

CERN Knowledge Transfer

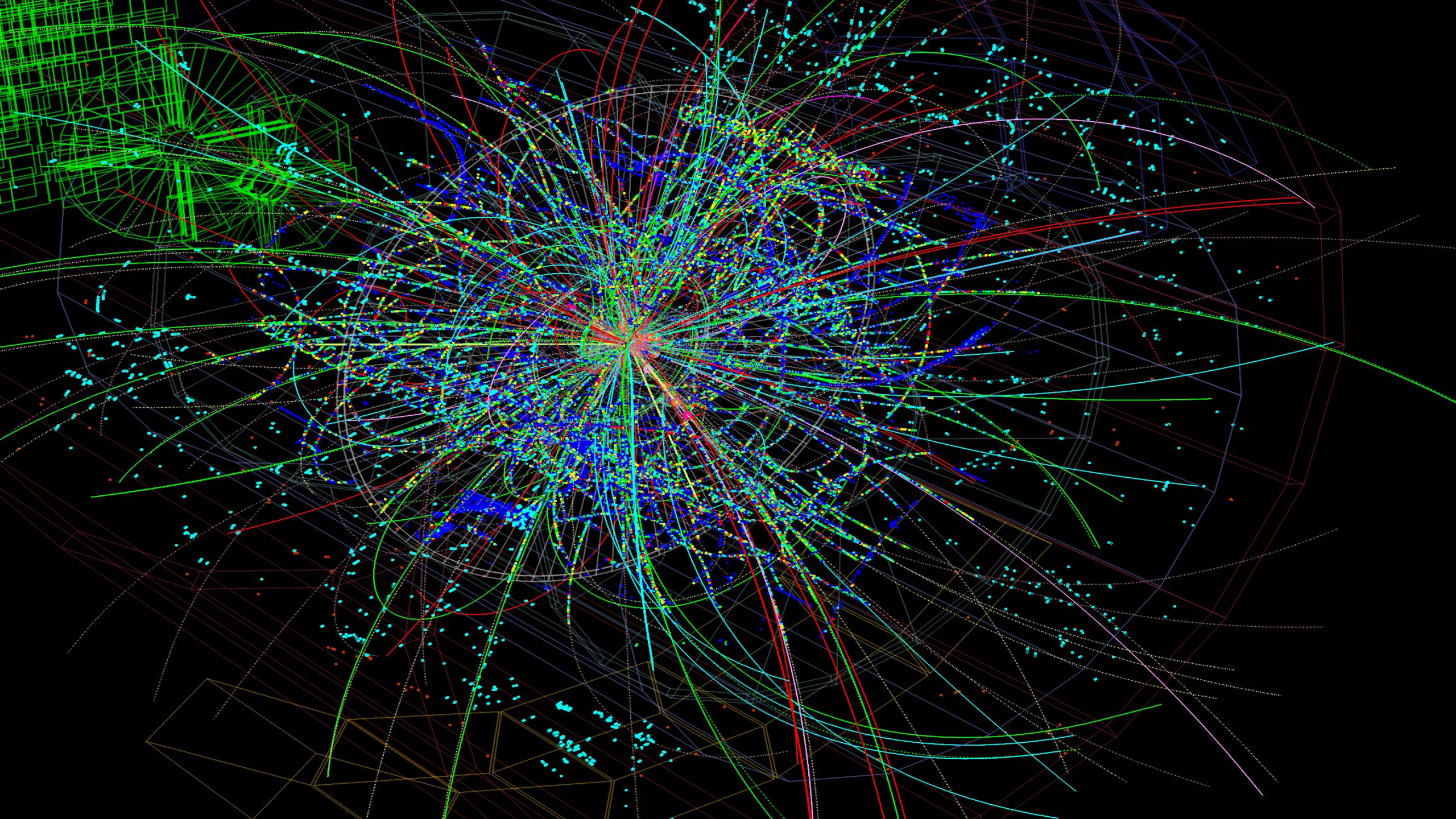
Han Dols

Section Leader Business Development
Knowledge Transfer Group
CERN



Council meeting in
Amsterdam when the
CERN convention was
signed (1953).





Machine Learning and Deep Learning

Industrial Controls and Automation

Data Analytics

Metrology

High and Ultra High Vacuum Systems

Health, Safety and Environment Management

Cryogenics

Optoelectronics and Microelectronics

High Volume Data Management & Storage

Superconducting Magnets

Particle Acceleration and Control

Radiation Protection and Monitoring

Particle Tracking and Calorimetry

Robotics

Sensors

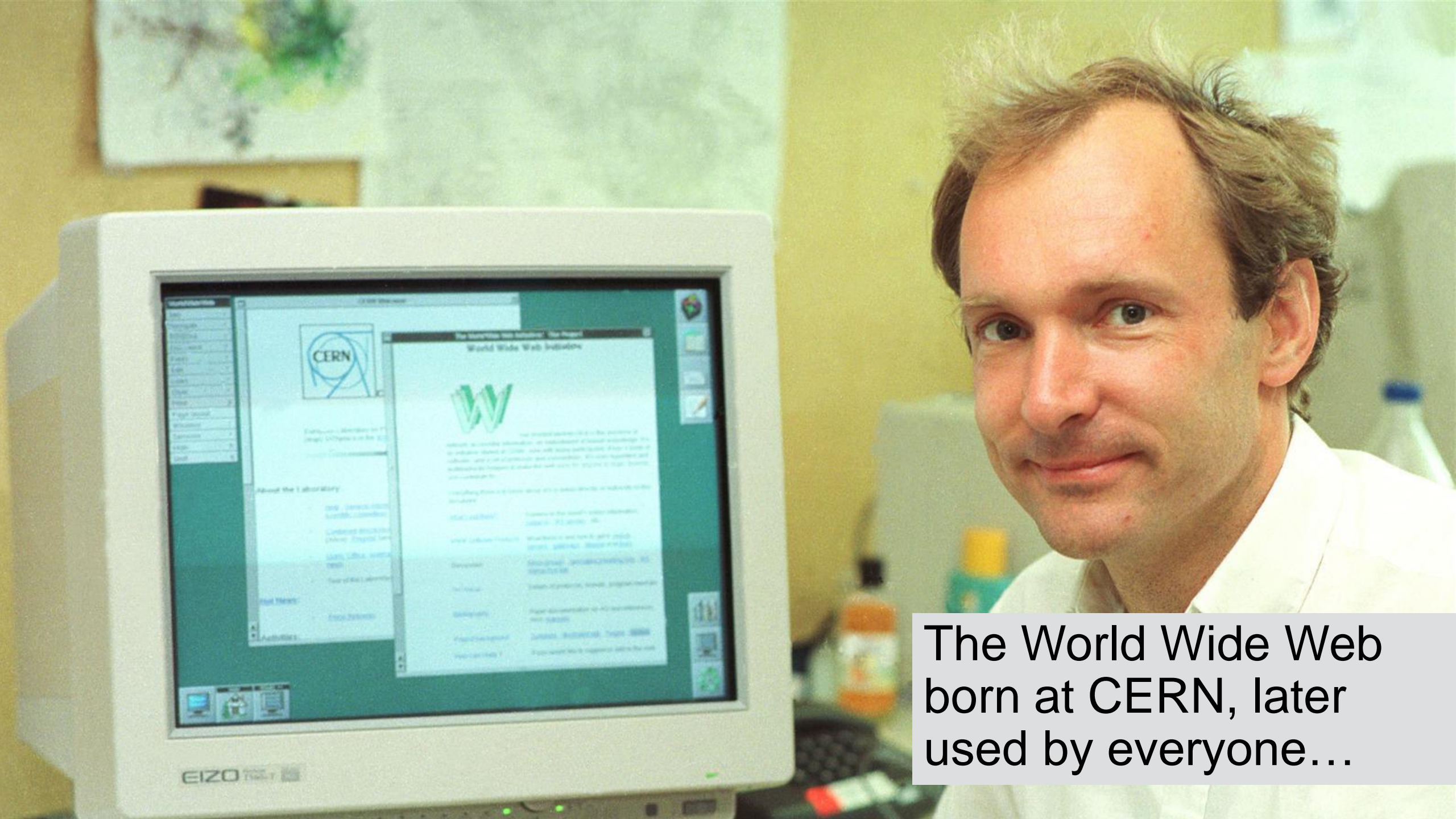
Material Science

Cooling and Ventilation

Collaboration Tools

Radio Frequency Technology

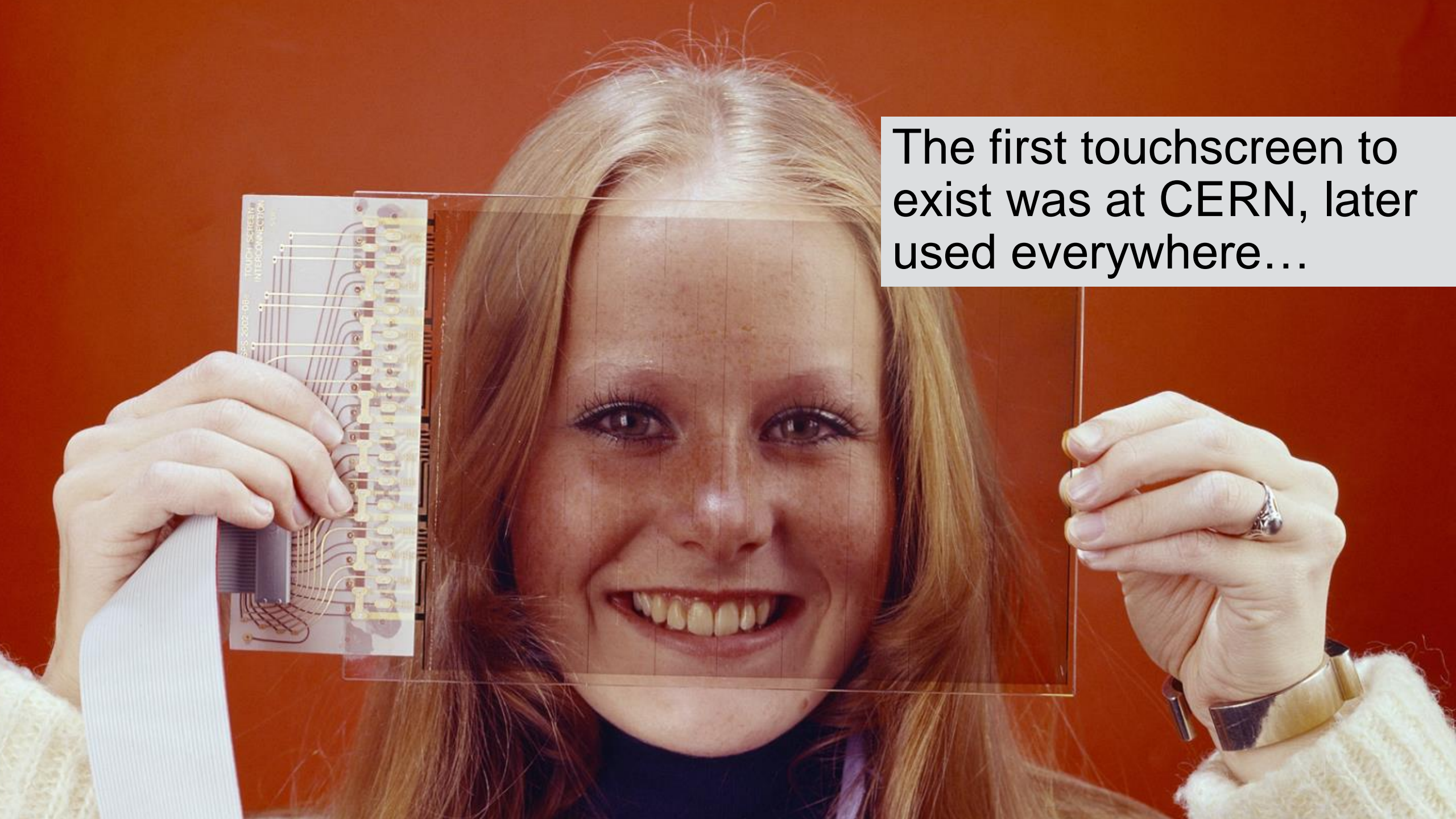
Manufacturing and Mechanical Processes



The World Wide Web born at CERN, later used by everyone...

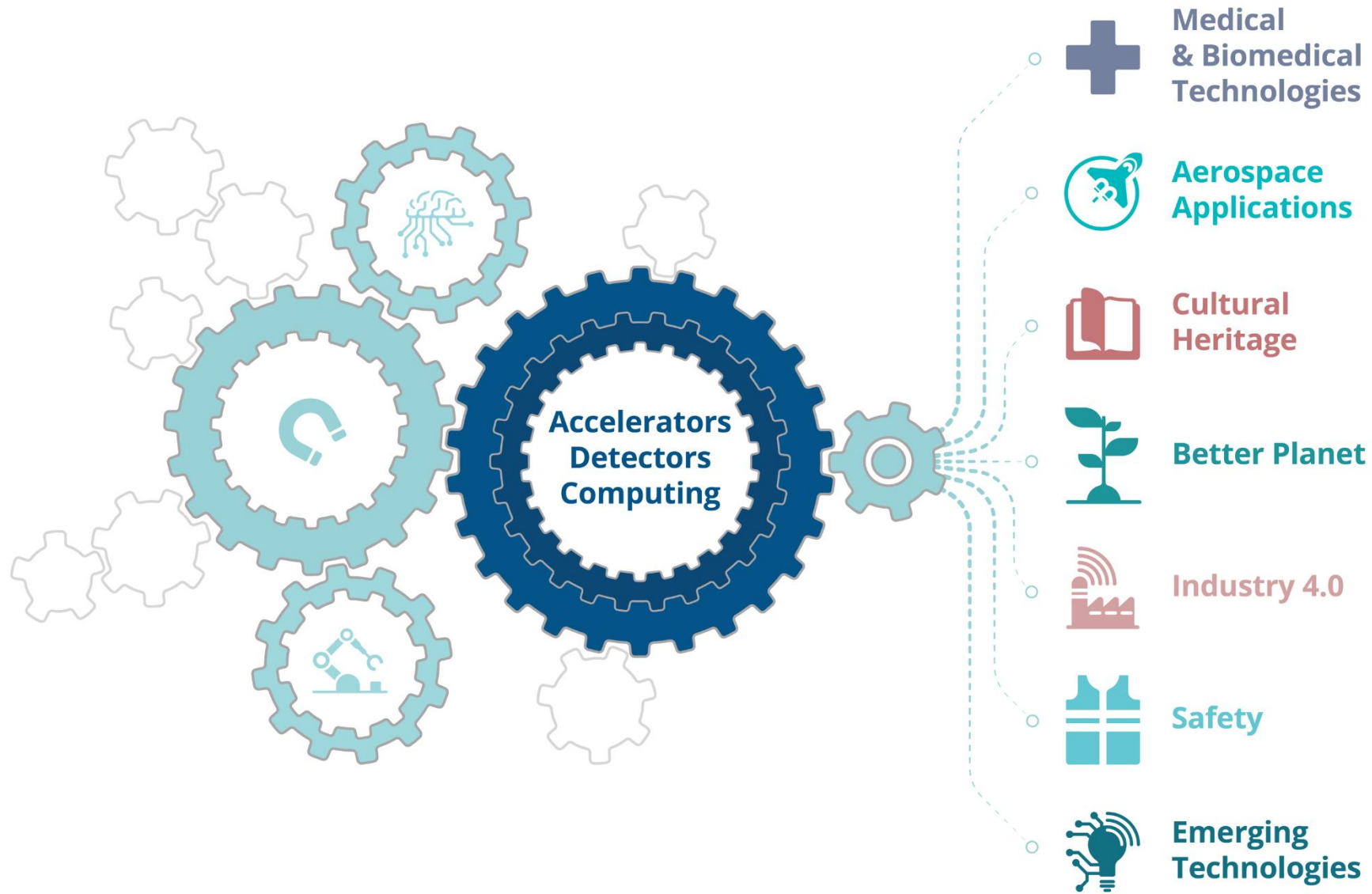


Trackball with optical encoders, used later in the mouse of a PC...



The first touchscreen to exist was at CERN, later used everywhere...

TOUCH SCREEN INTERCONNECTION



Funding Opportunities for CERN Projects

CERN Knowledge Transfer Fund
CERN Medical Applications Budget

Collaborations and Networks

Knowledge transfer networks
Strengthening links with Member States (KT Forum)
Relations with International Organisations
Knowledge transfer in EC co-funded projects

Entrepreneurship

Start-ups & Spin-offs
Entrepreneurship Meet-Ups
Business Incubation Centres
Entrepreneurship Programmes

Events

Knowledge Transfer Seminars
Conferences with a significant contribution by the Knowledge Transfer group

Intellectual Property Management

R&D collaborations
Patent portfolio
Licence, service & consultancy agreements

Open Source

Open Source Software
Open Hardware Licence

Support for CERN Personnel

Formal and practical training in business, entrepreneurship & knowledge transfer
Legal, business & intellectual property support



Medical & Biomedical Technologies

MEDICAL & BIOMEDICAL PHYSICS RESEARCH

Medical researchers, clinicians & patients rely on novel **particle detectors** for radiation

Radiobiology studies and innovative radioisotope production can be performed in special **accelerator** facilities

Computing & big data challenges in particle physics can provide solutions for biomedical research

BIOMEDICAL TECHNOLOGIES

Tools and techniques for particle physics find applications in **biomedical technologies**

IMAGING & DIAGNOSIS

Medical imaging relies on **particle detectors**, some directly resulting from fundamental research

The analysis of medical images requires sophisticated **computing** tools

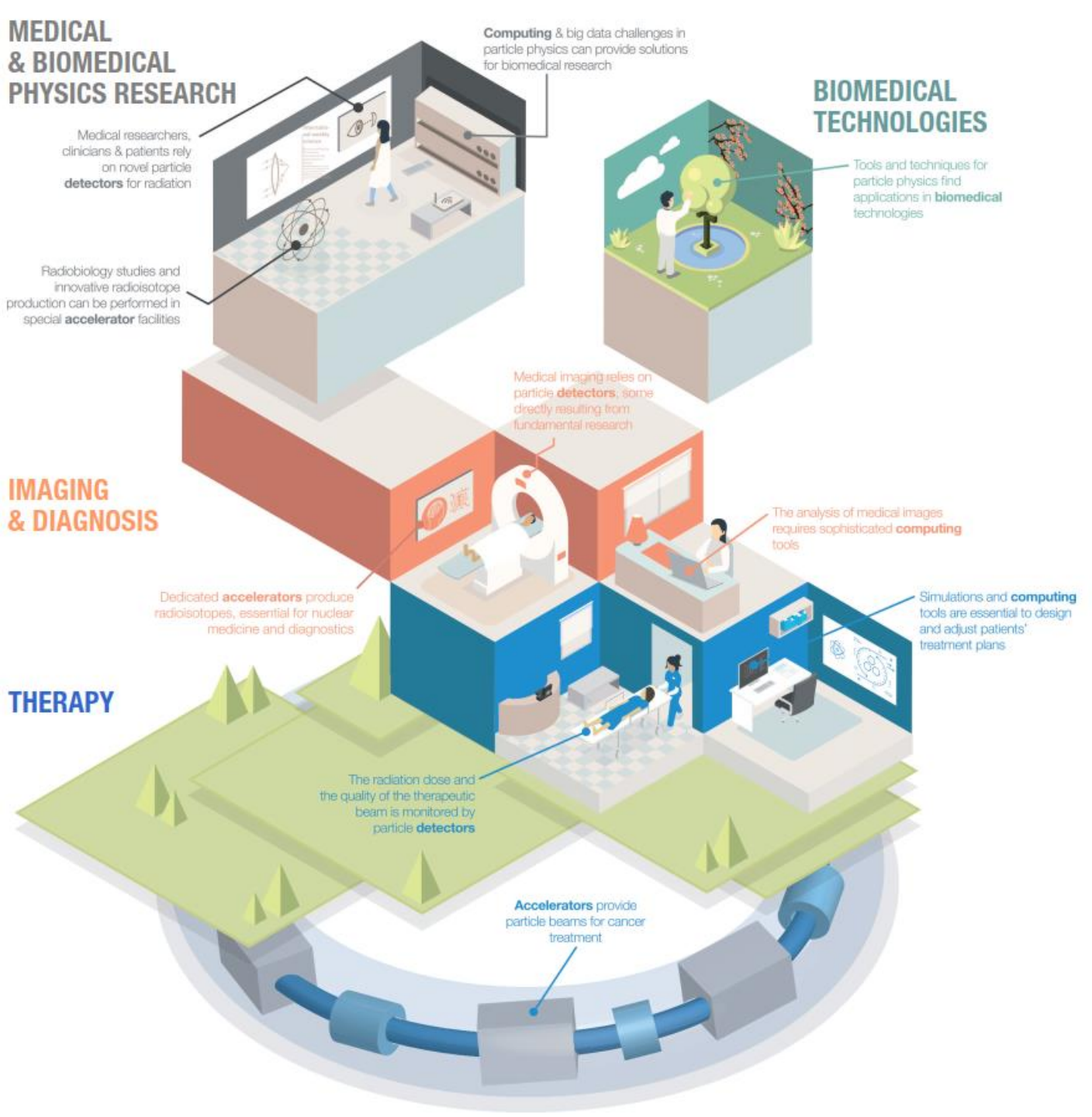
Dedicated **accelerators** produce radioisotopes, essential for nuclear medicine and diagnostics

Simulations and **computing** tools are essential to design and adjust patients' treatment plans

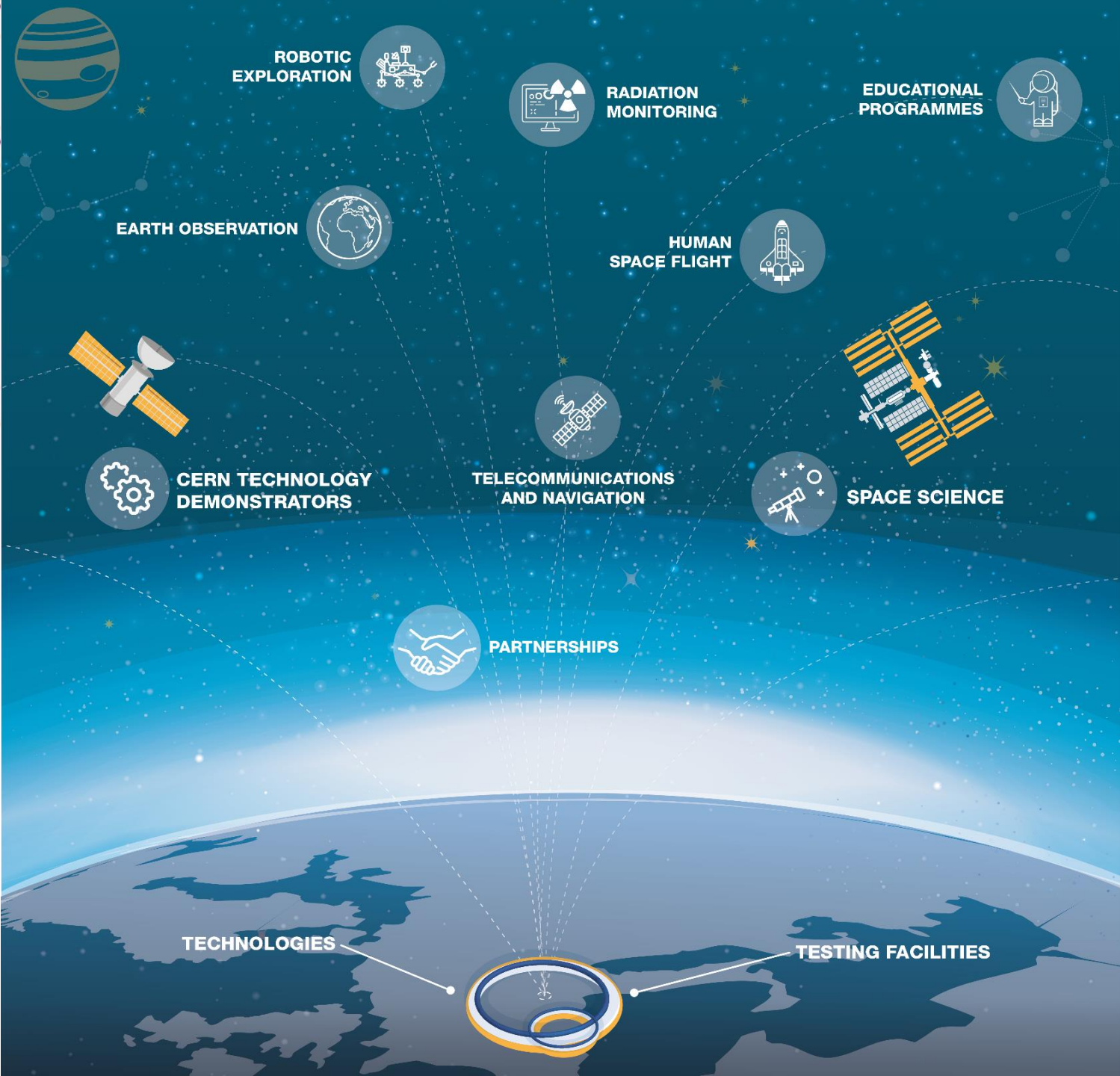
THERAPY

The radiation dose and the quality of the therapeutic beam is monitored by **particle detectors**

Accelerators provide particle beams for cancer treatment



Aerospace Applications

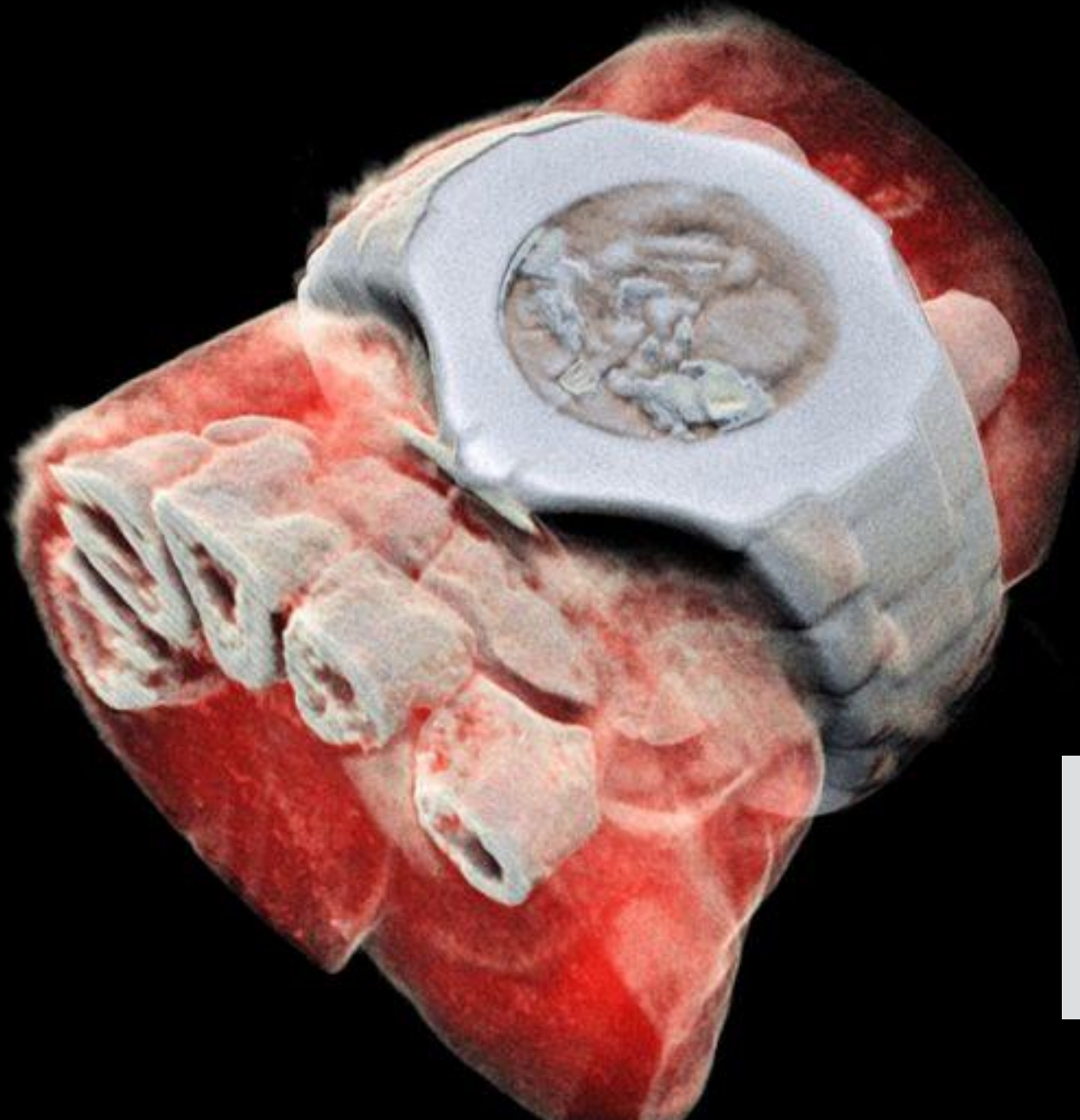




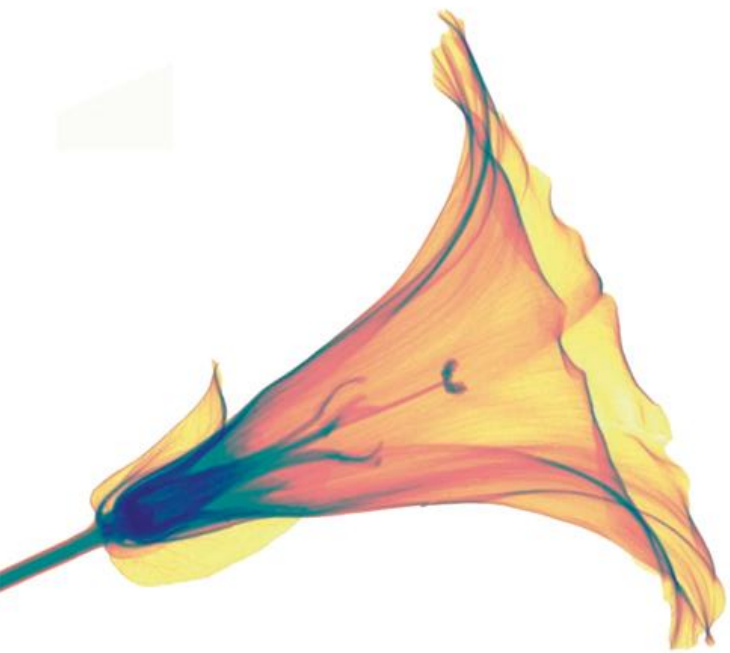
Bundesdruckerei (Berlin) works with CERN on next generation ideas for identity management and cryptography and data handling

ZENSEACT (Volvo Cars Company) teams up with CERN on fast machine learning using FPGAs.



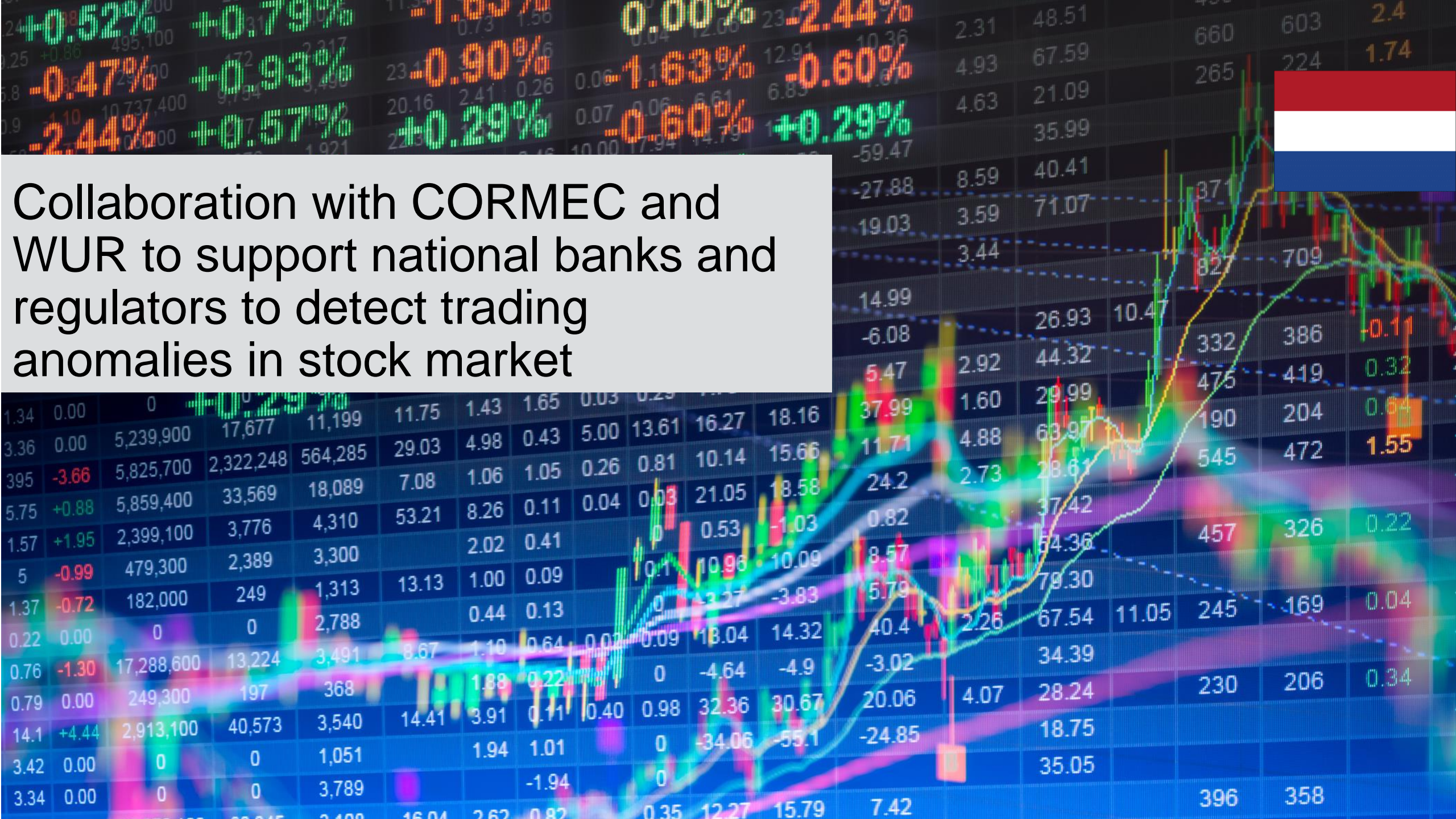


Next generation X ray finally in color (MARS Bio Imaging).



TPX3Cam fast optical photon camera (ASI)

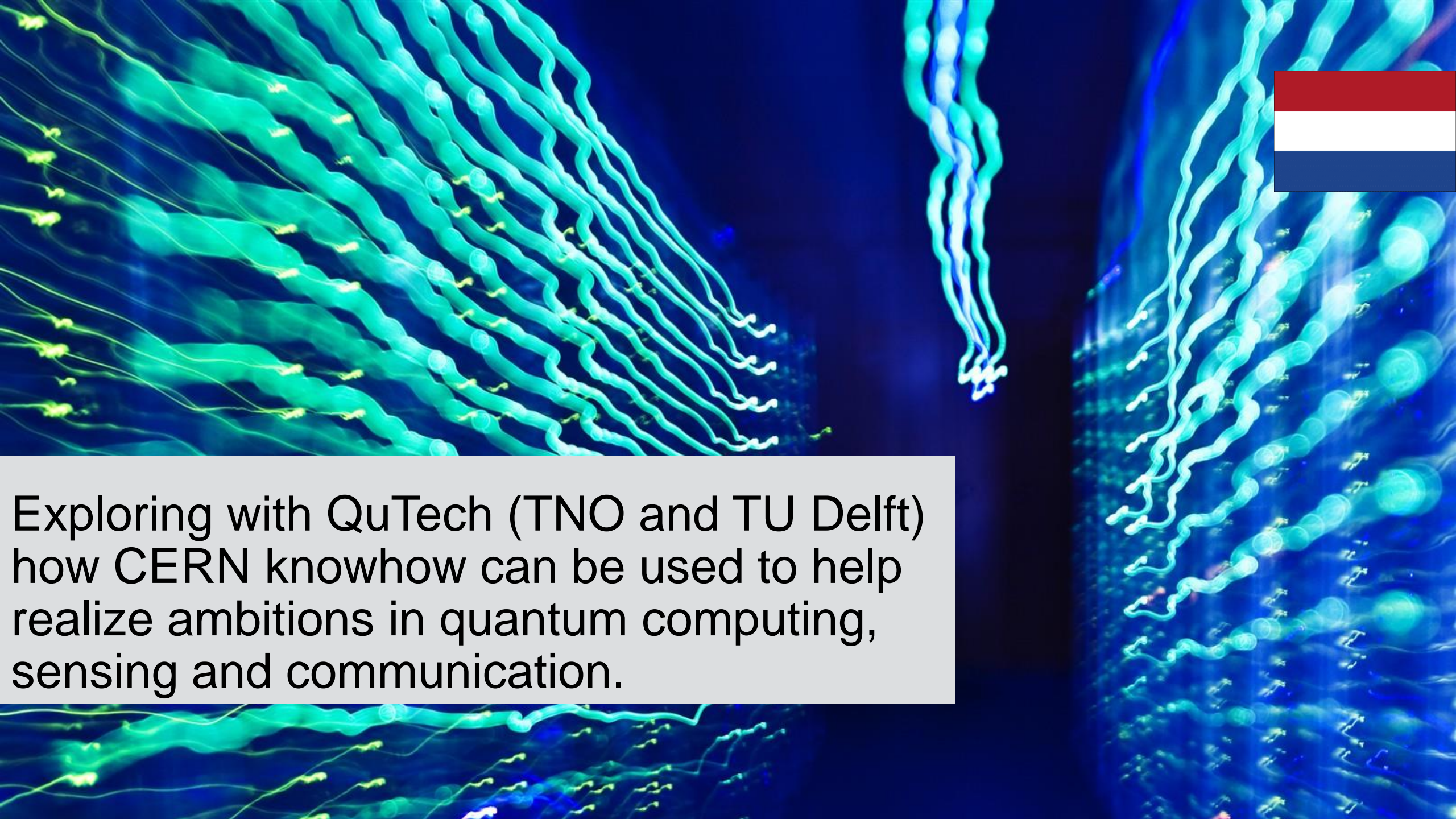




Collaboration with CORMEC and WUR to support national banks and regulators to detect trading anomalies in stock market



Project with CBS to help understand socio-economic challenges using agent based modelling techniques



Exploring with QuTech (TNO and TU Delft) how CERN knowhow can be used to help realize ambitions in quantum computing, sensing and communication.

CERN SUMMERSCHOOL

UNLEASH THE POTENTIAL OF NEW TECHNOLOGIES AT IDEASQUARE CERN

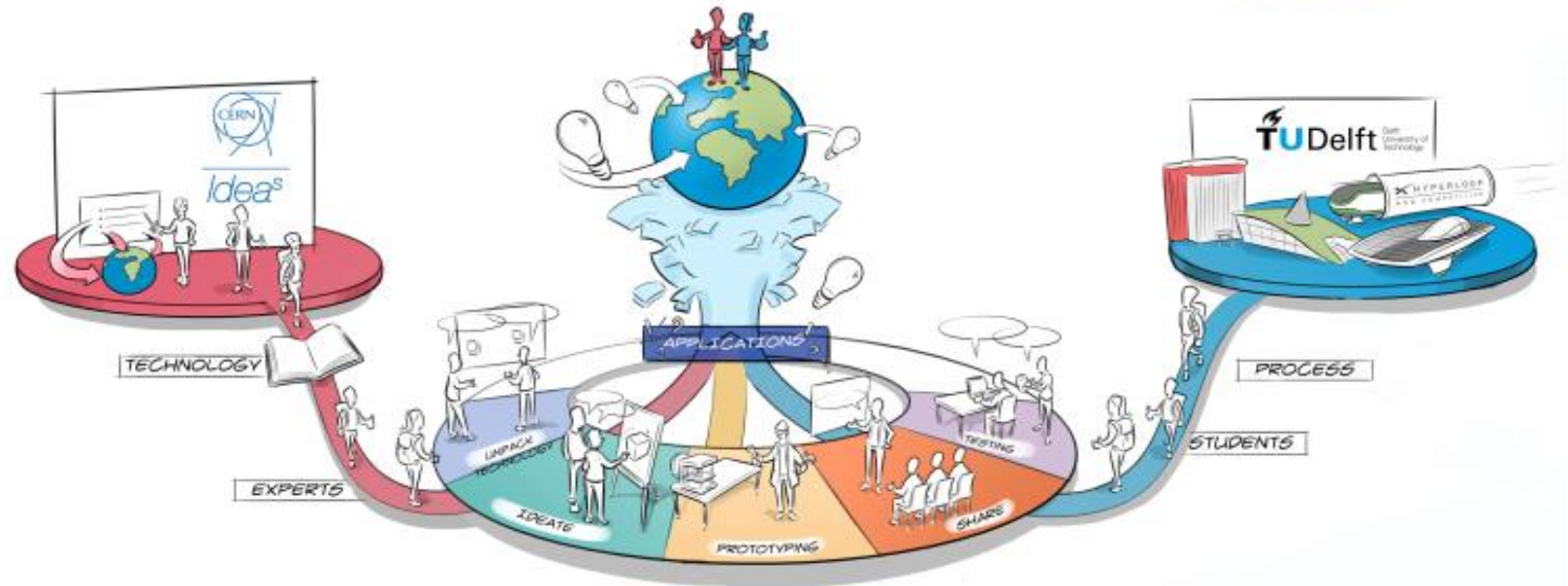
PRE
REGIST
before
March 21st

5 ECTS

- 25 students
- 5 Multidisciplinary teams
- 5 Attract Technologies
- open to students from UVA, EUR & TUDELFT

Estimation student contribution

tbd minimum €150



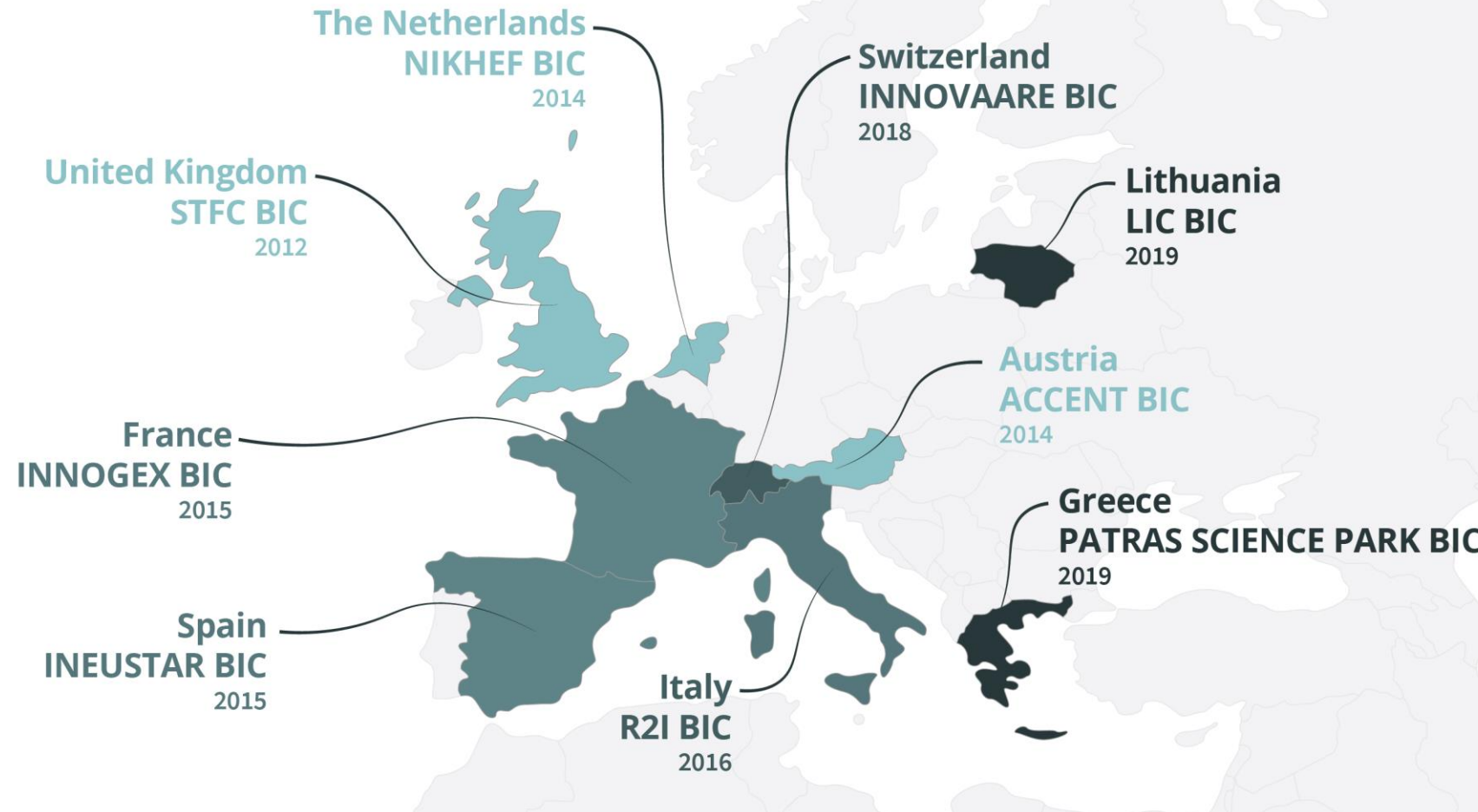
**A multi-disciplinary interactive summer (e-) course*
of TU DELFT in collaboration with CERN Ideasquare
and Nikhef**

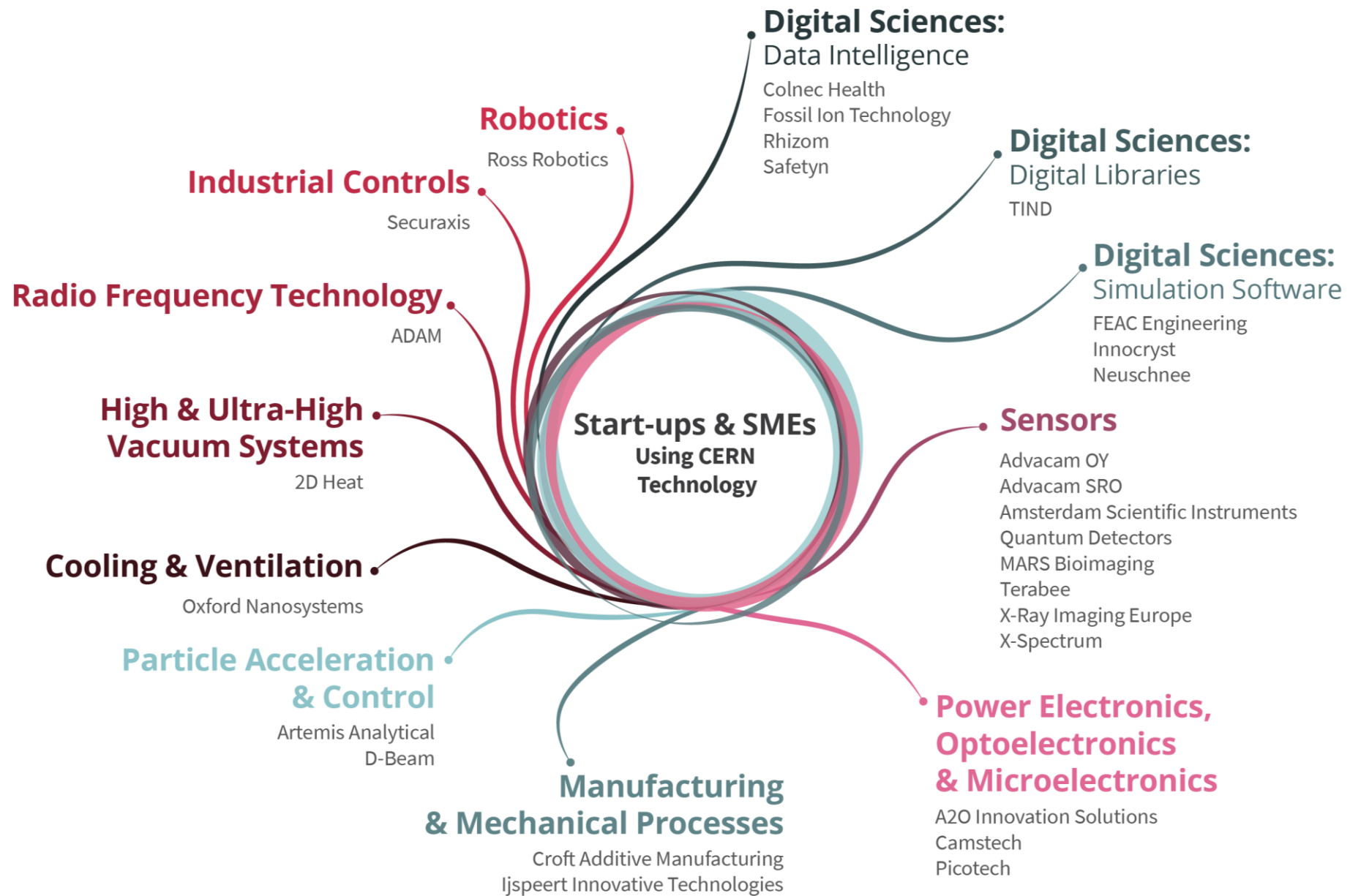
Kick-off

(27th of March)



Business Incubation Centers (BICs) help accelerate innovation in the CERN Member States.





29 + 30 AUG 2019*

STARTUP VILLAGE AMSTERDAM

ACE x CERN

BUILD YOUR STARTUP IDEA

CREATE INNOVATIVE SOLUTIONS USING
CERN SOFTWARE TECHNOLOGIES

(focused on: AI/Machine Learning/Big Data)

Sign up + more info: www.f6s.com/acexcern

*(2 FULL DAYS)



This program is open to participants with any type of background (from Informatics to humanities and social sciences).



EXPLORE CERN 2021

Interested in CERN technologies & entrepreneurship? Willing to compete for a slot at the CERN screening week? Join the 2-day Explore CERN program where we delve into the world of CERN by running mini design sprint sessions to create business cases around CERN technologies. The program is open to individuals and teams (up to 4 members) from all backgrounds (ranging from the arts to deep tech) based in the Netherlands and interested in solving their own challenge using CERN technologies or using their creativity to develop new applications based on existing CERN technologies. This program is initiated by CERN, Nikhef, Innovation Exchange Amsterdam (IXA) and executed by ACE Incubator (ACE).

CERN Hackathon





////// AIRCISION

FSO 5G co-creation project discussions running with Nokia, Ericsson and Huawei

inPhocal

InPhocal offers lasers solutions targeting waste free, high speed accurate printing.

Lessons learned

- Serendipity pays off
- You need passionate experts on both sides to make it work
- Start with a concrete project and business need
- Mind the gap – in language, culture, goals
- Knowledge transfer is hard work
- Be aware... magic may happen!



THANK YOU!

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