

# Introducing Knowledge Transfer @ CERN

Dr. Zoe Lawson

# Outline

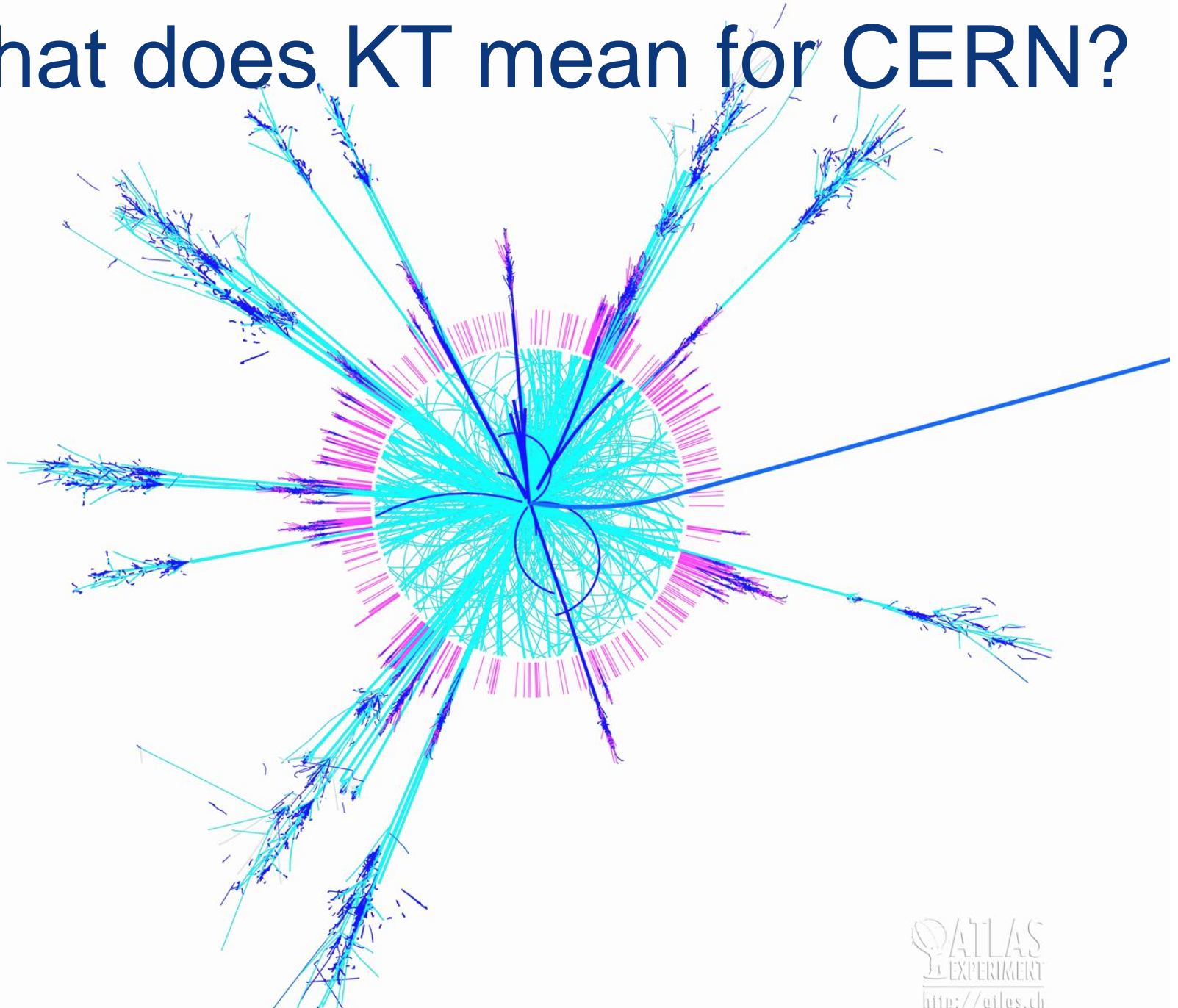
- 1) Knowledge Transfer (KT) & it's purpose
  - 2) Modes of KT @ CERN
  - 3) Modes in action; some examples
  - 4) CERN's technology domains
  - 5) A flavour of CERN tech; selected innovations
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- A complex network diagram with a central hub and many radiating lines, overlaid on a background of a particle detector or accelerator tunnel. The lines are colored in shades of red, orange, and yellow, suggesting a high-energy or data-intensive environment. The background shows a perspective view of a tunnel with a grid floor and a ceiling, with a bright light source at the end of the tunnel.



# what does KT mean for CERN?



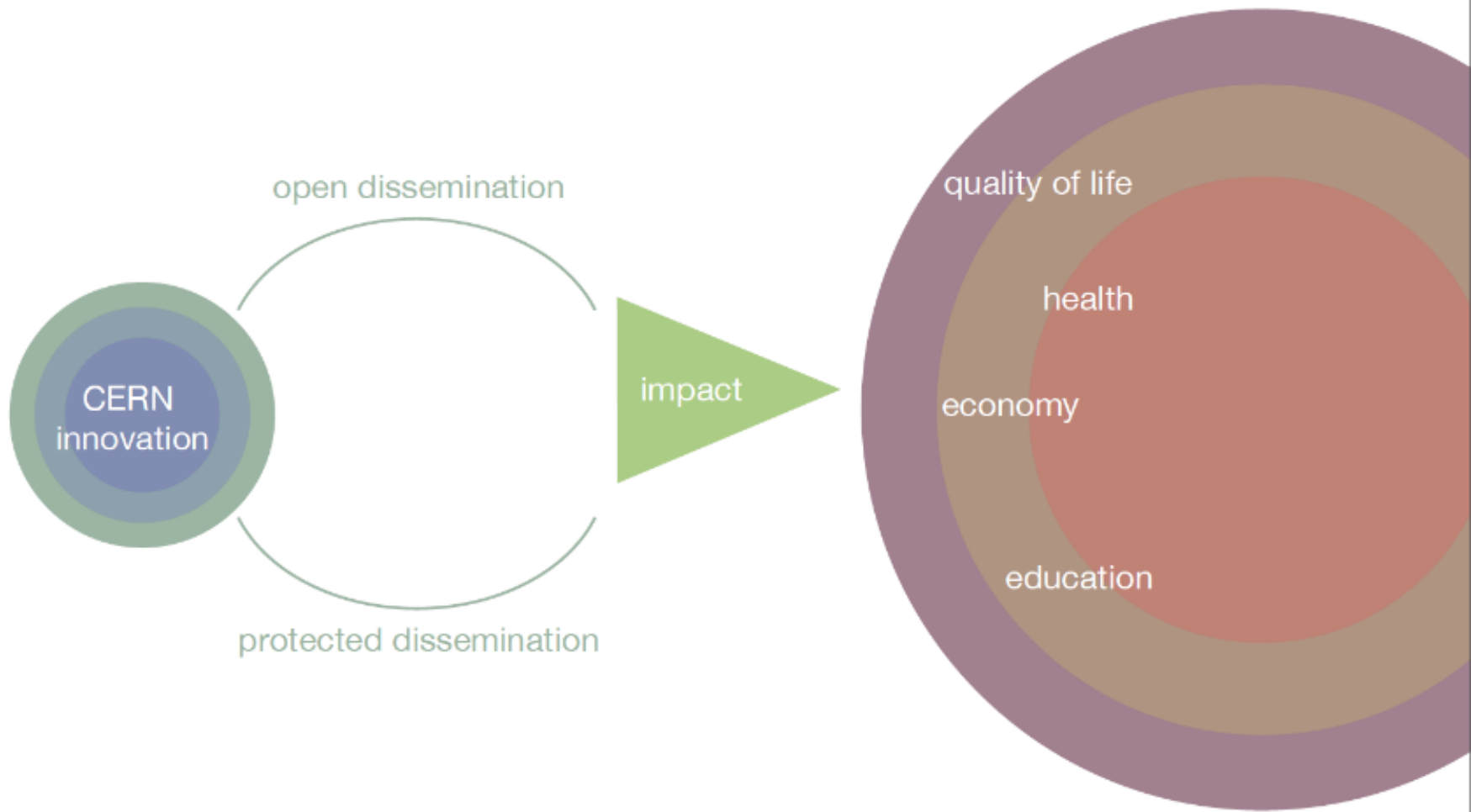
centre of  
excellence

positive force  
for societal  
benefit

sharing of  
technology



why do KT?

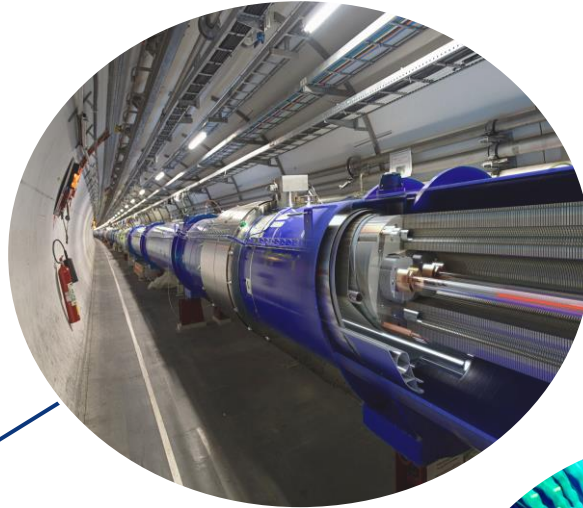




based on CERN's core research



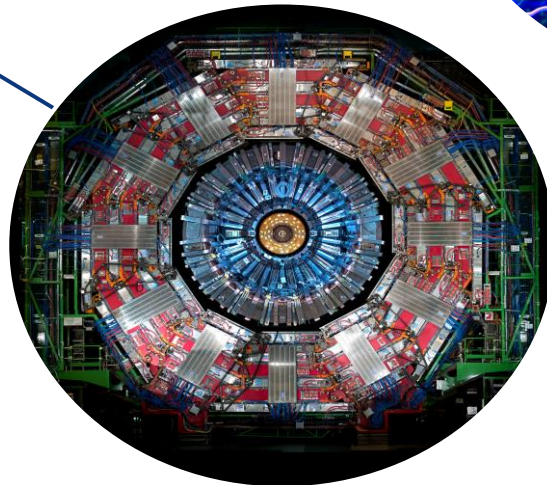
CERN  
core research domains



accelerators



ICT



detectors

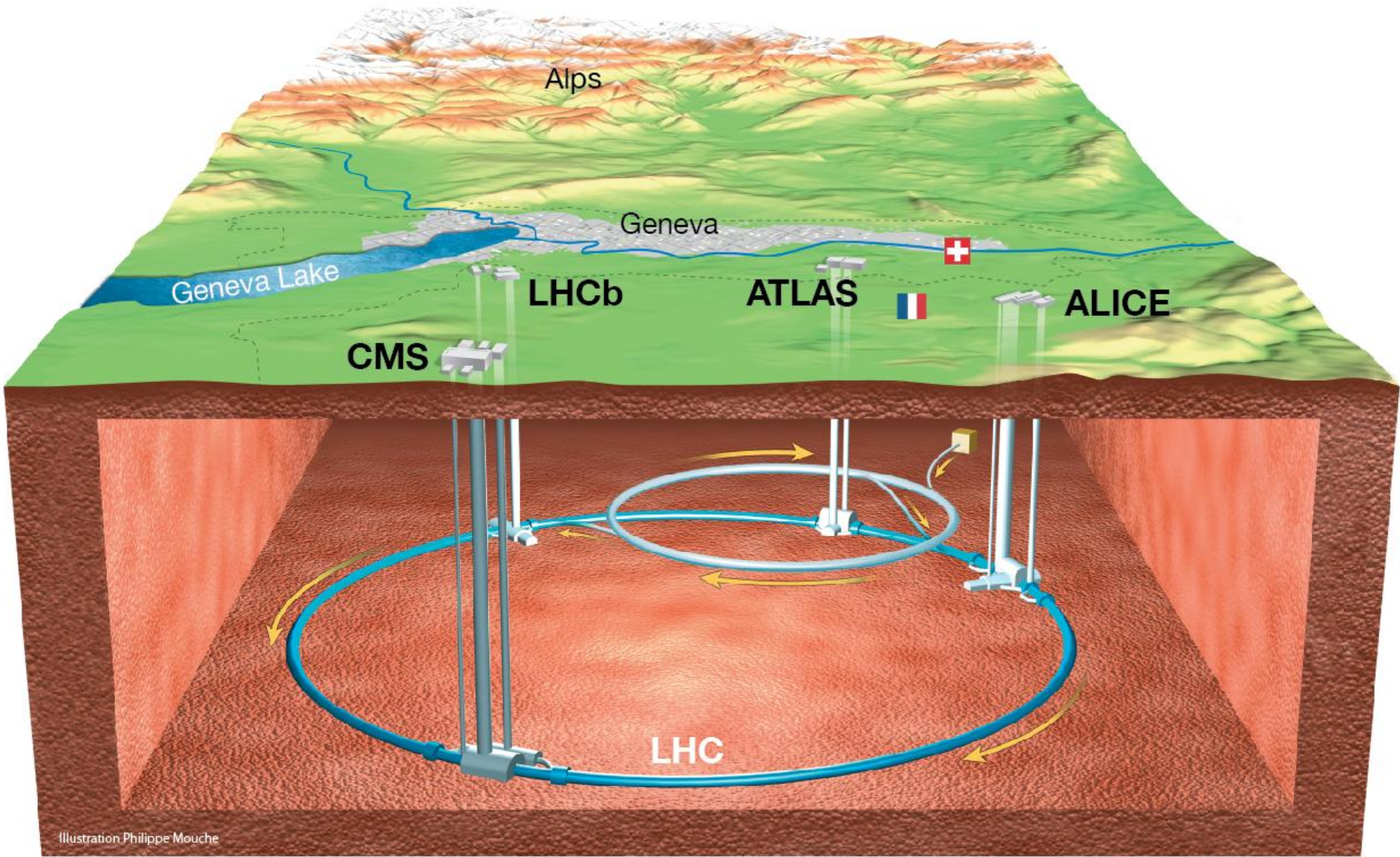


Illustration Philippe Mouche

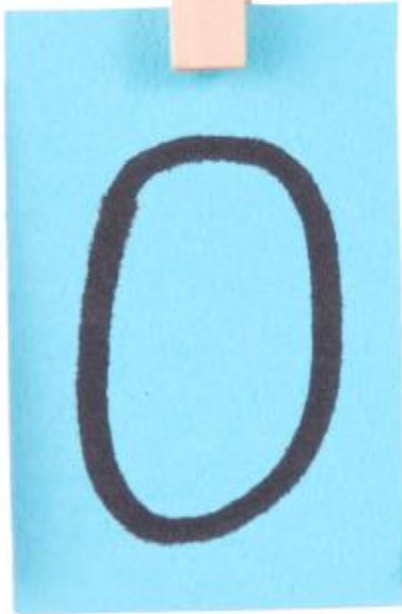


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- A complex network diagram with a central hub and many radiating lines, overlaid on a background of a particle detector or accelerator tunnel. The lines are colored in shades of red, orange, and yellow, suggesting a dense network of connections. The background shows a perspective view of a tunnel with a grid of lights on the walls, creating a sense of depth and technology.



H



O



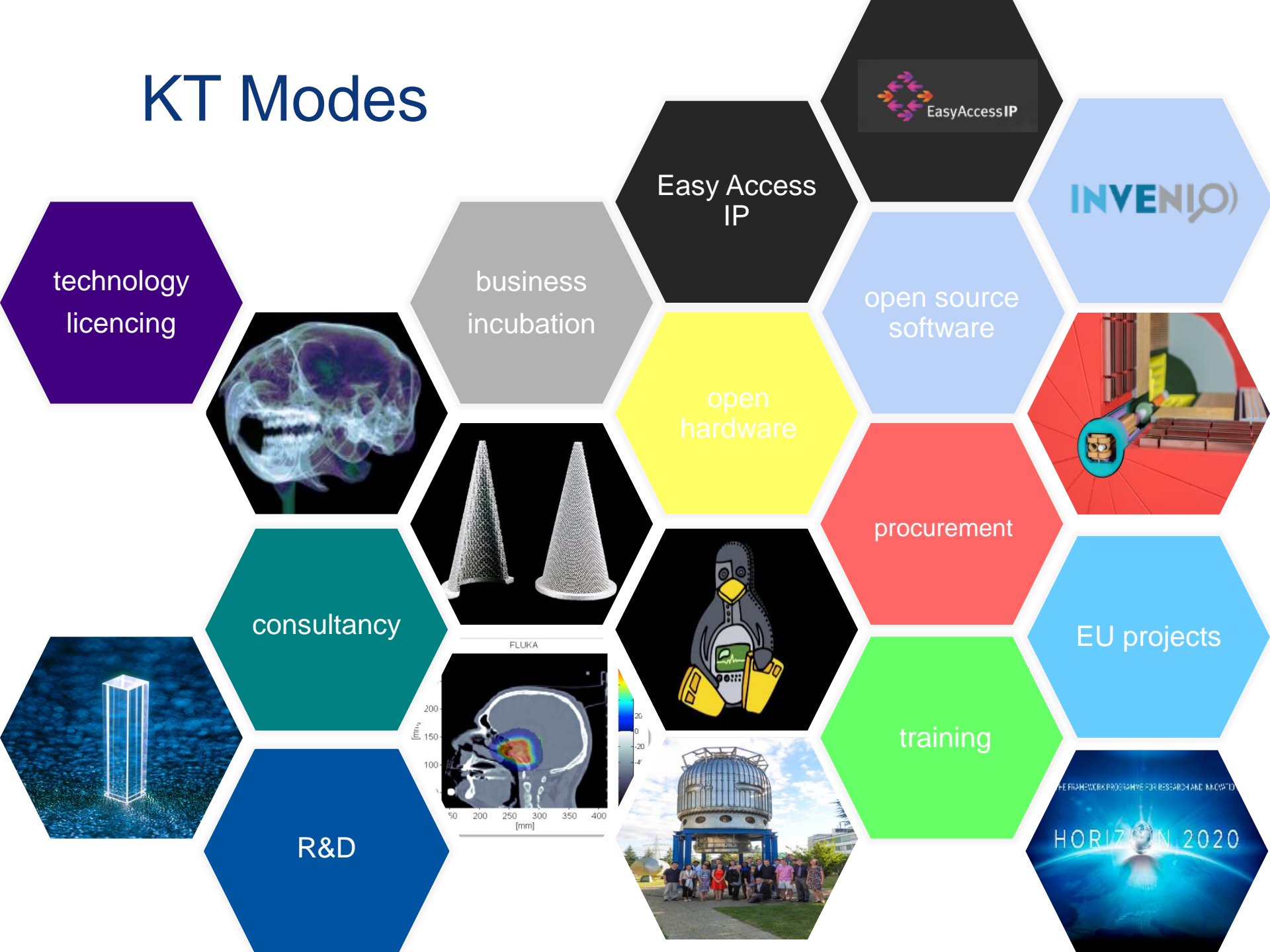
W



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# KT Modes



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- A complex network diagram with a central hub and many radiating lines, overlaid on a background of a particle detector tunnel. The network consists of numerous nodes and edges, with a dense central cluster and several distinct clusters of nodes extending outwards. The lines are colored in shades of red, orange, and yellow, suggesting a flow or intensity of connections. The background shows a perspective view of a long, cylindrical tunnel with a grid of lights on the walls, receding into the distance.

# Business Incubator Centres of CERN Technologies

**Austria**

**France**

**Finland**

**Greece**

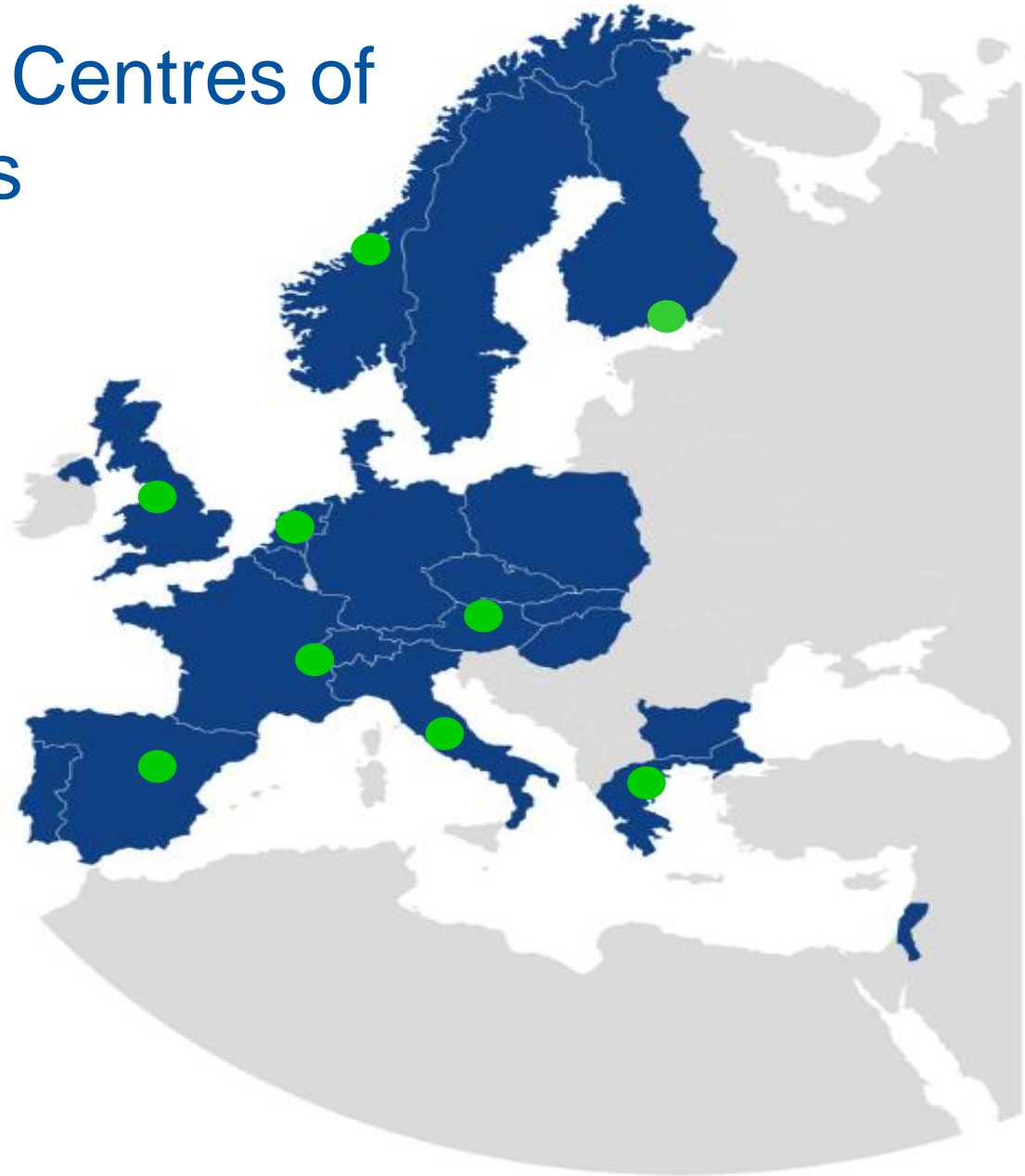
**Italy**

**Netherlands**

**Norway**

**Spain**

**UK**



# CERN Open Hardware Licence

A legal framework to facilitate knowledge exchange across the electronic design community.

In the spirit of knowledge and technology dissemination, the CERN OHL was created to govern the use, copying, modification and distribution of hardware design documentation, and the manufacture and distribution of products.





# INVENIO

Free software for running a digital library/document repository on the web

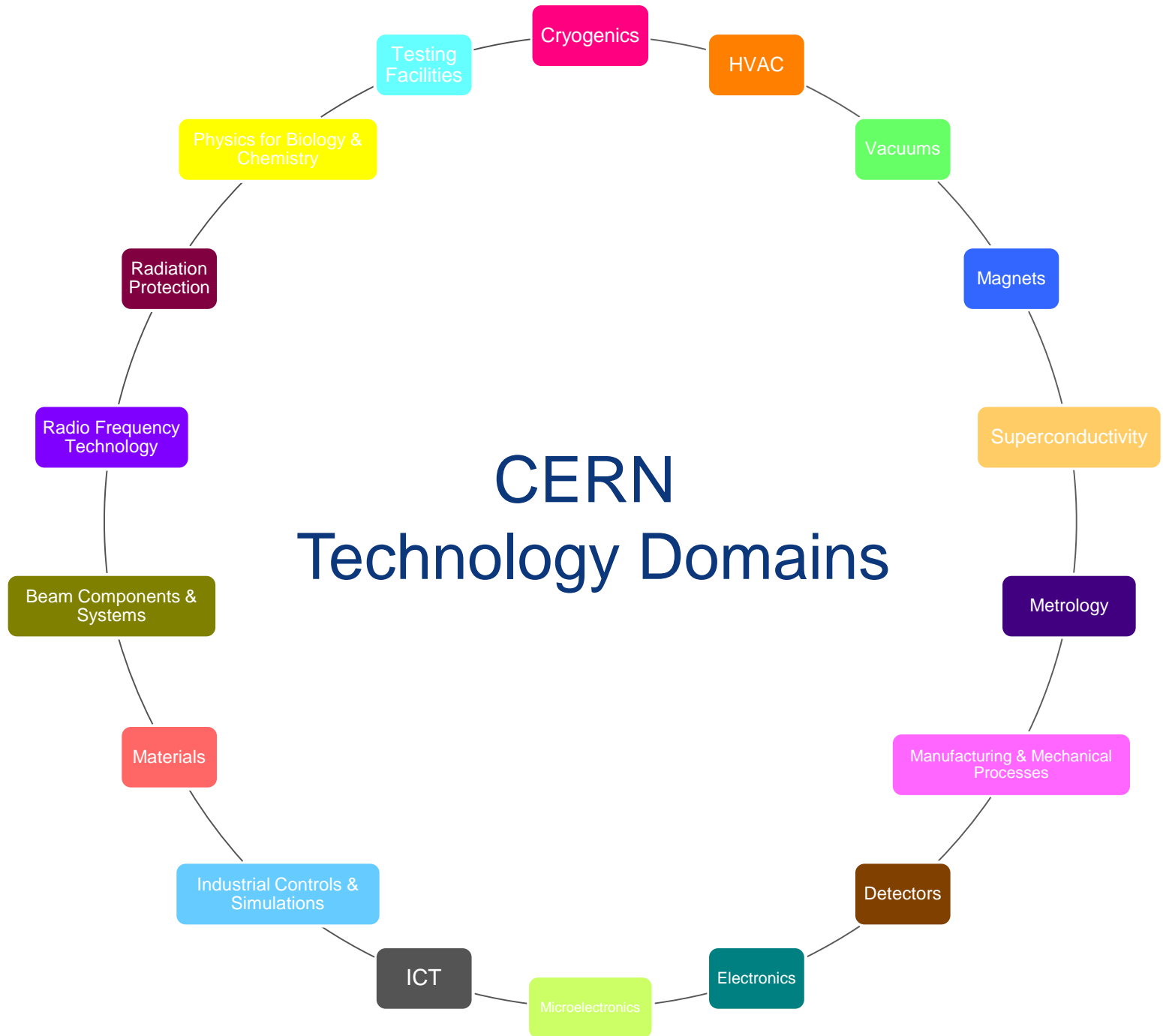
Document classification, indexing, curation, dissemination

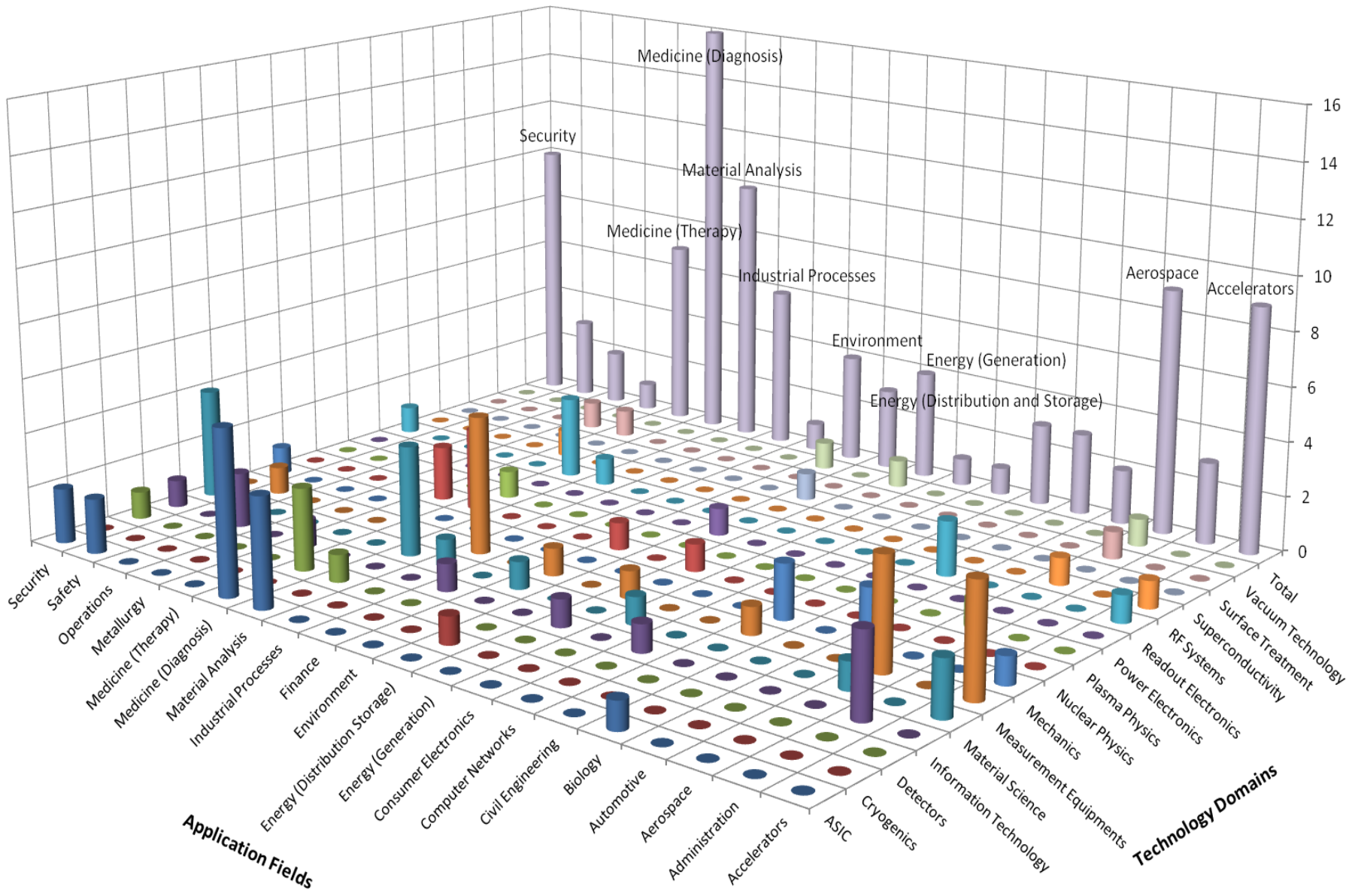
Diverse content types; articles, books, journals, photos, videos

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# CERN Technology Domains







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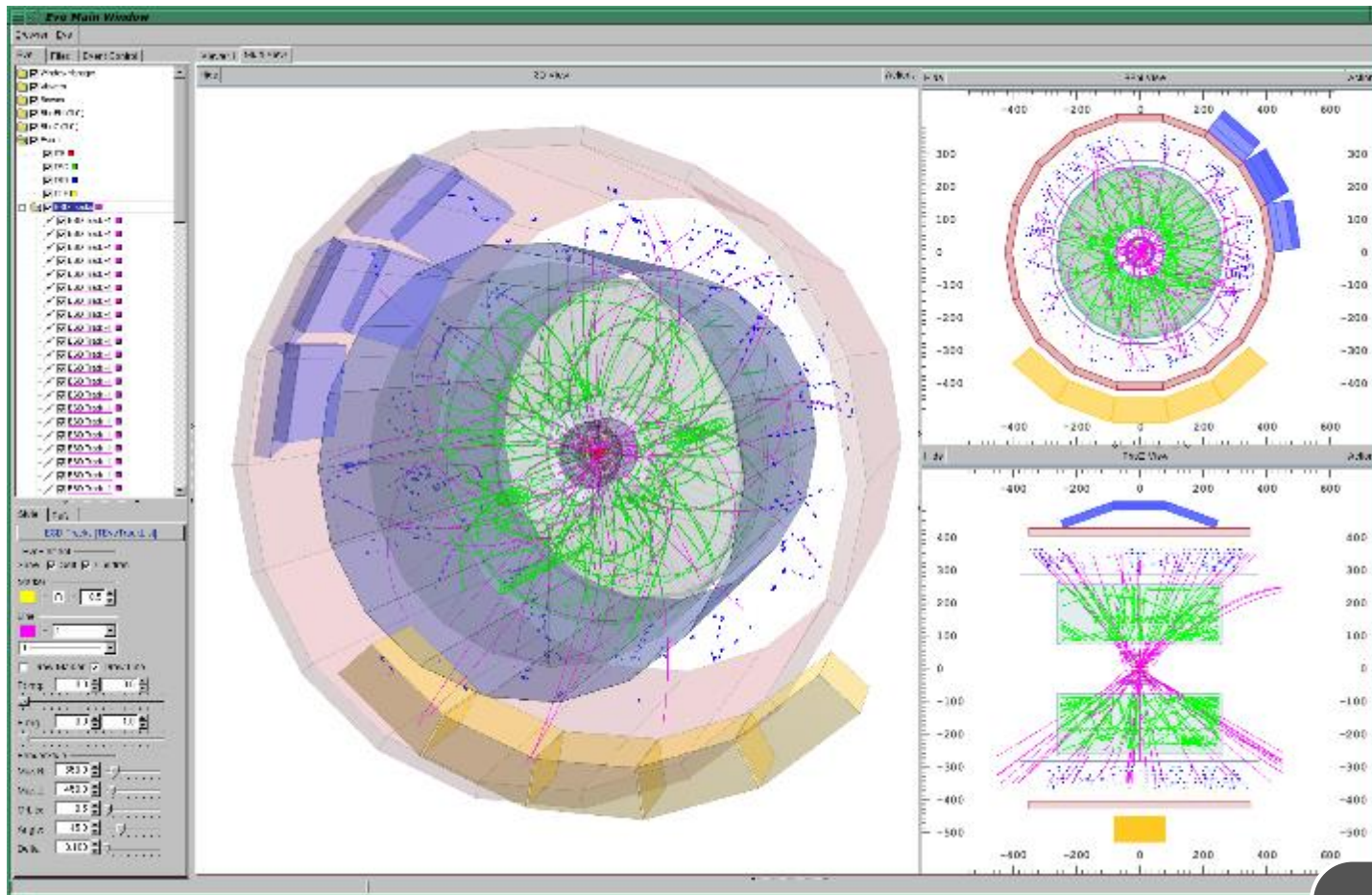
# MediPix



- Photon-counting particle detector; counted digitally in pixels, allowing images to be created.
- Recently used in electron diffraction of sub-micrometre protein crystals, which were previously unusable for conventional x-ray crystallography due to their small size
- Will hopefully permit a wider range of protein structures to be elucidated

Microelectronics

# ROOT



for data mining & computational neuroscience

ICT

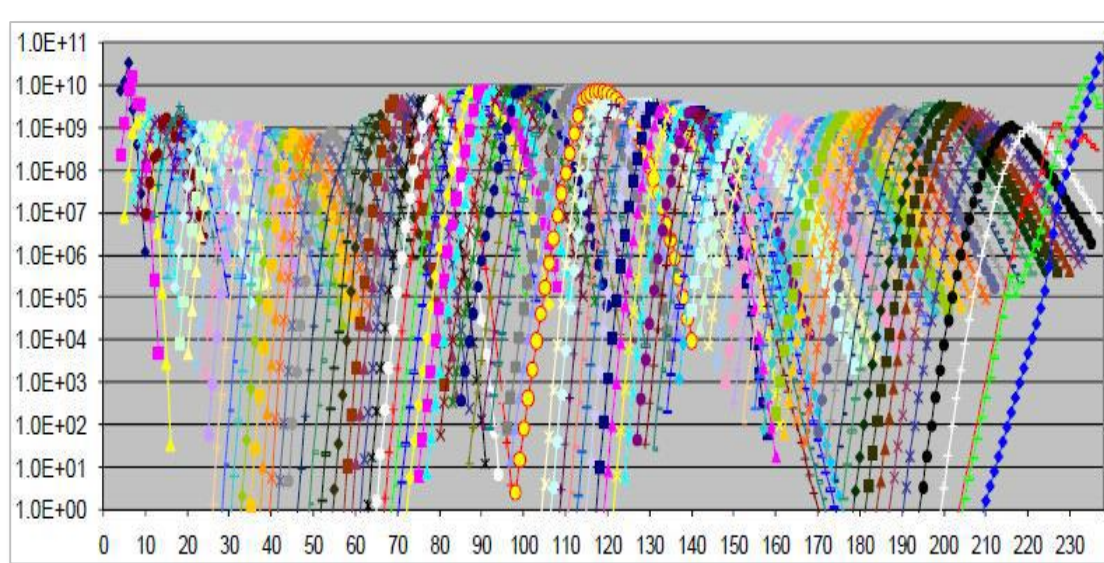
# CERN-MEDICIS

## **innovative radioisotopes for medical applications & research**

- Project based on using CERN's wasted proton beam to produce radioisotopes
- Irradiation of target materials located between ISOLDE targets and the beam dumps
- Recovery of radioisotopes to a shielded hot cell for preparation and packaging
- Transport to hospital/treatment/research centre

Physics for Biology &  
Chemistry

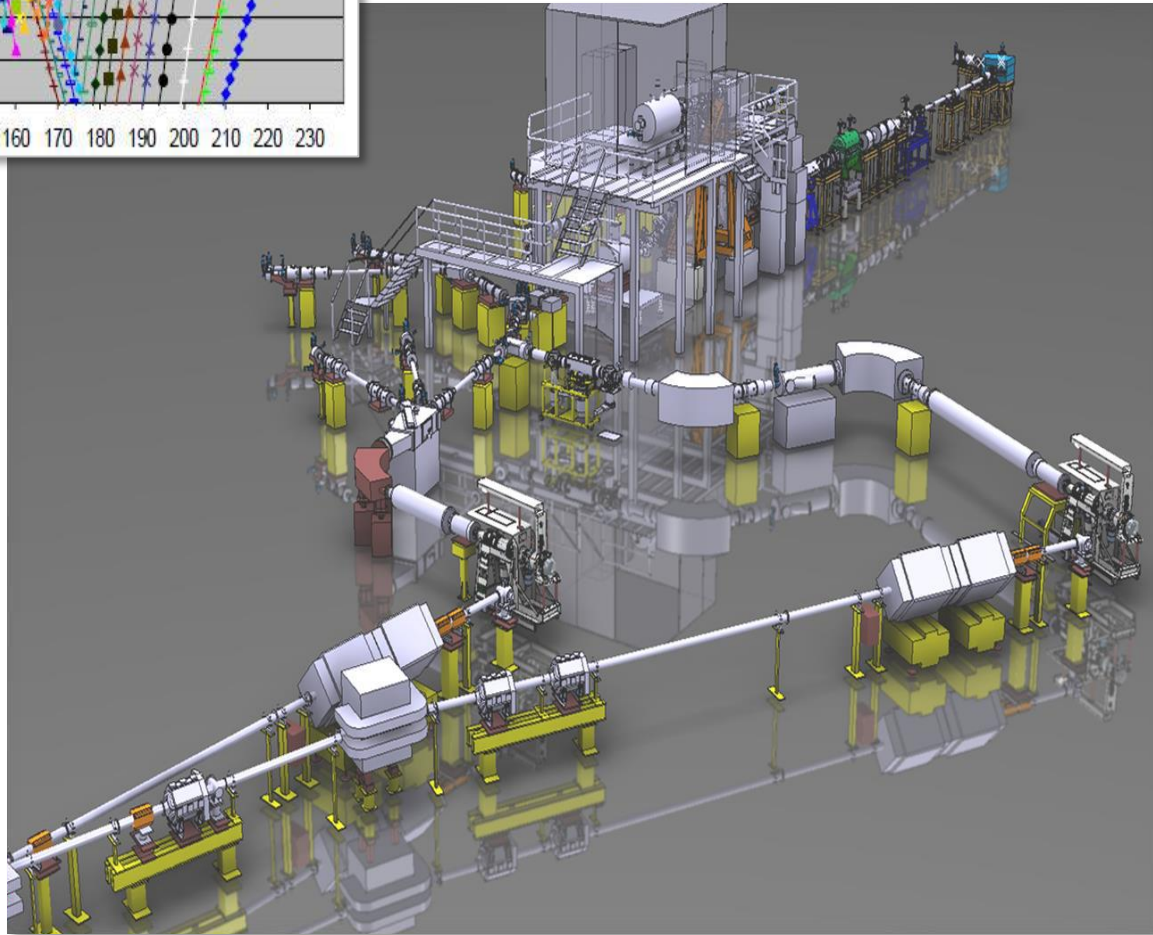




1000+ isotopes(for 73+ elements)



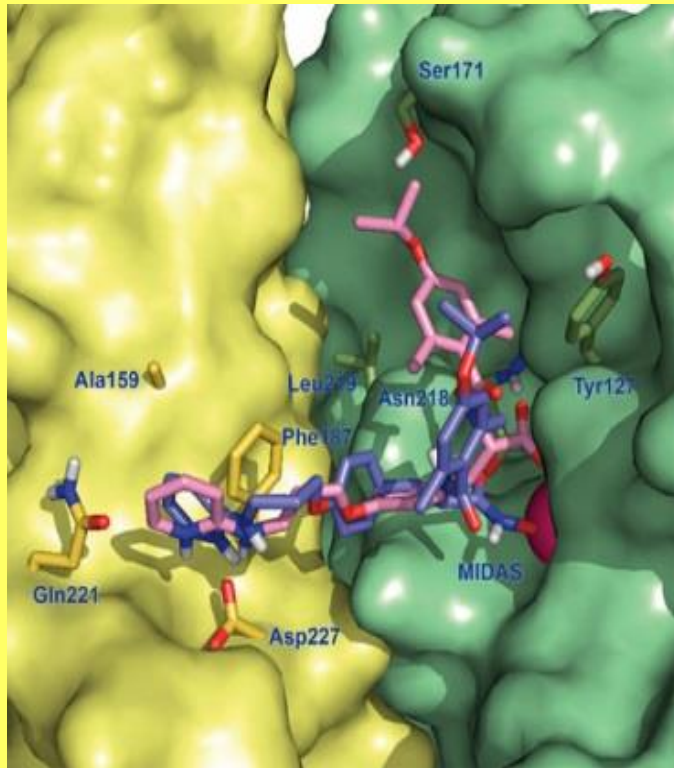
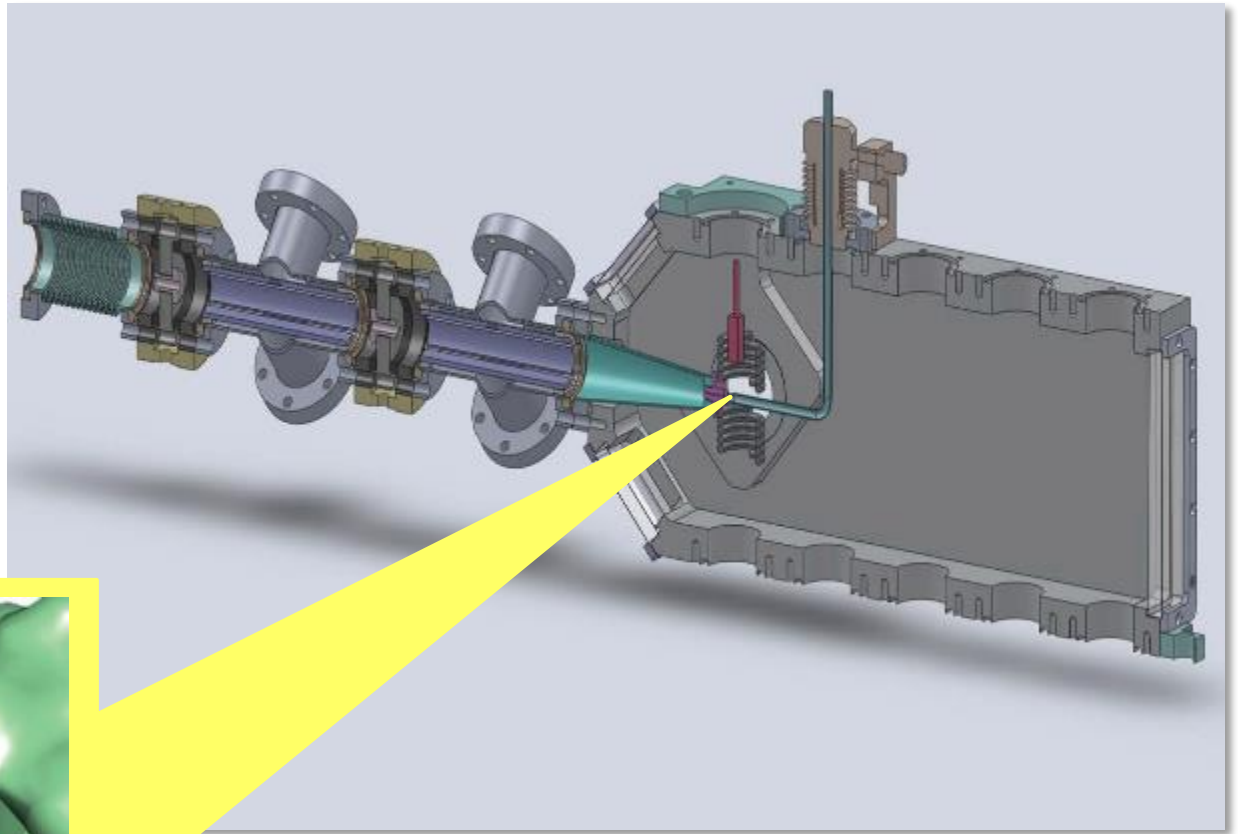
- innovative protocols (surgery/brachytherapy/combination)
- innovative isotopes for imaging and treatment
- biomedicine



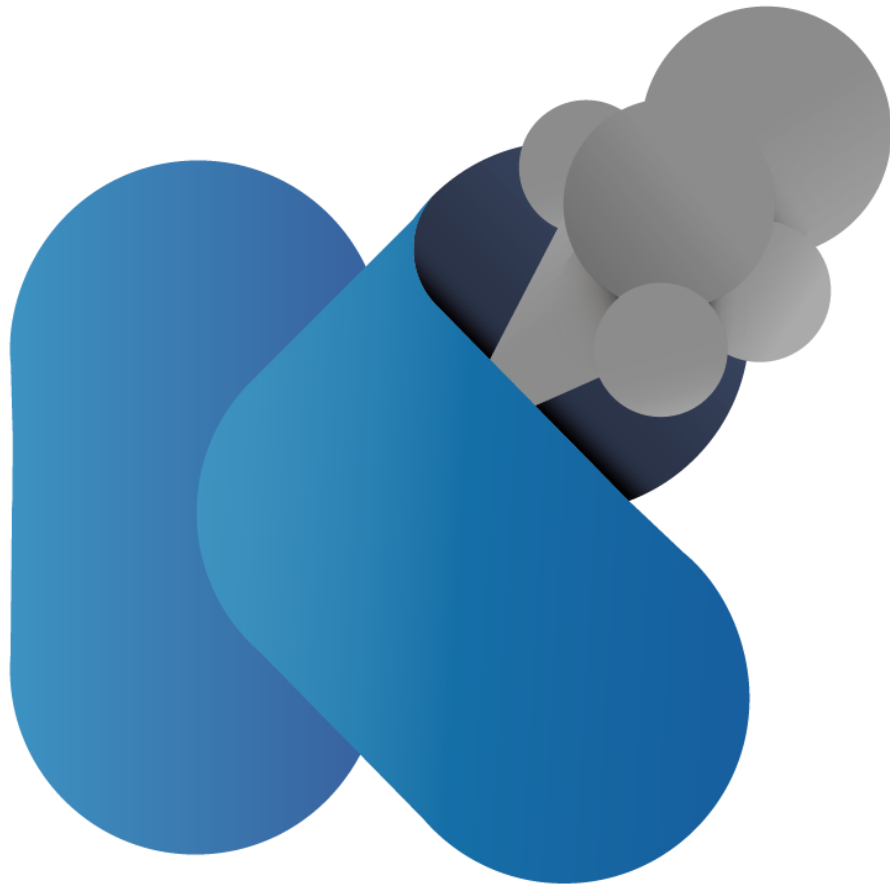
# Apparatus to Study Liquid Samples in Vacuum

- system for the study of biologically important metals (Cu, Mg, Zn), overcoming the problems of vacuum difference to make such work possible for the very first time
- radioisotopes of metal ions can be implanted into biological structures at ambient pressure allowing direct observation of their structural & functional properties

sample is positioned  
for radioisotope  
implantation



metal ions in atomic structures are  
directly observable



# Kryolize

Cryogenic safety software  
designed  
to automatically calculate value  
size &  
configuration

Cryogenics

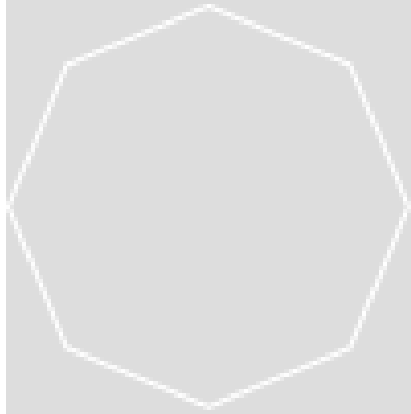




**B-RAD;**  
a novel radioactive particle detector

Detectors





# Challenge Based Innovation



We exist to support novel applications of CERN technology

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