WARSAW UNIVERSITY
HEAVY ION LABORATORY
and
WARSAW PET CENTRE

Jerzy Jastrzębski

January 26, 2007
EWON Meeting

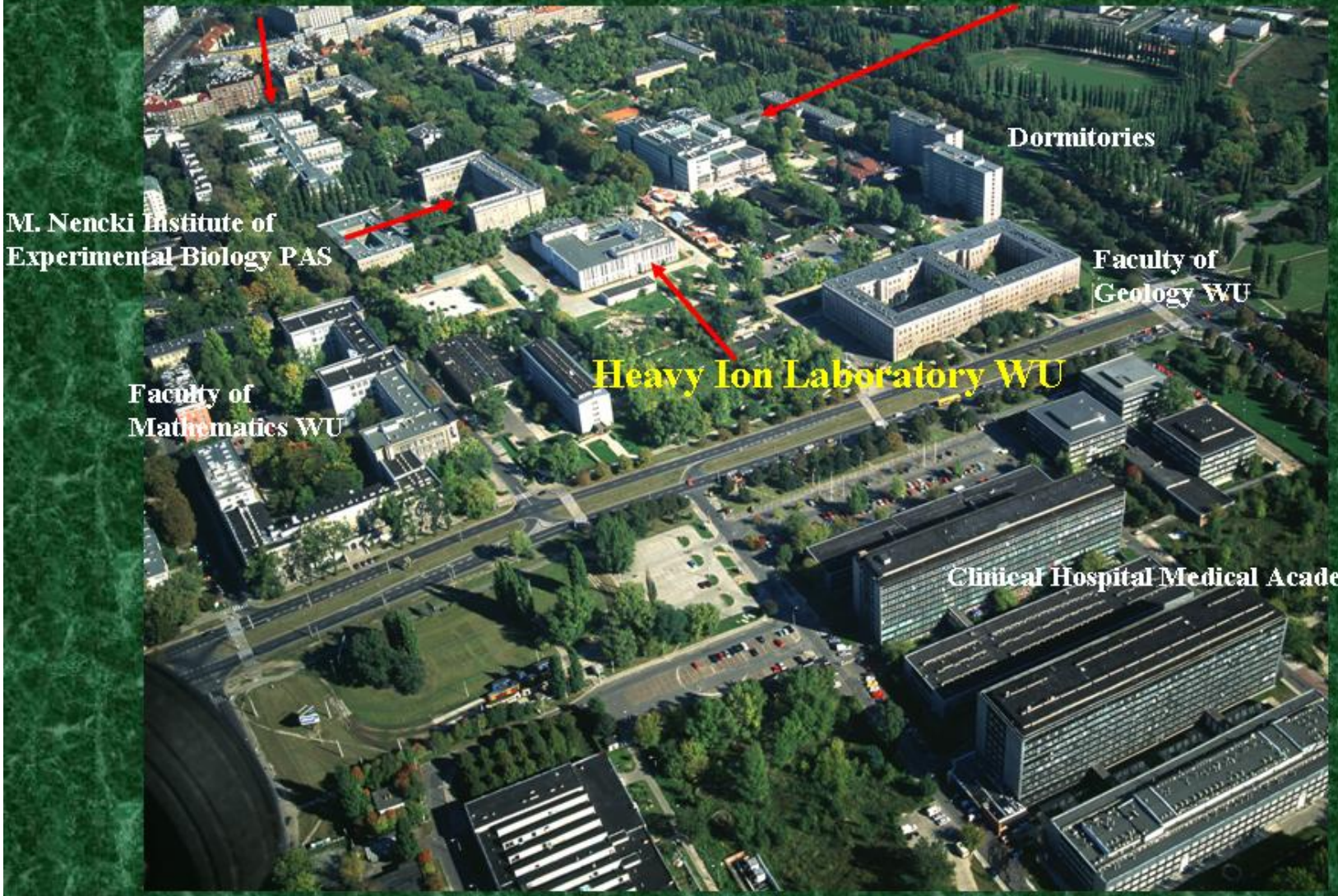
HEAVY ION LABORATORY

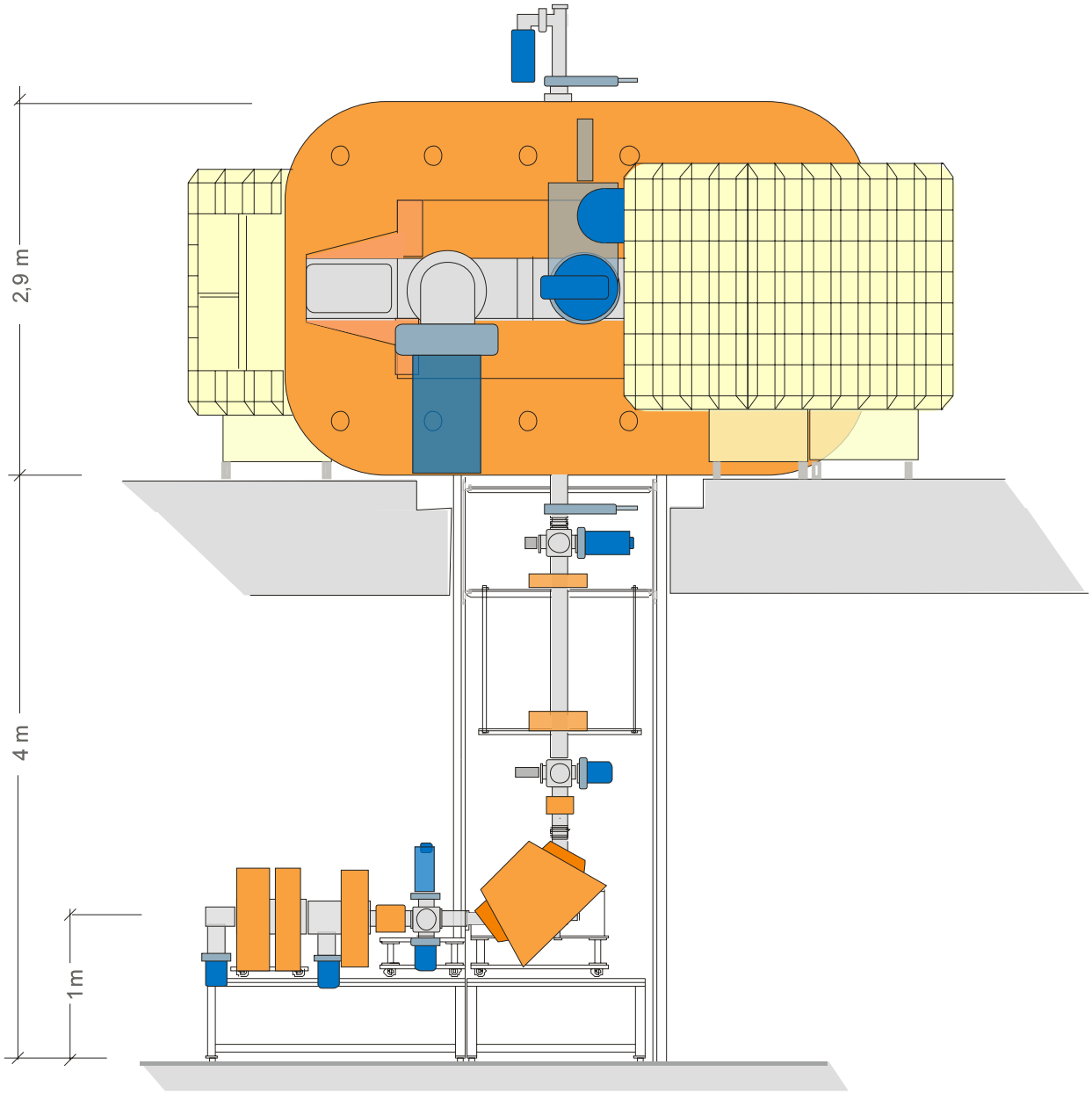
The Laboratory is an interdepartamental unit of the Warsaw University

Created in 1979:	*Based on the agreement of three state institutions: (present names):* *Ministry of Education* *Polish Academy of Sciences* *National Atomic Energy Agency*
Main equipment:	*heavy – ion isochronous cyclotron, accelerating ions up to mass 40 to the energies E=10MeV/A*
Cyclotron commissioning:	*1994, first beams with the PIG ion source* *1997, replacement of the PIG source by ECR*
Laboratory staff:	*62 people*
Number of cyclotron users until the end of 2006:	*about 600*
Building:	*10 000 m^2*
Including:	*Cyclotron vault* *Experimental hall* *Data acquisition room* *Conference room* *Seminar room* *Library* *Guest rooms (housing 12 persons)*

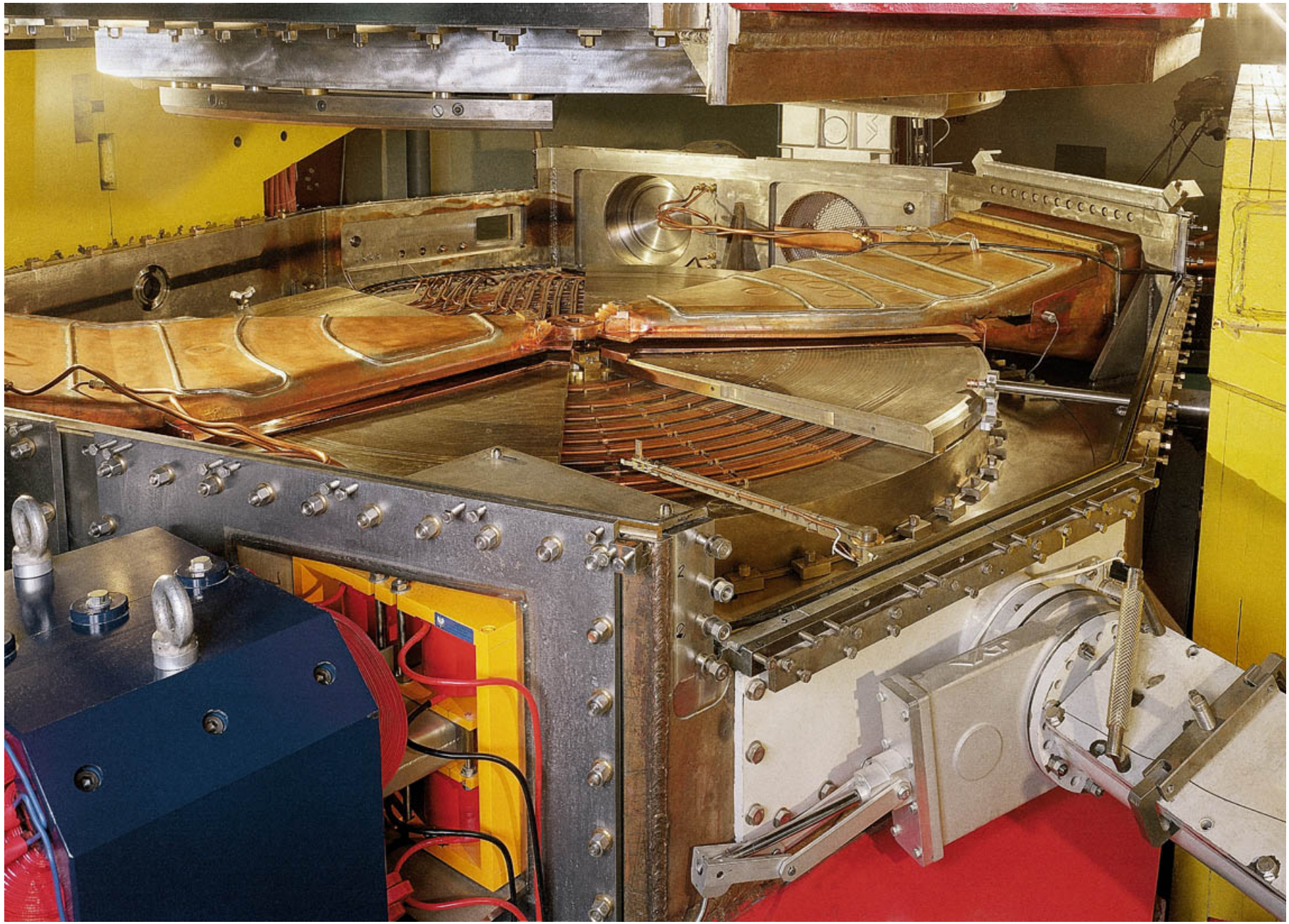
Heavy Ion Laboratory and its surroundings

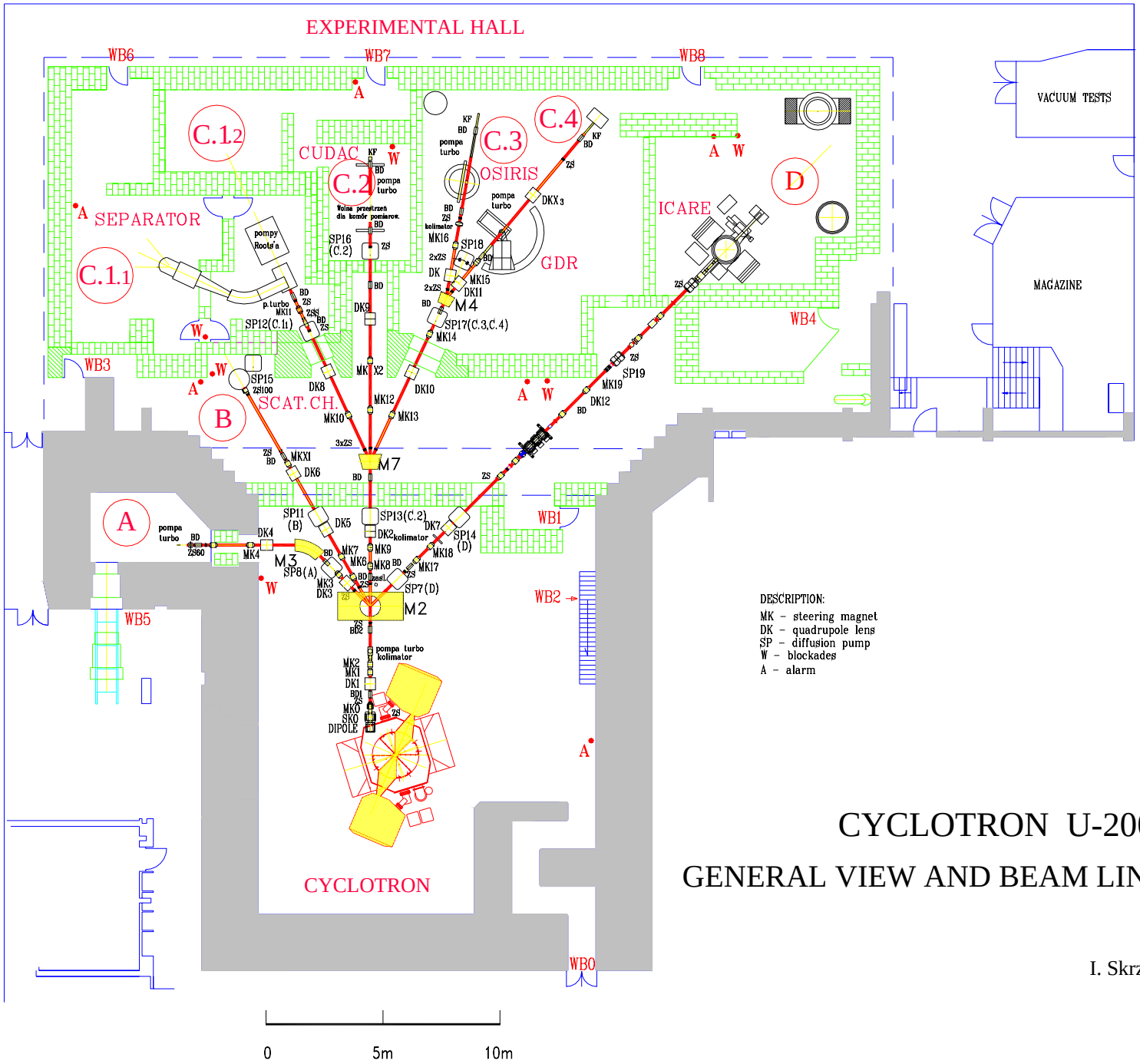
Ochota Campus - North





Side view of the cyclotron with its ECR ion source and injection line



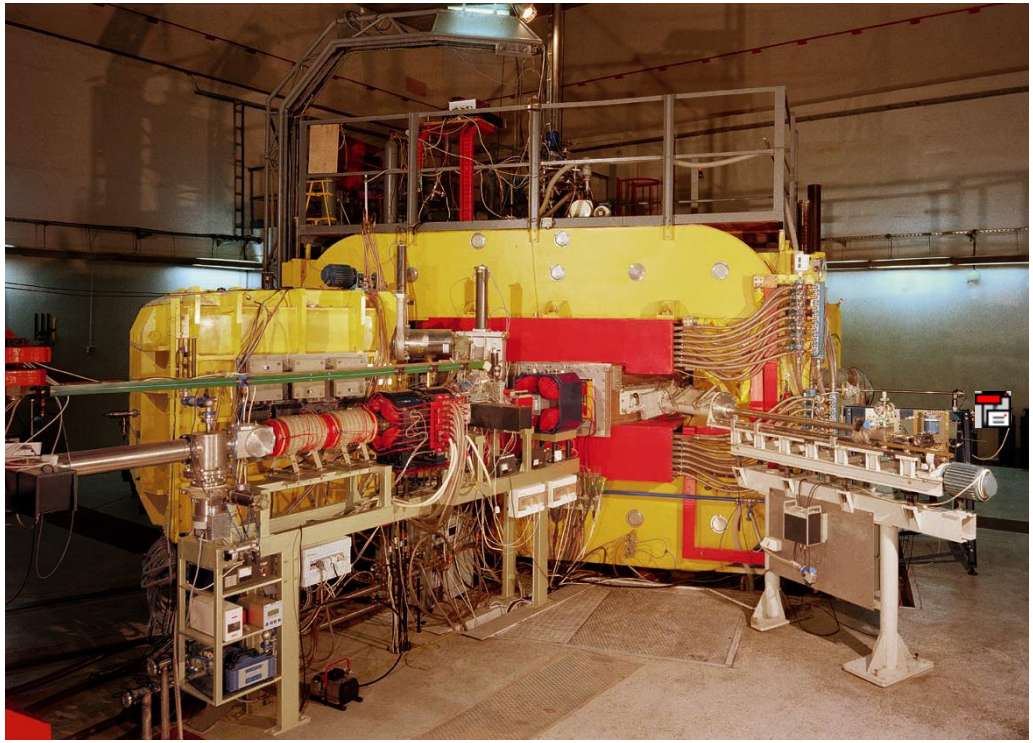


CYCLOTRON U-200P

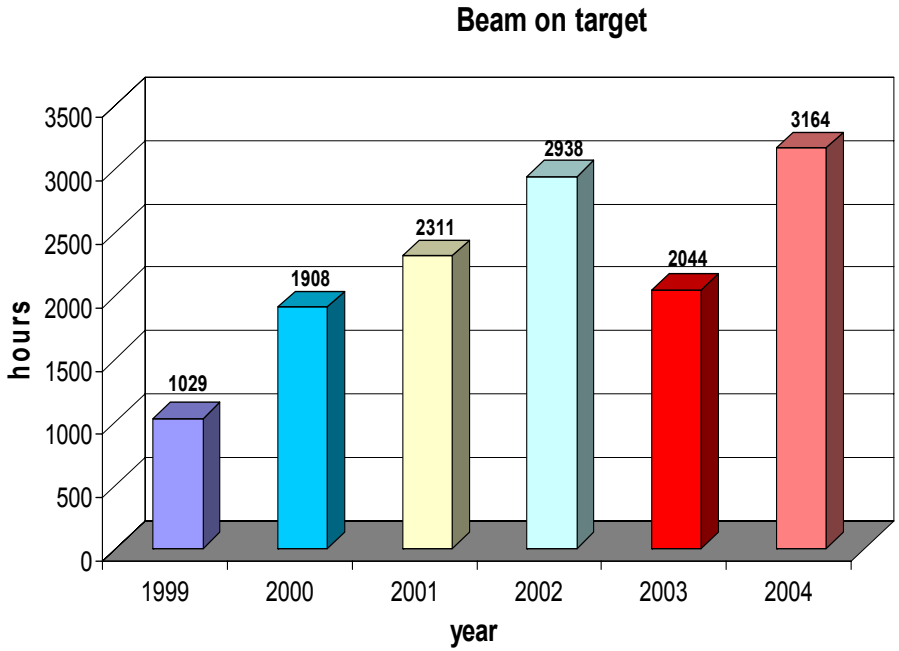
GENERAL VIEW AND BEAM LINES LAYOUT

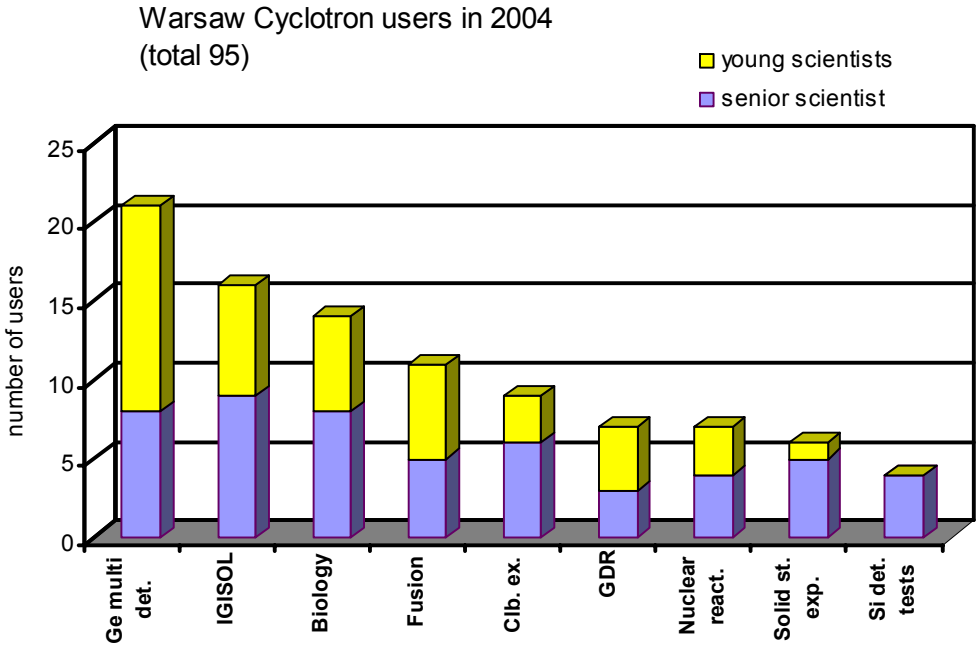
I. Skrzeczanowska 2006.09

Heavy Ion Laboratory – Warsaw University

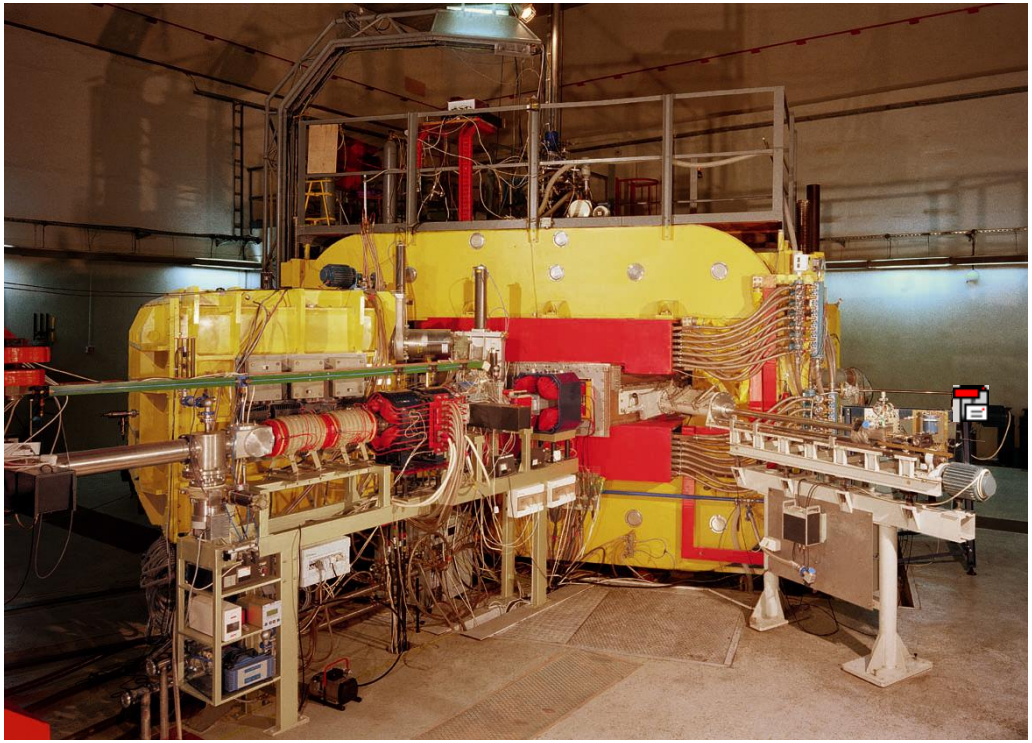


Dubna type K=160 machine
10 GHz (home made) ECR
Ions from B to Ar
2 – 10 AMeV energy





Heavy Ion Laboratory – Warsaw University



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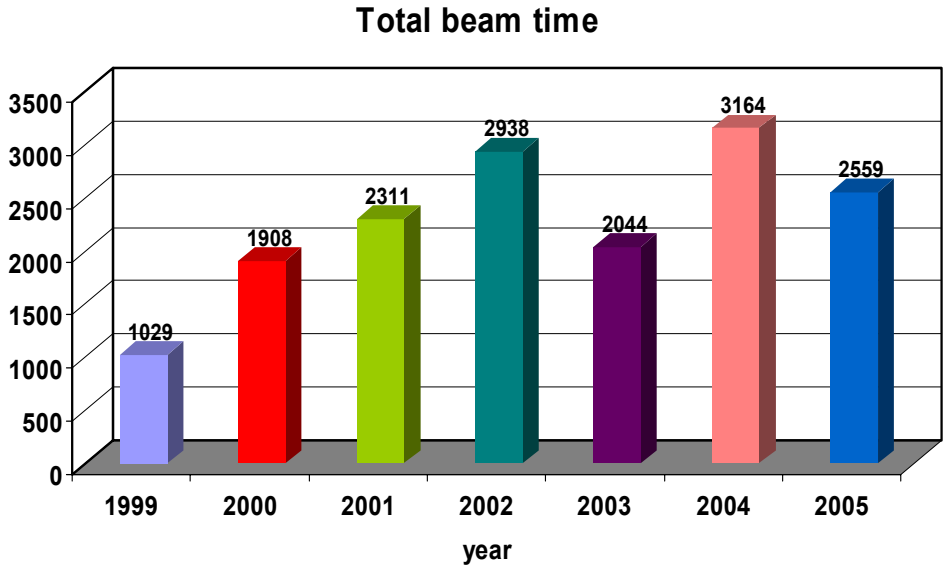
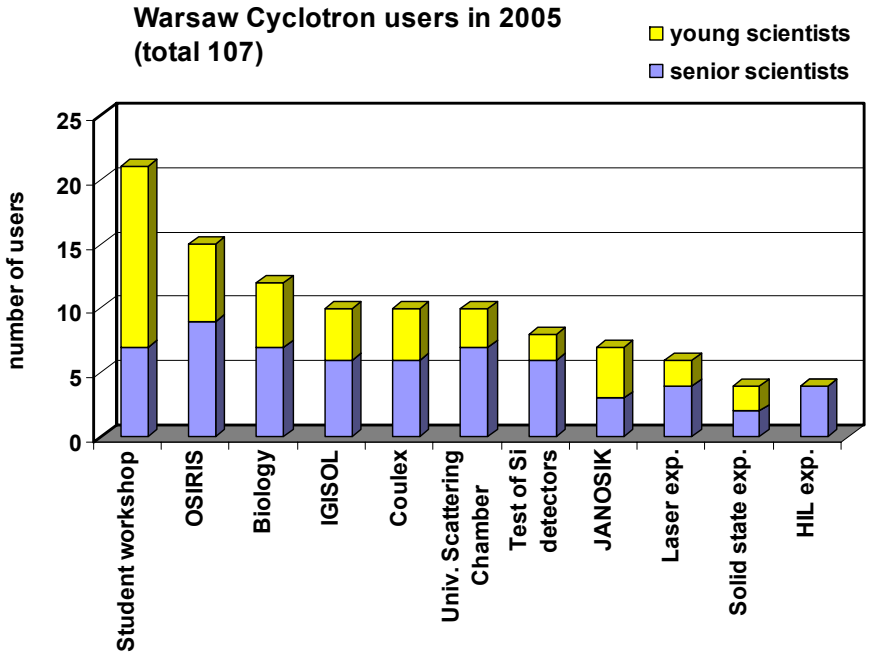
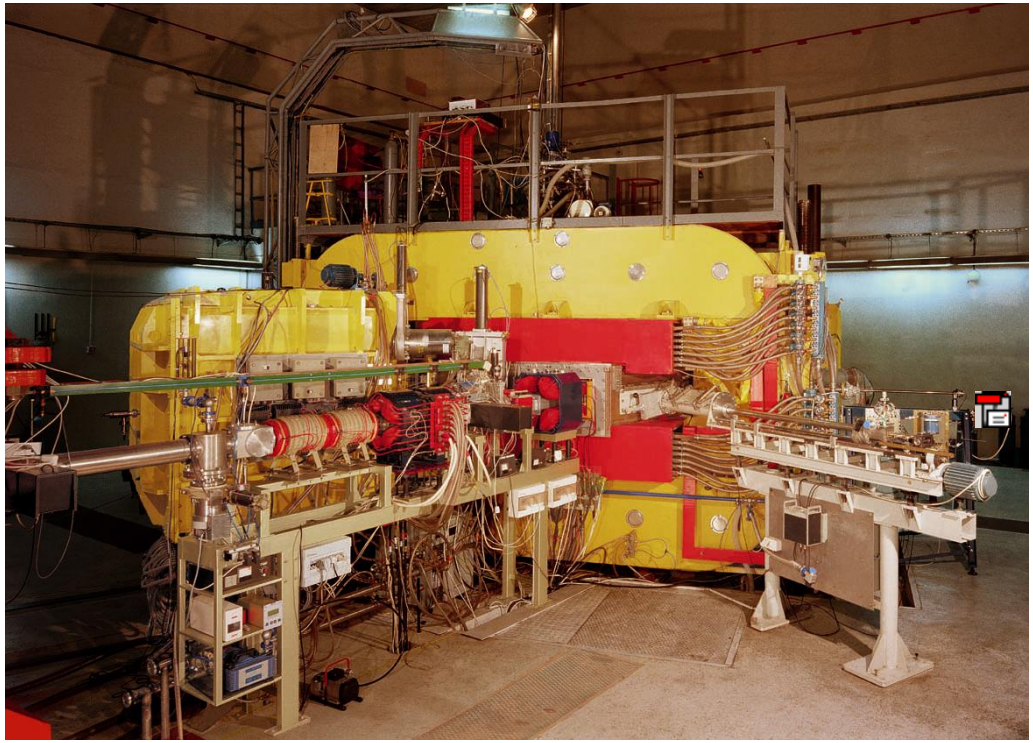




Heavy Ion Laboratory – Warsaw University



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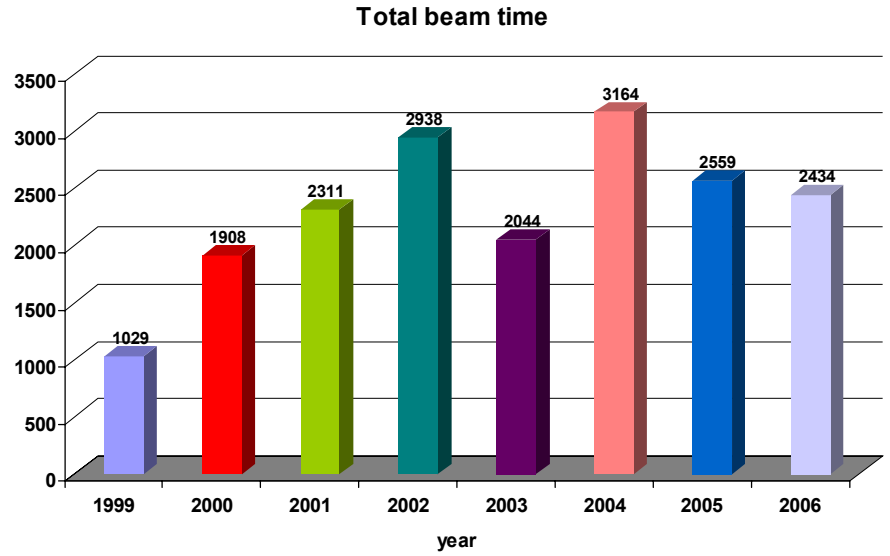
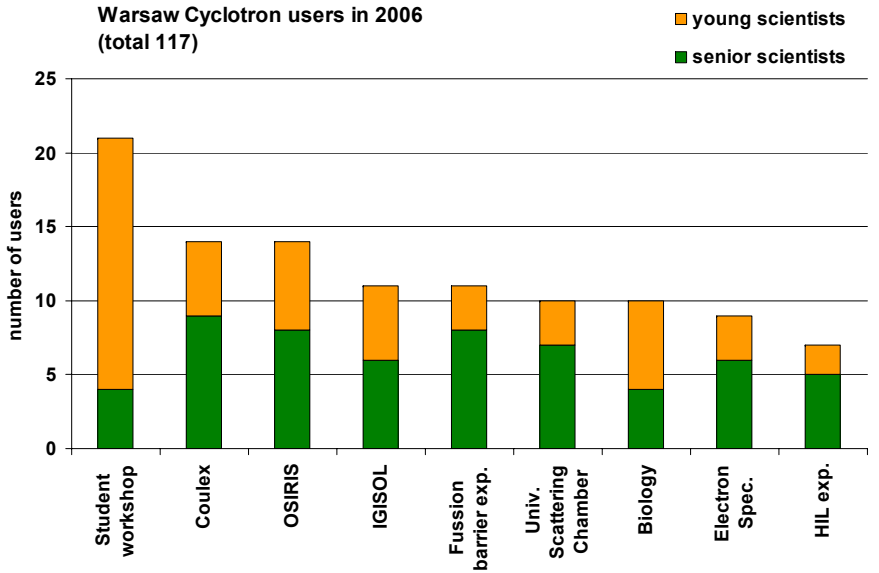
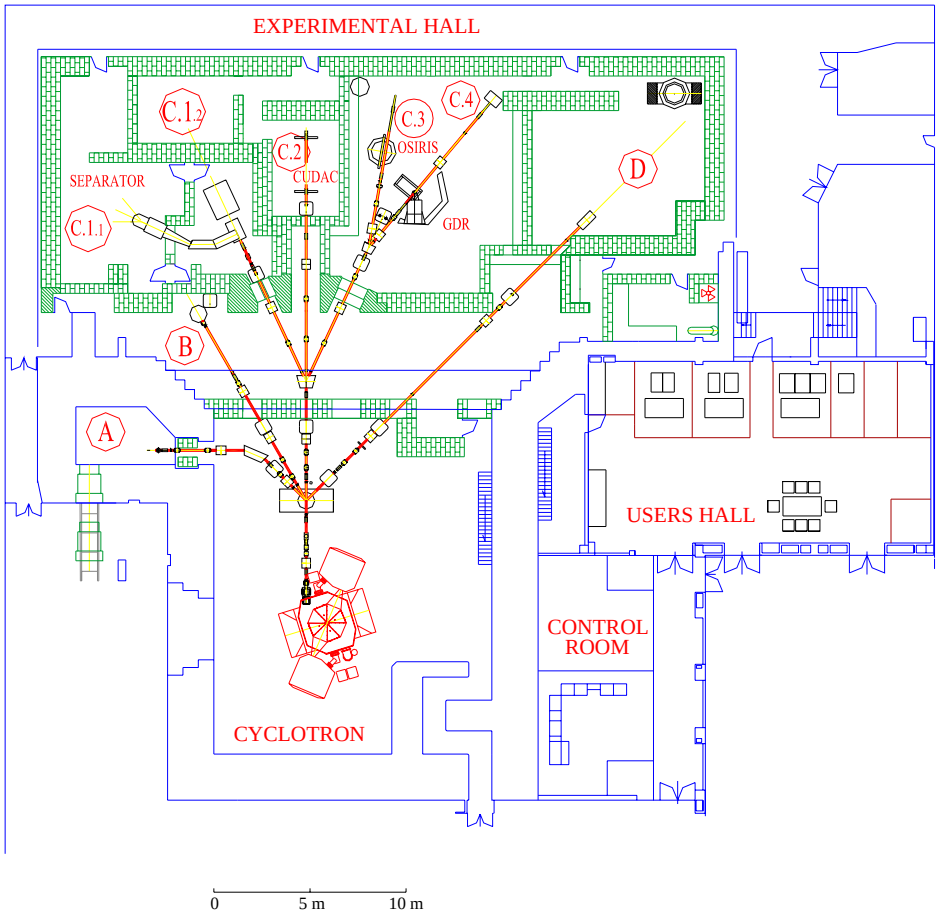
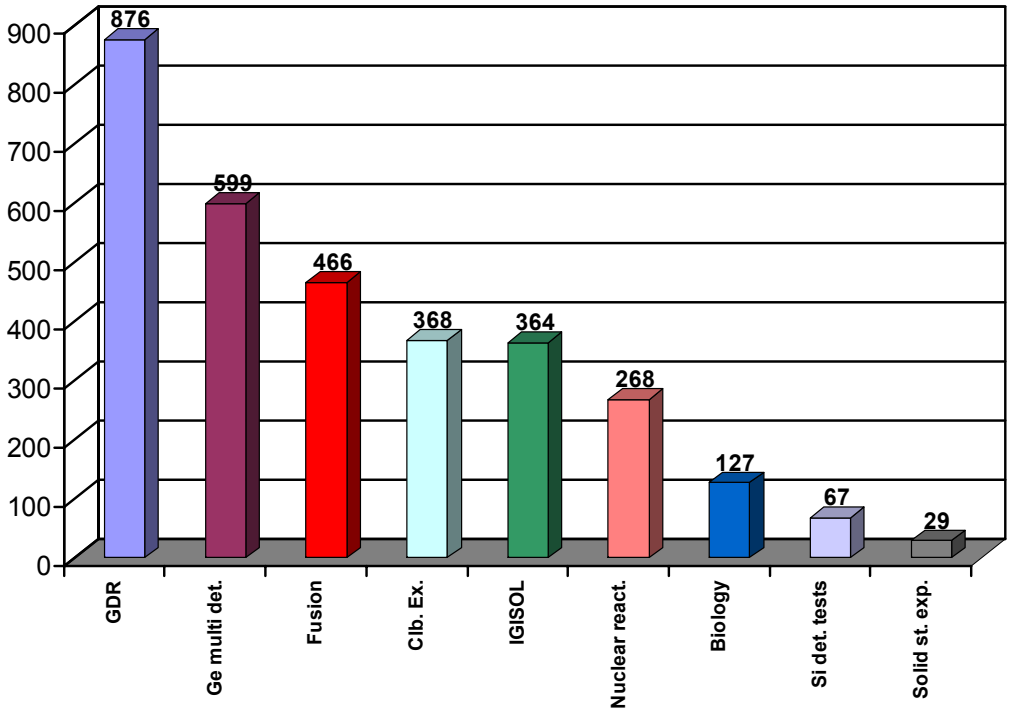




Experimental hall of HIL



Beam time for experiments in 2004



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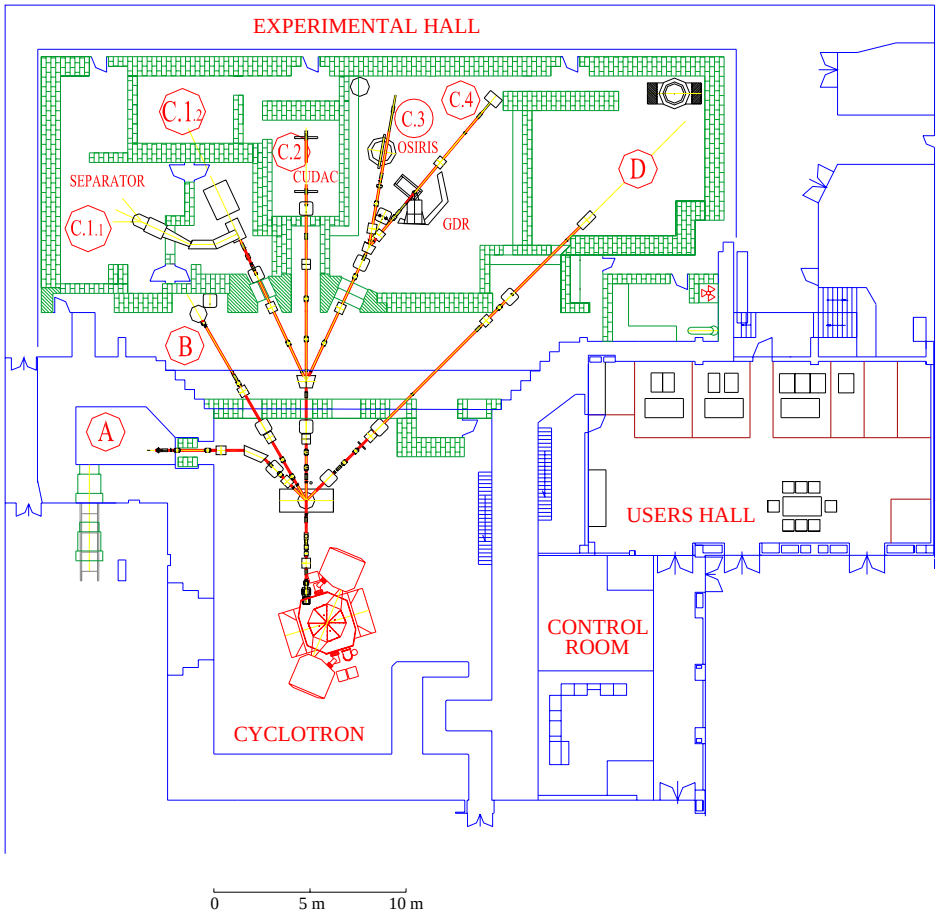
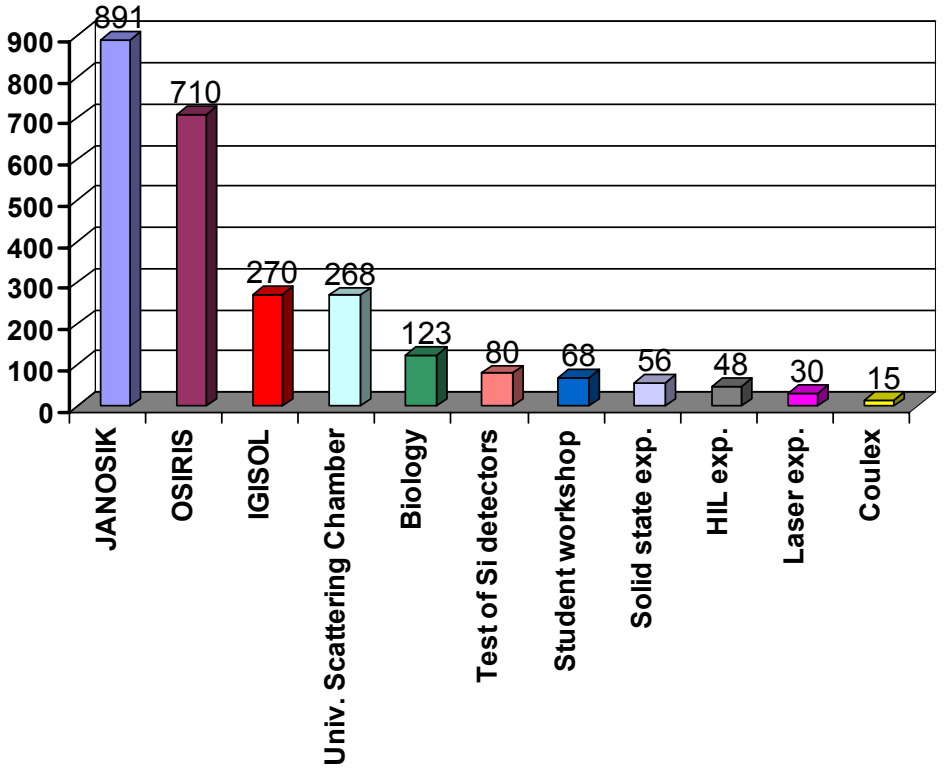


Beam time for experiments in 2005



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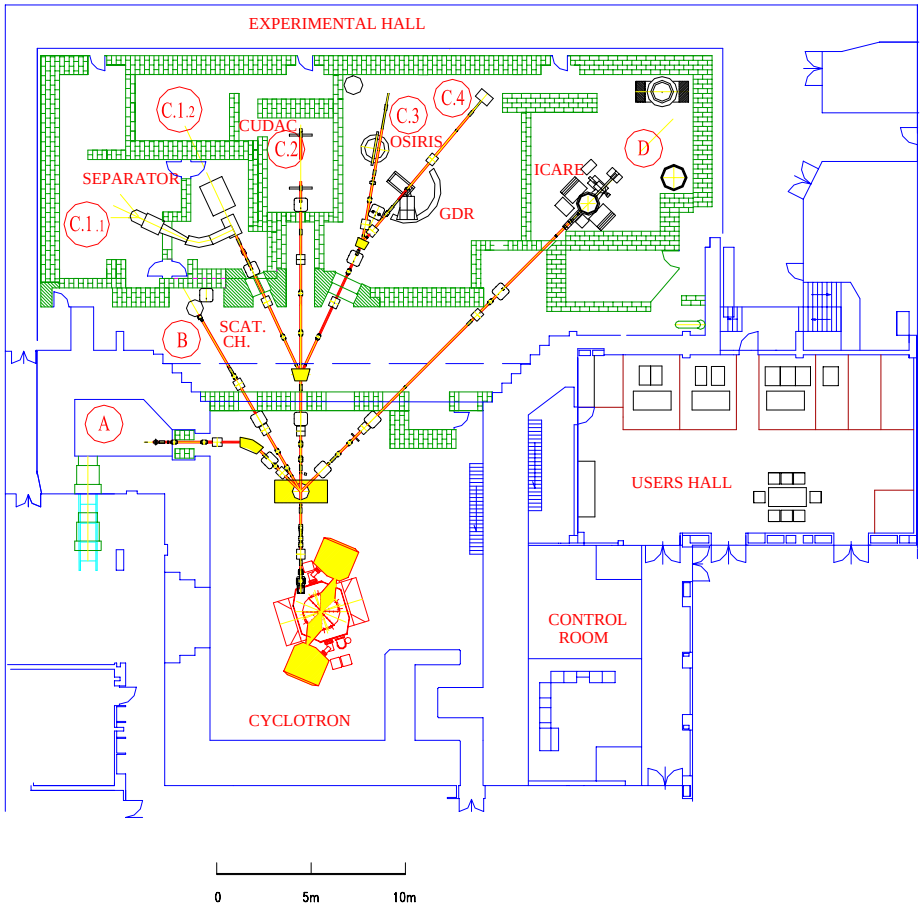
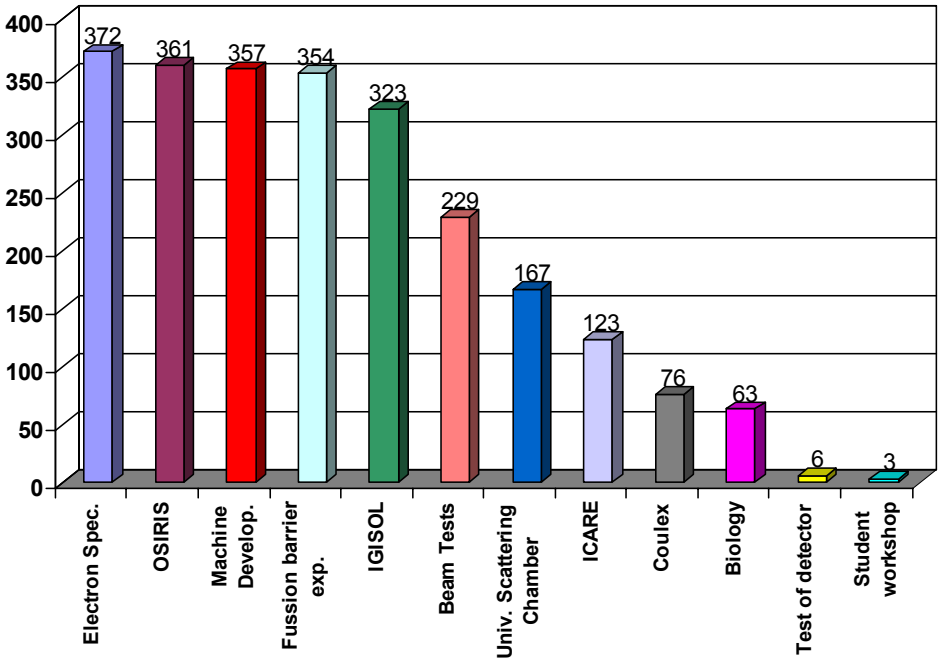
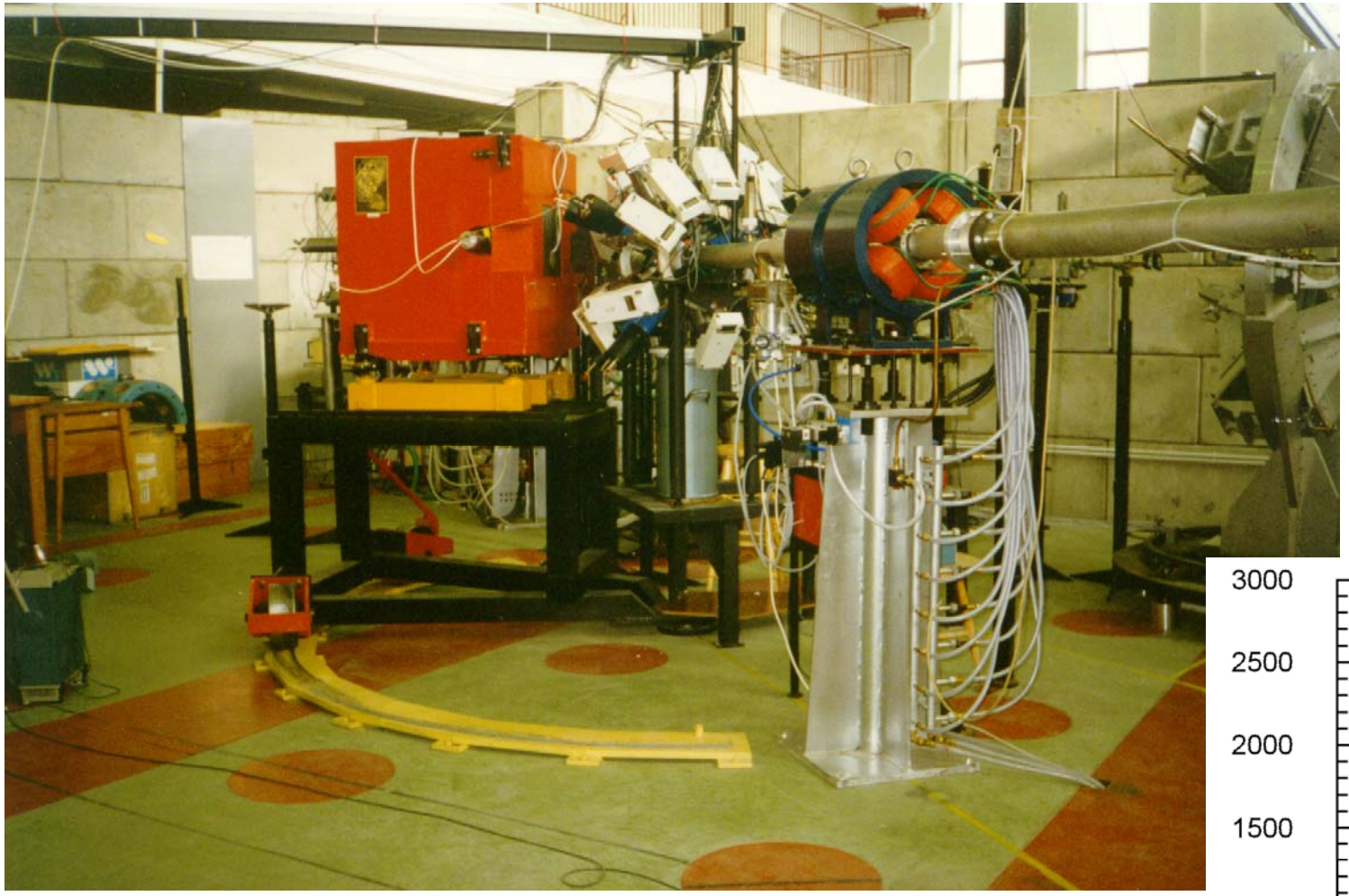


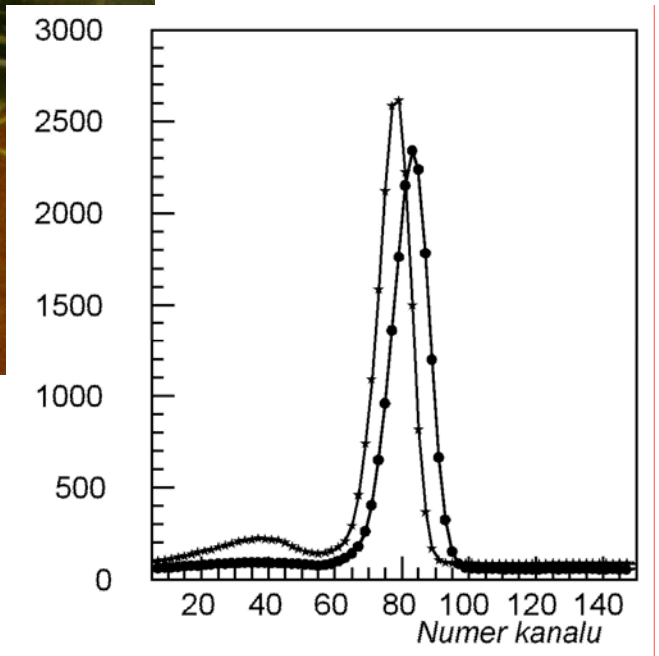
Beam time for experiments in 2006



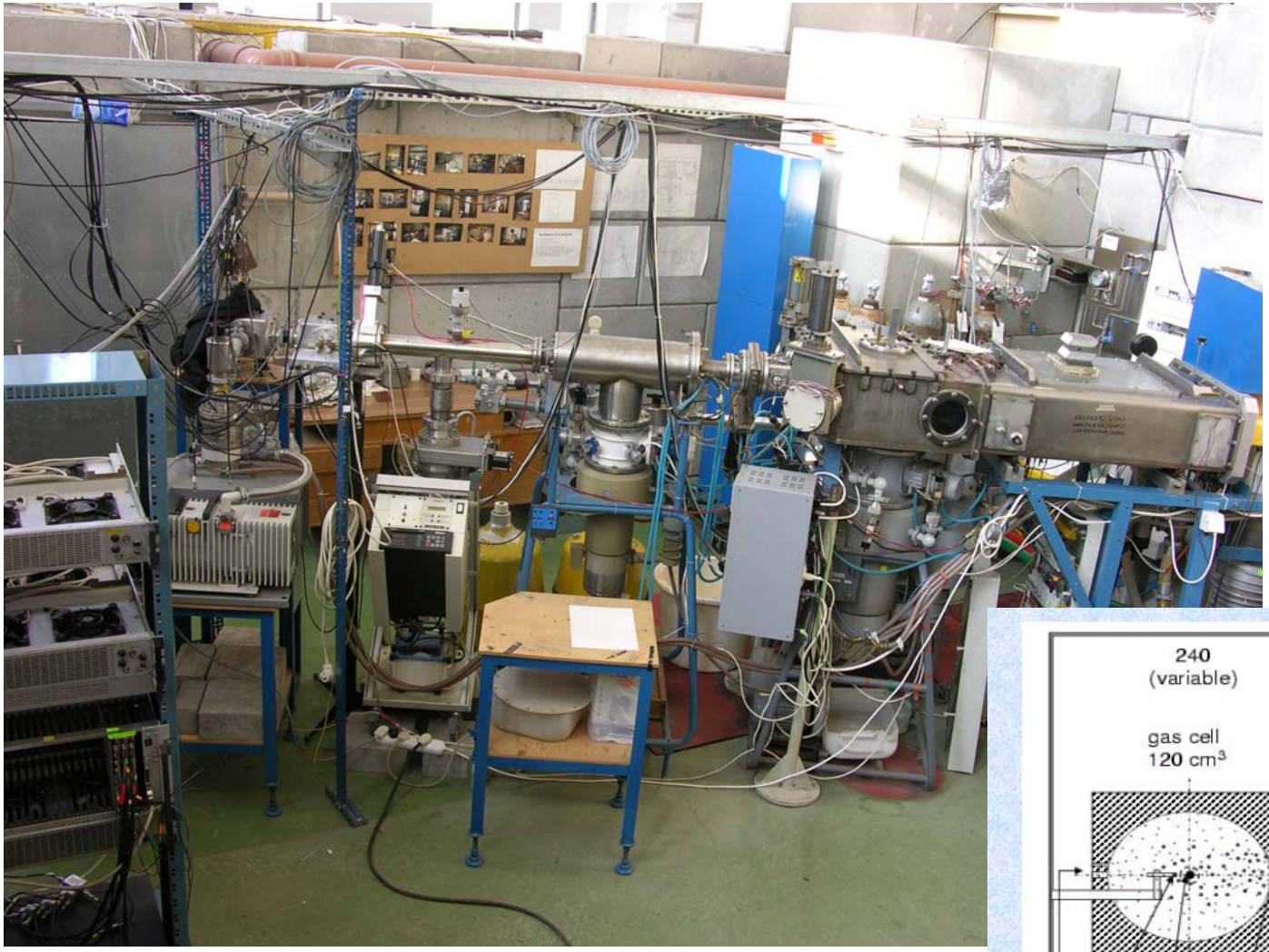
JANOSIK set-up at the Warsaw Cyclotron

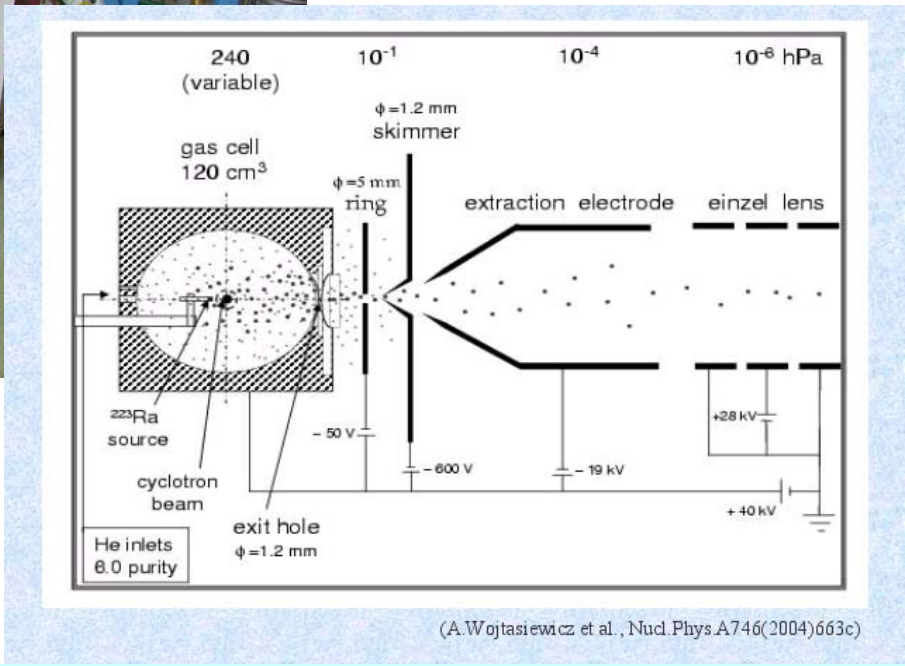


Time of flight spectrum



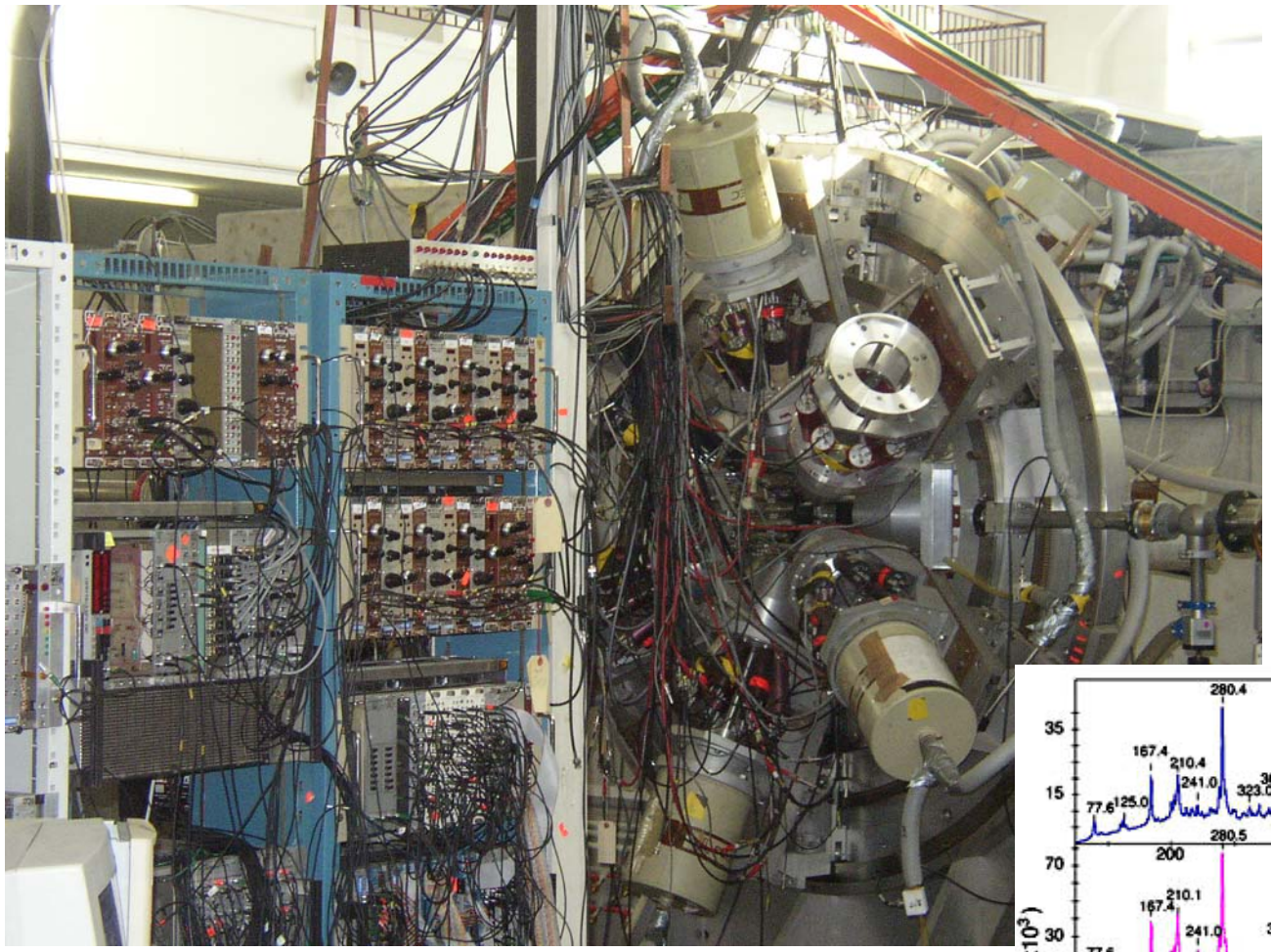
ION GUIDE AND ISOTOPE SEPARATOR ON - LINE

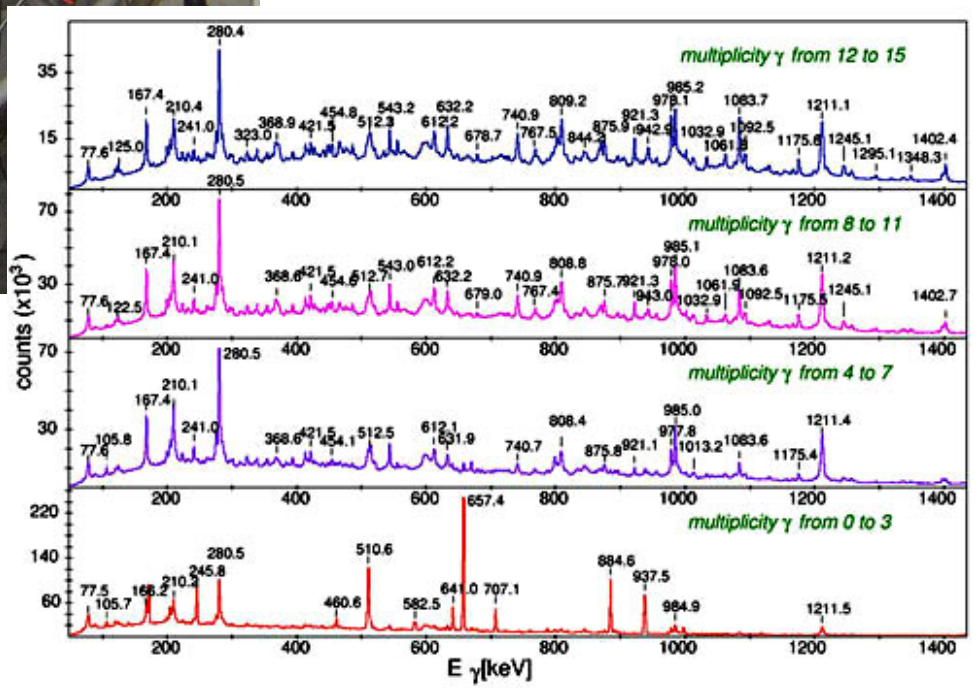




Operation principle of the IGISOL–type gas cell

OSIRIS HPGe - detector array

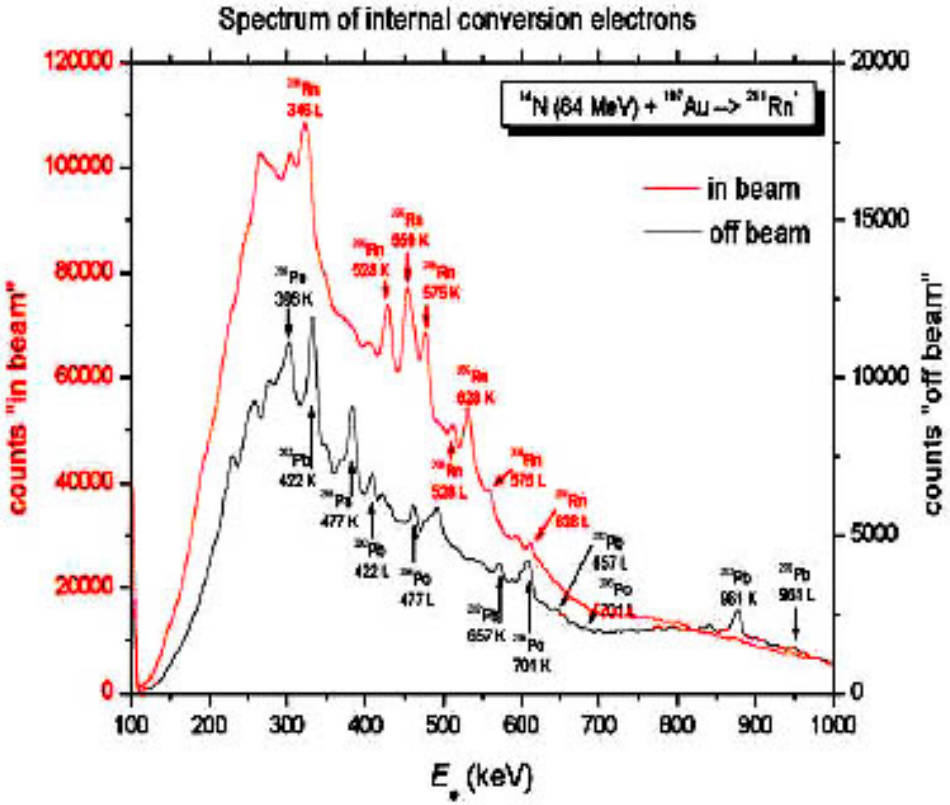




Example of energy spectra gated by different g-ray multiplicity as observed in the ^{98}Mo + ^{16}O reaction.

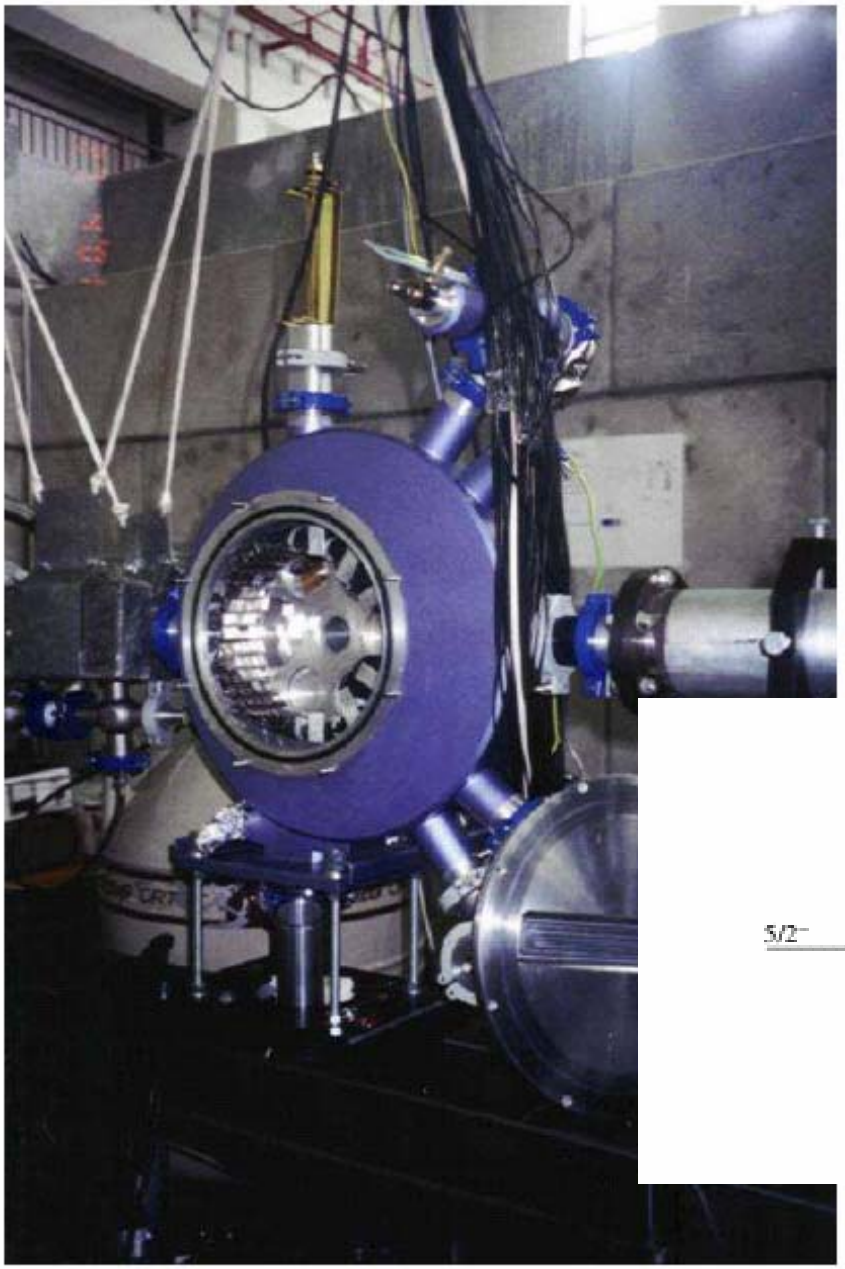
Spectroscopy of internal conversion electrons

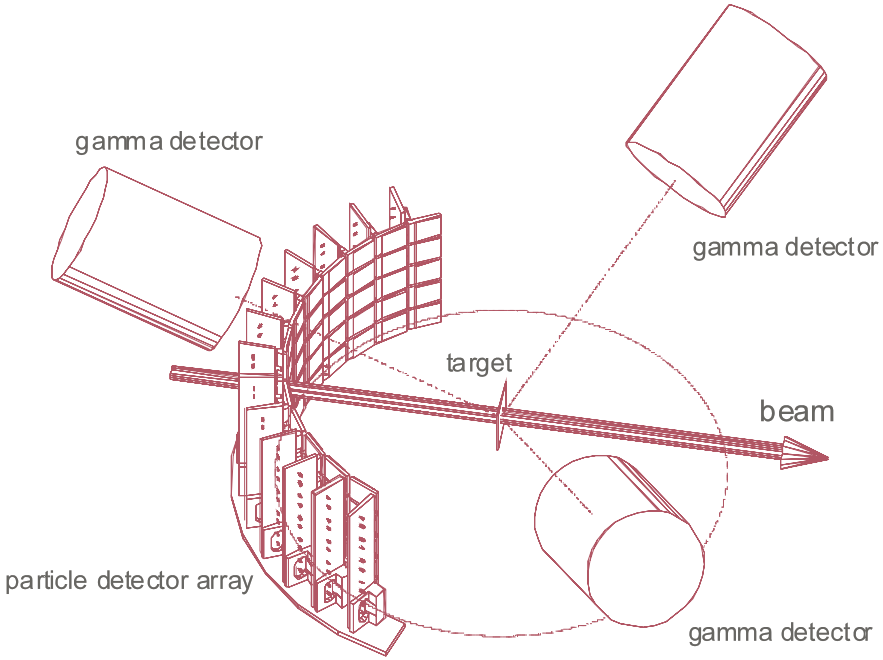
The new spectrometer of electrons combined with the OSIRIS II array



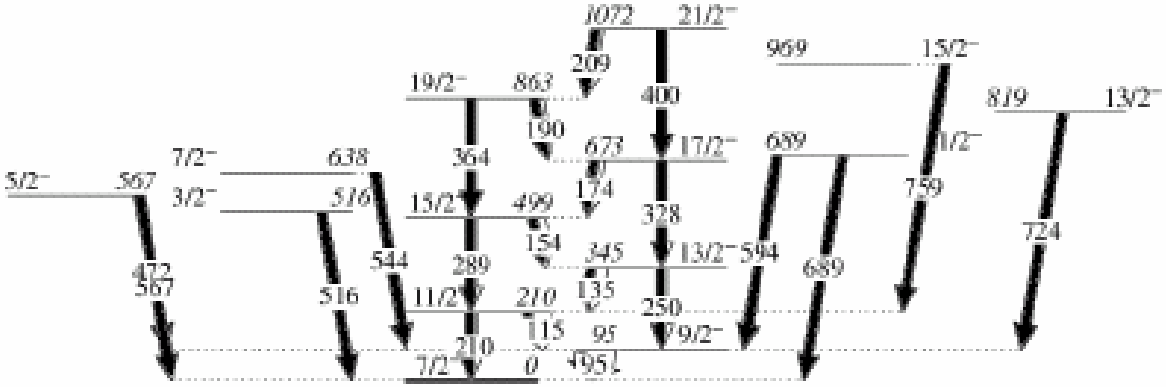
The internal conversion electron spectrum observed in the reaction:
14N + 197Au (in full amplitude window of photons).
The isotopes 202Pb and
206Po arise from the decay of 206Rn.

COULOMB UNIVERSAL DETECTOR ARRAY CHAMBER



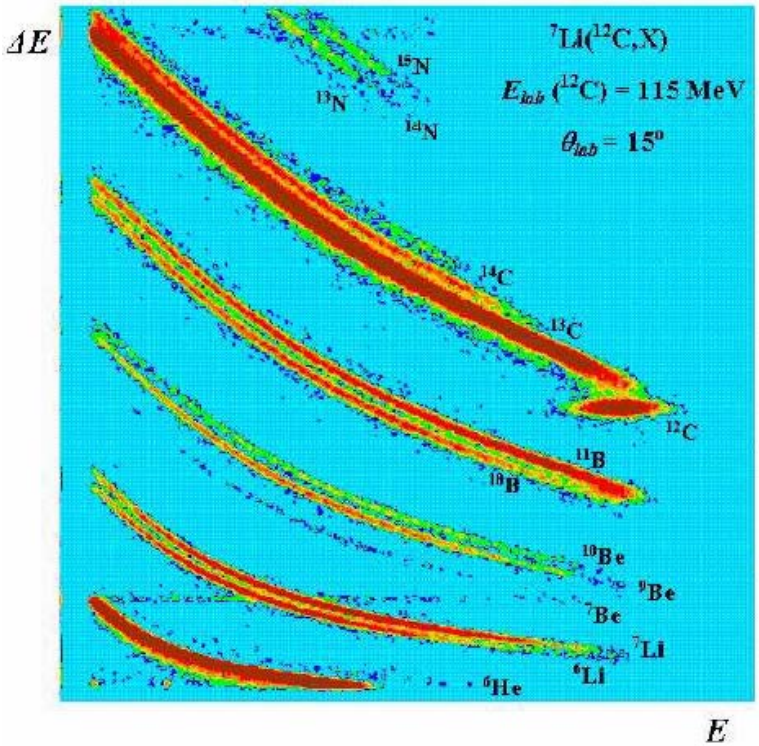


Schematic view of the CUDAC set-up



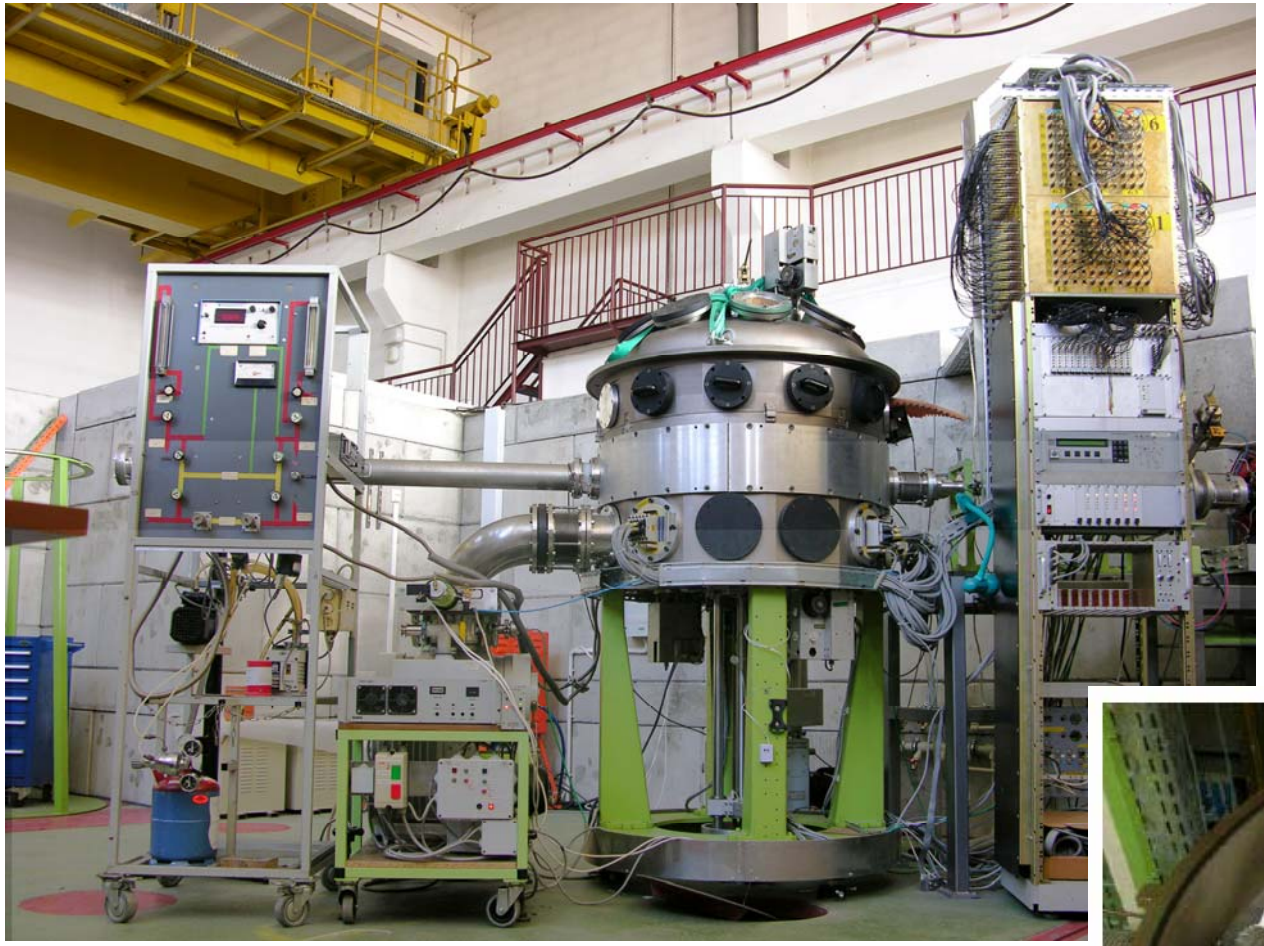
Energy levels of 165Ho and electromagneti transitions observed in our experiments

SYRENA - reactions with light nuclei



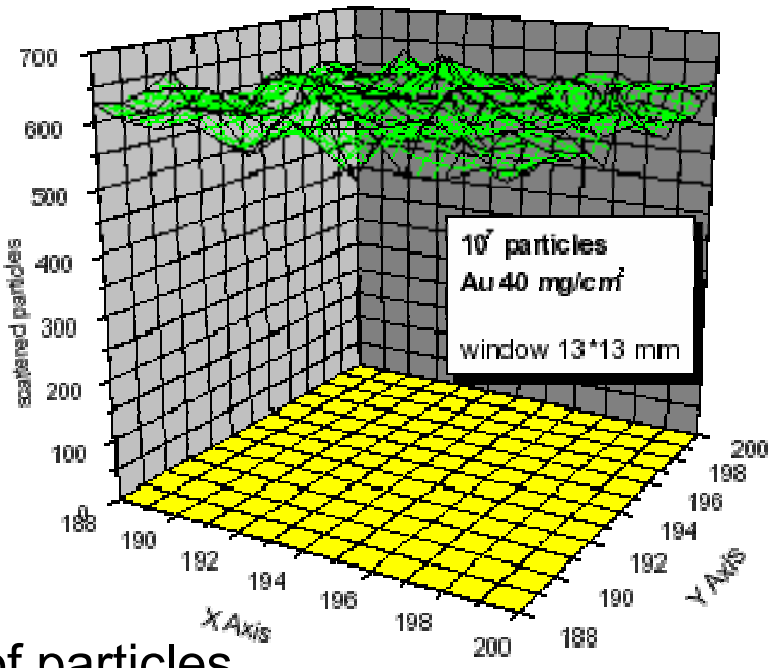
ΔE-E spectrum of the ^{7}Li(^{12}C,X) reaction products

PROJECT ICARE



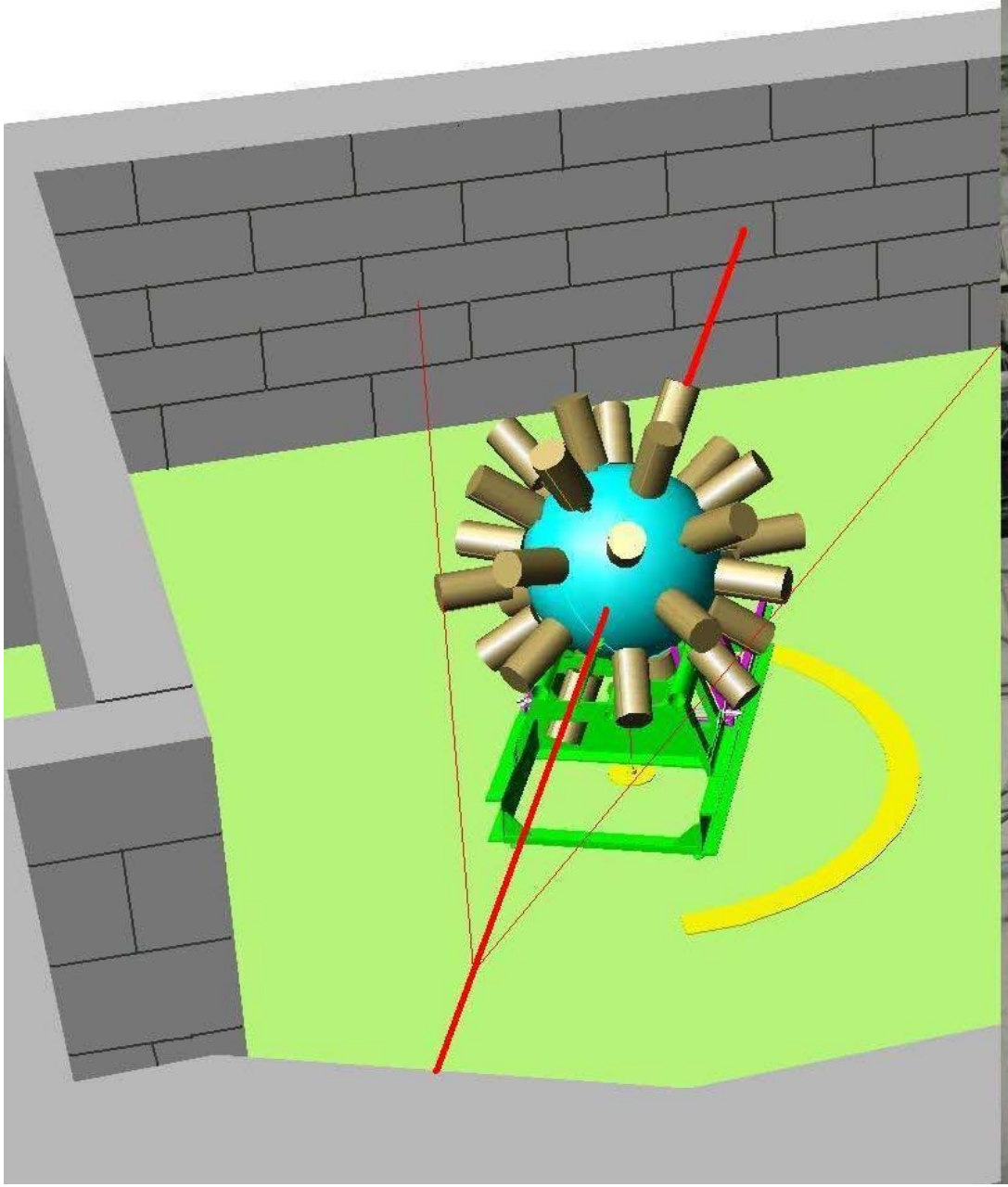
Inside view of ICARE

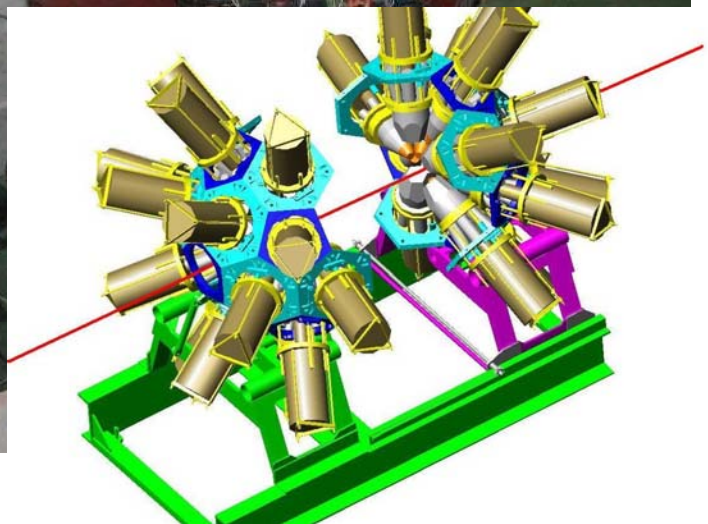
The facility with a horizontal beam for radiobiological studies



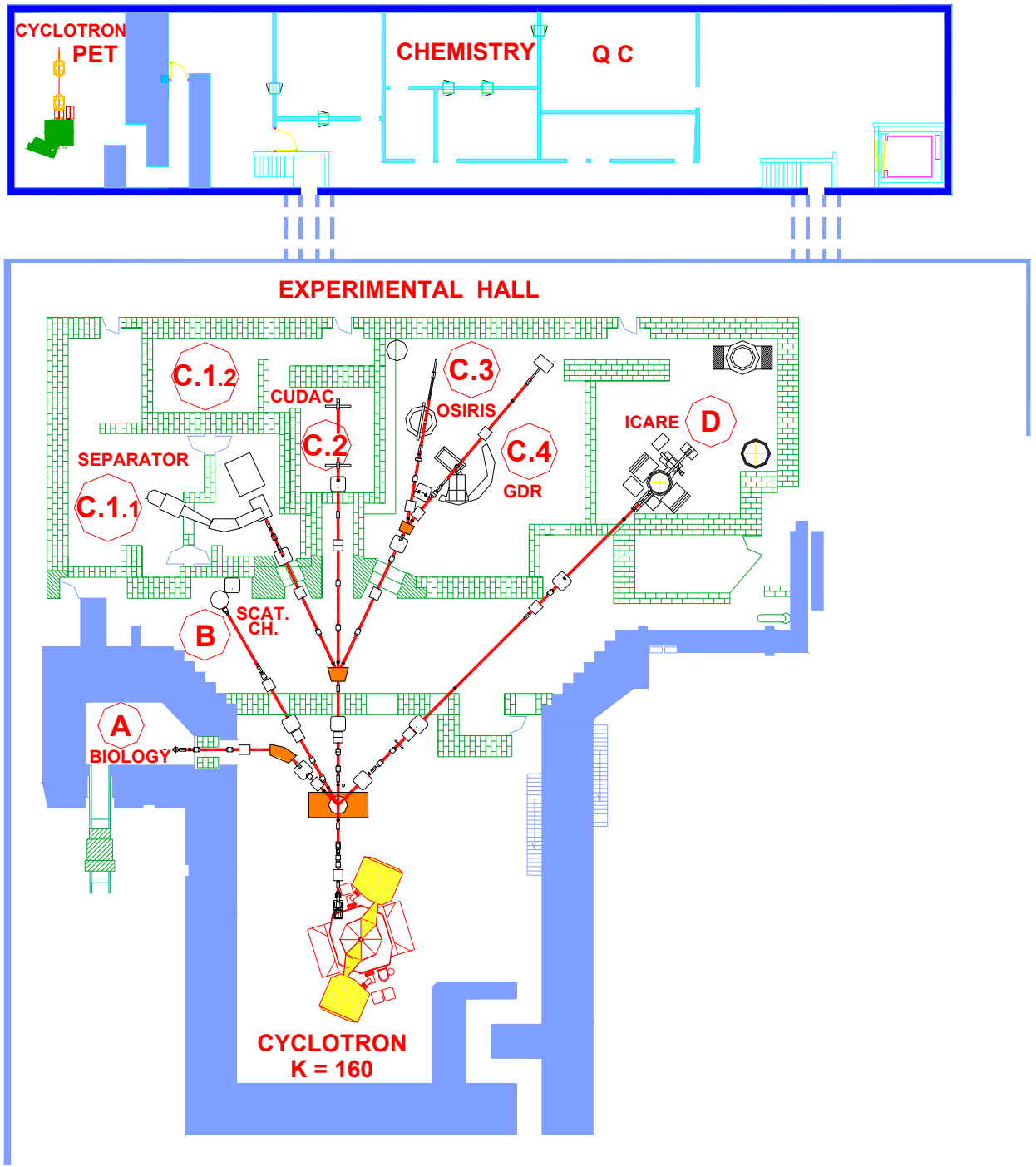
Two-dimensional plot of the number of particles at the irradiated target

TROLL - future project of the multidetector HPGe system





PET at HIL


CYCLOTRON
PET
CHEMISTRY
Q C
EXPERIMENTAL HALL
C.1.2
CUDAC
C.3
OSIRIS
ICARE
D
C.2
C.4
GDR
SEPARATOR
C.1.1
SCAT.
CH.
B
A
BIOLOGY
CYCLOTRON
K = 160

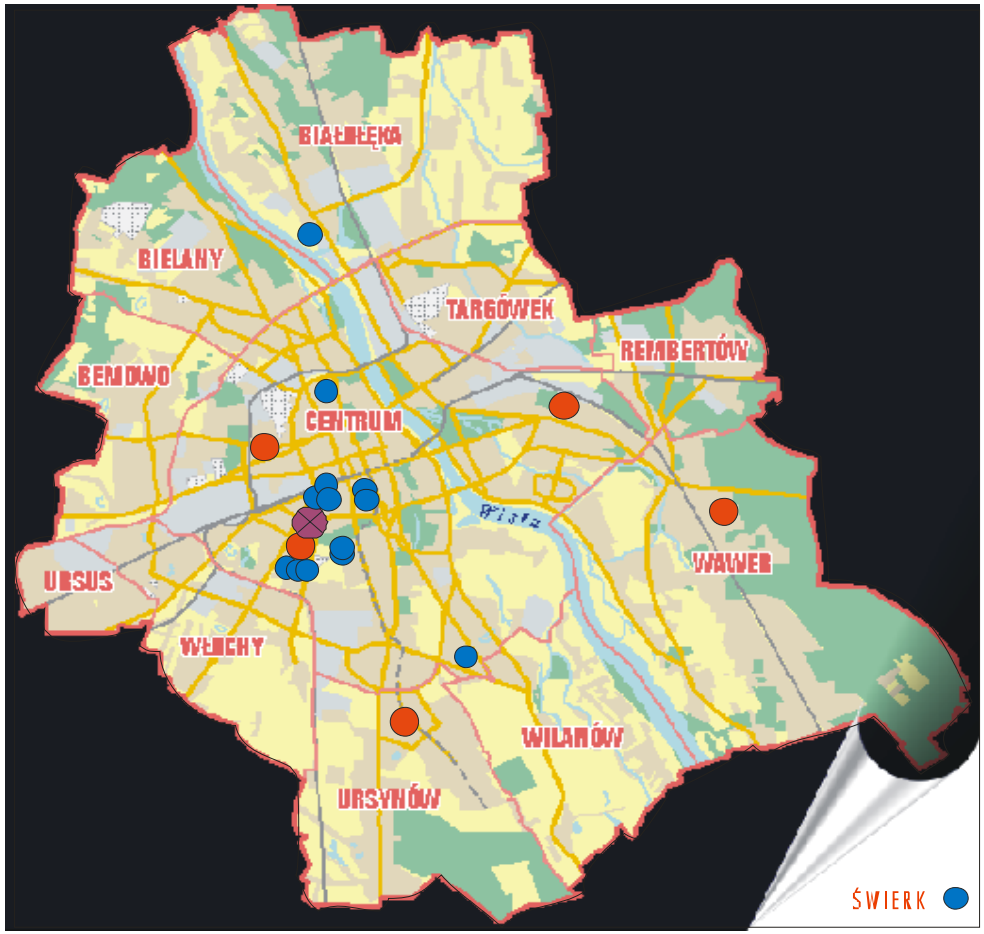
Warsaw Consortium for PET collaboration

1. Department of Nuclear Medicine, Academy of Medicine Clinical Hospital
2. Department of Nuclear Medicine, Institute of Cardiology
3. Division of Biomedical Engineering, Warsaw University of Technology
4. Division of Medical and Industrial Electronics, Warsaw University of Technology
5. Faculty of Biology, Warsaw University
6. Faculty of Chemistry, Warsaw University
7. Faculty of Physics, Warsaw University
8. Faculty of Psychology, Warsaw University
9. Heavy Ion Laboratory, Warsaw University
10. Institute of Biochemistry and Biophysics, Polish Academy of Sciences

Warsaw Consortium for PET collaboration

11. Institute of Nuclear Chemistry and Technics
12. Institute of Psychiatry and Neurology
13. Institute of Tuberculosis and Lung Diseases
14. Interdisciplinary Center of Mathematical and Computer Modeling
15. Military Medical Institute, Nuclear Medicine Center,
    Central Clinical Hospital of Ministry of Defense
16. M. Mossakowski Polish Academy of Sciences Experimental Medicine Center
17. M. Nencki Institute of Experimental Biology, Polish Academy of Sciences
18. Nuclear and Medical Electronics Division, Warsaw University of Technology
19. Oncology Center, Maria Skłodowska-Curie Institute
20. Radioisotope Centre – POLATOM

Warsaw Consortium for PET Collaboration



- Radiopharmaceuticals Production Center - HIL
- PET Diagnostic Centers
- Research Units