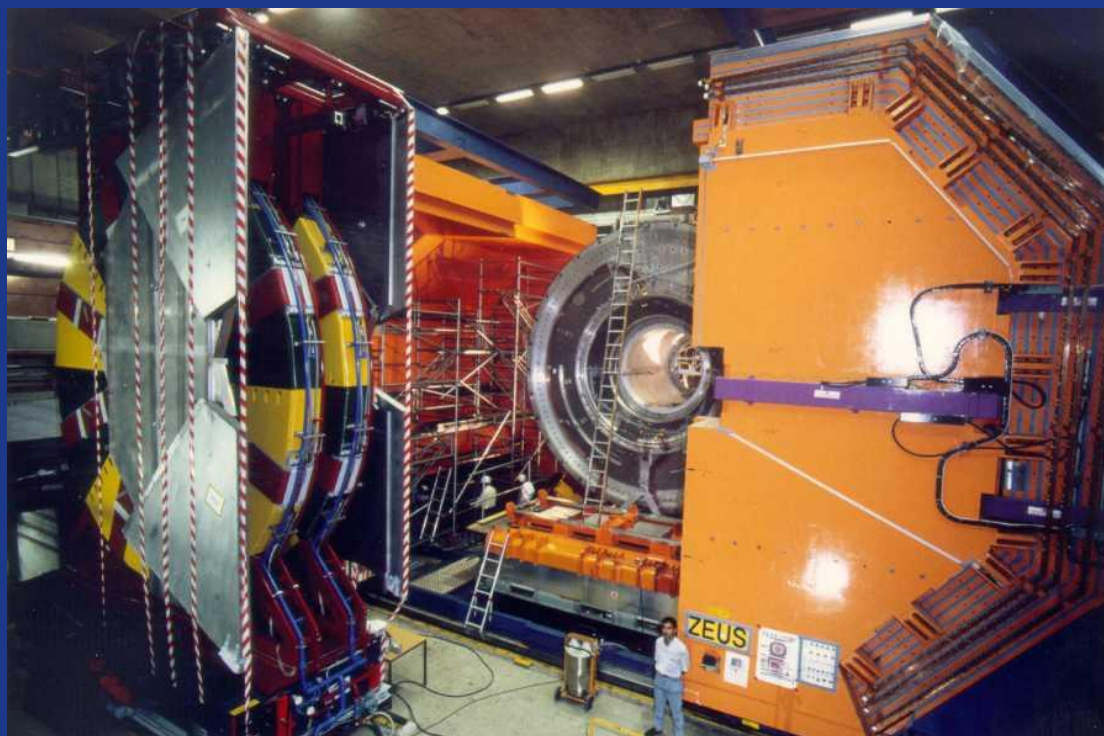




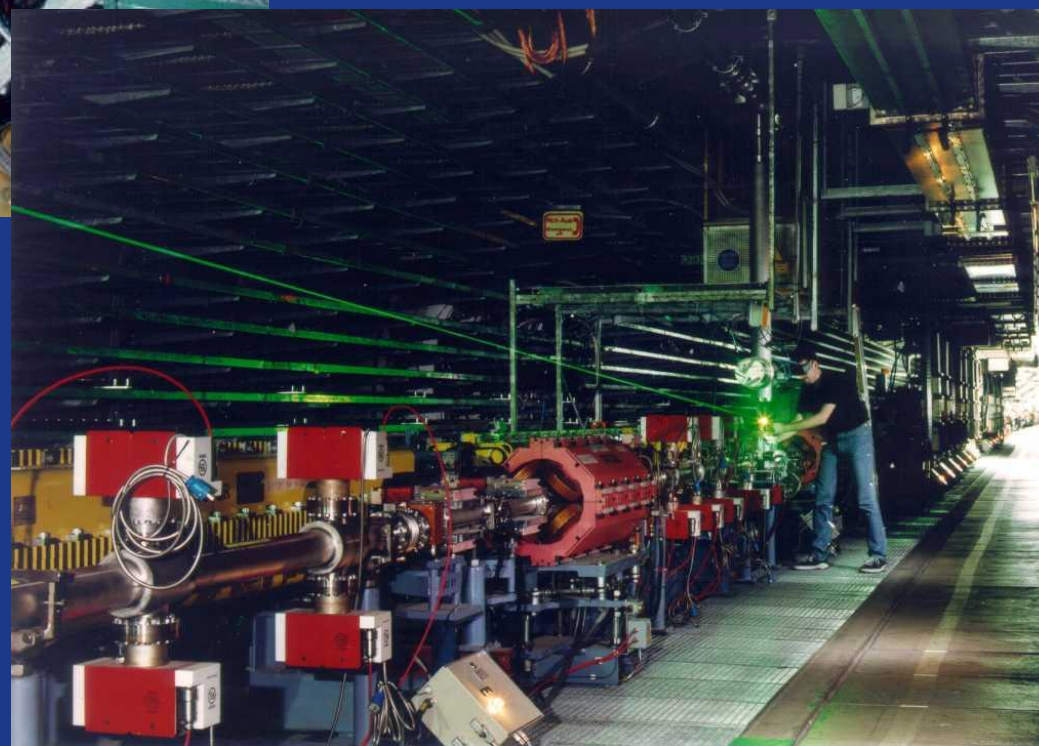


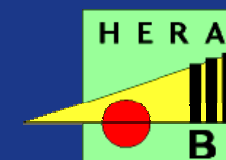
H1 detektor (1992. god)
12 x 10 x 15 metara
2800 tona





ZEUS detektor (1992. godina)
12 x 11 x 20 metara
3600 tona







Leter



Milan Milosevic
<http://www.mmilan.com>

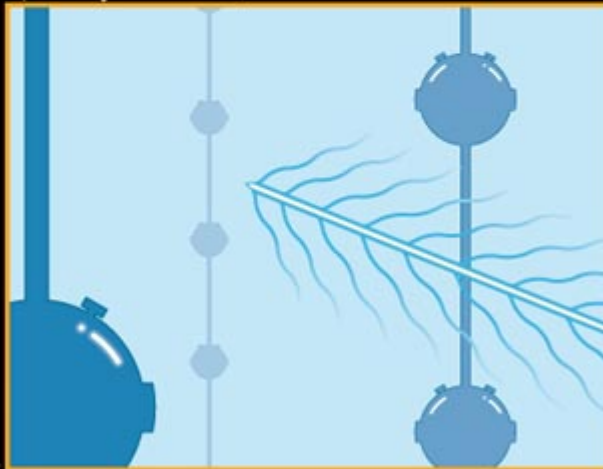
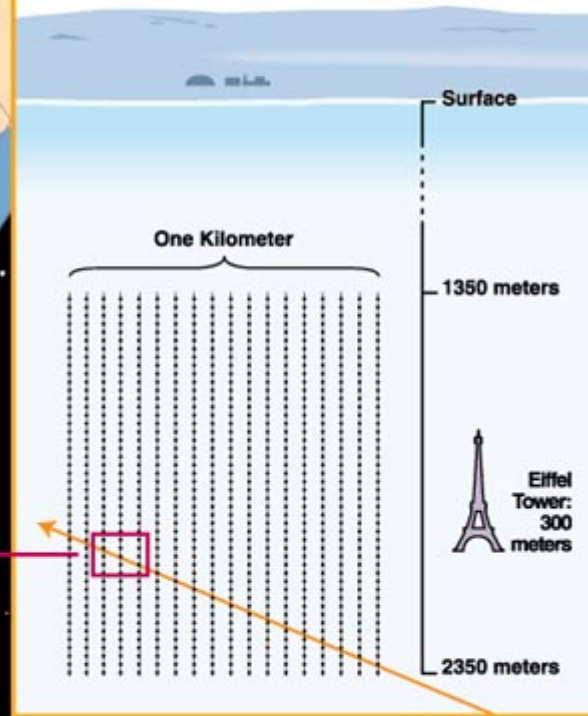




'Ice Cube' Neutrino Detector Array

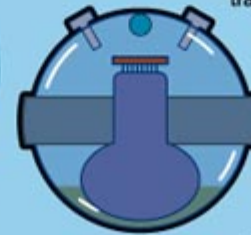
Buried a mile deep in the Antarctic ice, the Ice Cube Neutrino Detector Array promises a new kind of astronomy. When completed, Ice Cube will occupy a cubic kilometer of deep ice, transforming the polar ice cap into a detector capable of sampling the high-energy neutrinos that emanate from some of the most distant and violent phenomena in the cosmos - colliding black holes, galaxies with super violent cores and mysterious gamma ray bursts. Like ghostly messengers, high-energy neutrinos traverse huge distances, passing through stars, planets, magnetic fields and entire galaxies without skipping a beat.

To distinguish neutrinos from a background of cosmic ray muons, the Earth is used as a filter, with only neutrinos able to pass through the planet unchecked.

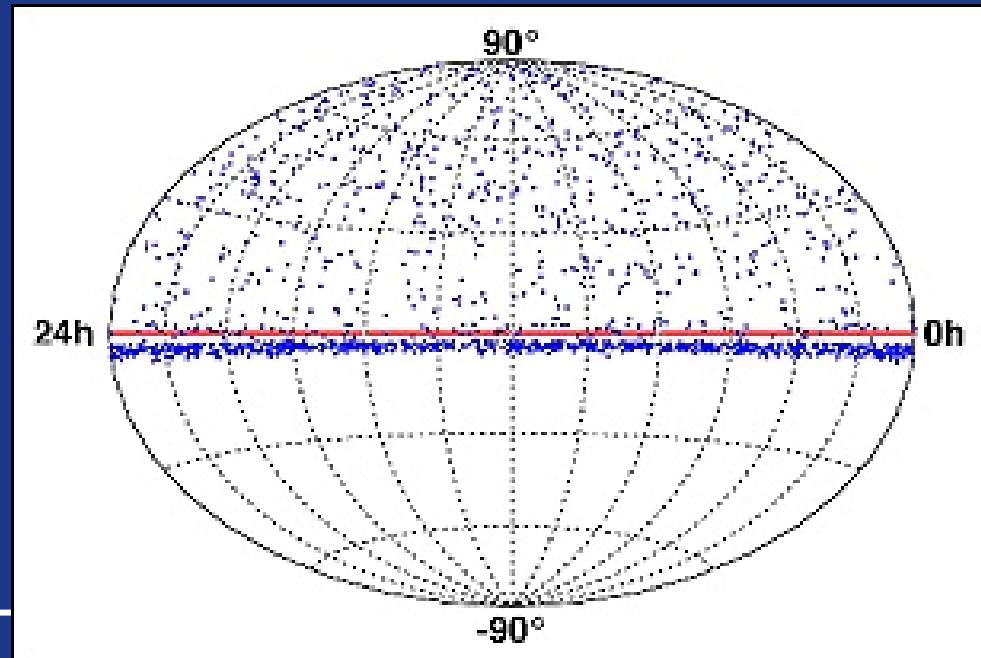
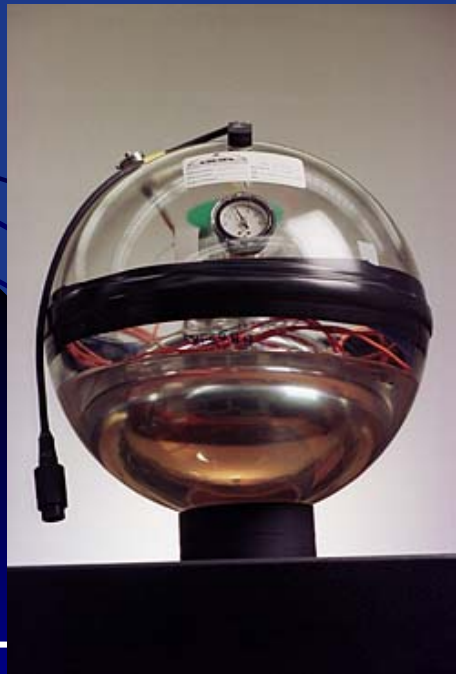


A trail of Cherenkov light is created when a neutrino, on very rare occasions, crashes head-on into another particle such as a proton or neutron. From the wreckage of those collisions emerges a muon which creates a fleeting trail of blue light on a path identical to that of the originating neutrino, allowing scientists to follow it back to a point of origin.

Slightly larger than a basketball, the optical sensors at the heart of Ice Cube are arranged on hundreds of electrical and fiber-optic cables. Deployed deep in the ice like beads on a necklace, the sensors work like light bulbs in reverse. They can capture light - even the faint and fleeting Cherenkov light traced by muons -



convert it to electricity, amplify it and turn it into an optical signal that is sent to the surface where it can be stored, read and interpreted.

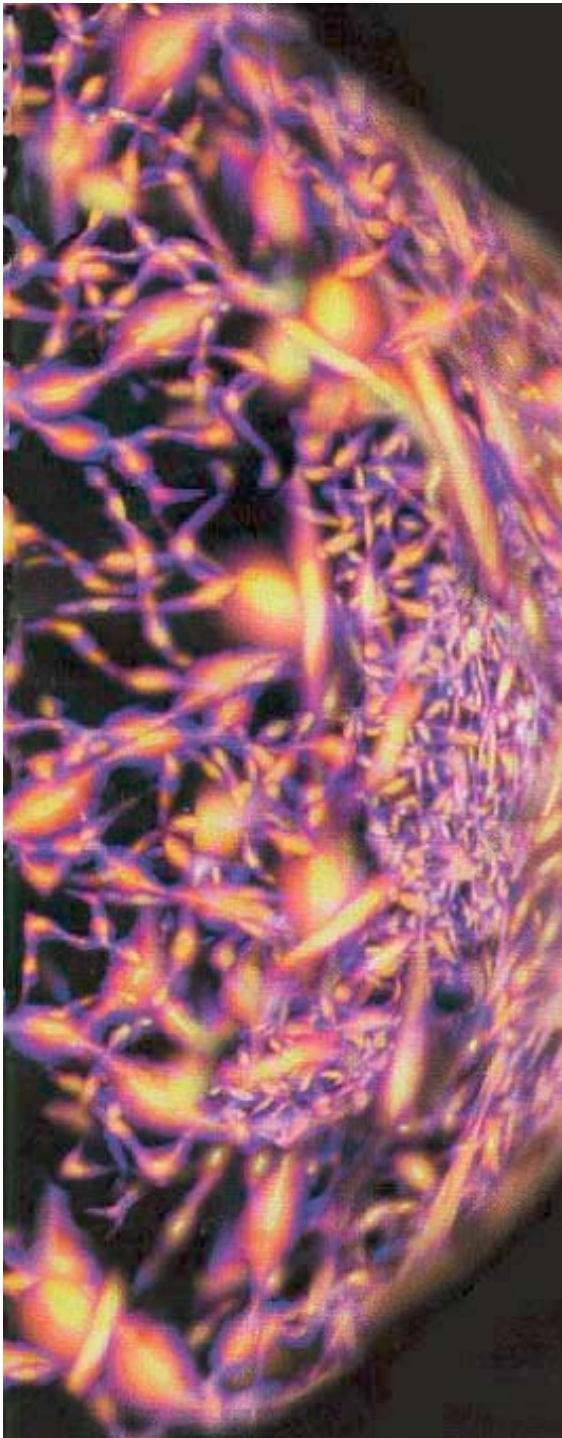


Letenka 2005



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KRAJ

