

# CERN: An Innovation Hub

**\_Ranveig Strøm**

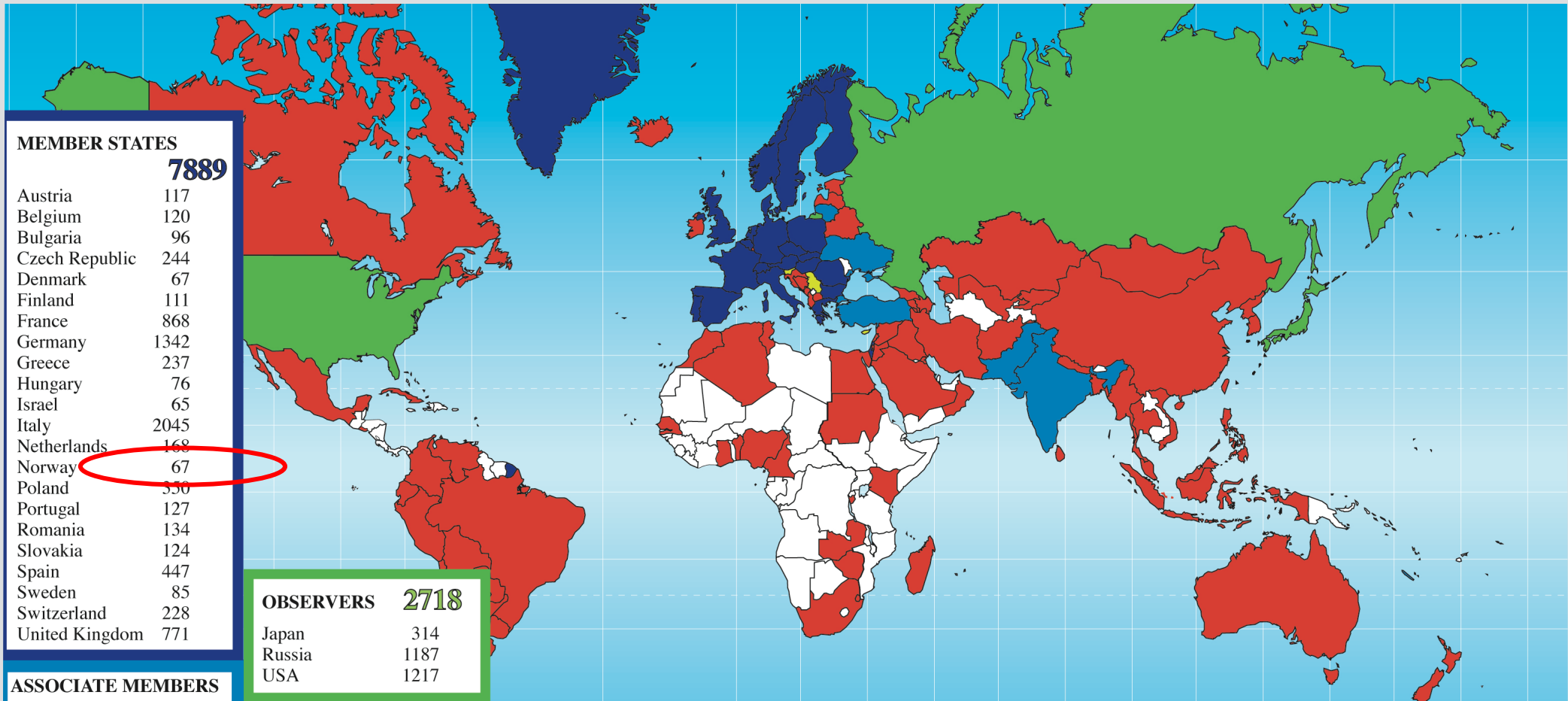
Entrepreneurship Development Officer  
CERN Knowledge Transfer

Founded in 1954  
"Science for Peace"  
Today: 22 Member states

2500 staff  
1800 other personnel  
13000 scientific users



# Distribution of all CERN Users by Nationality



**MEMBER STATES** **7889**

Austria	117
Belgium	120
Bulgaria	96
Czech Republic	244
Denmark	67
Finland	111
France	868
Germany	1342
Greece	237
Hungary	76
Israel	65
Italy	2045
Netherlands	168
Norway	67
Poland	330
Portugal	127
Romania	134
Slovakia	124
Spain	447
Sweden	85
Switzerland	228
United Kingdom	771

**OBSERVERS** **2718**

Japan	314
Russia	1187
USA	1217

**ASSOCIATE MEMBERS** **745**

India	357
Lithuania	35
Pakistan	65
Turkey	173
Ukraine	115

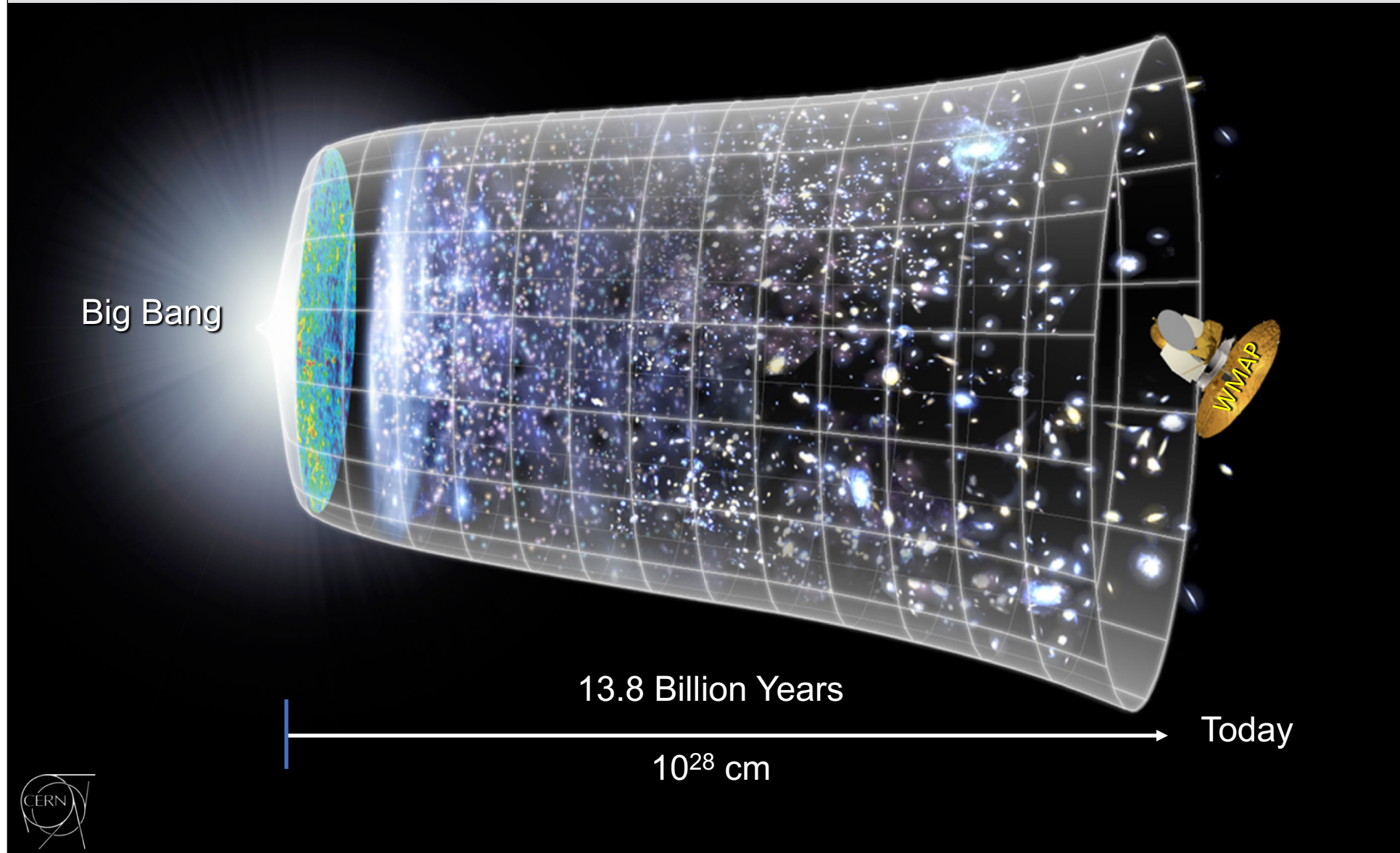
**ASSOCIATE MEMBERS IN THE PRE-STAGE TO MEMBERSHIP** **118**

Cyprus	26
Serbia	57
Slovenia	35

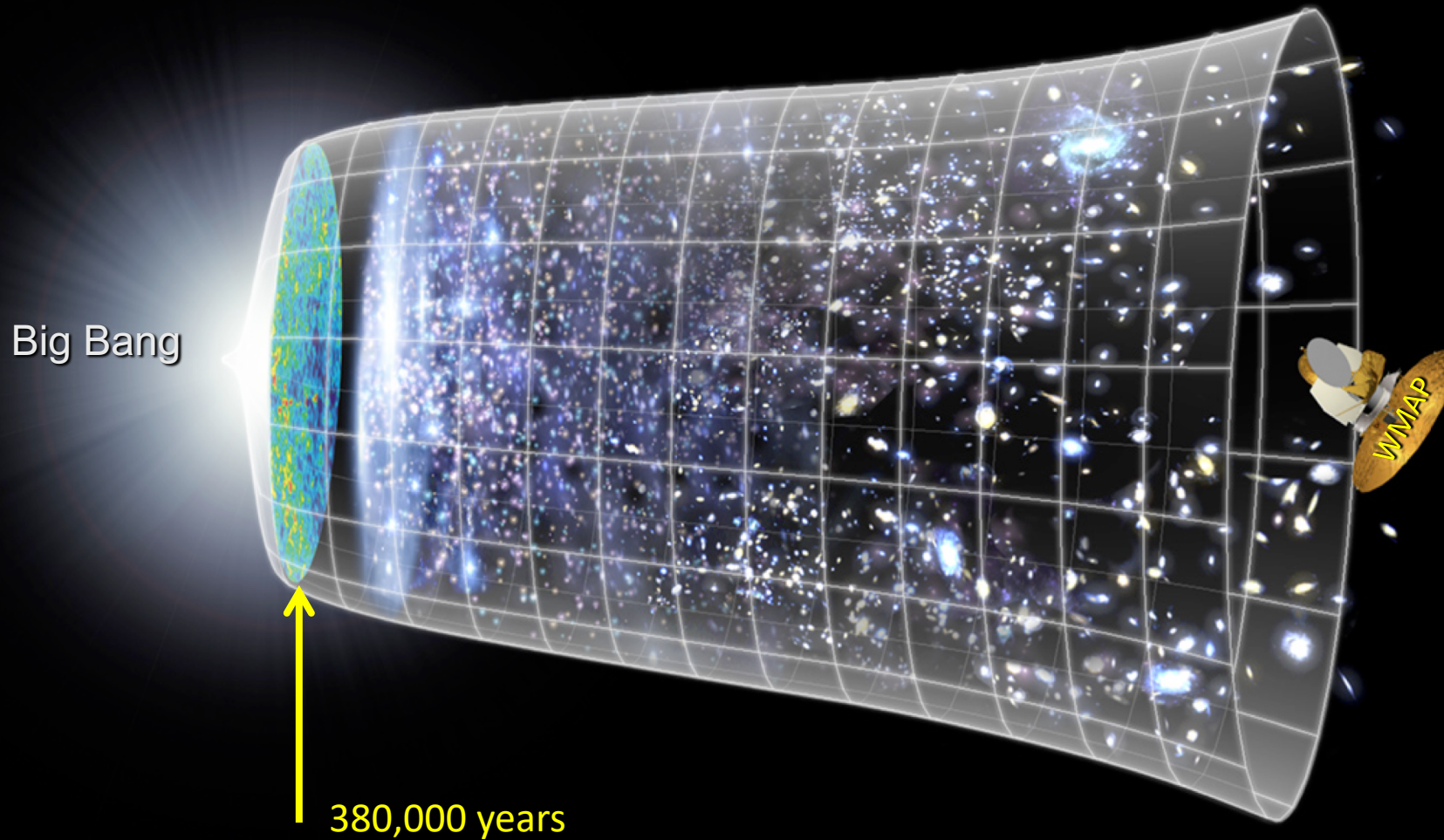
**OTHERS** **1872**

Afghanistan	1	Bolivia	4	Egypt	31	Kazakhstan	5	Mongolia	2	Philippines	3	Thailand	22
Albania	3	Bosnia & Herzegovina	2	El Salvador	1	Kenya	3	Montenegro	11	Saint Kitts and Nevis	1	T.F.Y.R.O.M.	2
Algeria	14	Brazil	135	Estonia	15	Korea Rep.	185	Morocco	20	Saudi Arabia	2	Tunisia	5
Argentina	27	Burundi	1	Georgia	46	Kyrgyzstan	1	Myanmar	1	Singapore	4	Uruguay	1
Armenia	19	Cameroon	1	Ghana	1	Latvia	2	Nepal	10	Senegal	1	Uzbekistan	4
Australia	31	Canada	161	Hong Kong	1	Lebanon	23	New Zealand	5	Singapore	4	Venezuela	10
Azerbaijan	10	Chile	20	Iceland	3	Luxembourg	2	Nigeria	3	South Africa	56	Viet Nam	13
Bangladesh	11	China	510	Indonesia	11	Madagascar	4	North Korea	1	Sri Lanka	6	Zambia	1
Belarus	48	Colombia	45	Iran	51	Malaysia	15	Oman	3	Sudan	1	Zimbabwe	2
Benin	1	Croatia	41	Iraq	1	Malta	9	Palestine (O.T.)	7	Swaziland	1		
		Cuba	12	Ireland	16	Mauritius	1	Paraguay	2	Syria	1		
		Ecuador	6	Jordan	1	Mexico	82	Peru	7	Taiwan	51		

# Understanding the very first moments of our Universe after the Big Bang



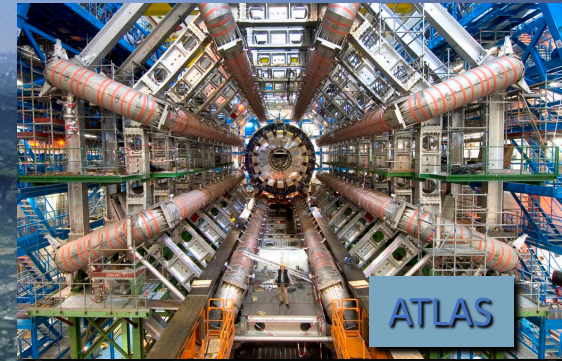
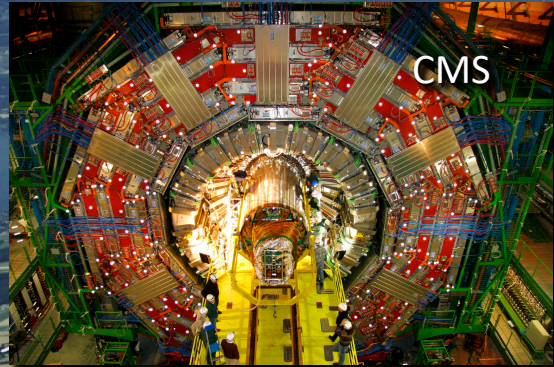
# Understanding the very first moments of our Universe after the Big Bang



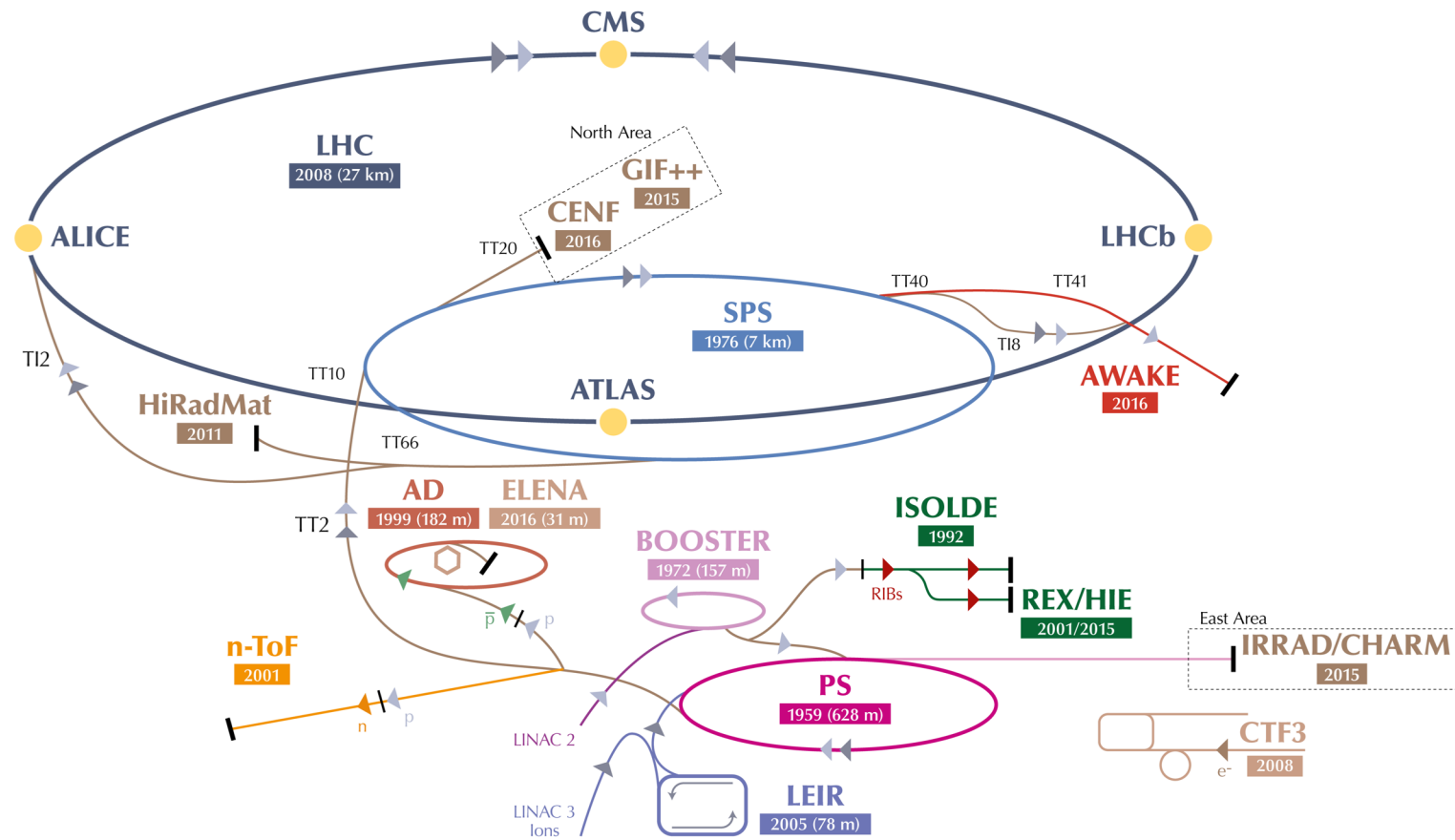


The Large Hadron Collider





The experiments



▶ p (protons)    ▶ ions    ▶ RIBs (Radioactive Ion Beams)    ▶ n (neutrons)    ▶  $\bar{p}$  (antiprotons)    ▶  $e^-$  (electrons)

LHC Large Hadron Collider    SPS Super Proton Synchrotron    PS Proton Synchrotron    AD Antiproton Decelerator    CTF3 Clic Test Facility

AWAKE Advanced WAKEfield Experiment    ISOLDE Isotope Separator OnLine    REX/HIE Radioactive EXperiment/High Intensity and Energy ISOLDE

LEIR Low Energy Ion Ring    LINAC LINear ACcelerator    n-ToF Neutrons Time Of Flight    HiRadMat High-Radiation to Materials

CHARM Cern High energy AccelRator Mixed field facility    IRRAD proton IRRADIation facility    GIF++ Gamma Irradiation Facility

CENF CErn Neutrino platform



## \_CERN's mission

Push back the frontiers of knowledge

Unite people from different countries  
and cultures

Train scientists and engineers of  
tomorrow

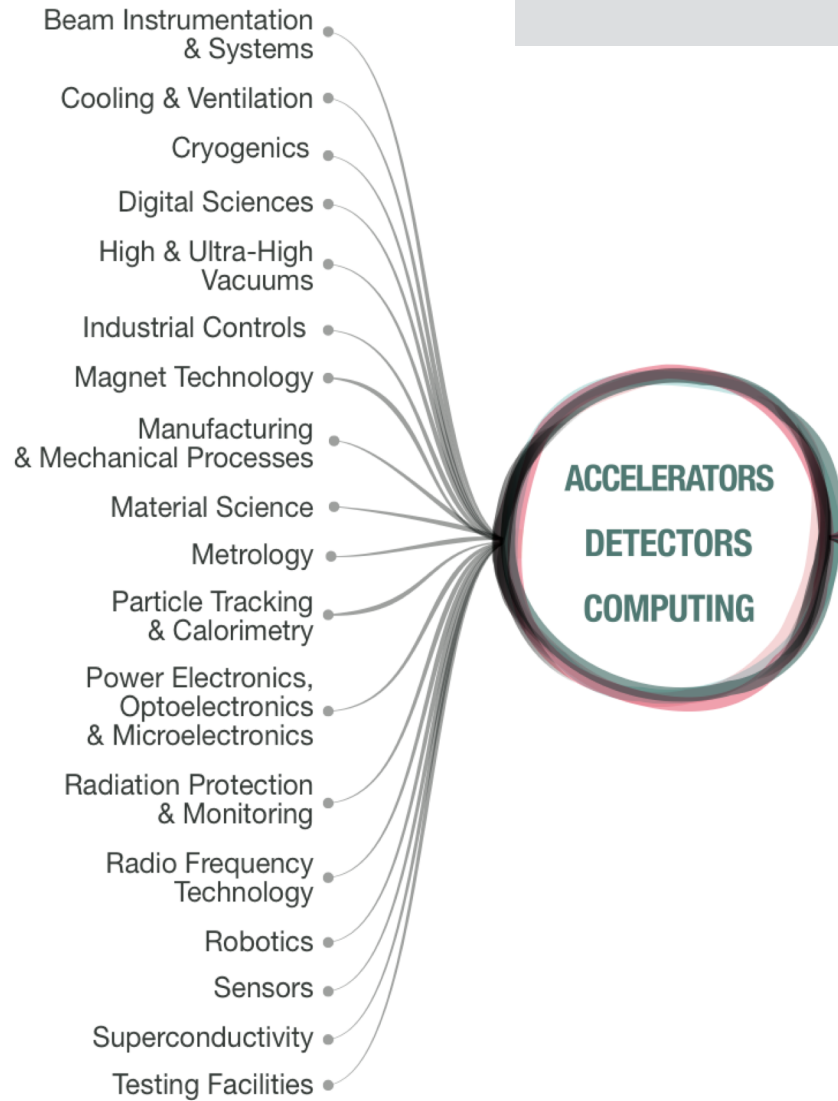
Develop new technologies for  
accelerators and detectors



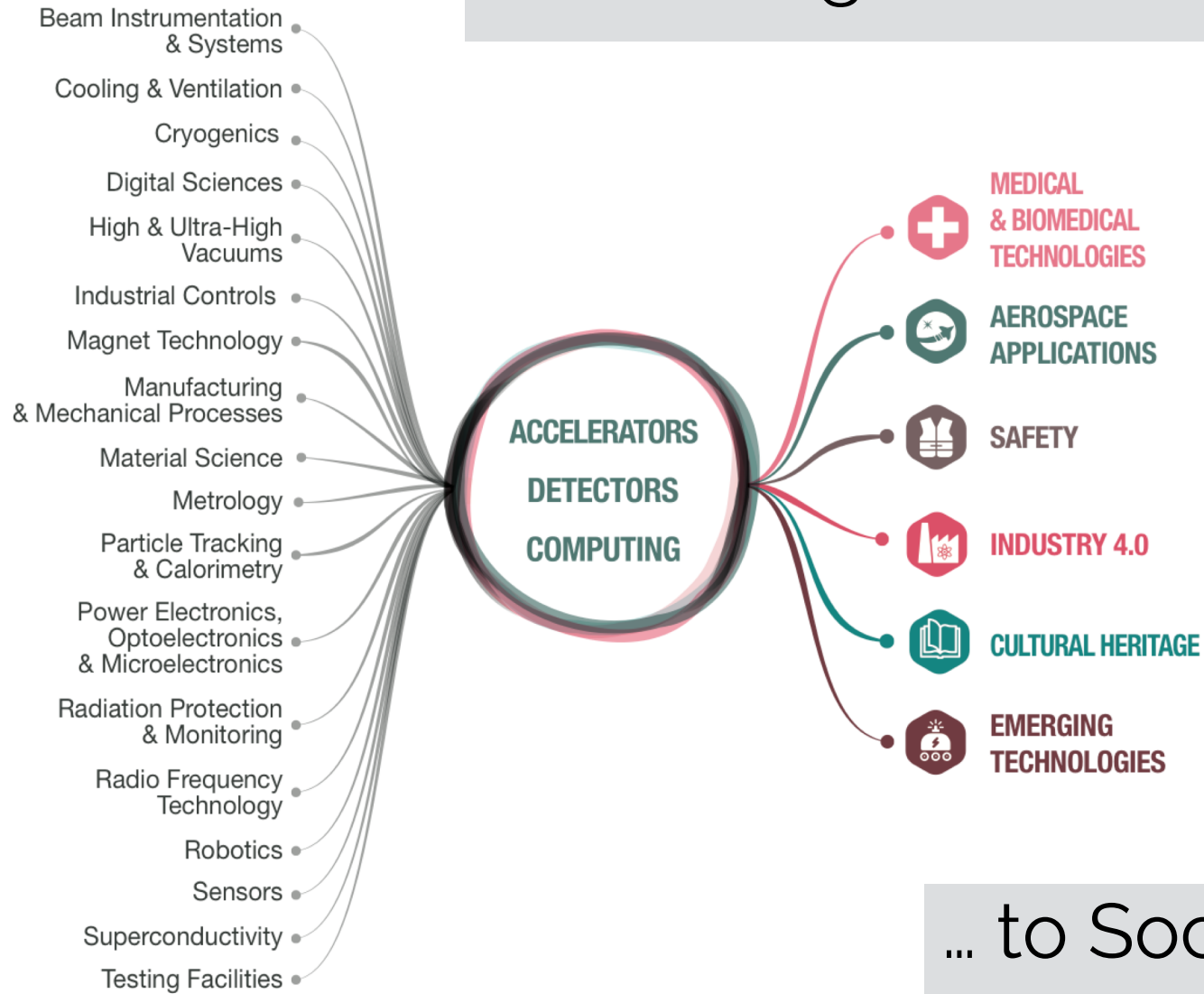
# From CERN Technologies ...



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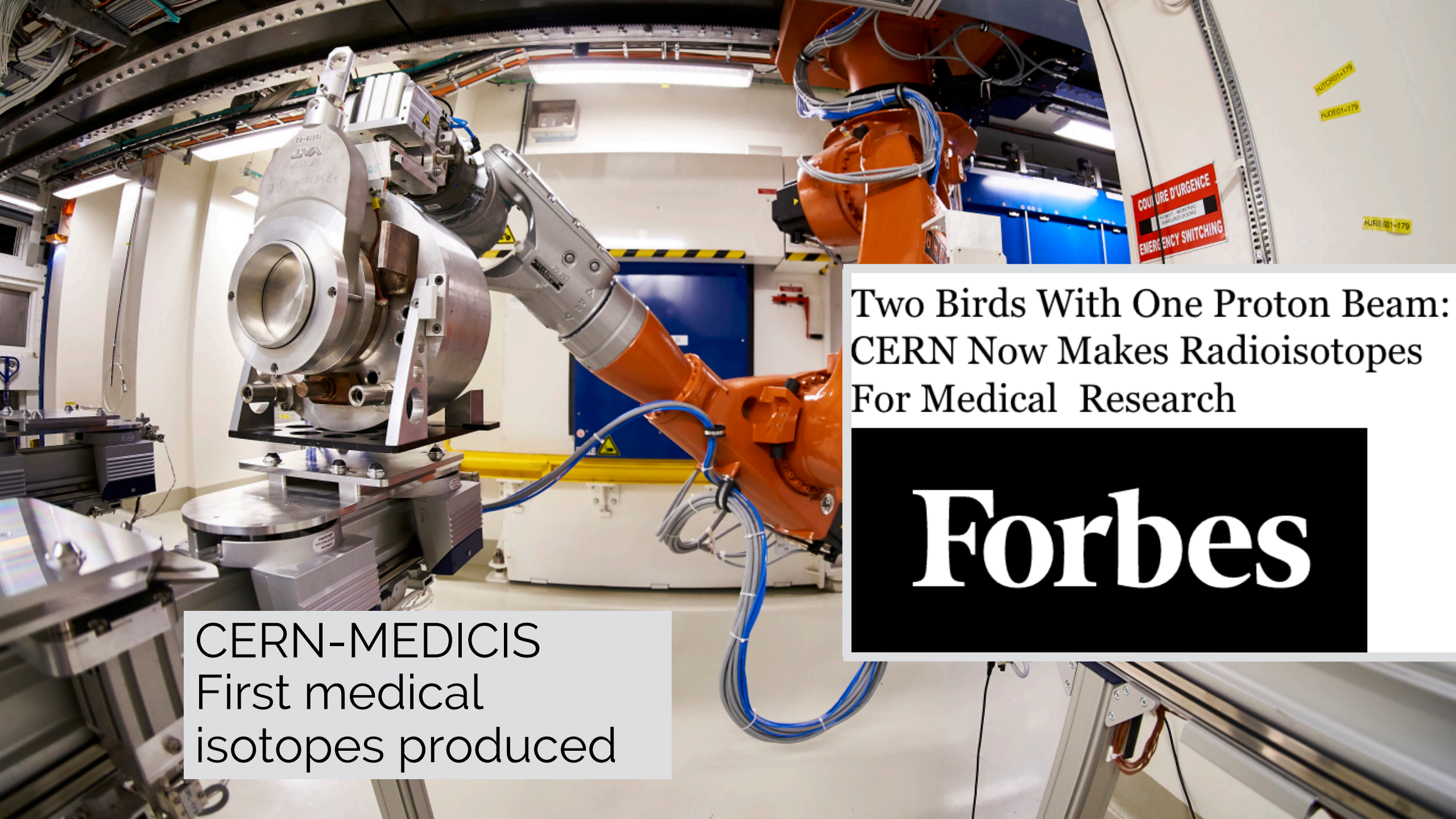
... to Society

# The World Wide Web - born at CERN



The first touchscreen to exist was at CERN



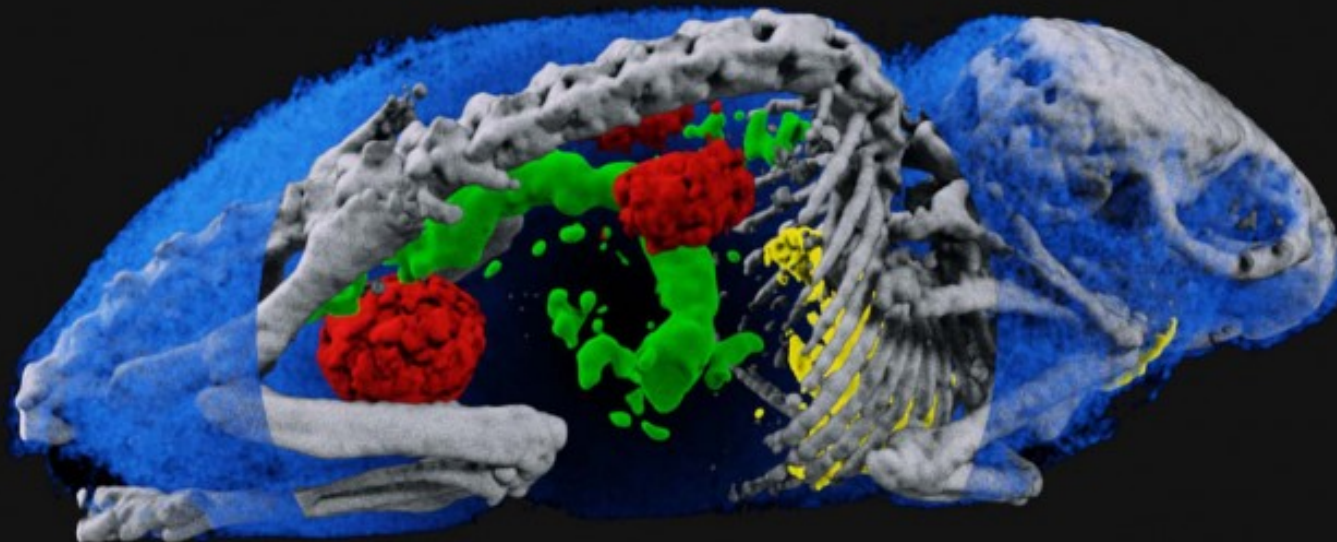


# Two Birds With One Proton Beam: CERN Now Makes Radioisotopes For Medical Research


**Forbes**

CERN-MEDICIS  
First medical  
isotopes produced

# Spectral imaging - Medipix chip





A man with dark, wavy hair and a mustache, wearing a white long-sleeved shirt and white gloves, is holding a framed painting. The painting depicts the Virgin Mary in a red and blue robe, holding the Christ Child. The scene is set in a laboratory or museum environment with a complex metal frame and a camera or sensor mounted on it. The man is looking towards the camera.

X-ray eyes for  
cultural heritage –  
Medipix chip

From the LHC to space - Timepix chip



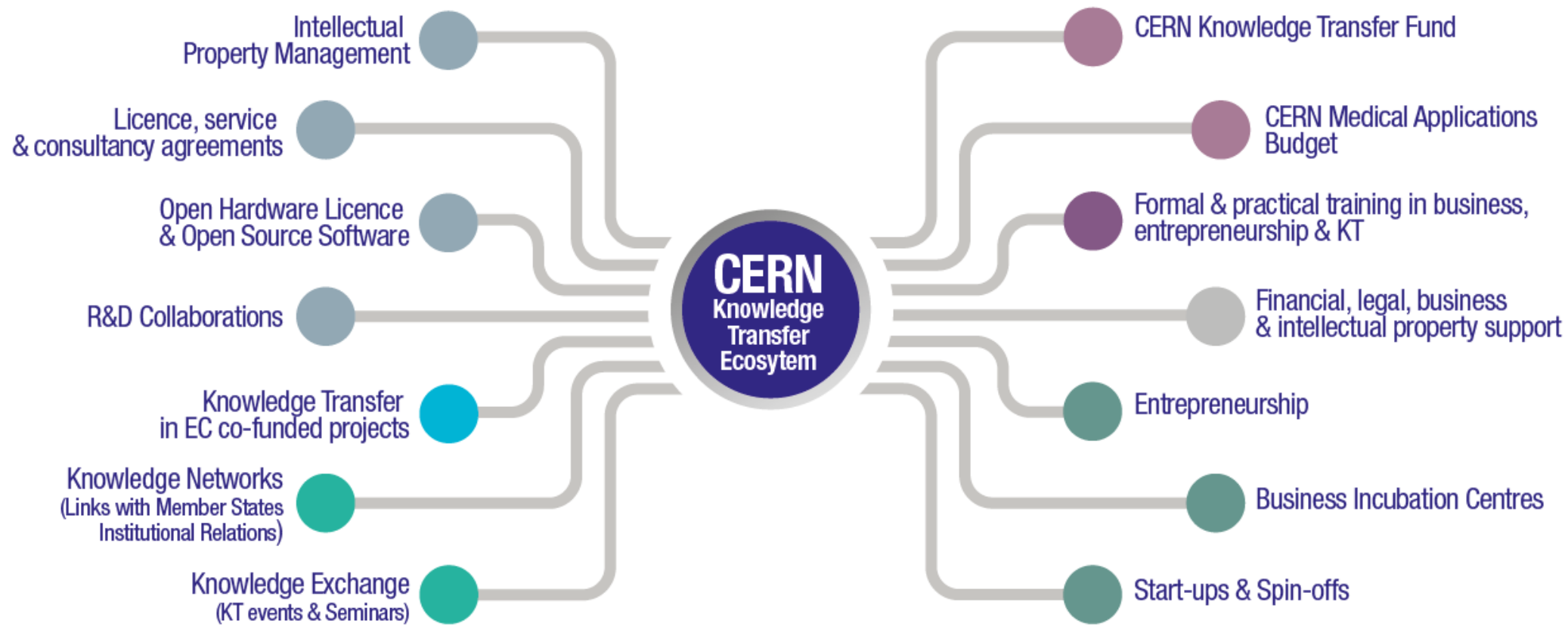


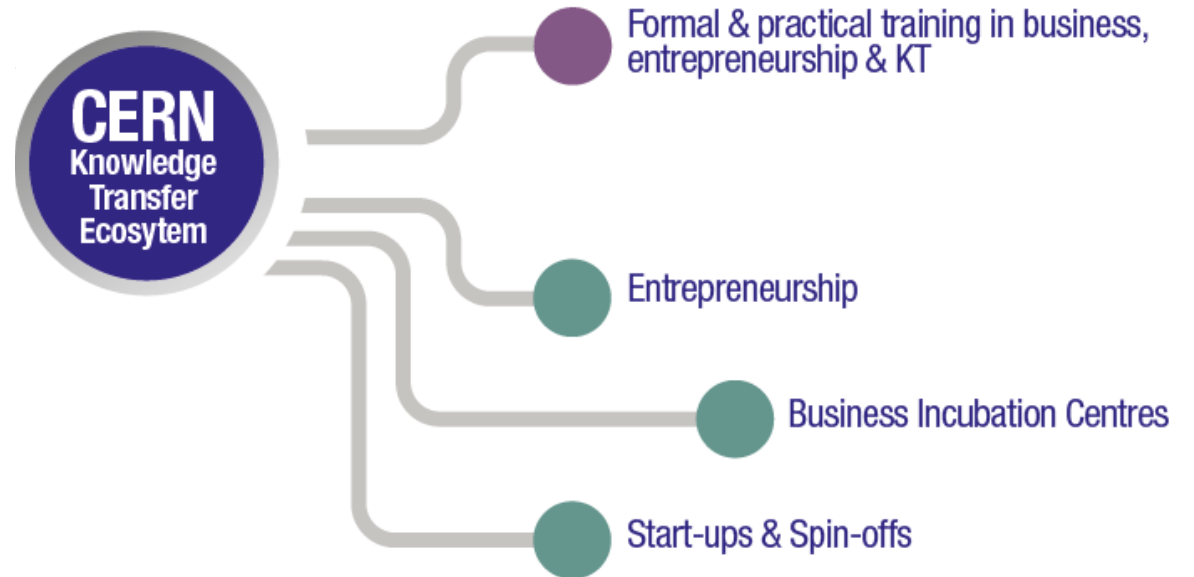
CERN's controls  
middleware software  
for worldwide factory  
automation.



Machine learning to improve  
vaccine production

CERN - Sanofi



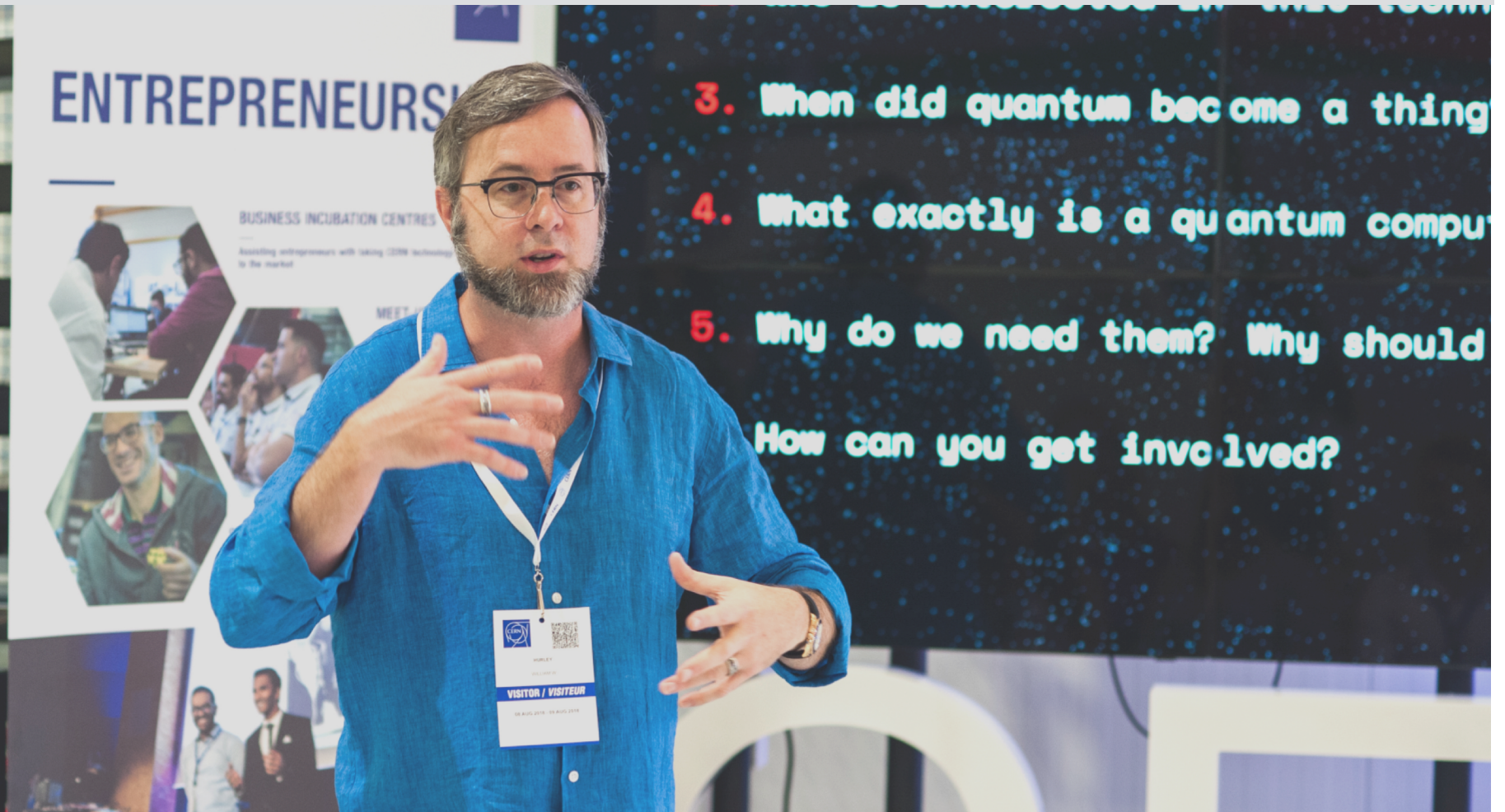




# Building a culture of entrepreneurship



# Entrepreneurship Meet-Ups



<http://cern.ch/go/Bnc7>



M-E-D  
|| || ||  
T-E-C-H  
|| || ||  
H-A-C-K

AN INNOVATION COMPETITION WHERE TEAMS CAN SOLVE MEDTECH PROBLEMS PITCHED BY HEALTHCARE ORGANISATIONS AND INDUSTRY.

#CERNMEDTECHHACK

AWARD FEST, FIND OUT MORE AT:  
[INDICO.CERN.CH/E/MEDTECHHACK18](https://indico.cern.ch/e/medtechhack18)



CERN MedTech:Hack



# CESP

## CERN Entrepreneurship Student Programme

Phase 1:  
Explore

Phase 2:  
Evaluate

Phase 3:  
Exploit

Phase 4:  
Conclude

Week 1

Week 2

Week 3

Week 4

Week 5

- CERN & its research
- Technology deep diving sessions
- Brainstorming & new applications

- Two market assessment sprints
- Market evaluation based on identified opportunities

- Series of lectures and workshops focusing on high-tech venture creation
- Carve out business model

- Series of lectures and workshops focusing on high-tech venture creation
- Validate business model

- Final pitch
- Finalise business concept
- Finalise proof-of-concept and prototypes

# NTNU Screening Week – 10 years in 2018



3179  
K-C09

Start-up based on  
CERN student  
programme

## REIMAGINING LIBRARY TECHNOLOGY



### TIND ILS

Management of print and  
electronic resources.



### TIND RDM

Capture and preserve datasets of  
any size and format.



### TIND DA

Digital archive for digitized and  
special collections.

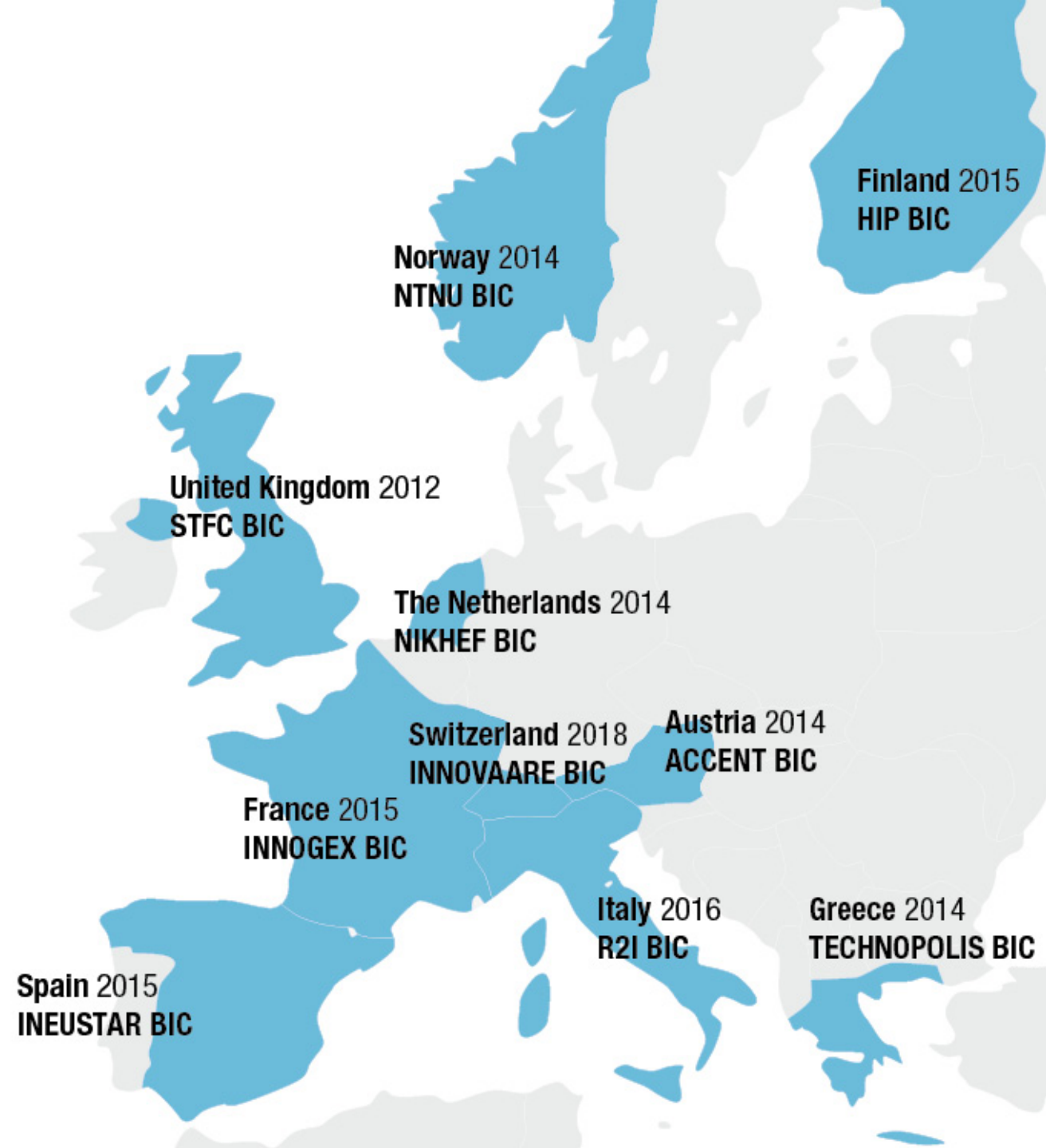


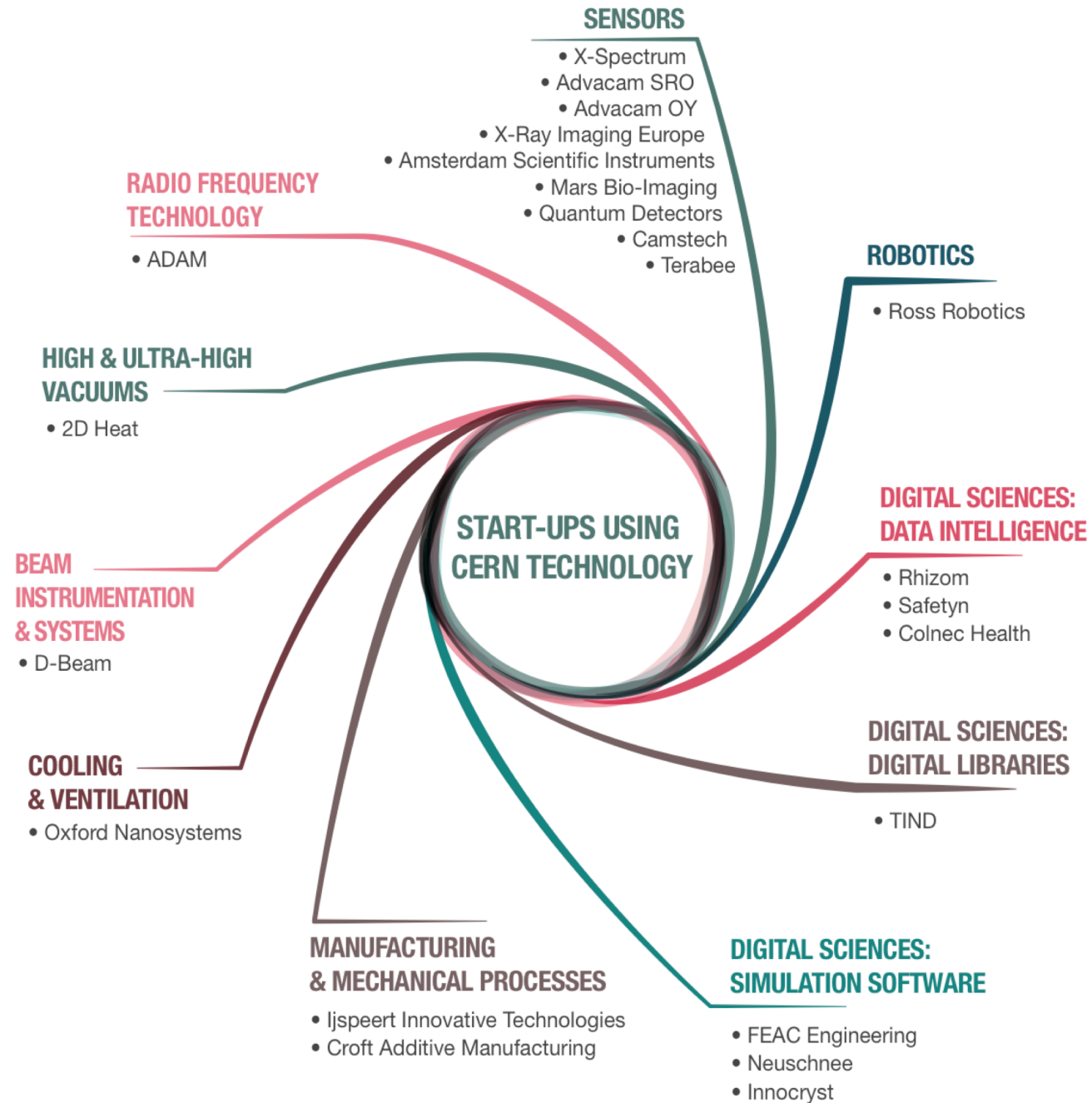
### TIND IR

Manage publications and other  
traditional research output.

# CERN BICs

Network of  
Business  
Incubation  
Centres





# Start-ups accepted in BICs in 2018



STFC BIC



STFC BIC



INEUSTAR BIC



INNOGEX BIC



INNOVAARE BIC

## \_Contact

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CERN

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