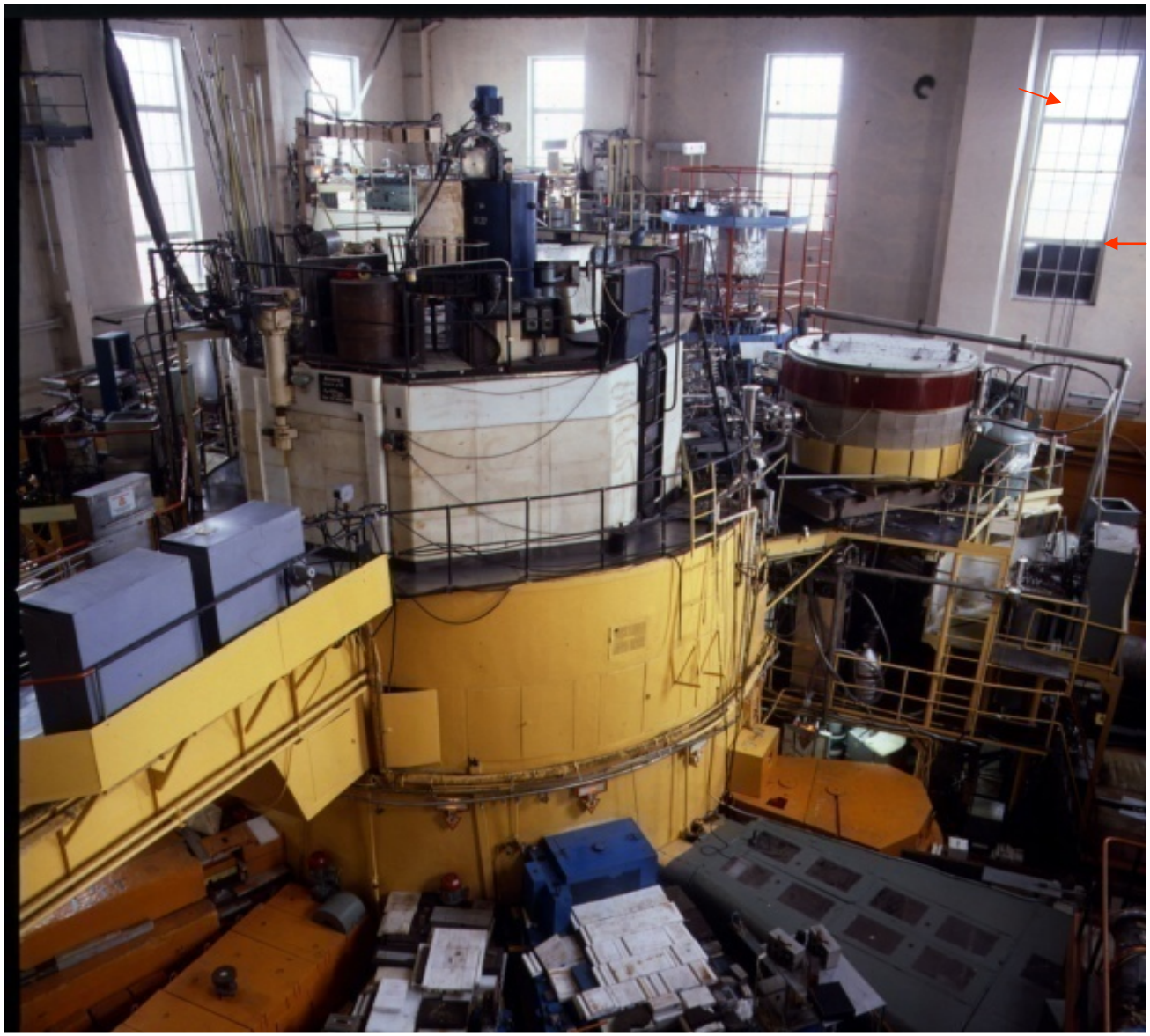
Petersburg Nuclear Physics Institute

Petersburg Nuclear Physics Institute was founded in 1954 as a part of Physical-Technical Institute of the Academy of Sciences of the USSR and since 1971y. has the status of the Institute. It is situated in Gatchina city which was the Russian Emperor's suburban residency. Now Gatchina is one of nicest places in the St.Petersburg region.

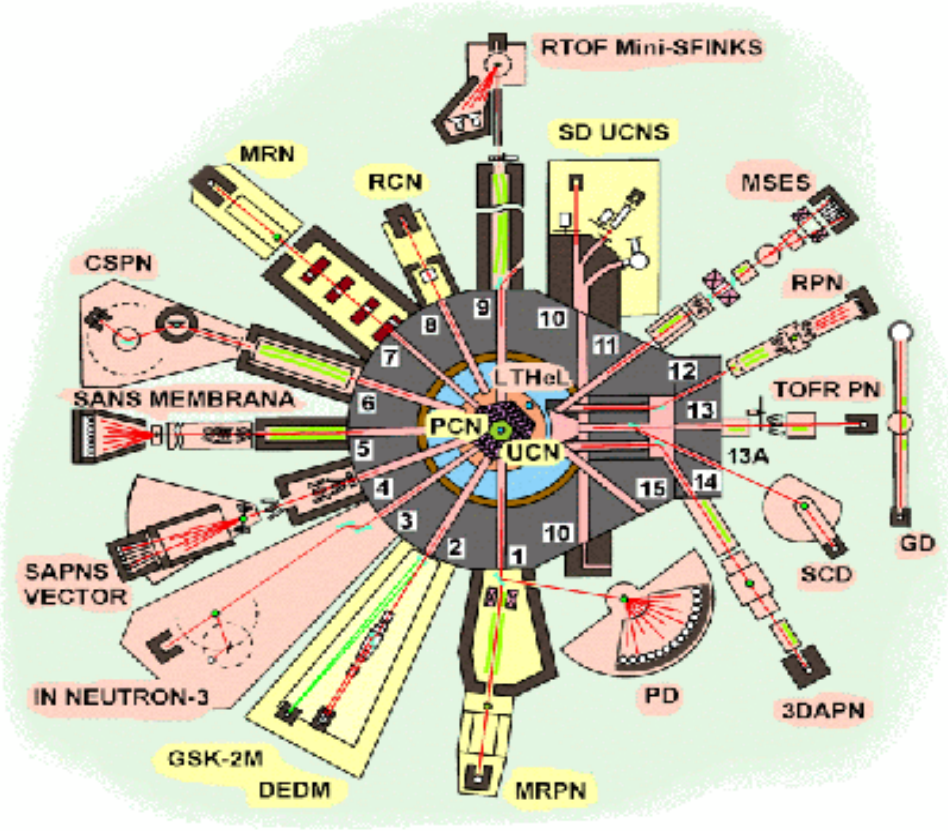
Stuff of the Institute includes about 600 researchers and 800 engineers; total number of co-workers is about 2000.

Scientific activity of the Institute is determined by great experience of the personnel and by the potential of the our main facilities:



18MW nuclear reactor WWR-M, research facilities on neutron beams

- **Nuclear water-water reactor WWR-M was constructed for basic and applied researches; heat power is 18 MW, neutron flux in the core is about 2×10^{14}n/cm^{2}s.**



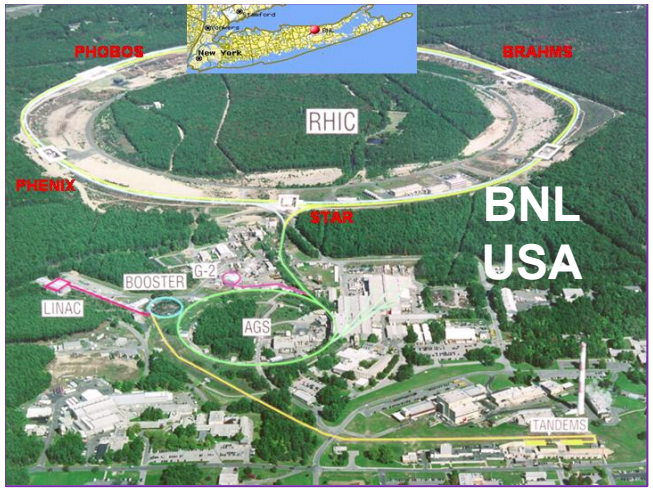
1GeV proton synchrocyclotron

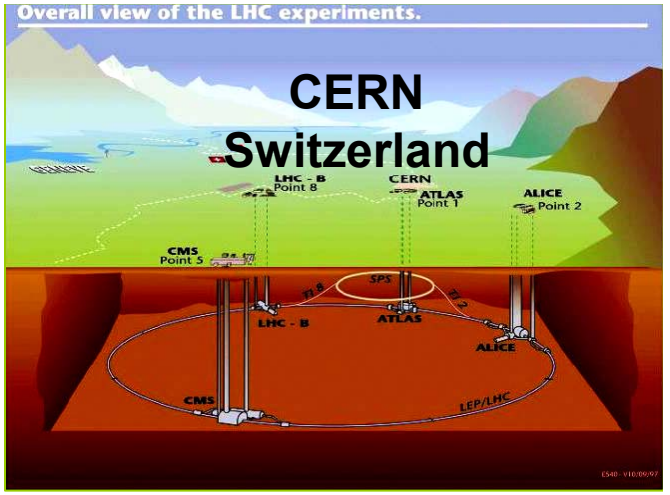
Buildings for 100MW reactor PIK

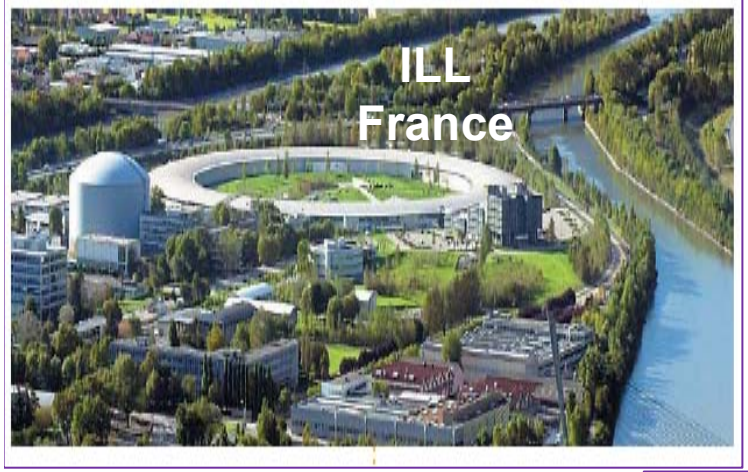
Nuclear high flux reactor PIK with heat power 100MW has the only analogous concurrent, the reactor HFR in Grenoble, but it is constructed for wider opportunities for experiments. Now the creating of the reactor is about completion; physical start with 100kW heat power is planned to 2009y; full power should be achieved in 2011y. Calculated neutron flux in the water cavity will be up to 5×10^{15}n/cm^{2}s.

- Main fields of activity of the Institute are:
- 1) Investigations of basic properties of elementary particles and fundamental interactions in the energy range from energies of ultra-cold neutrons up to energies available with largest colliders.
- 2) Nuclear physics, from conventional nuclear spectroscopy and applications such as neutron-activation analysis up to relativistic nuclear physics.
- 3) Condensed matter physics, such as physics of magnetic materials, phenomena of high temperature superconductivity, physics of biological substances.
- 4) Molecular and radiation biophysics, genetics.
- 5) Theoretical physics: theory of nuclei and elementary particles, theory of the solid state, theory of nuclear reactors and particle accelerators.
- 6) Nuclear medicine: irradiation of the cancerous tumors by the proton beam of the cyclotron.
- 7) Design and producing of new devices for basic and applied science: electronics, detectors, spectrometers for fast analysis of materials and so on.

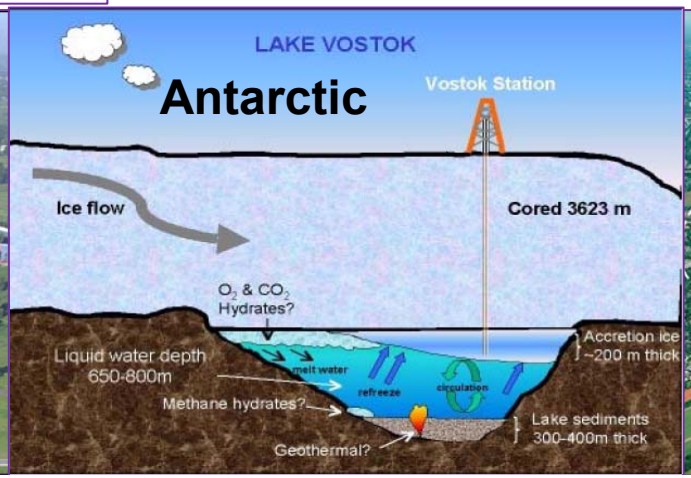
International collaboration

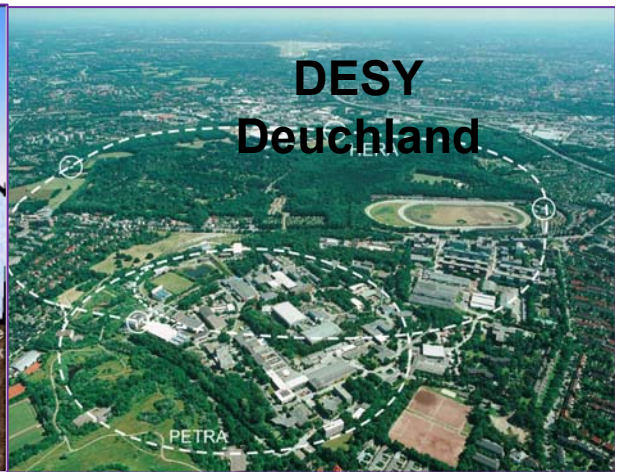




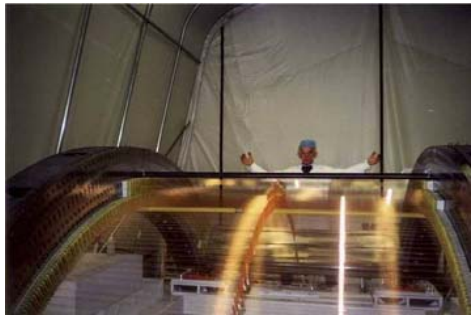


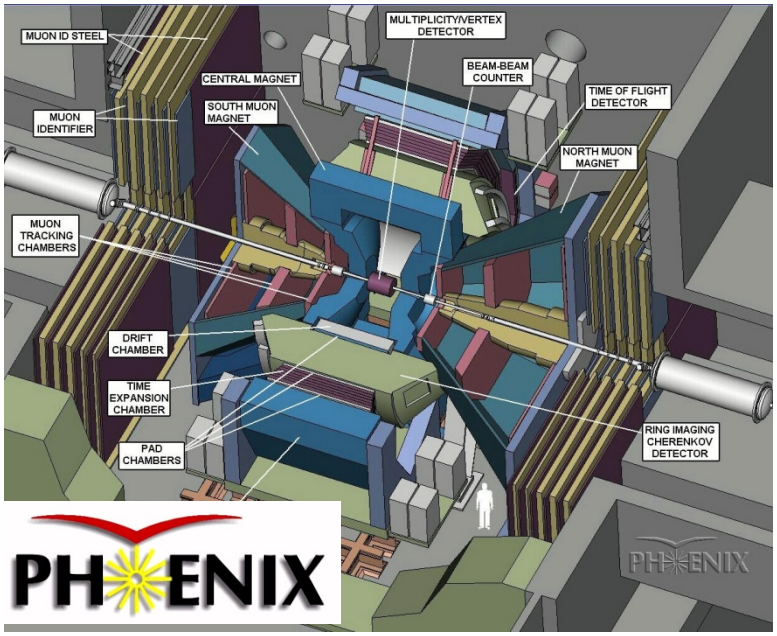
Fields of researches:
-physics of elementary particles
-relativistic nuclear physics;
-low and middle energy physics;
-physics of condensed matter;
-biophysics

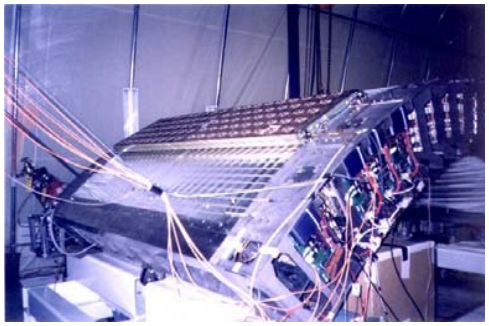


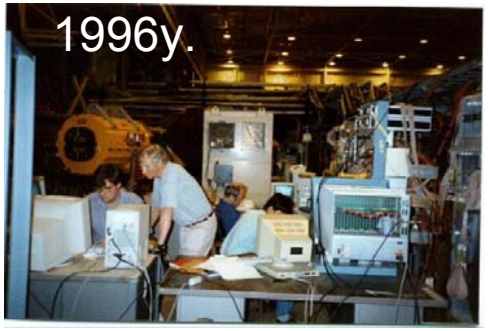


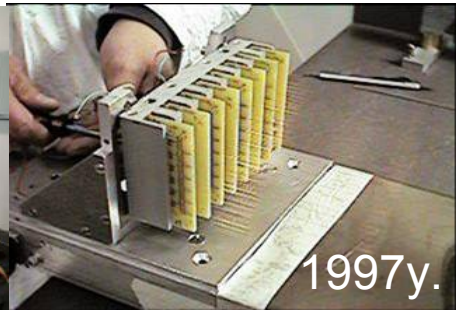
PNPI
In BNL (USA)



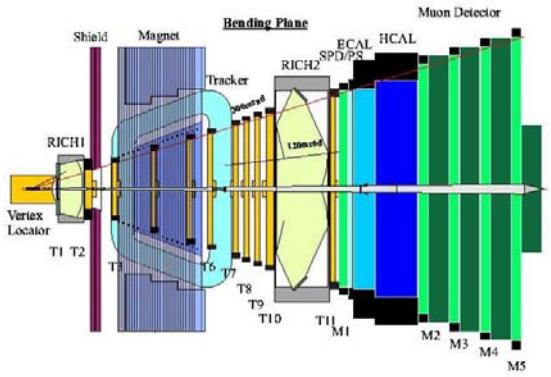




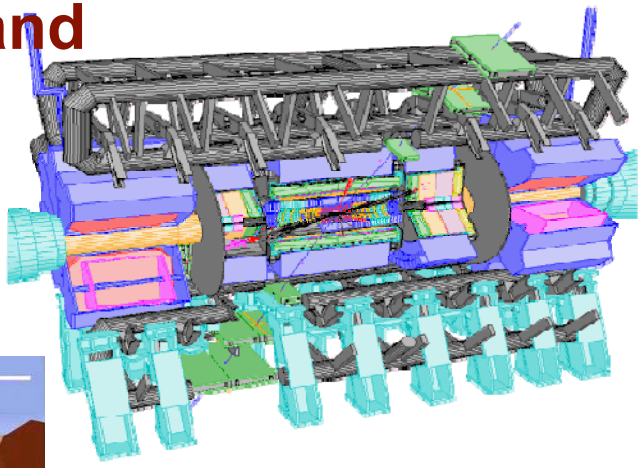




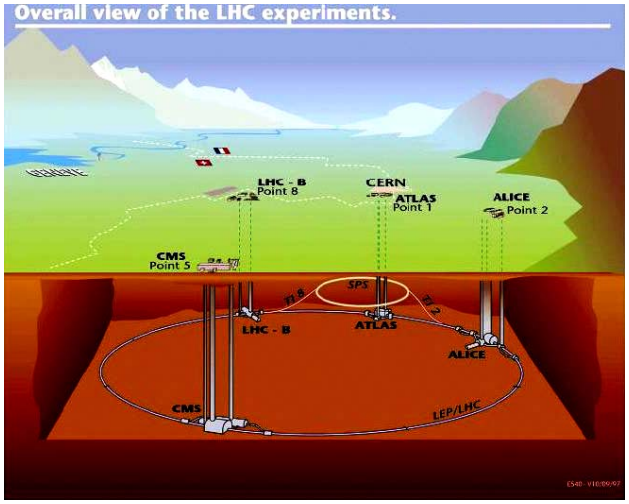
Research facilities at LHC
CERN, Switzerland



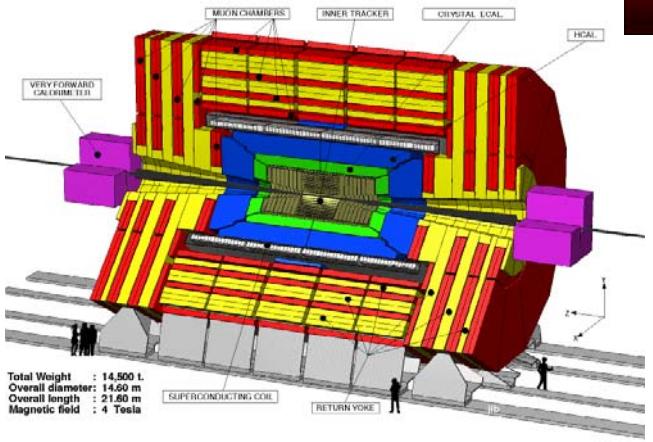
LHCb



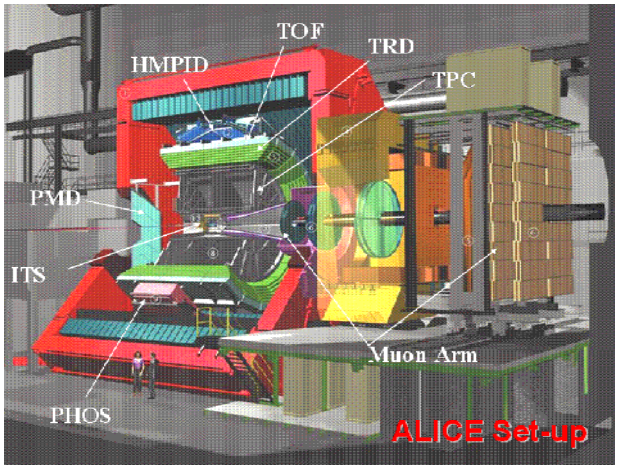
ATLAS



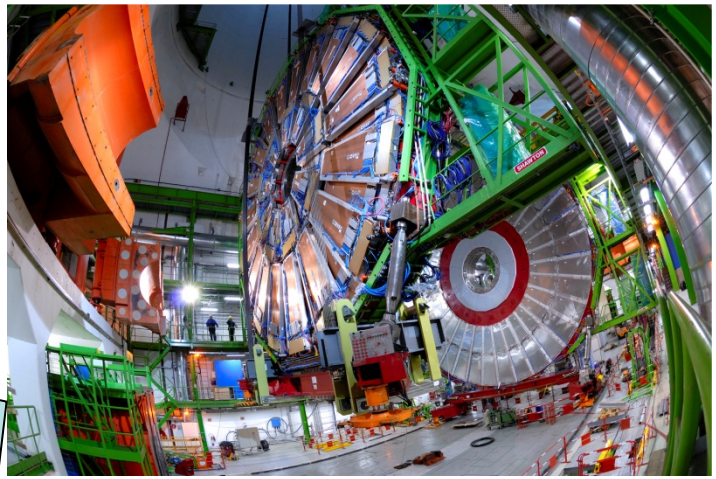
CMS

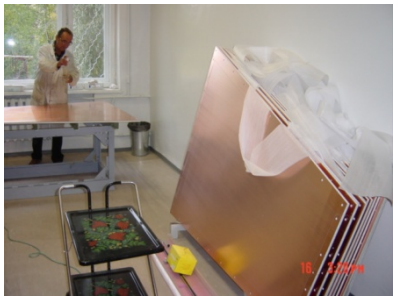


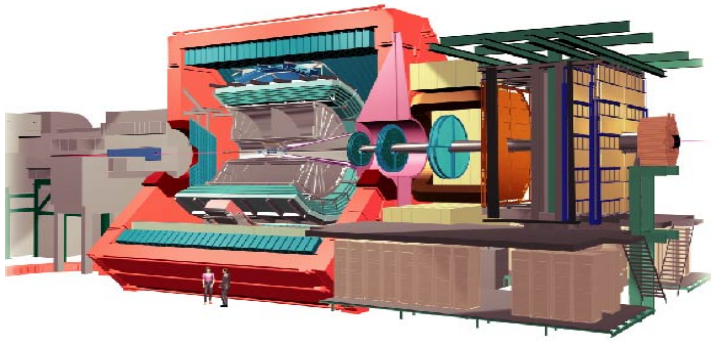
ALICE



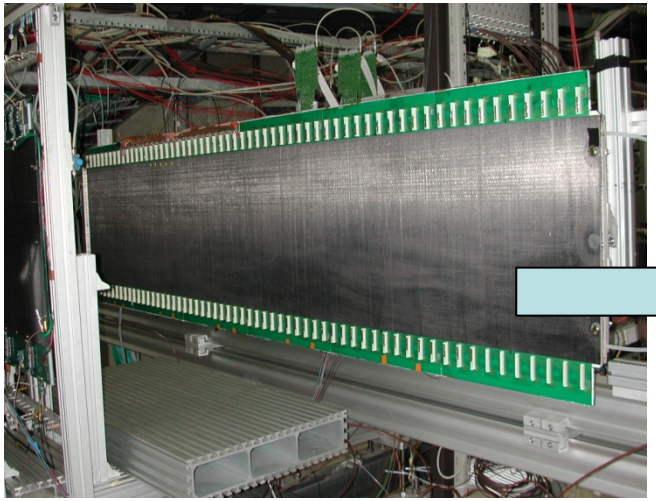
CSC Production at PNPI

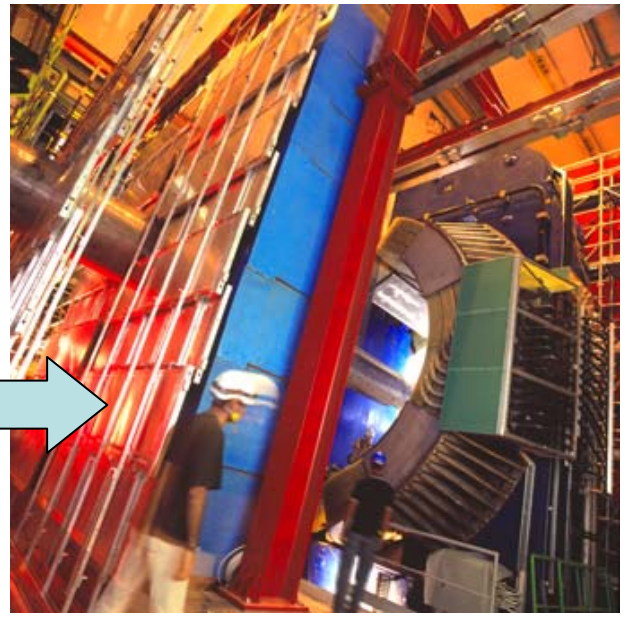


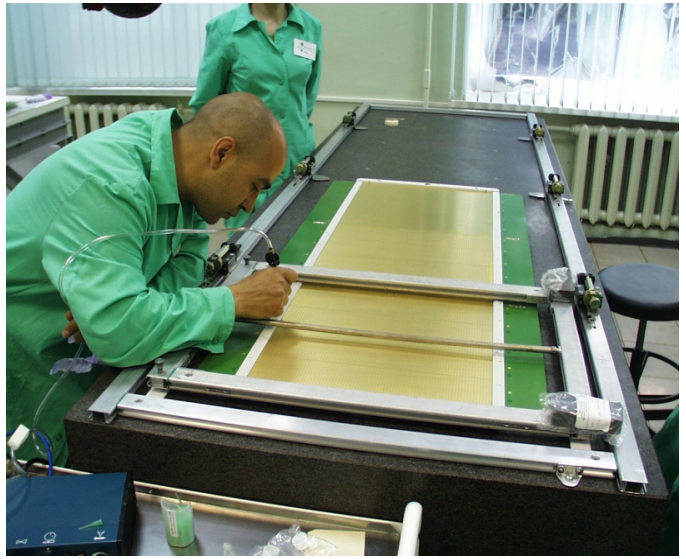




Wire chamber for ALICE Muon Arm







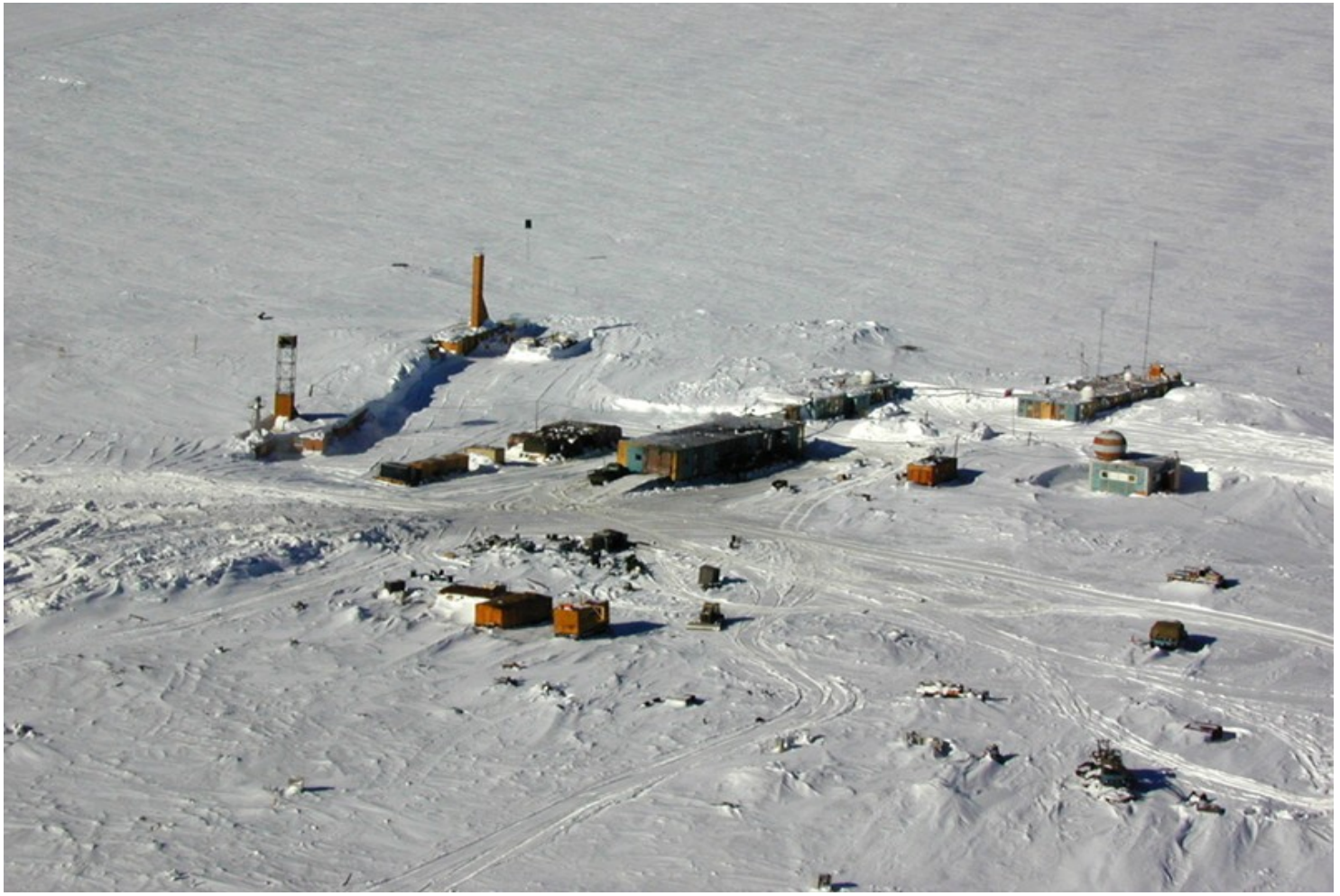
Neutron life time:
$\tau_n = (878,5 \pm 0,7_{st} \pm 0,3_{syst})$ s
Measured by “Gravitrap”.

PNPI
at ILL (France)

2005

Molecular and radiation physics department

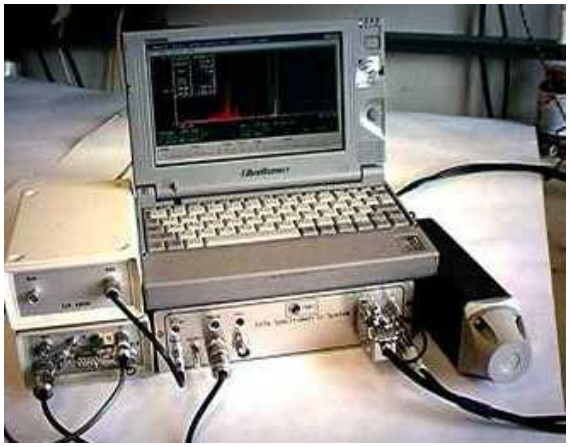
Nuclear methods give wide opportunities for researches in biology.
Main fields of investigations are:
-biophysics of macromolecules,
-enzymology
-protein biosynthesis
-genetics of eucariotes
-molecular geomicrobiology
-DNA biosynthesis
-molecular genetics
-biopolymers
-organic synthesis
-cell biology
-human molecular genetics
And so on…

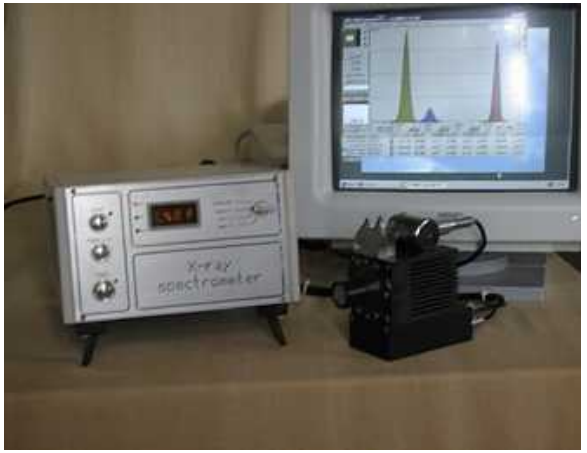


Antarctic station VOSTOK. Searches of unusual living forms in the water of the under-ice lake Vostok.

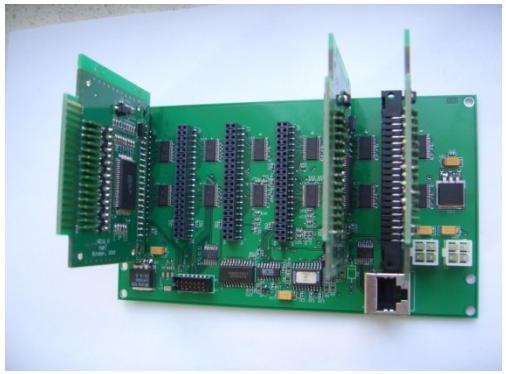
- Proton beam therapy.
- More than 1300 patients.
- Result: clinical remission
- from 85 to100%

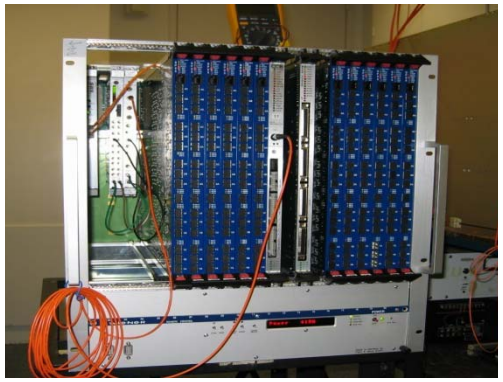
Spectrometers for technical applications



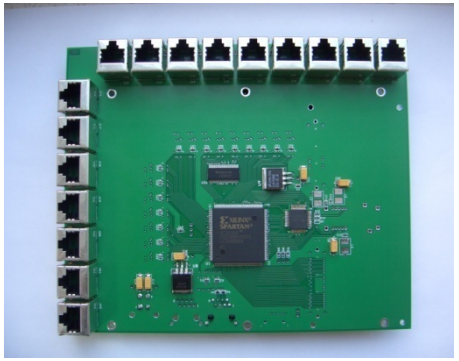


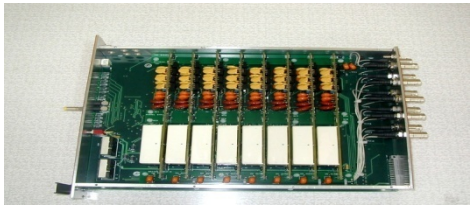
Devices for medicine

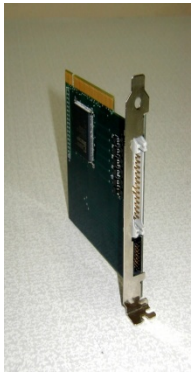


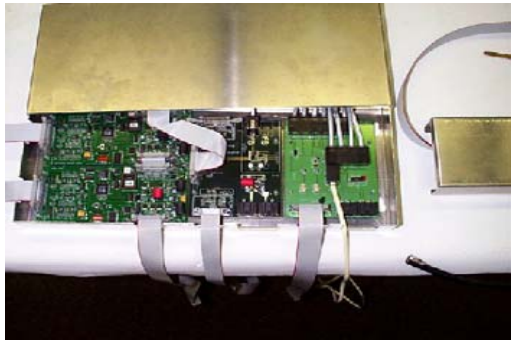


Electronics for science









That's All, Folks!

For more details see

www.pnpi.spb.ru