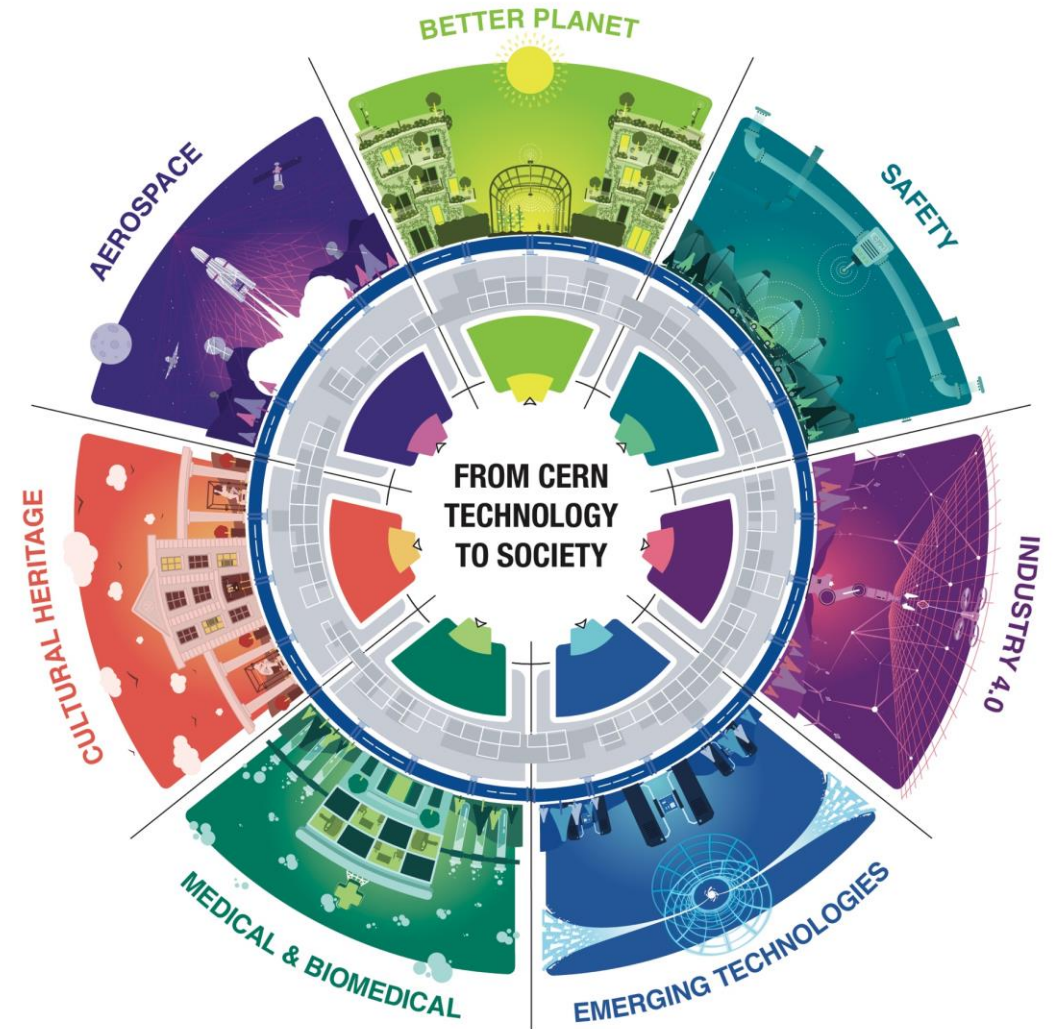


# Knowledge transfer highlights from 2021

**Priyanka Dasgupta**

Knowledge Transfer group, IPT Department

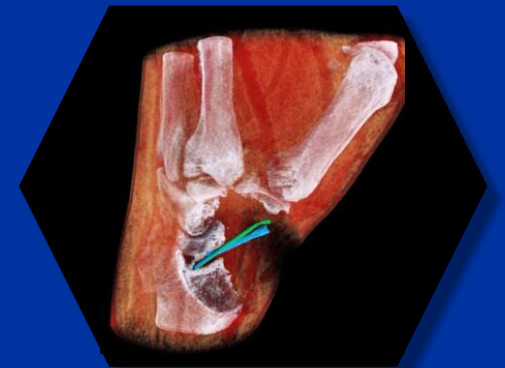
06.05.2022



# MARS Bioimaging



3D colour X-ray scanner using CERN Medipix technology arrived at the Lausanne University Hospital (CHUV) to start clinical trials.





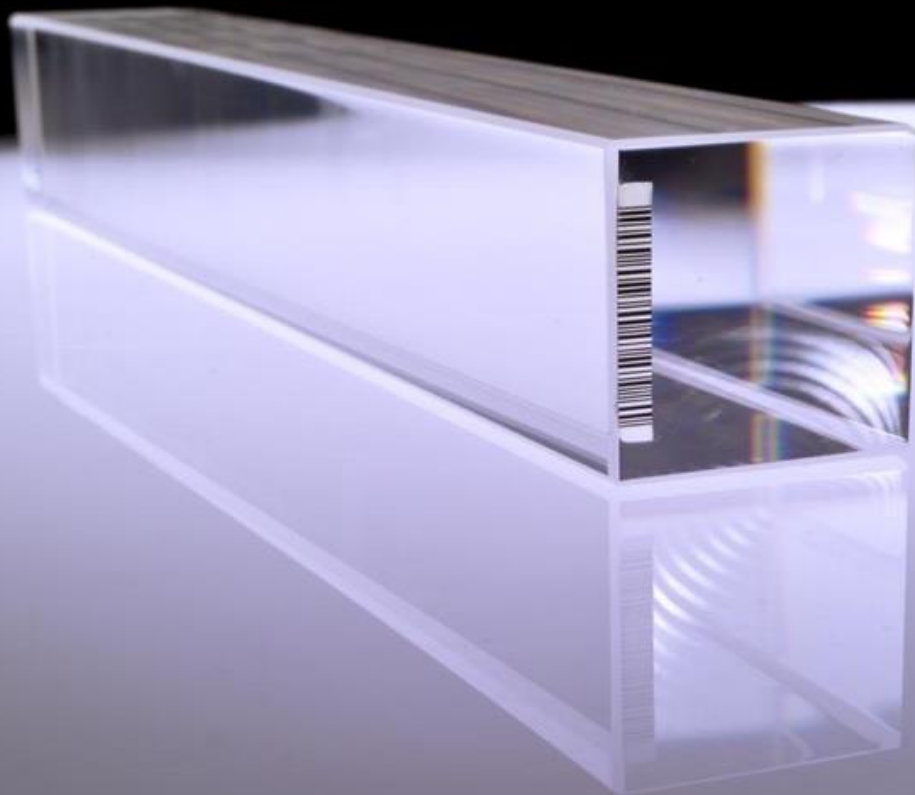
# Crystal Clear Collaboration

Celebrating 30 years

Development with the University Hospital of Bern for biological imaging and PET for organ-on-a-chip.

Project with TERAPET for non-invasive dose monitoring for proton therapy.

Development of fast heterostructure scintillators for PET.





GEMPix-based detectors for hadron therapy and microdosimetry being tested at CNAO.

CHUV has secured funding for the construction of a prototype FLASH VHEE radiotherapy facility based on CLIC technology.



CERN's COVID airborne risk assessment tool (CERA), made open source. Collaboration with WHO.

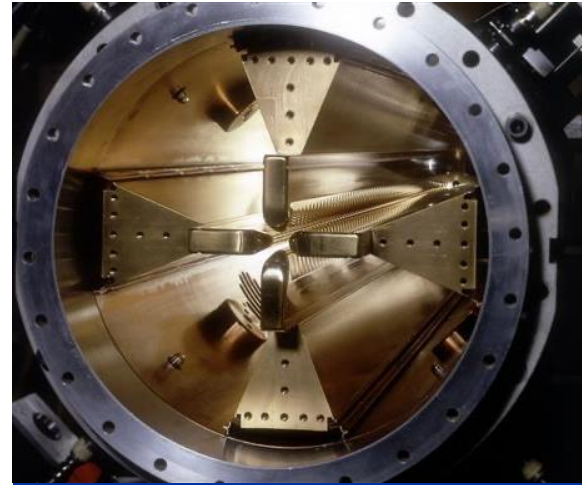
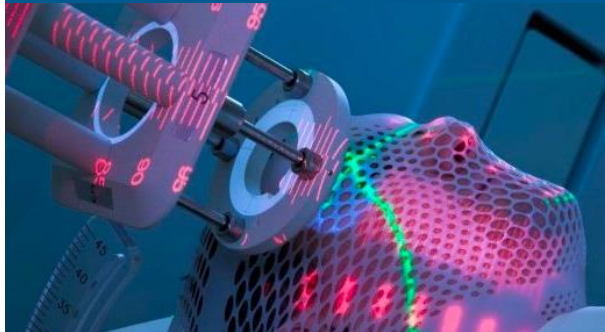
New prototype version of the High Energy Ventilator (HEV) for clinical use in low- and middle-income countries; developed by scientists in the UK and Brazil.





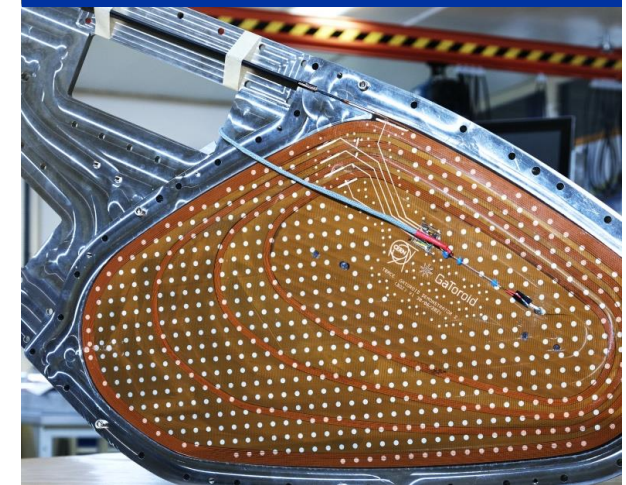
CERN and SEEIIST have produced a design report of an innovative facility based on a room-temperature synchrotron.

CERN's MEDICIS facility produced the first samples for targeted alpha therapy.



CERN and CIEMAT completed the first out of four modules of a RFQ for a future carbon-ion therapy linear accelerator.

CERN assembled the first high-temperature superconductor prototype coil for GaToroid.





# Technologies for a Better Planet



CERN Innovation Programme  
on Environmental Applications

CERN spinoff  
PlanetWatch grew its  
global network to 32k+  
connected sensors  
worldwide for air quality  
monitoring.



Partnership with  
Transmutex to help  
CERN build innovative  
and safer nuclear  
energy production  
systems.

The internal launch of  
the CERN Innovation  
Programme on  
Environmental  
Applications (CIPEA).



Partnership with ABB  
Motion to identify  
potential energy saving  
opportunities.





# Aerospace Applications

Partnership with ESA in the field of quantum technology and artificial intelligence models for earth observation (QUAI4EO).

The ESA-supported CHIMERA project to adapt the CHARM irradiation facility for heavy ion testing.





*“AS HUMANS VENTURE INTO SPACE, THE RADIATION LEVELS INCREASE, AND SO DOES THE NEED FOR RELIABLE DOSE MONITORING.”*

**Florence Clément**, project manager of the Lumina experiment, CNES/CADMOS

# Lumina

Astronaut Thomas Pesquet activated Lumina, a CERN tested optical fibre-based dosimetry experiment, on board the International Space Station.



# Financial Markets

CERN data analysis tool ROOT protects commodity and financial markets from fraud, in partnership with CORMEC and Wageningen University.

Partnership with Jumptrading to improve speed and scalability of CERN Virtual Machine File System for worldwide software distribution.

*"THE COLLABORATION WITH CERN HAS STIMULATED NOVEL RESEARCH METHODS AND INSIGHTS ON IDENTIFYING MANIPULATIONS IN FINANCIAL MARKETS, THAT WERE UNTHINKABLE BEFORE."*

**Joost M.E. Pennings,**  
Professor at the Wageningen University



# Zenseact collaboration

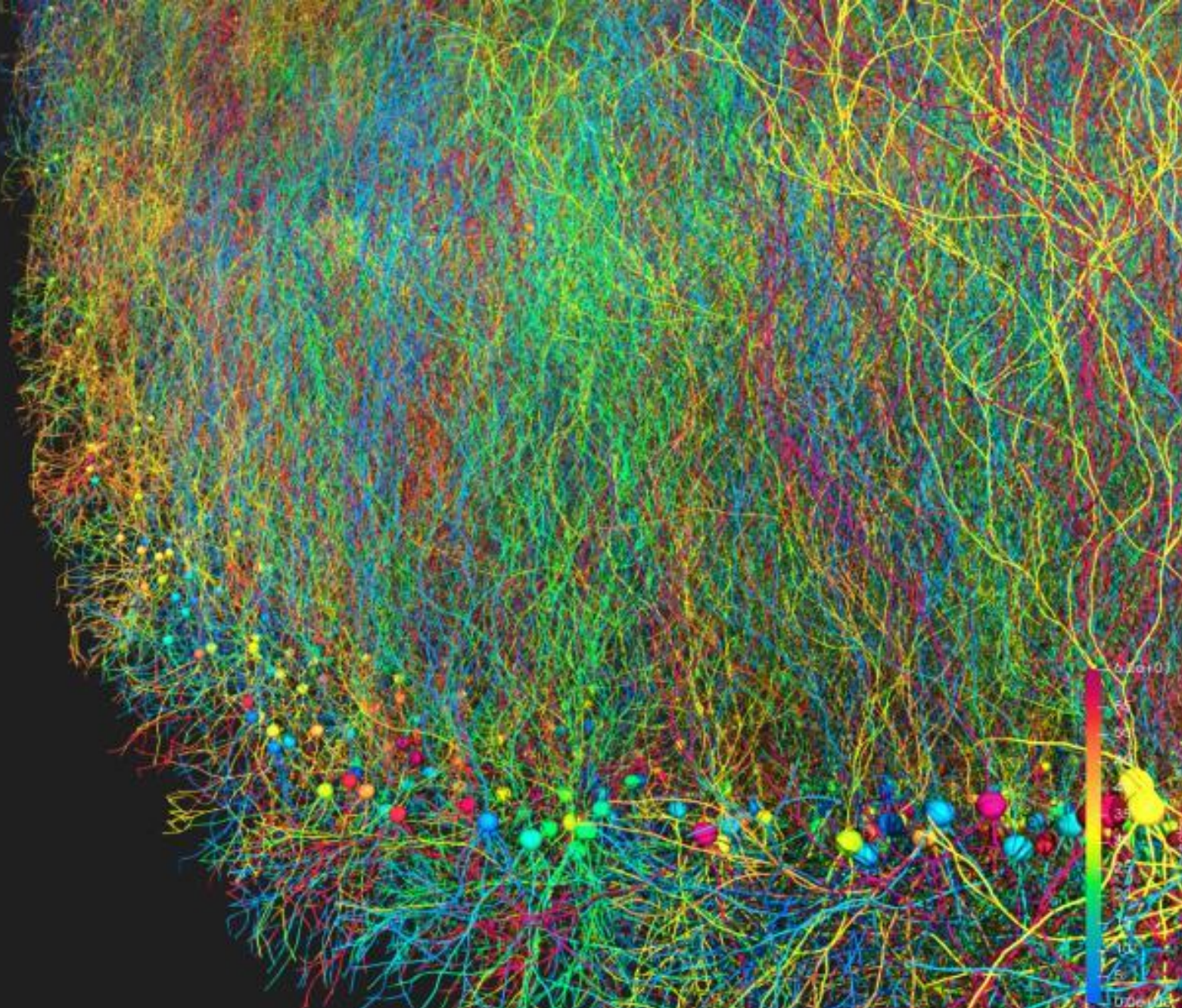
Zenseact has been exploring how machine learning algorithms used for the LHC can be applied to help avoid collisions in autonomous vehicles.



# BioDynaMo

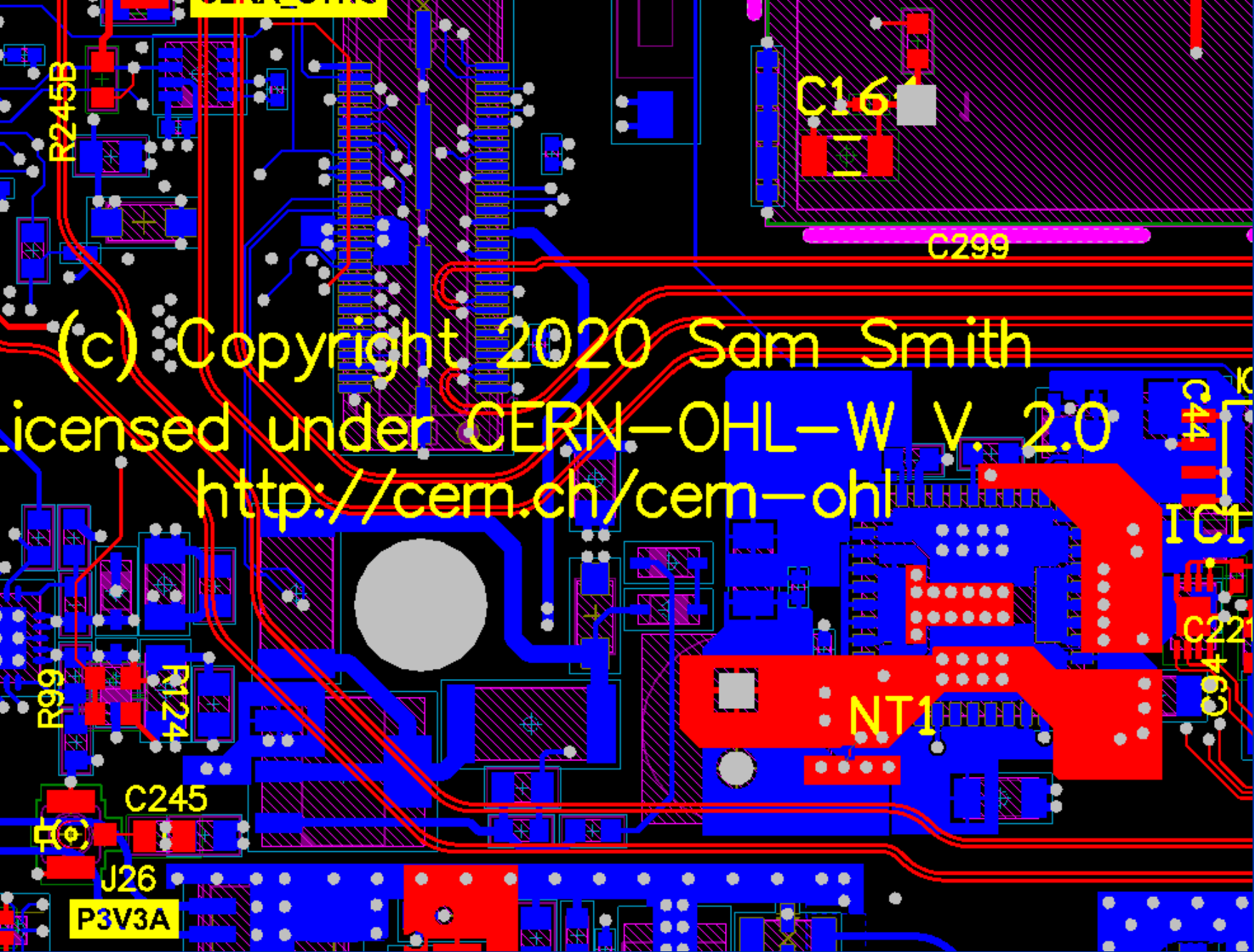
BioDynaMo, an open-source agent-based simulation software, has been used to model the behaviour and spread of the SARS-CoV-2 virus.

CERN partnered with Statistics Netherlands to use BioDynaMo to perform large-scale data modelling on socio-economic parameters.





# CERN OHL 2.0

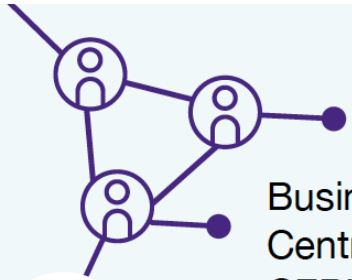


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<http://cern.ch/cern-ohl>

The CERN Open Hardware Licence 2.0 became Open Source Initiative (OSI) certified, making the selection and application of the licences easier.



# Entrepreneurship Activities



Meet-Ups

Business Incubation Centres (BICs) for CERN Technologies

INSEAD

New deep-tech program

**50+**

Participants

*CERN ENTREPRENEURSHIP*

*STUDENT PROGRAMME (CESP)*

*CERN-NTNU SCREENING WEEK*

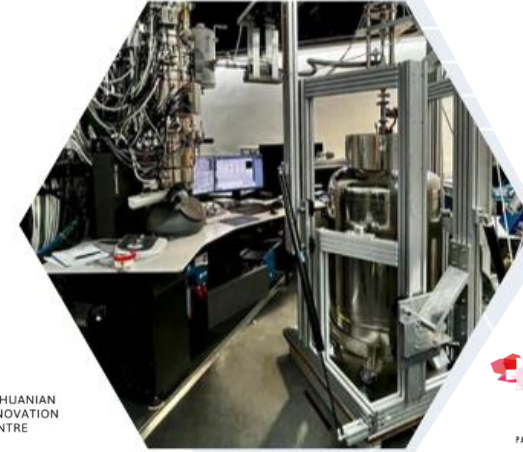
*CERN-BIC SCREENING WEEK*

## Startups accepted in 2021



LITHUANIAN INNOVATION CENTRE

**Delta Biosciences**



SWITZERLAND INNOVATION PARK INNOVARE

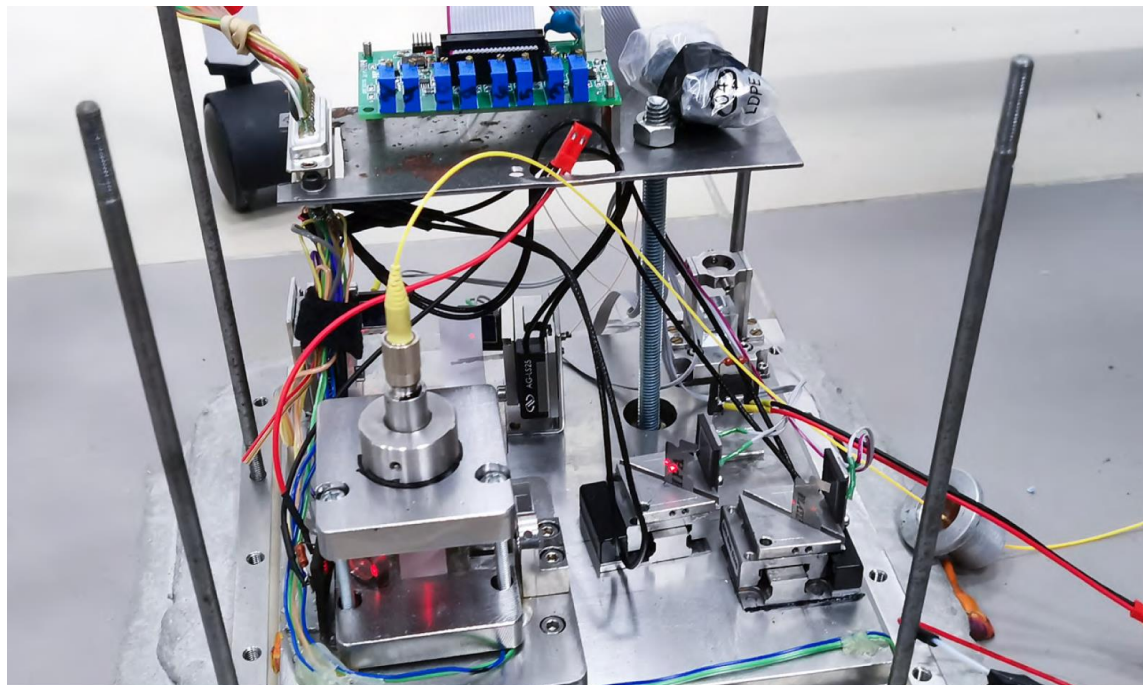
PAUL SCHERRER INSTITUT PSI

**condenZero**



**Lumiphase**

# SUSTAINABLE DEVELOPMENT GOALS

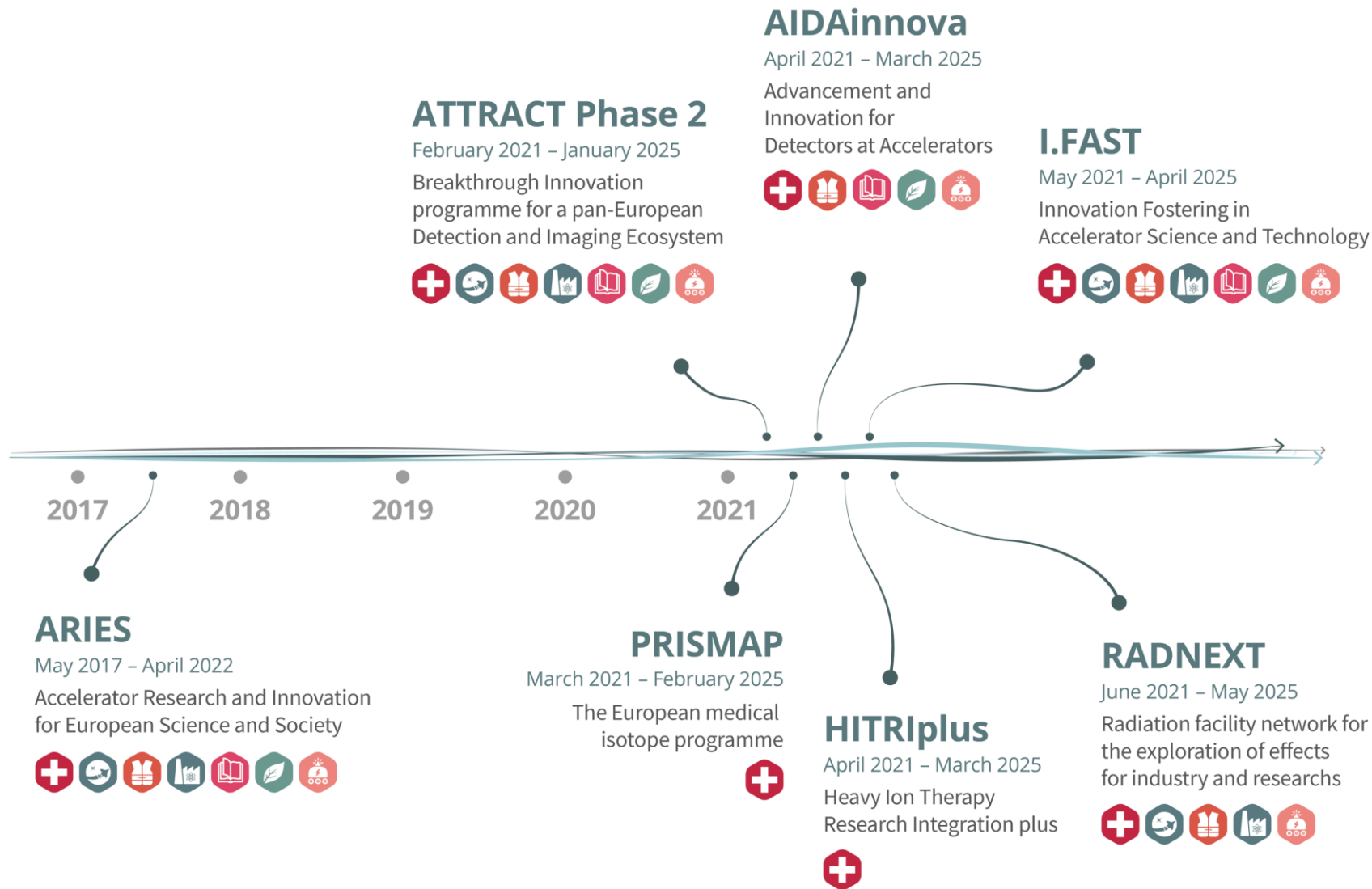


## CERN Technology Impact Fund

CERN Technology Impact Fund launched to contribute to the UN Sustainable Development Goals (SDGs).

The first selected project, the Compact Precision Laser Inclinator (CPLI), could save lives by providing earlier earthquake alerts.





In 2021, six projects started which are (partially) funded by the EC and have a strong KT component.



Knowledge Transfer  
*Accelerating Innovation*

<https://kt.cern/>