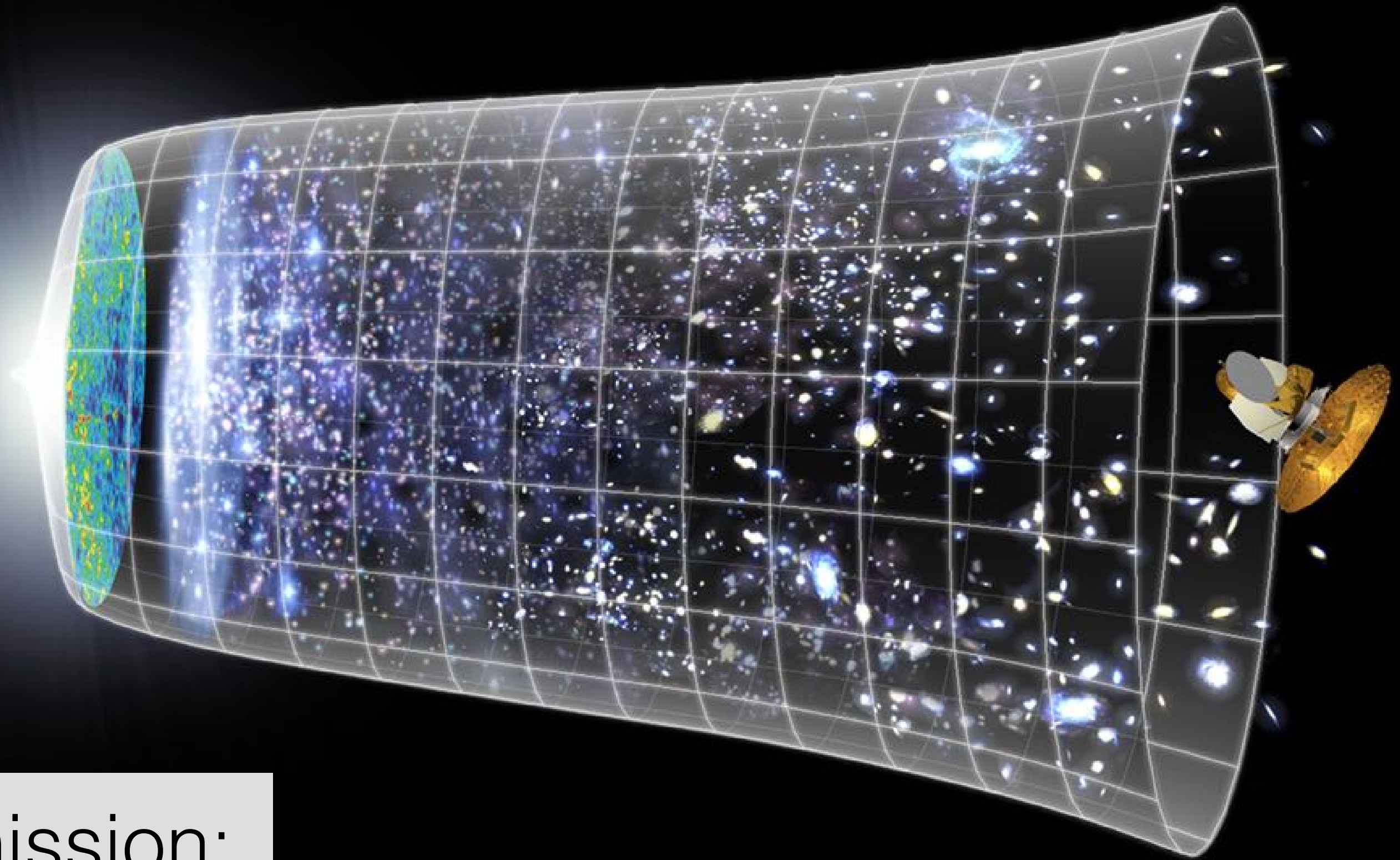


# From CERN knowledge to society

**Manuela Cirilli**

Medical Applications Section Leader  
Knowledge Transfer Group





CERN's mission:  
Basic research

# WHERE THE WEB WAS BORN

In the office of the project director  
Wide Web was created

Started in 1989 but a project was launched in 1990  
was first funded when a 100 million Swiss franc  
Research Swiss 100 million Swiss franc  
Company for High Energy

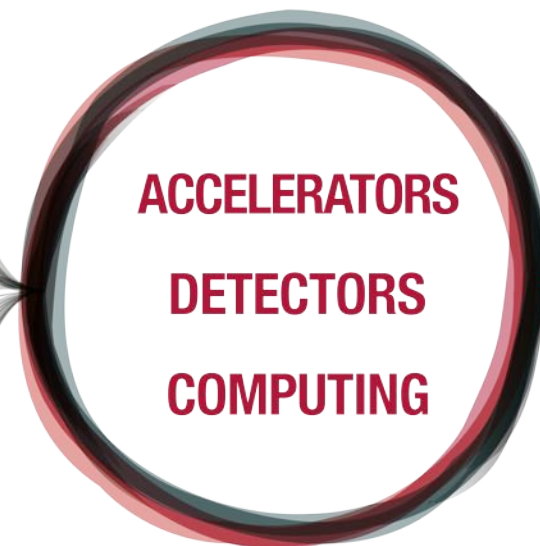
In 1991 the first computer network was  
I was connected to the Swiss  
from CERN to the University  
of Geneva

In the year of 1991 the first computer network  
CERN and the University  
of Geneva were connected  
to the Swiss network  
and the first computer network  
was created

In 1993 the first computer network  
was created in the office of the project director  
Wide Web was created

# From CERN Technologies ...

- Particle Acceleration & Control
- Cooling & Ventilation
- Cryogenics
- Digital Sciences
- High & Ultra-High Vacuum Systems
- Industrial Controls
- Magnet Technology
- Manufacturing & Mechanical Processes
- Material Science
- Metrology
- Particle Tracking & Calorimetry
- Power Electronics, Optoelectronics & Microelectronics
- Radiation Protection & Monitoring
- Radio Frequency Technology
- Robotics
- Sensors
- Superconductivity
- Testing Facilities



-  **MEDICAL & BIOMEDICAL TECHNOLOGIES**
-  **AEROSPACE APPLICATIONS**
-  **SAFETY**
-  **INDUSTRY 4.0**
-  **CULTURAL HERITAGE**
-  **EMERGING TECHNOLOGIES**

... to Society

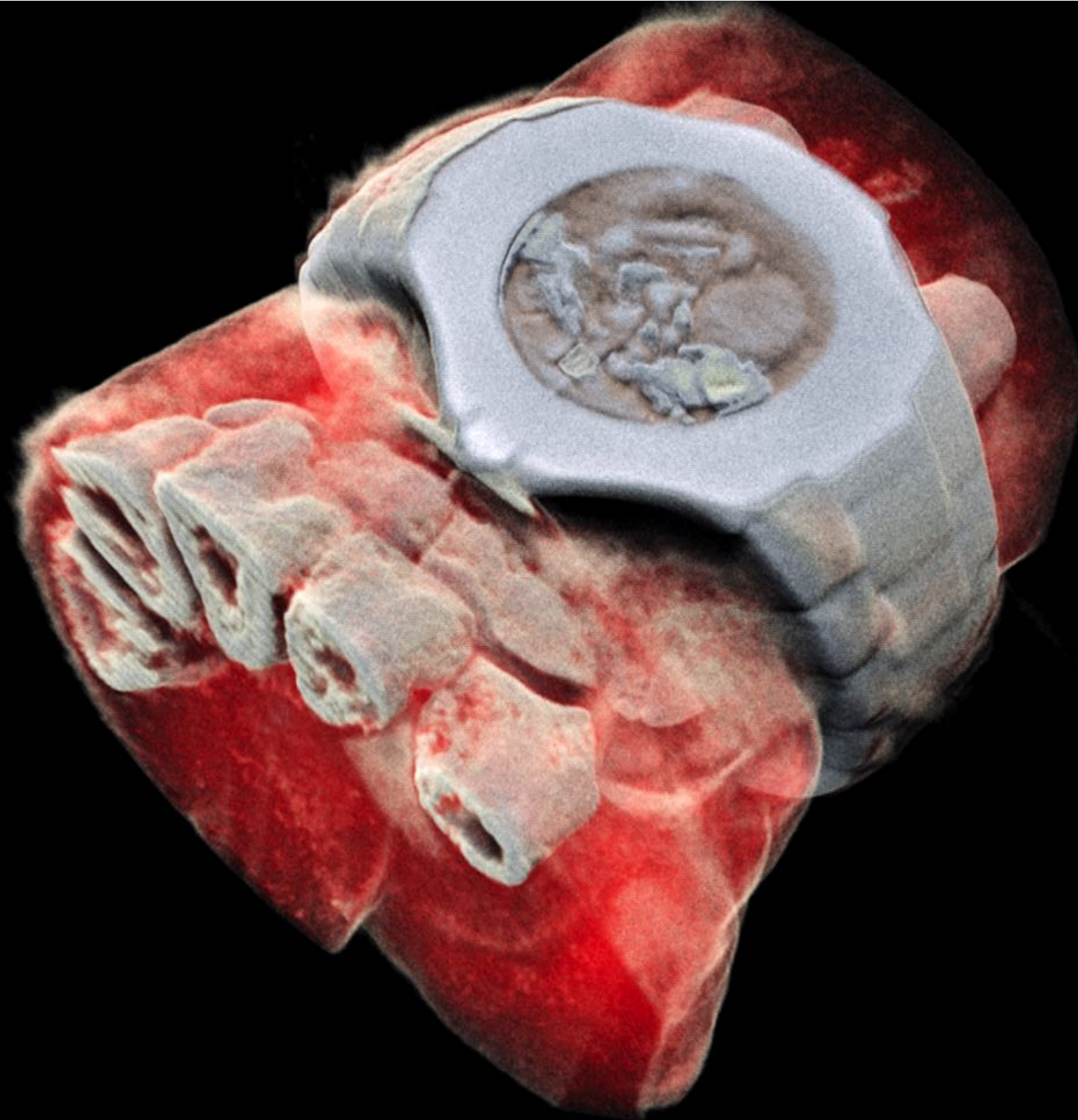
# This is what we call knowledge transfer

CERN's unique:  
Technologies  
Know-how  
Infrastructures



# First 3D colour X-ray images of a human – using Medipix3 technology

July 2018





Jun 2019 | Jun 2021

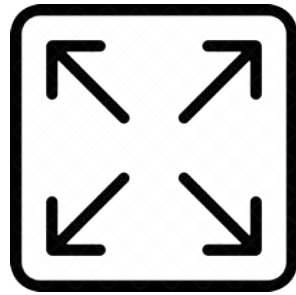
**Automotive**  
Fast machine learning for autonomous driving

**Collaboration R&D**  
ZENUITY (company owned by Volvo Group and Veoneer) is innovating in driver-assistance and autonomous-driving technologies. For this purpose, fast machine learning using FPGAs is relevant to the automotive worlds. Collaboration HSL4ML with CERN.

Zenuity (Volvo Cars / Veoneer) teams up with CERN on fast machine learning using FPGAs .



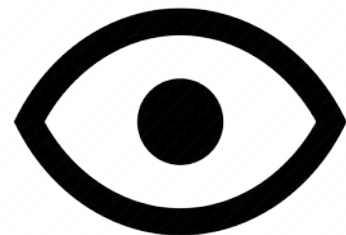
# KT Mission



**Maximise** the technological and knowledge return to society in particular through Member States industry



**Promote** CERN as a centre of excellence for technology and innovation



**Demonstrate** the importance and impact of fundamental research investments

**Key concepts: Dissemination and Impact**



# Knowledge Transfer Channels

Dedicated actions to **foster the transfer of technologies and know-how** to other fields than particle physics  
(very often with the involvement of industry)

Technology-intensive **procurement contracts**

## **People**

(very hard to quantify but extremely impactful for particle physics)



## About us

We aim to maximise the positive global impact of CERN on society



# CERN's Knowledge Transfer Group

“  
*Places like CERN contribute to the kind of knowledge that not only enriches humanity, but also provides the wellspring of ideas that become the technologies of the future.*

”

Fabiola Gianotti, Director-General of CERN

### Our mission

The Knowledge Transfer group at CERN aims to engage with experts in science, technology and industry in order to create opportunities for the transfer of CERN's technology and know-how. The ultimate goal is to accelerate innovation and maximise the global positive impact of CERN on society. This is done by promoting and transferring the technological and human capital developed at CERN. The CERN KT group promotes CERN as a centre of technological excellence, and promotes the positive impact of fundamental research organisations on society.

### GET IN TOUCH

Contact the CERN Knowledge Transfer team.

[Contact now](#)

### ABOUT US

[Our Mission](#)

[Our Team](#)

[Group's Organisational Chart](#)

[Annual Report](#)

[Recent Press Coverage of CERN Knowledge Transfer Activities](#)

[Newsletter](#)

[KT Partners @ CERN](#)

<http://kt.cern>

## 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

## Open Source

Open Source Software  
Open Hardware Licence

## Entrepreneurship

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

## Support for CERN Personnel

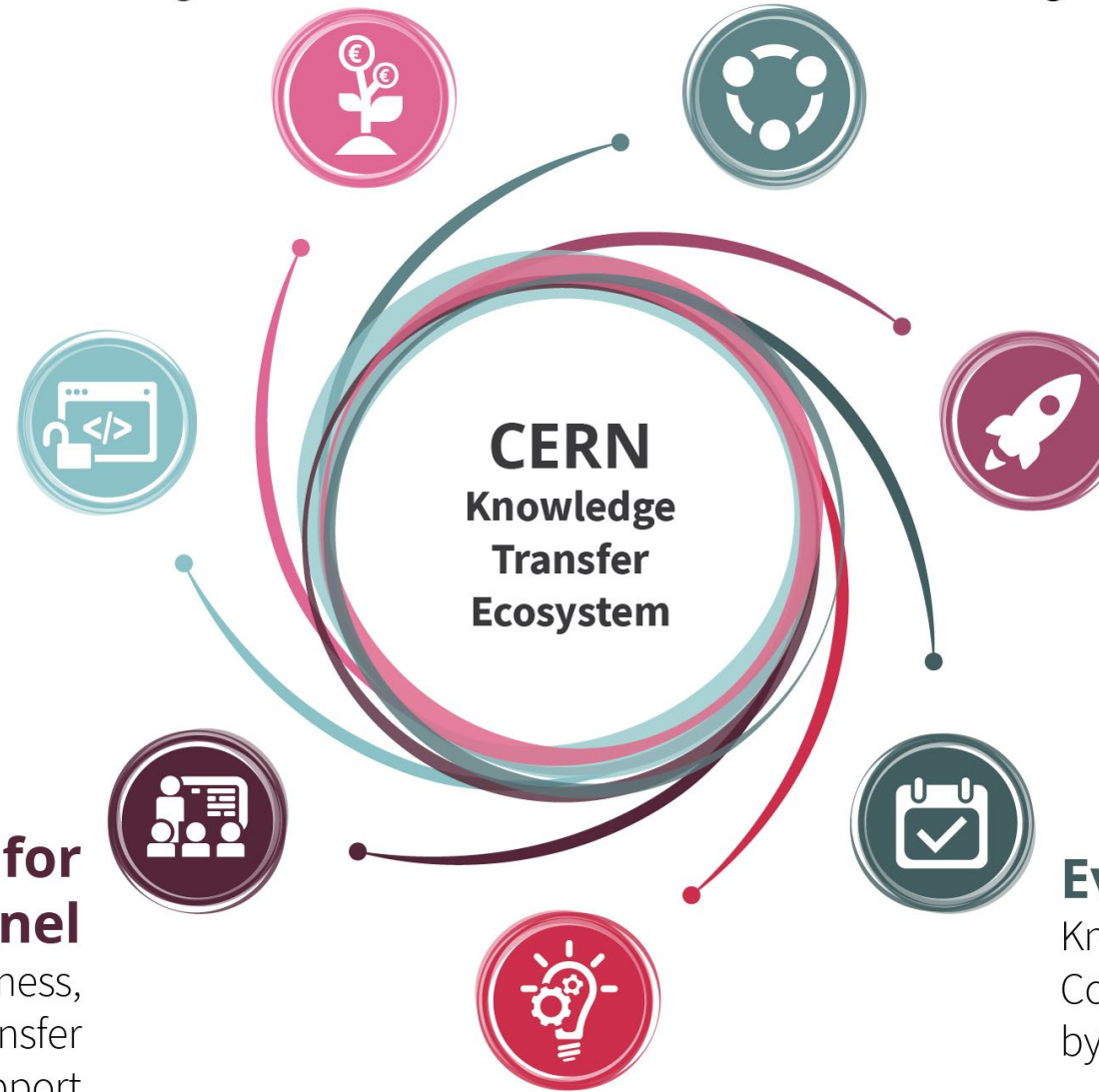
Formal and practical training in business, entrepreneurship & knowledge transfer  
Legal, business & intellectual property support

## 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



# CERN openlab takes part in CERN's knowledge-transfer ecosystem



CERN explores a variety of avenues to engage with experts in science, technology and industry

In close collaboration with CERN's dedicated Knowledge Transfer group, CERN openlab explores how research and industry can collaborate in the innovation process.

The CERN Medical Applications budget is supporting (among other projects):

BioDynaMo

LivingLab

SmartLinac

All presented today

Lukas Breitwieser  
Jean De Montigny



Want to know more?

Visit <http://kt.cern>

Sign-up to our newsletter  
<http://kt.cern/newsletter>

Contact us at [kt@cern.ch](mailto:kt@cern.ch)

[Manuela.Cirilli@cern.ch](mailto:Manuela.Cirilli@cern.ch)