



Nuclear Science and Technology in National Centre for Nuclear Research

Krzysztof Kurek



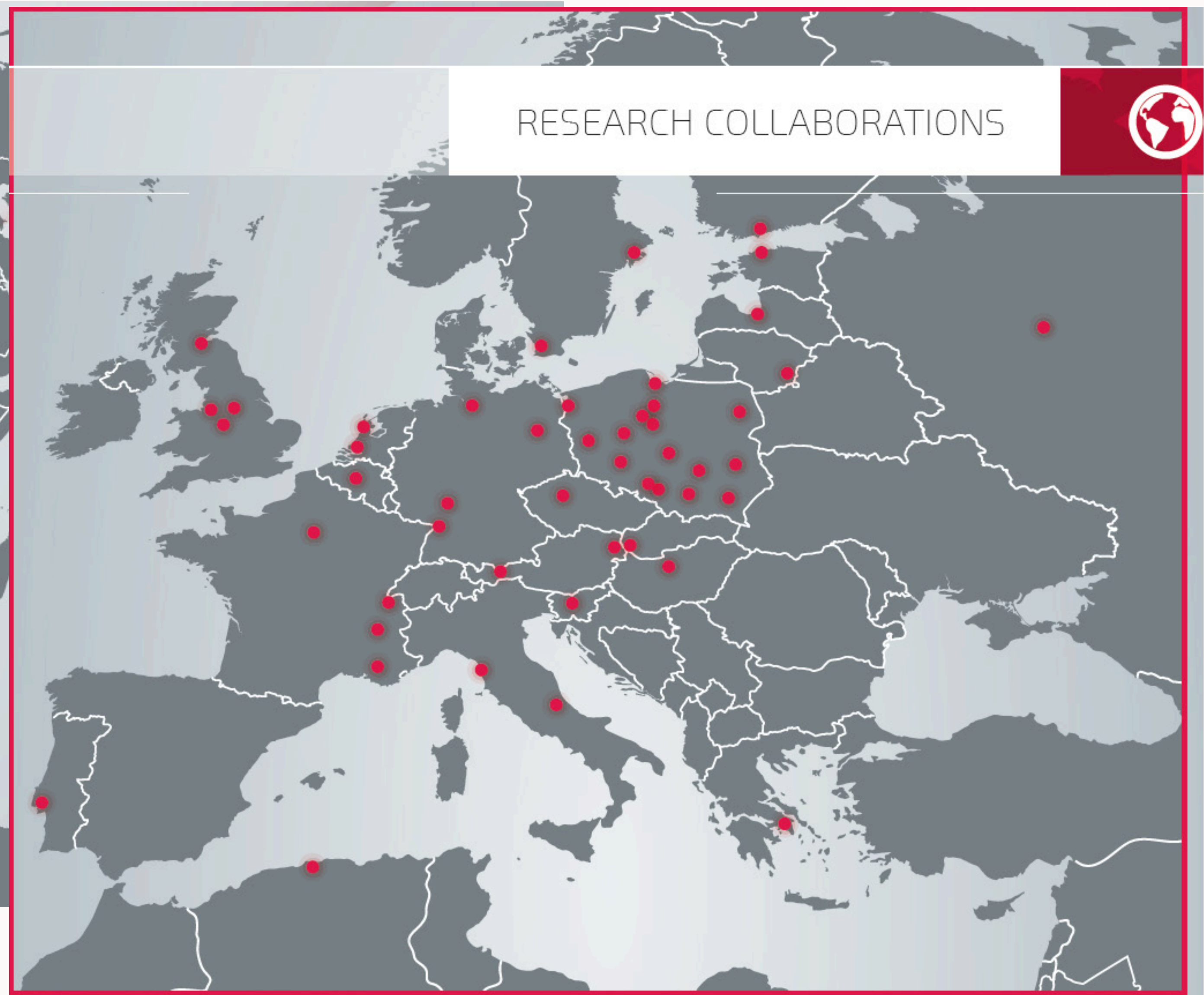
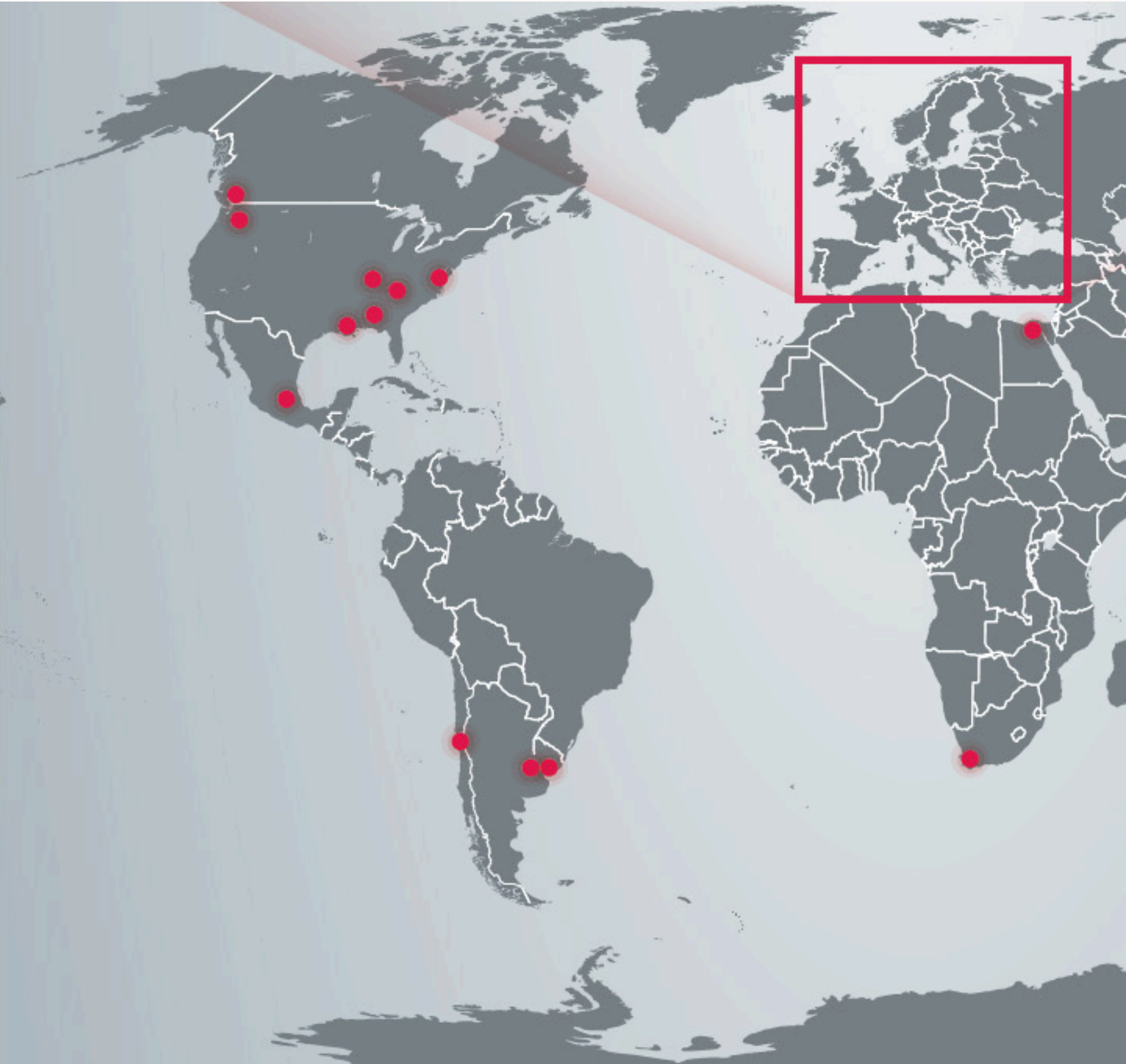
NATIONAL
CENTRE
FOR NUCLEAR
RESEARCH
ŚWIERK



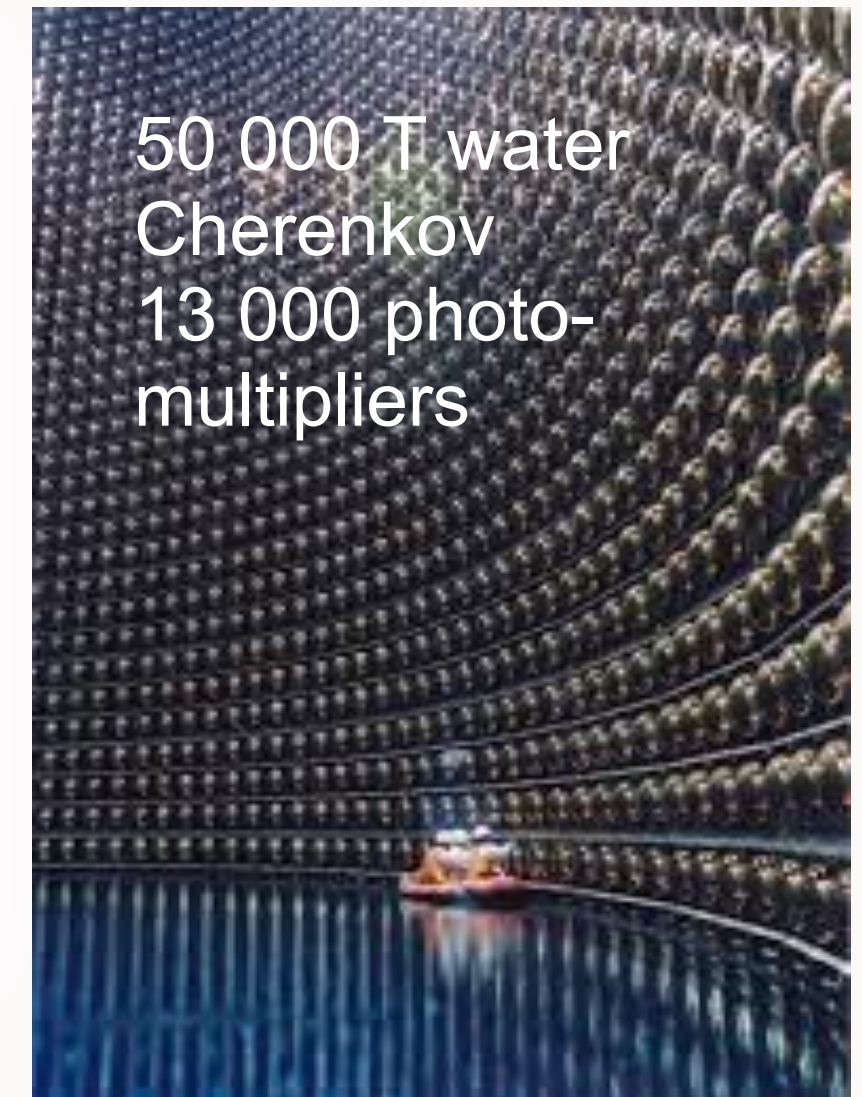
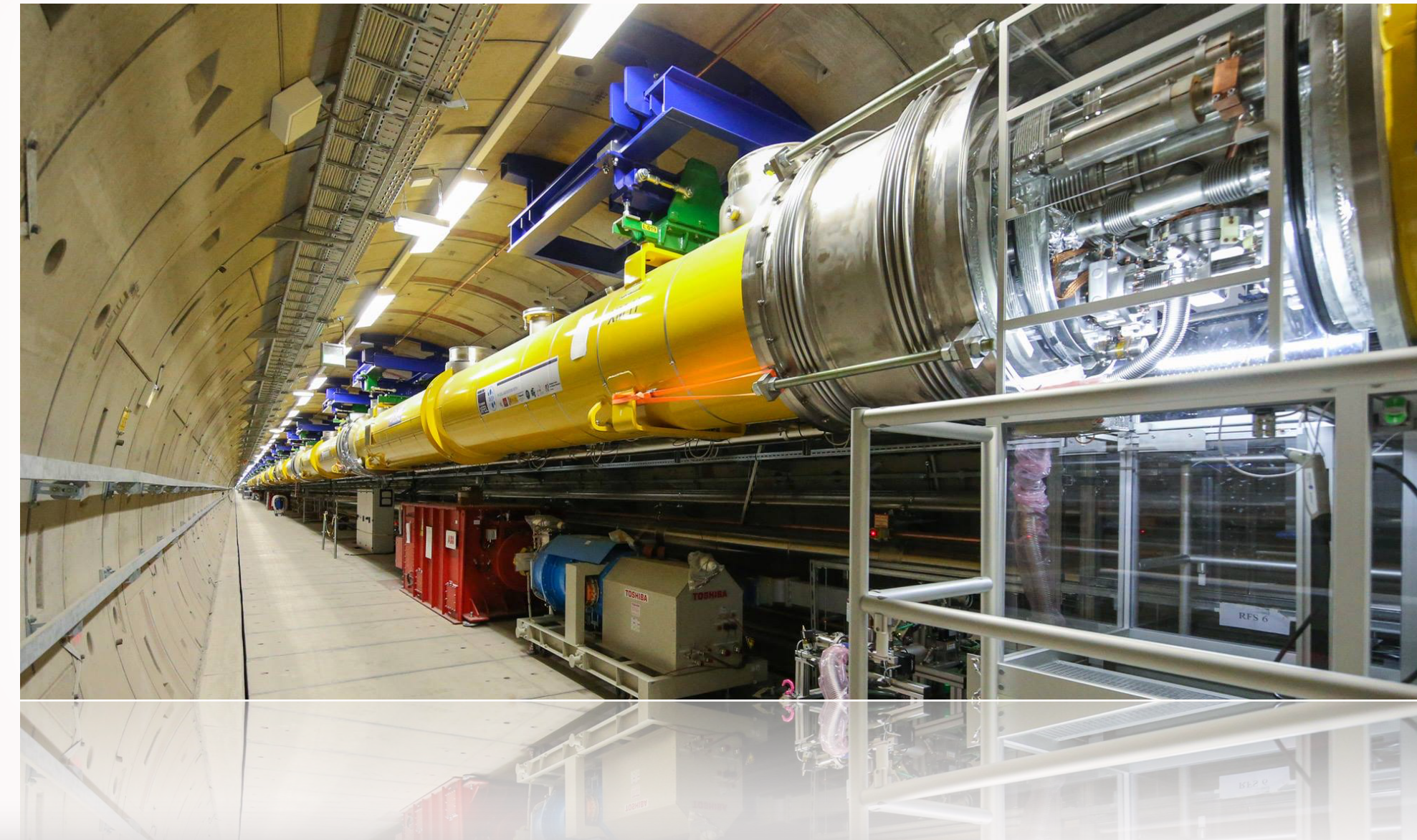


International collaborations with leading laboratories in the world (CERN, DESY, Grenoble, JParc, FAIR, Julich, ESS, T2K), cooperation in many universities around the world

RESEARCH COLLABORATIONS

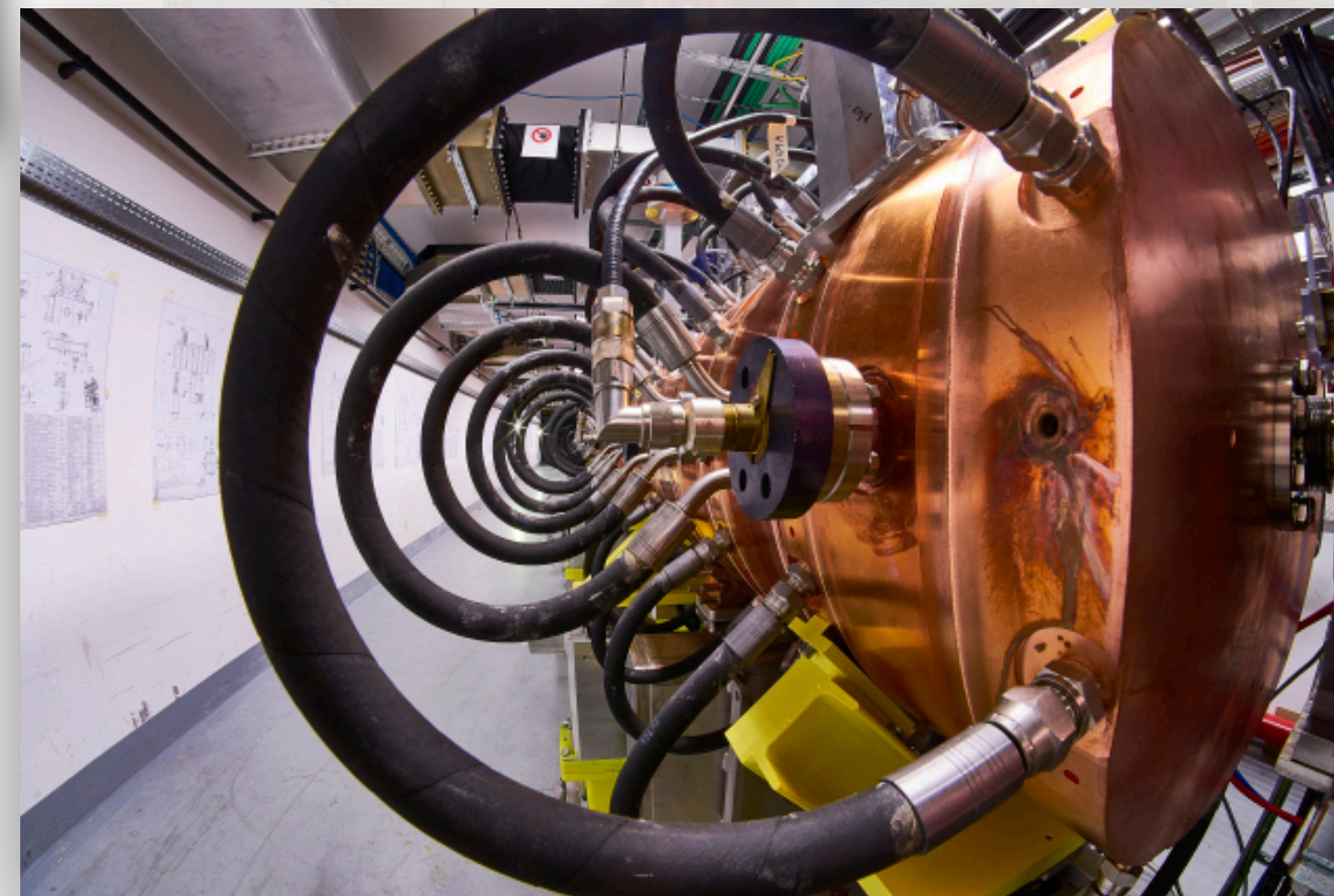


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NCBJ contribution:

- CMS muon trigger system
- LHCb „straw tube”
- Linac4 - accelerating structures
- GBAR - e accelerator

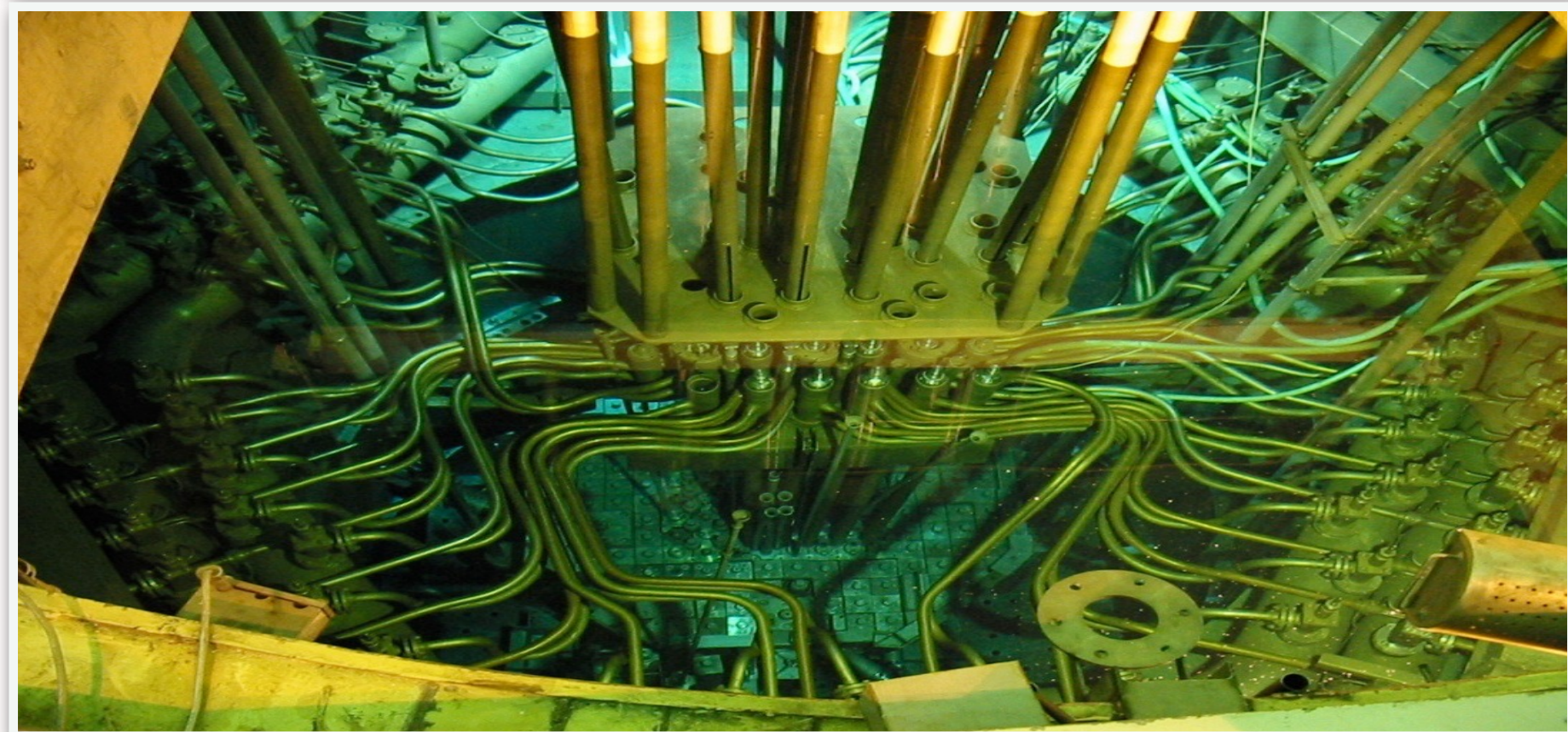
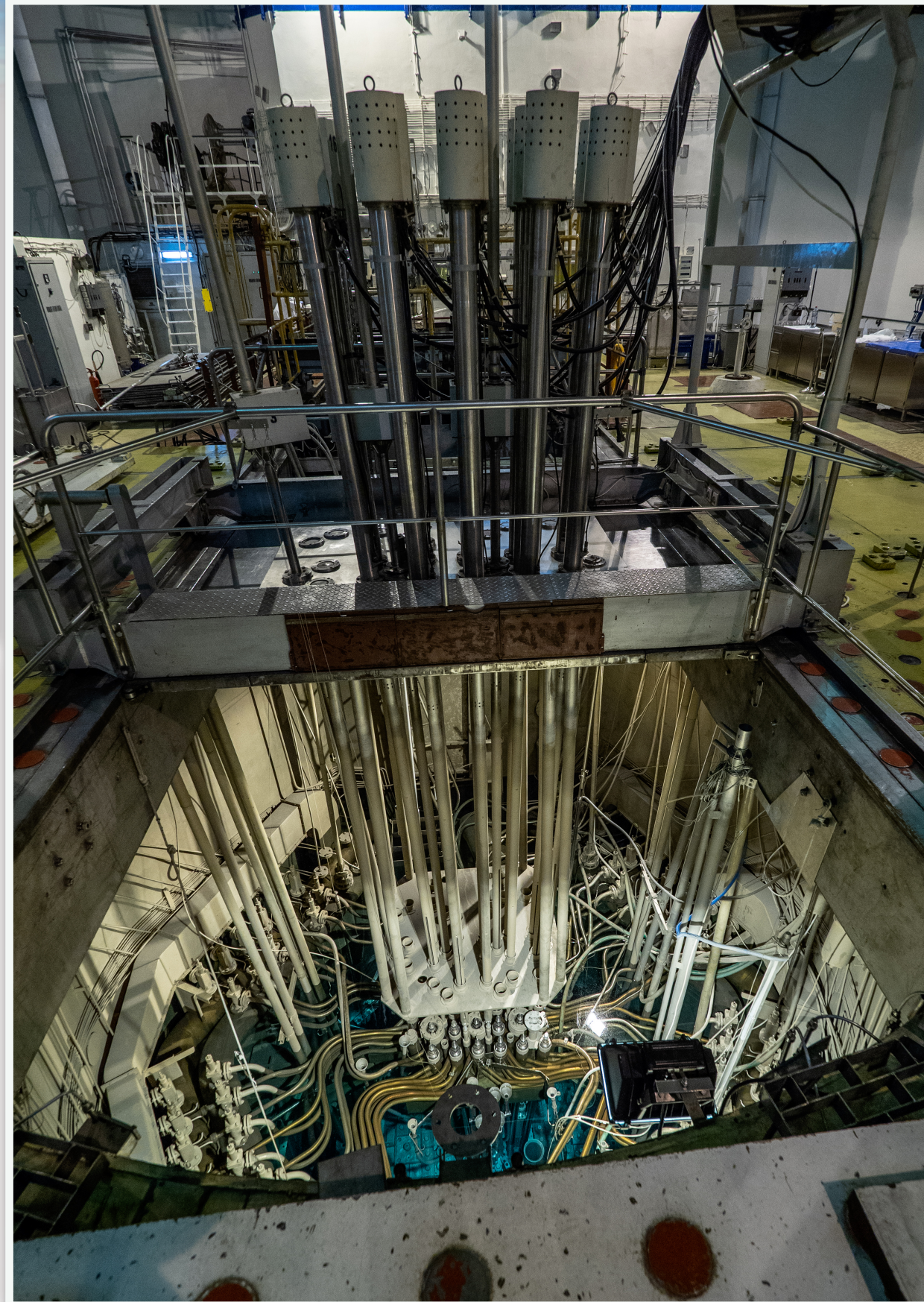


Nuclear research reactor MARIA



Reaktor
MARIA

- built in 1974
- upgrade 1992, 2011, 2017-...
- pool type
- H₂O, Be moderated
- 30 MW thermal power
- neutron flux:
 - thermal $4 \cdot 10^{14}$ n/cm²s
 - fast $2 \cdot 10^{14}$ n/cm²s



One of the best neutron sources!

- Curium
- POLATOM-NCBJ

Radioisotopes
for 400k patients a week!



Centrum Informatyczne Świerk

Thermal and flow calculations,
Material sciences computations
Molecular dynamics,
Data analysis for CERN
MC calculations etc

~ 80 000 cores



^{131}I hot cells



^{90}Y & ^{177}Lu hot cells



Radiopharmaceuticals with marketing authorisation

Quality Assurance System certified:

ISO: PN-EN ISO 9001:2015-10
cGMP and GLP

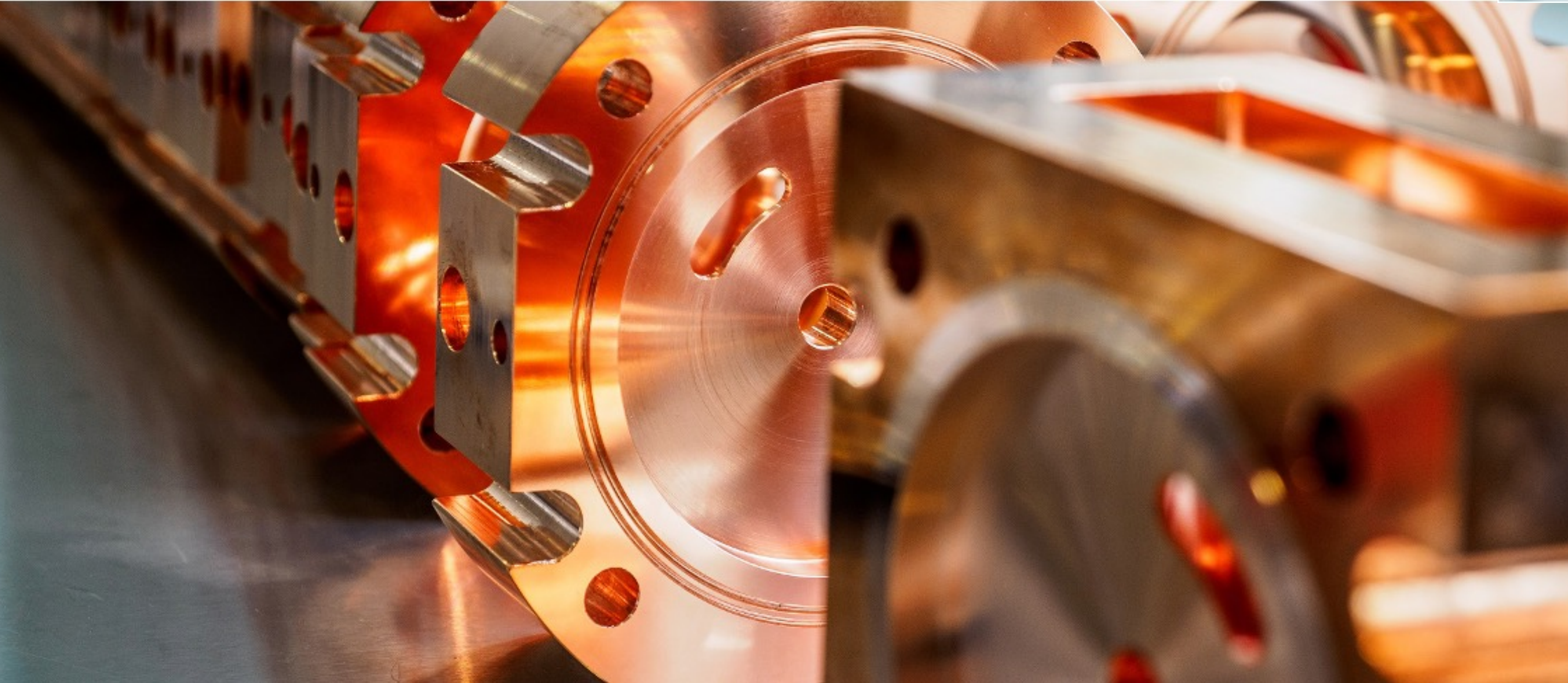
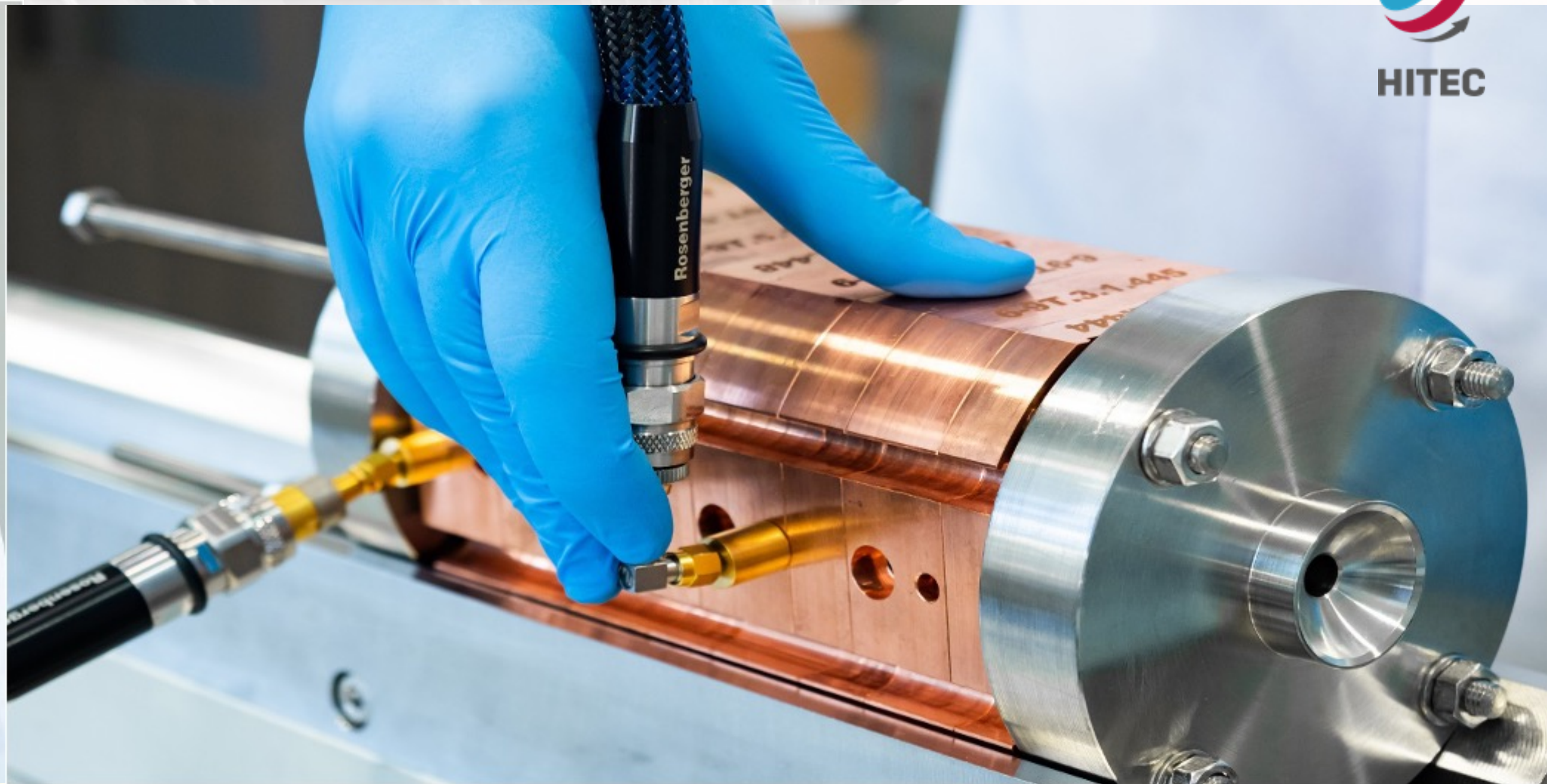


$^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ generator line



^{131}I -Hipuran,
 ^{131}I -MIBG injection solutions line

Export to 80 countries
100% polish market (except PET)
Medicines for 17 million patients a year







Mobile medical electron
accelerator for intraoperative
Radiation Therapy



120 projects among them Infrastructure projects: 155 M€

NOMATEN

Centre of Excellence in Multifunctional Materials
for Industrial and Medical Applications

- Partnership NCBJ - VTT (FIN) - CEA (FRA)
- ISC

Center of Excellence - EC grant Teaming +
IRA grant from FNP

cost: ~ 25 M€

CENTRIX

double radiographic accelerator + LAB
cost: ~ 5 M€

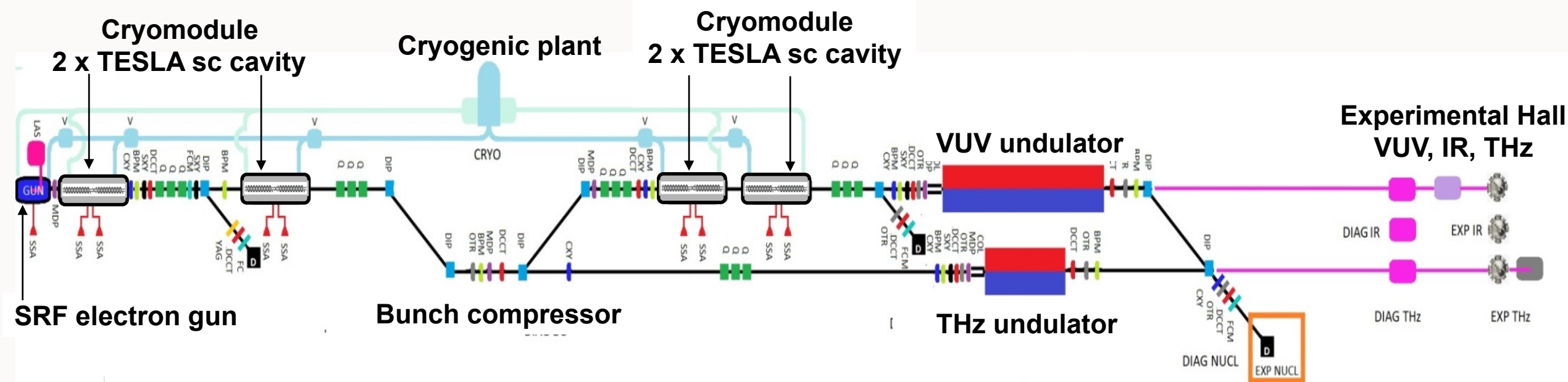
CERAD

40 M€

Center of Design and Synthesis
of Radiopharmaceuticals for
Molecular Targeting

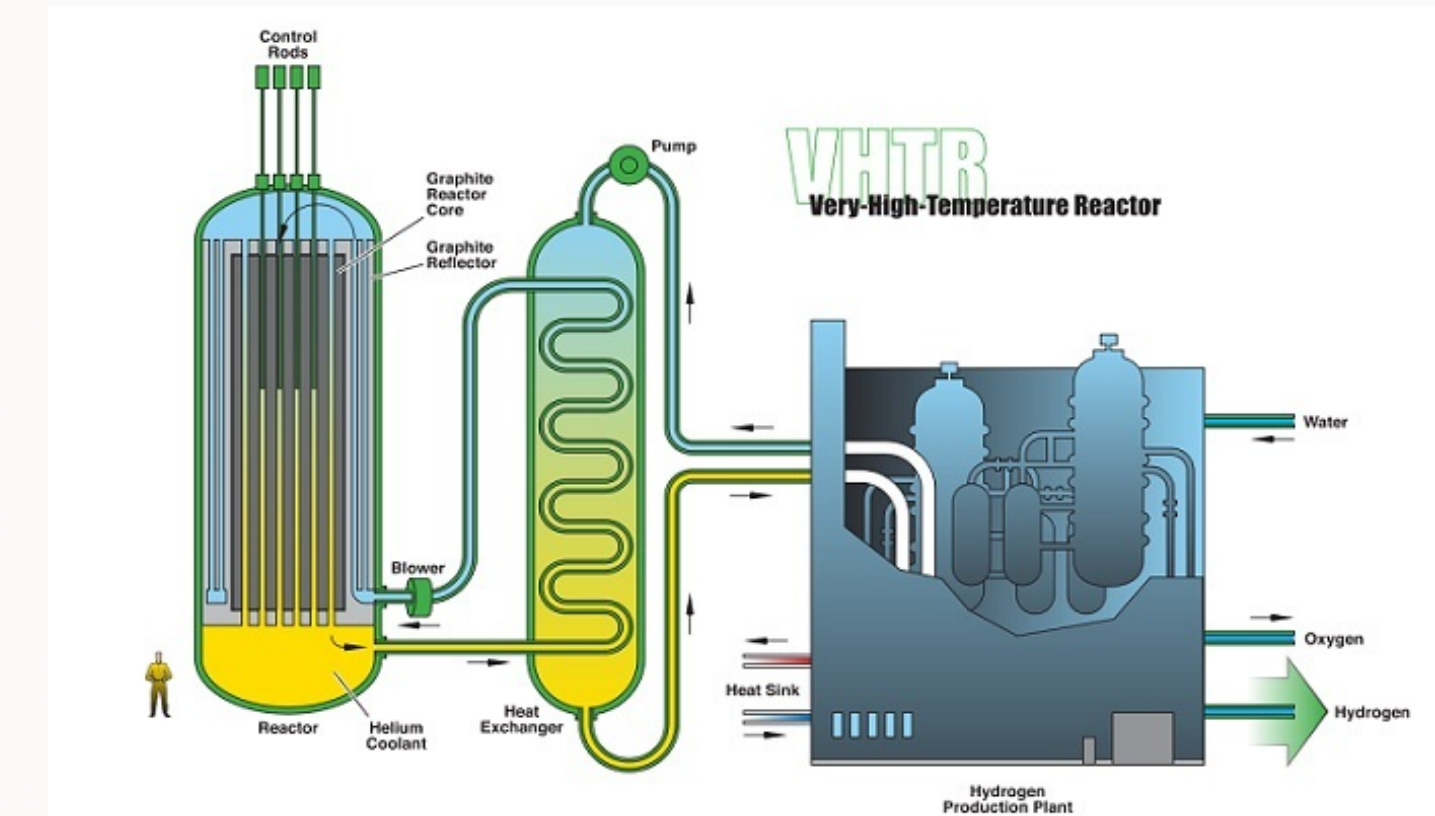
polfel

70 M€



Electron beam
cw: up to 130 MeV
Lp: up to 187 MeV

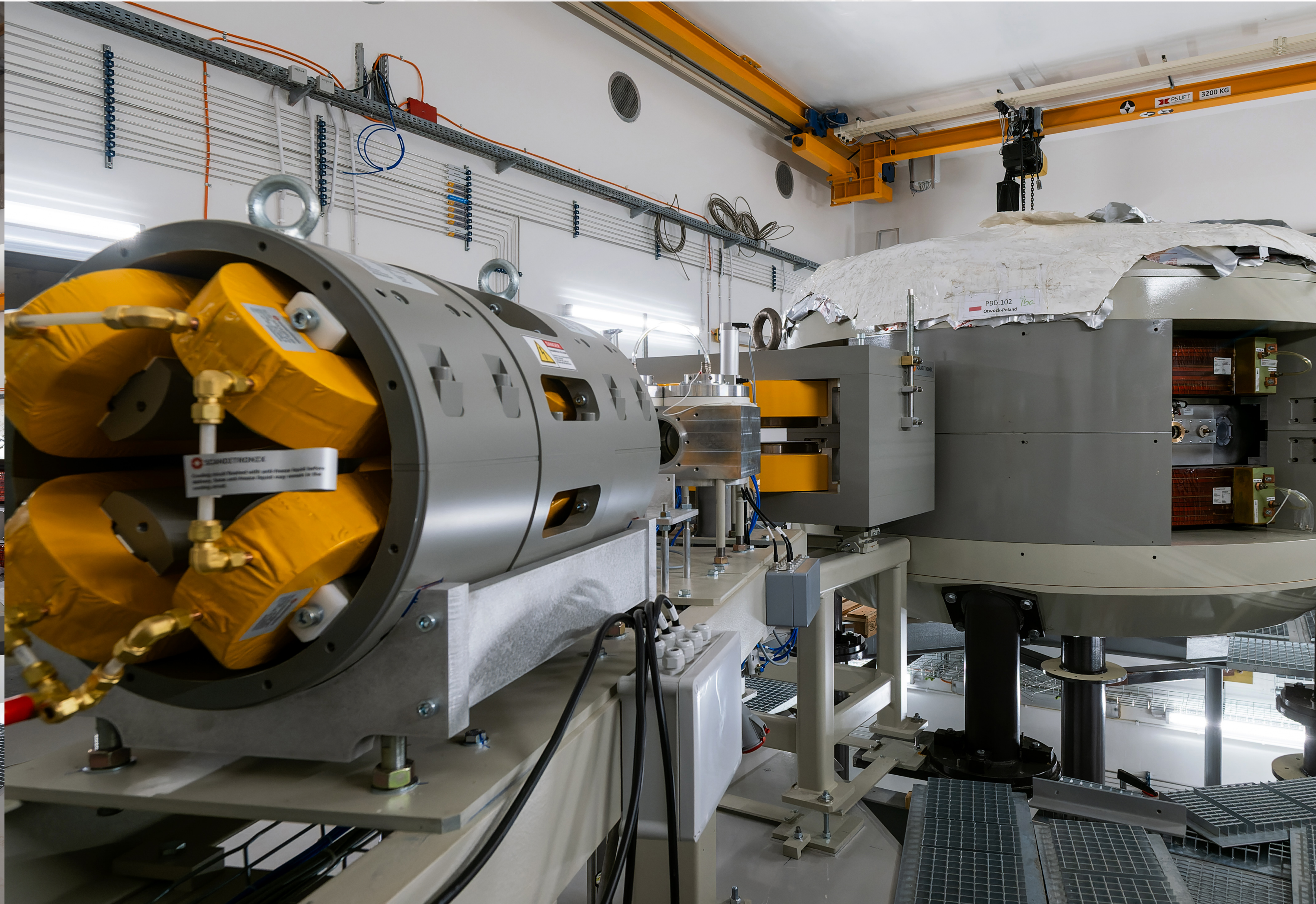
HTGR - MEiN - 15 M€











Thank you for your attention



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