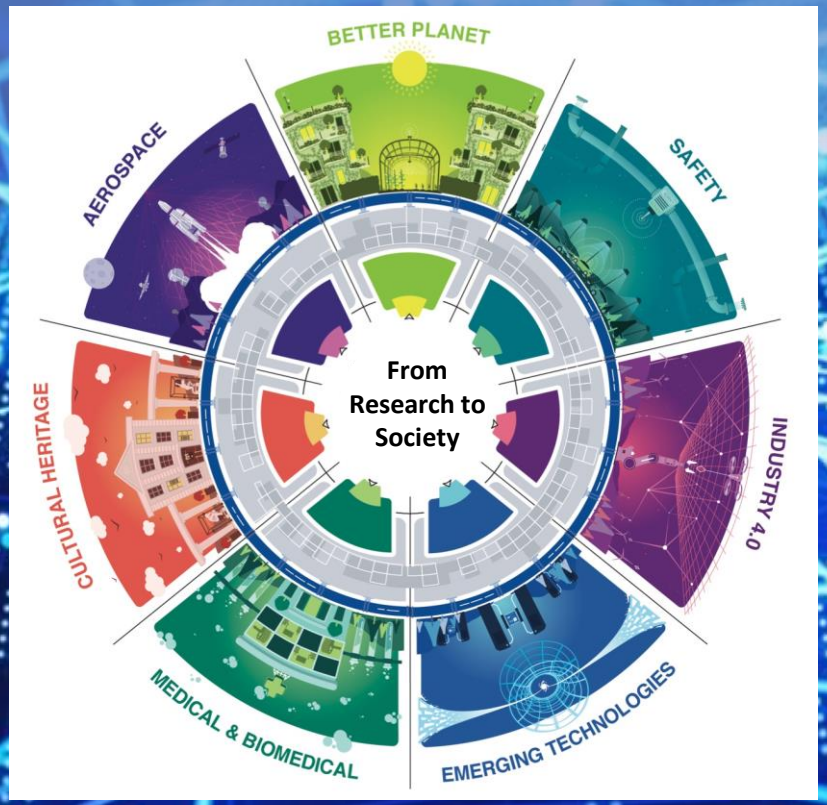
ILO report and Technology Transfer in Germany



Ties Behnke DESY

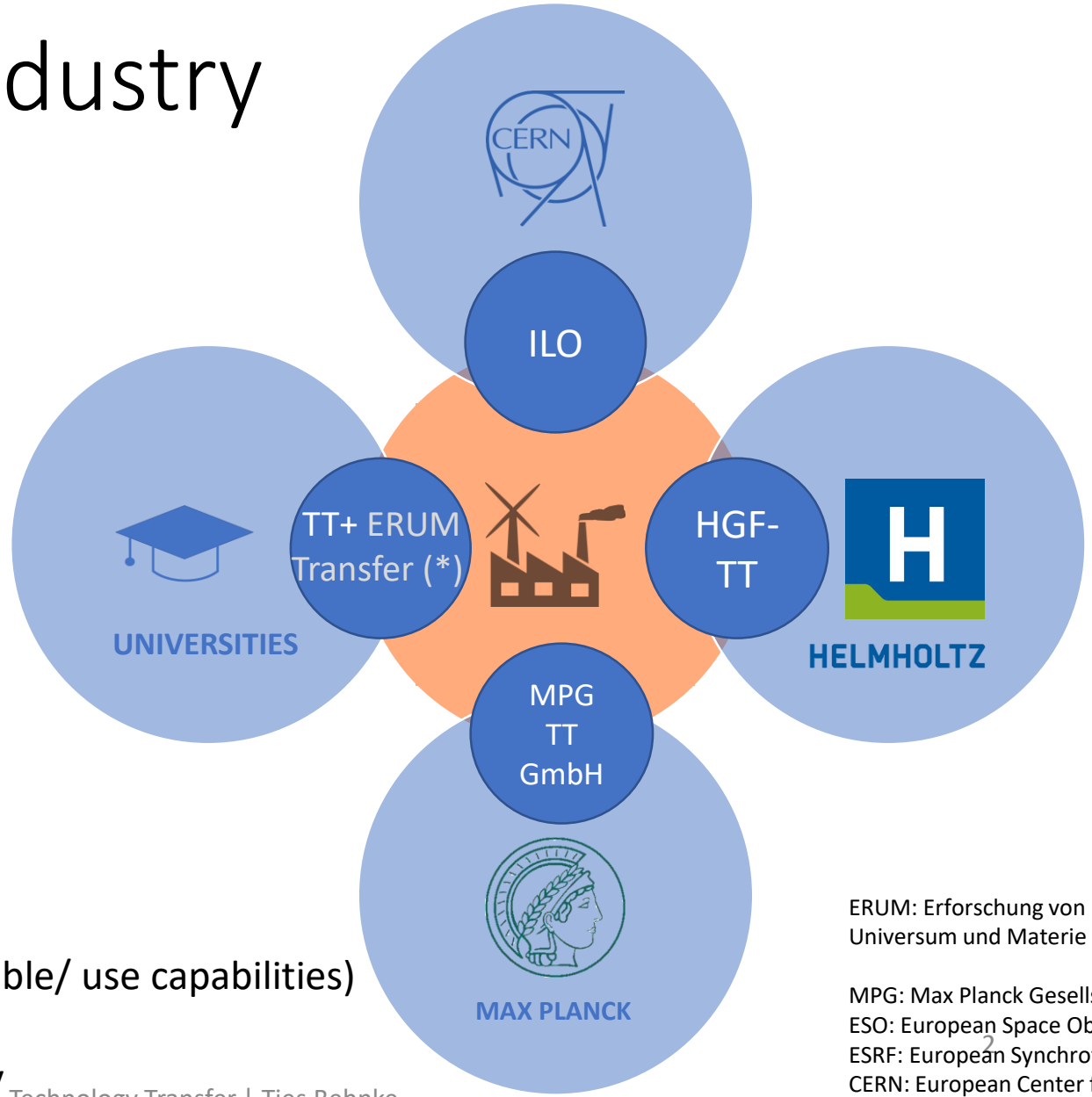
Technology and Industry

Industrial Liason officers (ILO)

- ESO
- ILL/ ESRF
- CERN
- XFEL

Bundesministerium für Bildung und Forschung

pt.desy.de/clio



Technology Transfer (TT):

Helmholtz structures the national scene
Universities play a strong local role

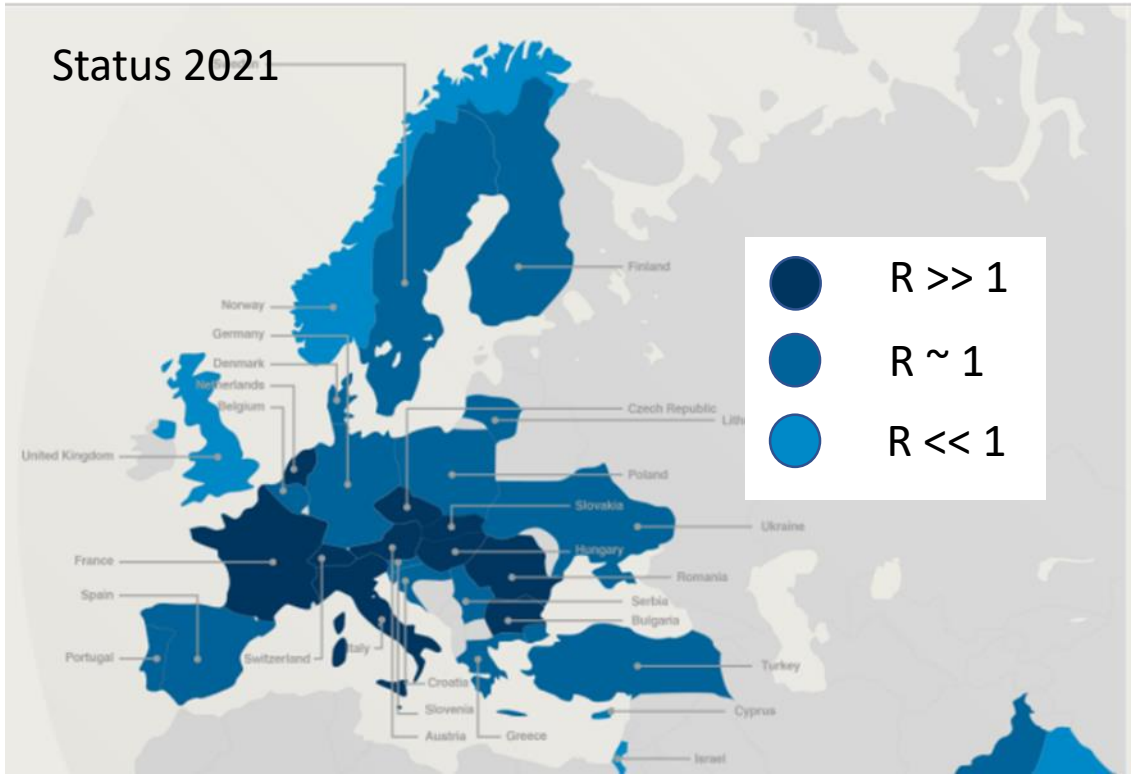
Connection to industry

- Giving high tech business to industry (enable/ use capabilities)
- Spinning results from research to industry

ERUM: Erforschung von Universum und Materie (future)

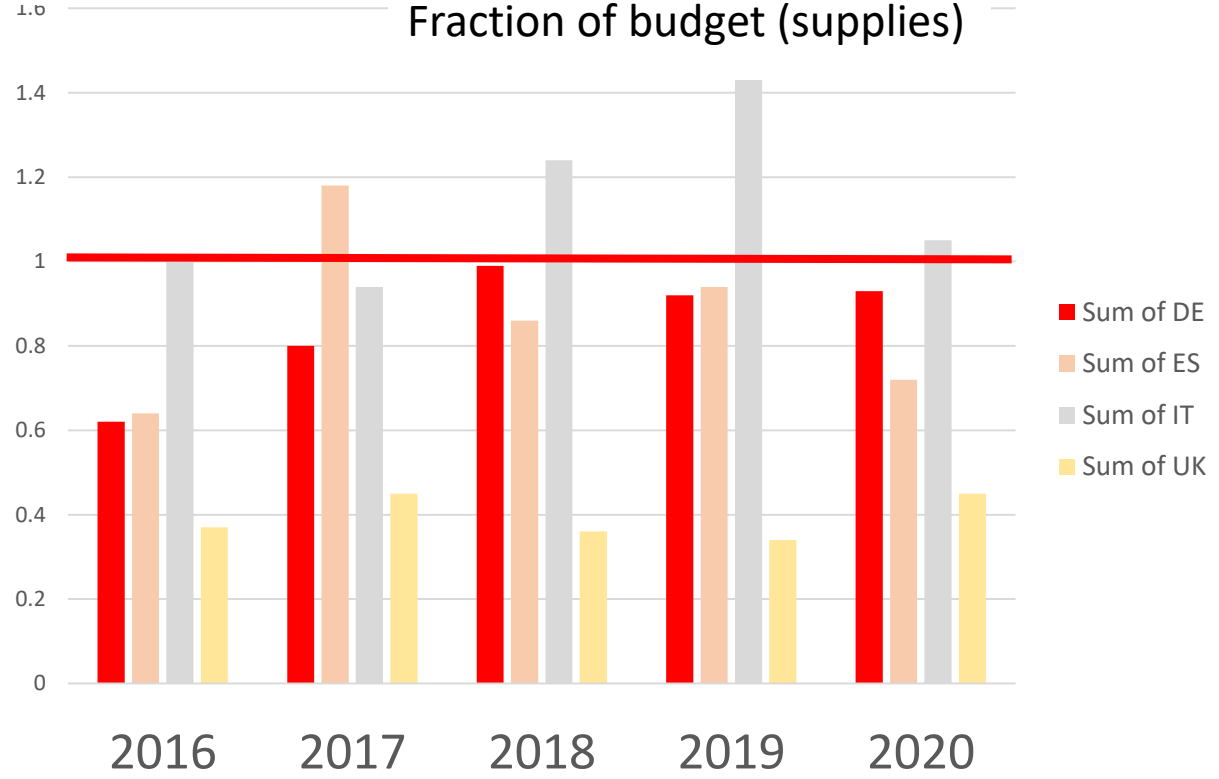
MPG: Max Planck Gesellschaft
ESO: European Space Observatory
ESRF: European Synchrotron Research facility
CERN: European Center for Nuclear Research
XFEL: European Free Electron Laser

Industrial Return: CERN



Overview on industrial return in Europe

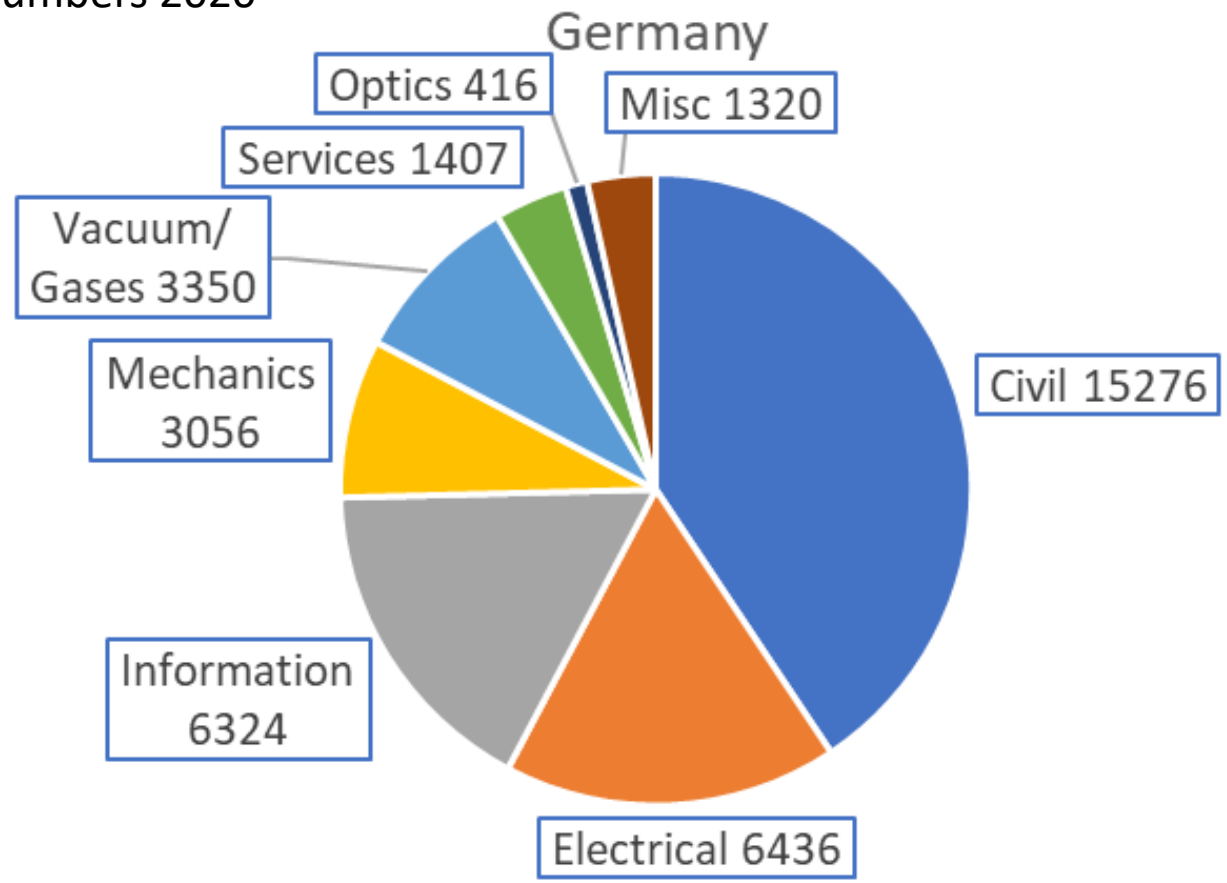
Return= Fraction of Orders (supplies) to Germany / Fraction of budget (supplies)



CH/ F as host states significantly larger
Germany: positive development, close to 1

Where does the money go?

Numbers 2020



Example

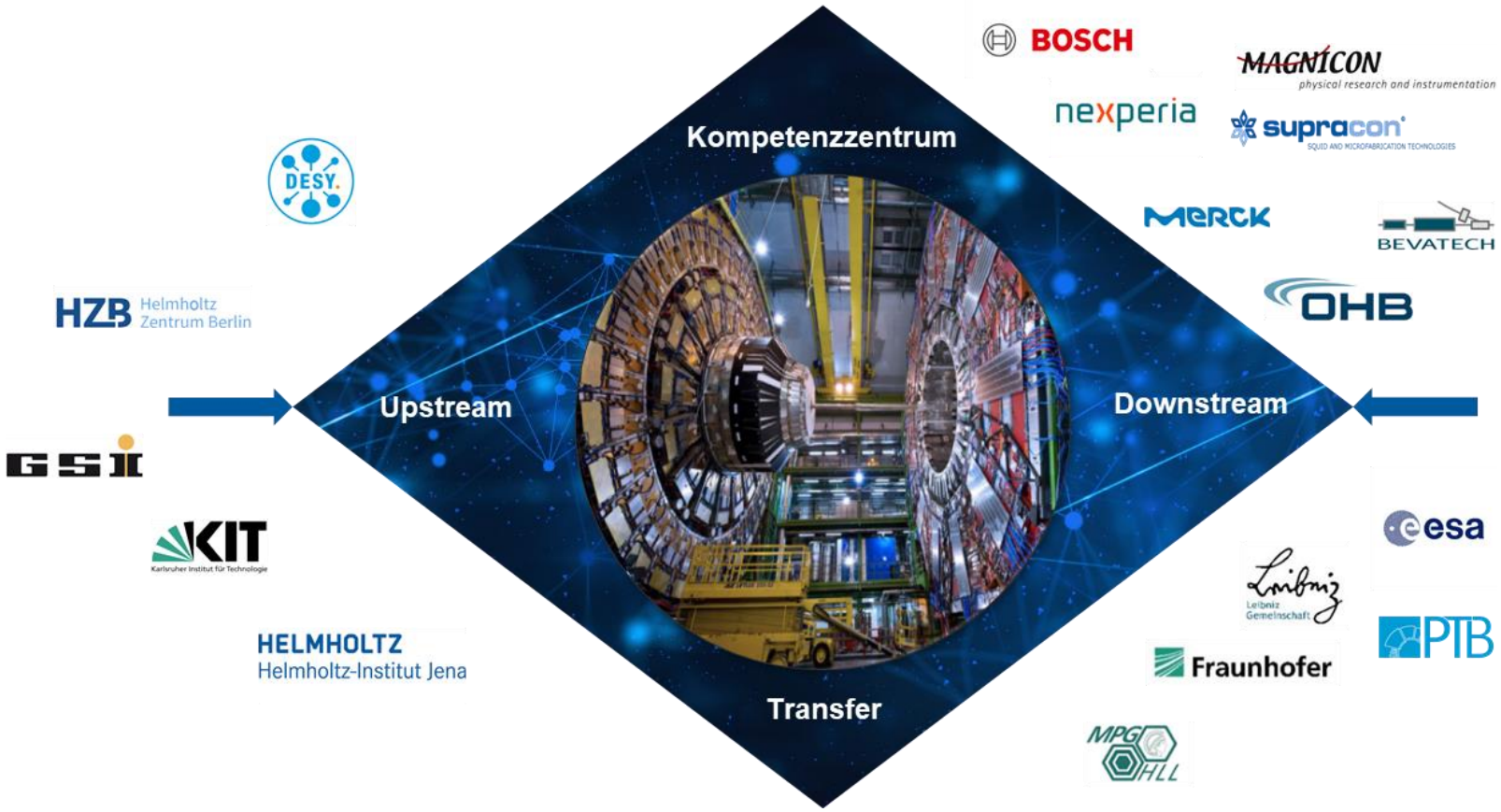
BRUKER

[Superconducting wires for the LHC magnets]

All numbers in kEUR

Involving industries

An example for an industry/ research network

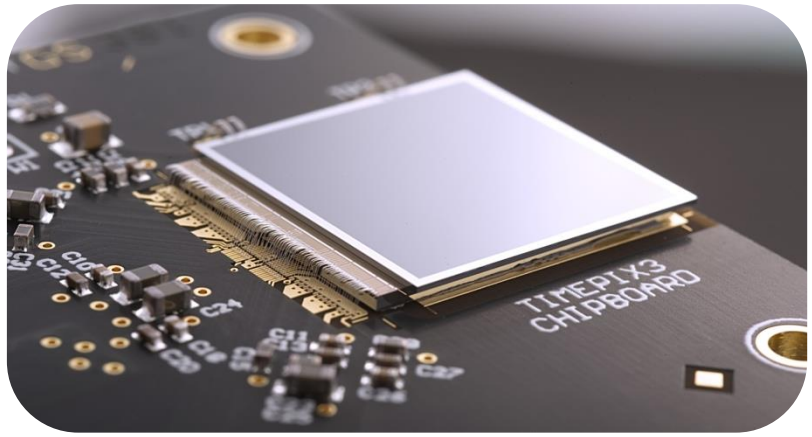


Innovation flow
is bi-directional

Development of an industrial network between research, and industry
for **detector technologies**

Medipix: an example of Tech Transfer

Hardware developments



medipix collaboration

- Science driven collaboration, international
- CERN lead, up to 7 German (Bonn, Freiburg, Erlangen, Muenchen, Karlsruhe, Hamburg…) institutes involved
- Applications in Science and Industry
- Example for transfer
  - Different field (photon science)
  - industry

XSPECTRUM

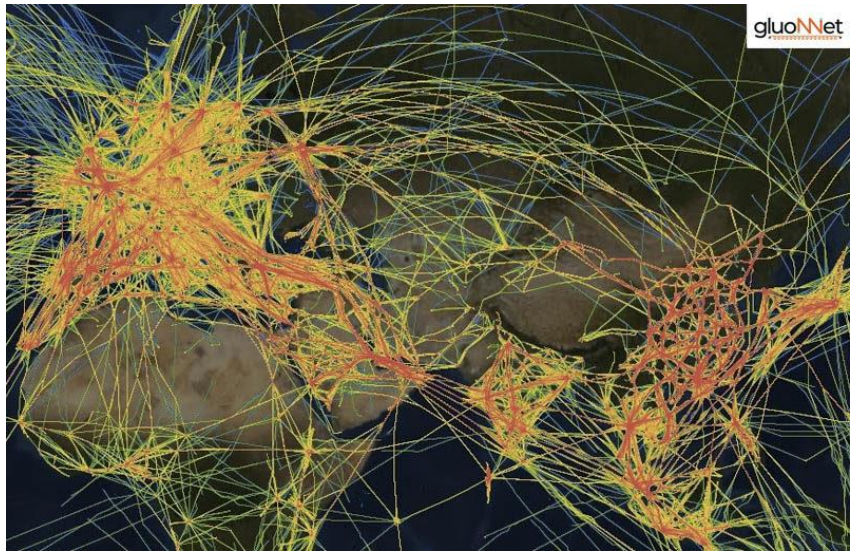
Spin-off company from DESY

- Strong relation to science imaging
- Medipix technology as one pillar

Examples: Germany and CERN in knowledge transfer

Digital know-how - algorithms

gluoNNet: a big data enterprise start-up.
Develop Software as a service in the area of large data/ complex systems
CERN-DESY-others



Managing flight routes of planes

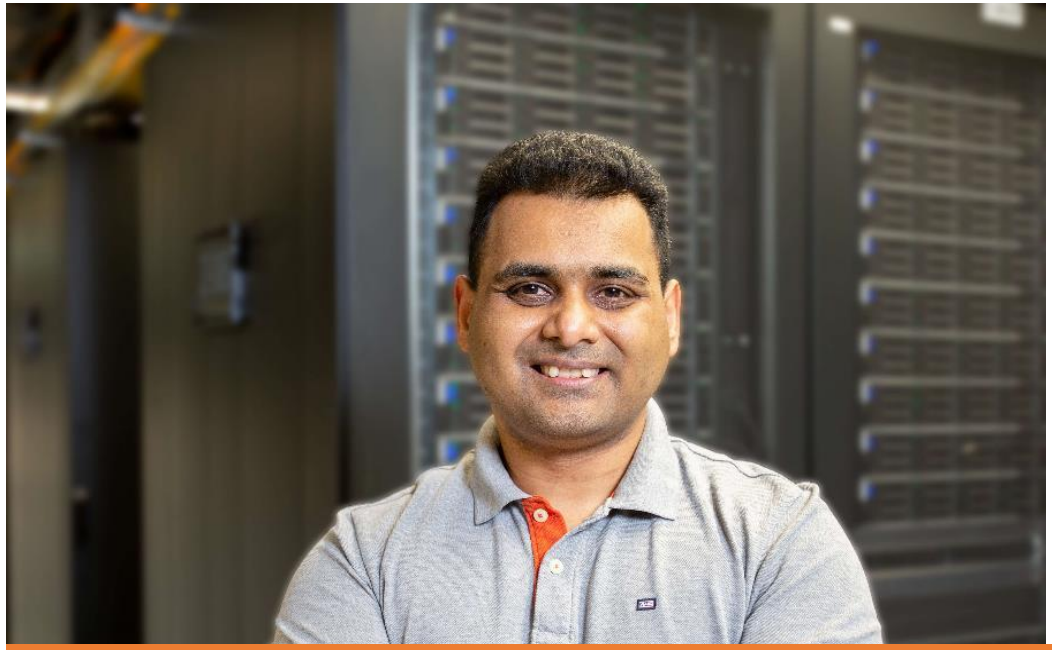
Bundesdruckerei (Berlin) collaborates with CERN to explore the application of CERN's ROOT in new approaches to data cryptography, ID security, privacy and quantum encryption.

BlueYonder
Supply Chain Nation

Spinoff from KIT/ HEP
1.1 Billion $ revenues 2020
Founded in 2000, by now American based (Panasonic)
Still efficient pipeline for people from research into industry

Digital Health with Machine Learning and AI

From particle physics to a health startup



Ayan Paul, theoretical physicist,DESY

CoVis app since 2020
App to evaluate your personal infection risks: rolled out to major app stores

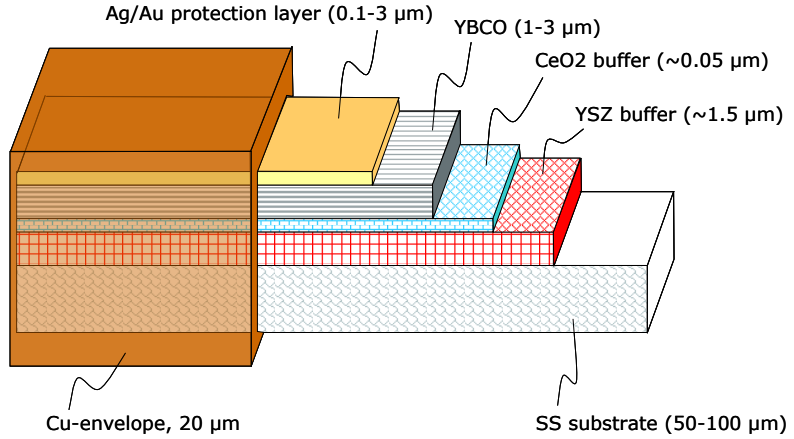
R&D cooperation

Trigger industrial applications

Cooperation CERN KIT for superconducting cables

- High temperature superconducting cables
- CERN supports R&D at KIT
- Cooperation with major industrial supplier: Bruker

- FCC needs… industrial base



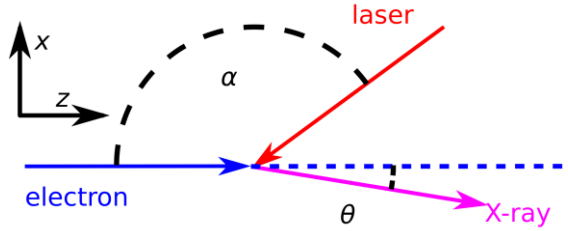
Universities

Several projects ongoing

- Clear focus on medical applications
- Very often triggered by personal connections, not by institutionalized contacts

Example: “PlasmedX” project

- Development of a compact (Laser Plasma based) X-ray source for functional imaging of tissues
- Brilliant source, small enough to be installed at a Hospital
- Cooperation UHH, UKE



Compact Thompson source

High performance detectors

Outlook

Technology Transfer is an important aspect of our research

- The system of Industrial Liason Officers at major infrastructures is well established and works well
  - Reached return of close to 1
  - Germany / industries in Germany are part of the effort to develop the future technologies needed

- TT is organized at different levels in Germany

  - Universities/ national research centers/ international research centers

  - TT increasingly recognized to be thought of as part of our research at all levels: TT needs to become “normal”

  - We see a significant roll-out of technologies into non-science areas