



Giorgio Keppel

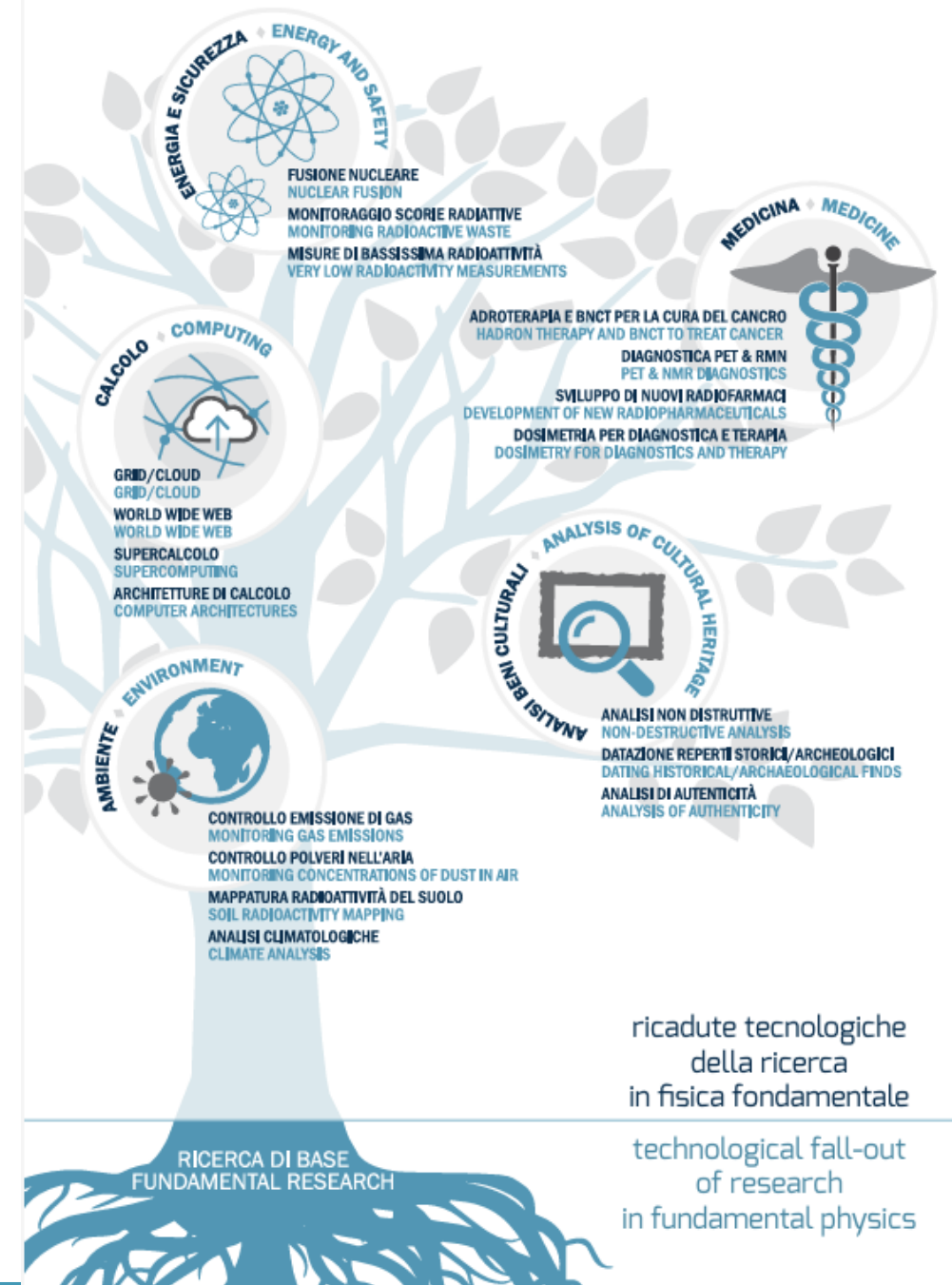
# INFN Technology Transfer: organization and successful examples

11 July 2024 – keppel@infn.it



# knowledge transfer

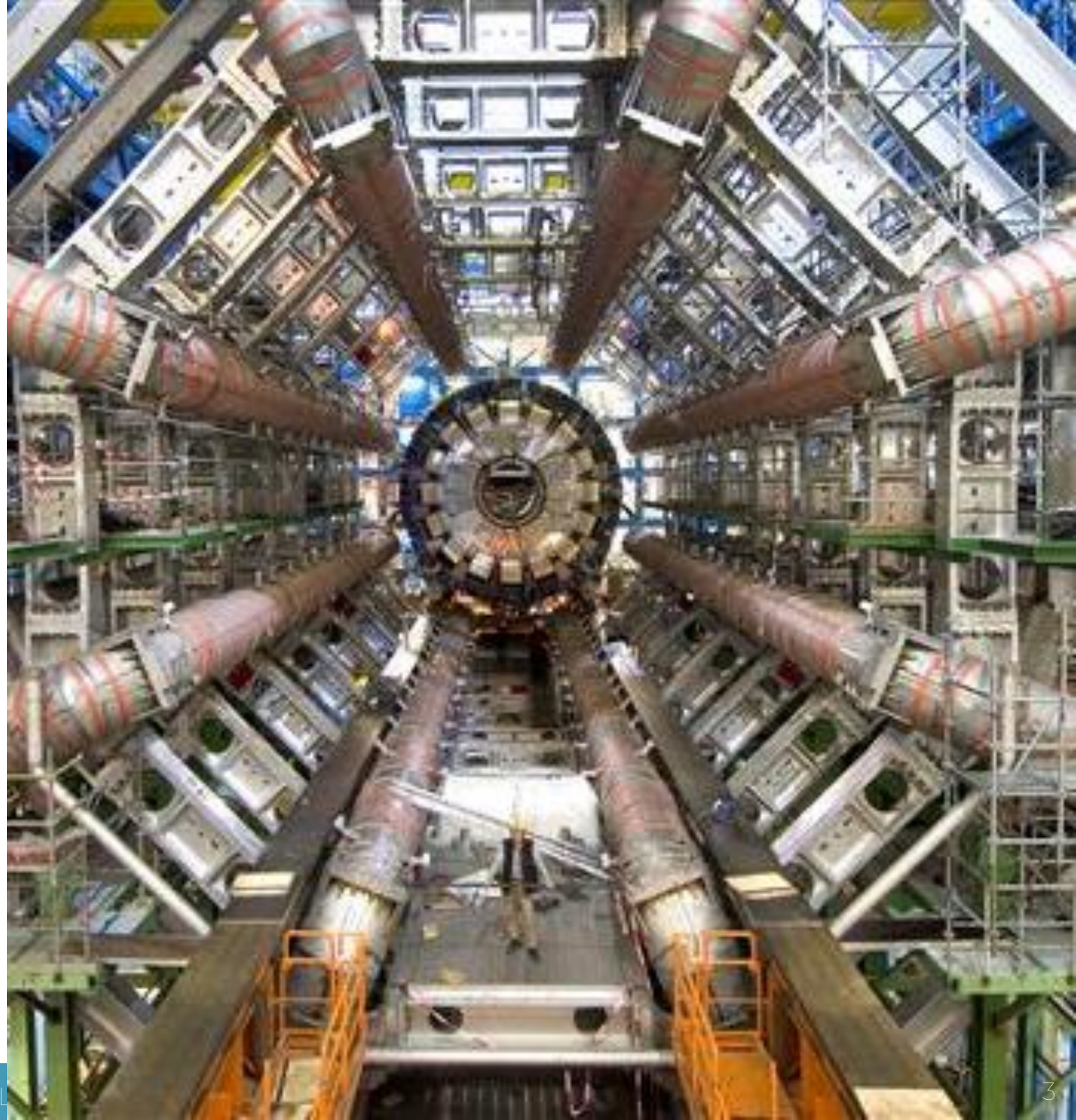
- Why do TT in INFN
- How to do TT in INFN
  - Organization
  - Tools
  - Opportunities

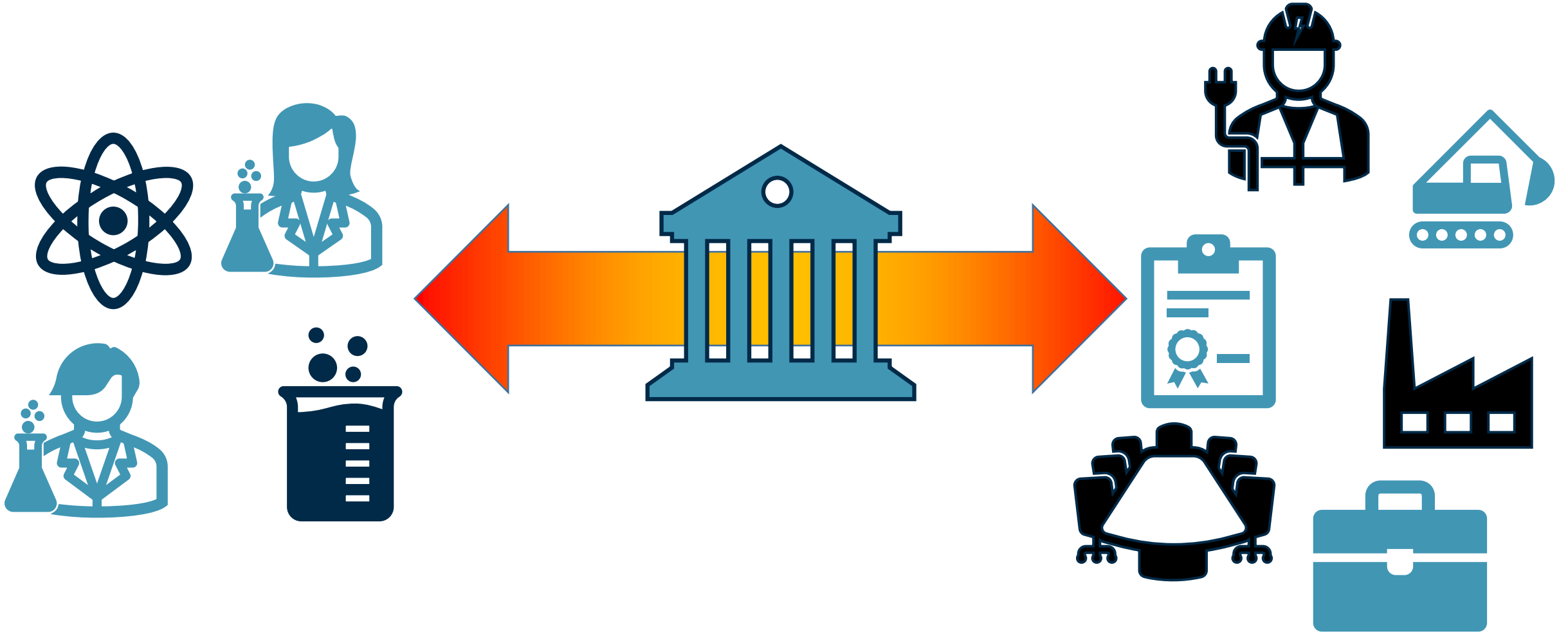




# TT Mission

- Despite INFN's wide recognition in the field of scientific and technological innovation, national and regional priorities for funding basic scientific research may change in the not too distant future.
- The question posed by policymakers to research organizations is: what is your social and economic impact? For every €1 invested by the state, how much return (always measured in €) does society get?
- It is essential to highlight demonstrable success stories related to social challenges, to emphasize the positive impact on society of funded activities.





# What Technology Transfer Does (and Does Not Do)

INFN generates **knowledge** and shares it with

- Scientific community
- Society
- Economic entities that exploit acquired knowledge for their own purposes.

TECHNOLOGY TRANSFER = set of regulations and procedures of the knowledge market generated by academic organizations

It is not applied research

# Tech transfer mission

- To optimize the impact of INFN science, Technologies and know-how on society and promote knowledge exchange with stakeholders
- 
- INFN supports its applied research to generate the technologies necessary to conduct experiments in fundamental Physics research
  - As we develop technologies for internal use (TRL 6-7), almost all our KTT activities must begin with identifying a second use;
  - In some particularly demanding sectors, such as health, space, energy, cultural heritage, INFN supports applied research aimed directly at obtaining results to be used outside the Physics environment;

In what instances does INFN interact with economic entities?



INFN pays the economic entity  
(purchase, procurement)

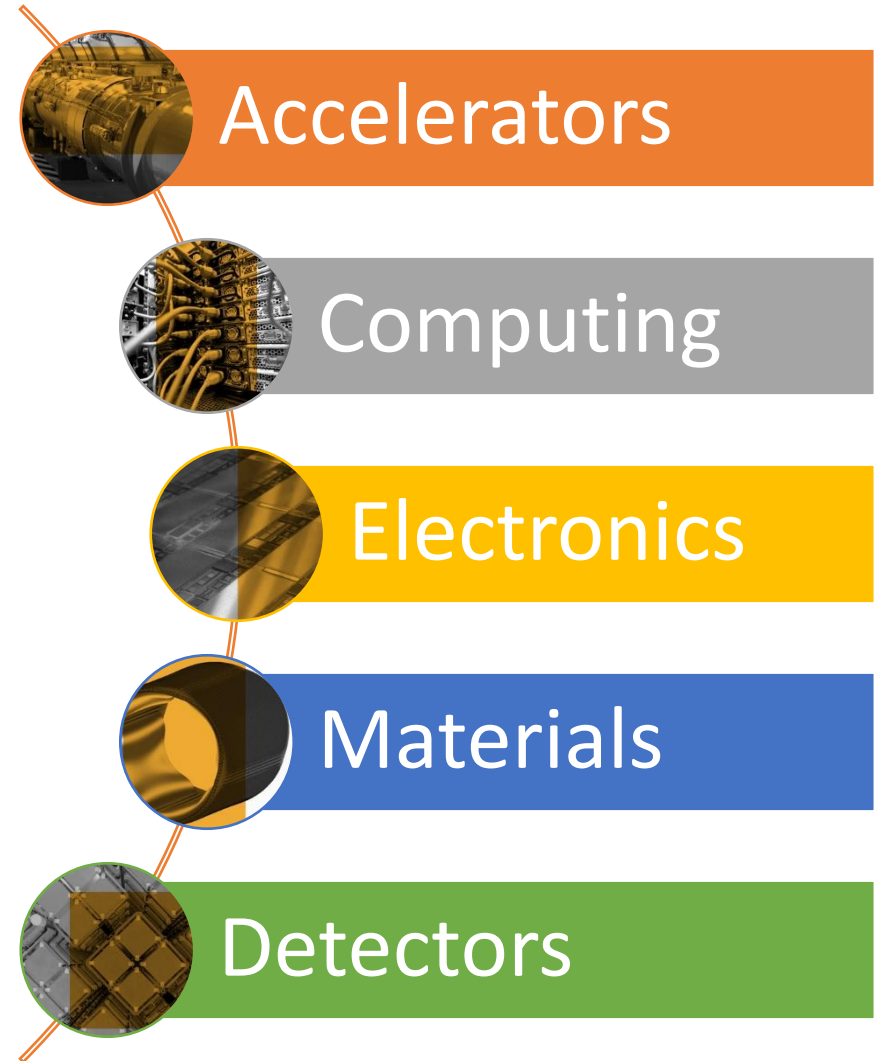
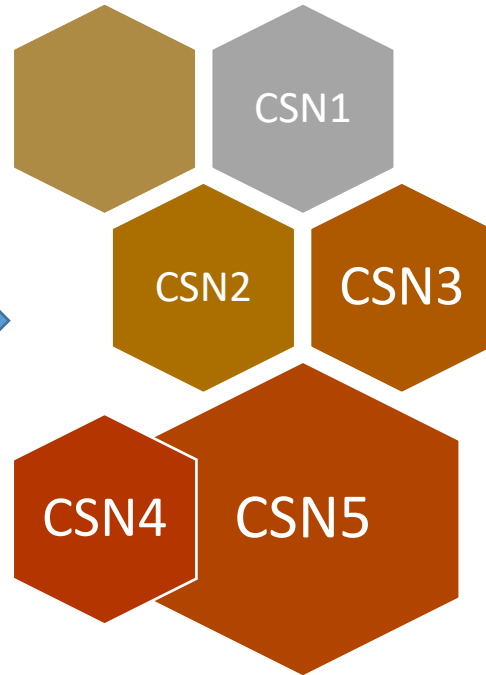
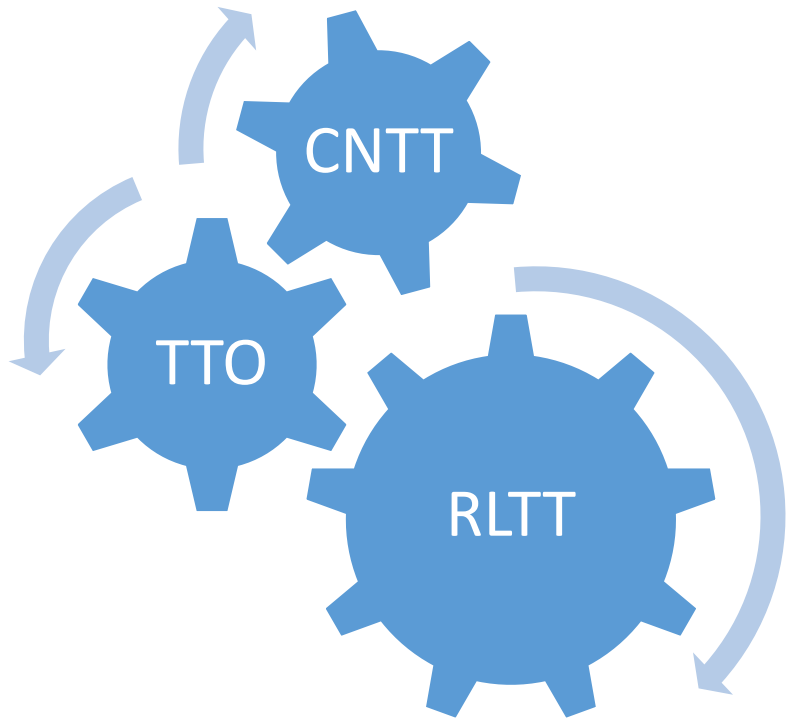


The costs are shared  
(collaborative research).



The economic entity pays INFN  
(for third-party services,  
acquisition of licenses, etc.)





Scientific committees and Networks  
(INFN-Acc, INFN-E, INFN-4LS..)  
PNRR

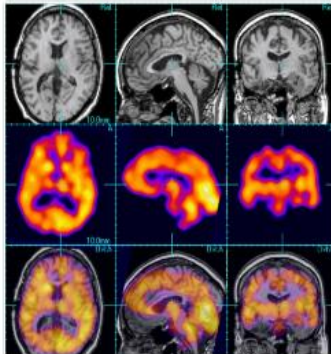


# Portfolio IP: Patent and Know how



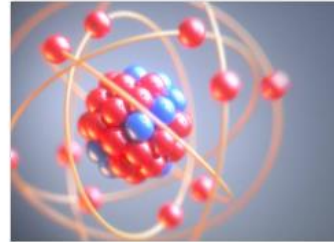
## RADIONUCLIDI

Un nuovo metodo di produzione di radionuclidi di elevata qualità da usare come precursori per radiofarmaci.



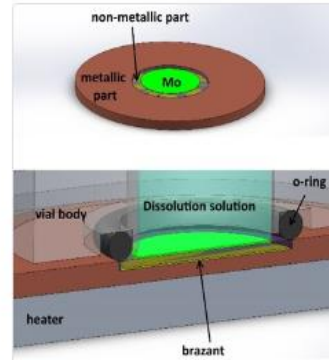
## PRODUZIONE Cu67

Metodo e bersaglio innovativi per la produzione di Cu 67 tramite ciclotrone, per applicazioni in diagnostica medica e terapia.



## COLLIMATORE COMPATTO

Collimatore per neutroni in configurazione multicanale che garantisce elevate capacità collimanti in dimensioni compatte.



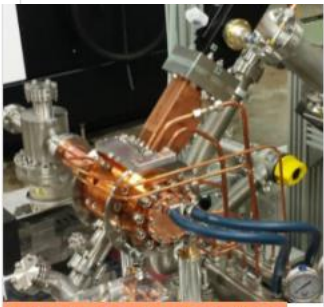
## TARGETS RADIONUCLIDI

Metodo di realizzazione di target solidi per la produzione di radionuclidi, precursori di radiofarmaci, tramite ciclo



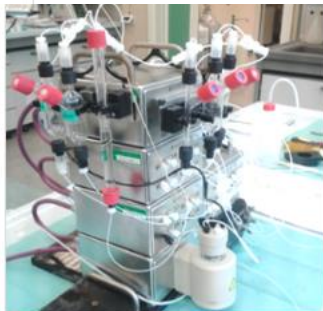
## SDD CON AREA OTTIMIZZATA

Rivelatore a deriva di semiconduttore per spettroscopia X e  $\gamma$ , ottimizzato per consentire il recupero dell'inefficienza ai bordi.



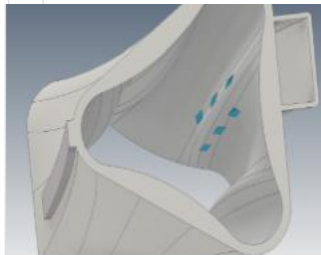
## OLTRE LA BRASATURA

L'invenzione sostituisce la brasatura: mantiene inalterate le proprietà meccaniche dei metalli e garantisce ottime prestazioni del prodotto finale.



## TECNEZIO 99-m

Tecnica di produzione del radionuclide Tecnezio-99m mediante ciclotroni commerciali.



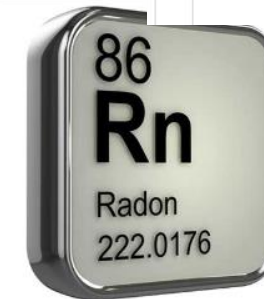
## RISONATORE MICROONDE

Innovativa struttura di camere al plasma per le sorgenti ioniche ECR utilizzate per gli acceleratori di particelle.



## TRANSURANICI

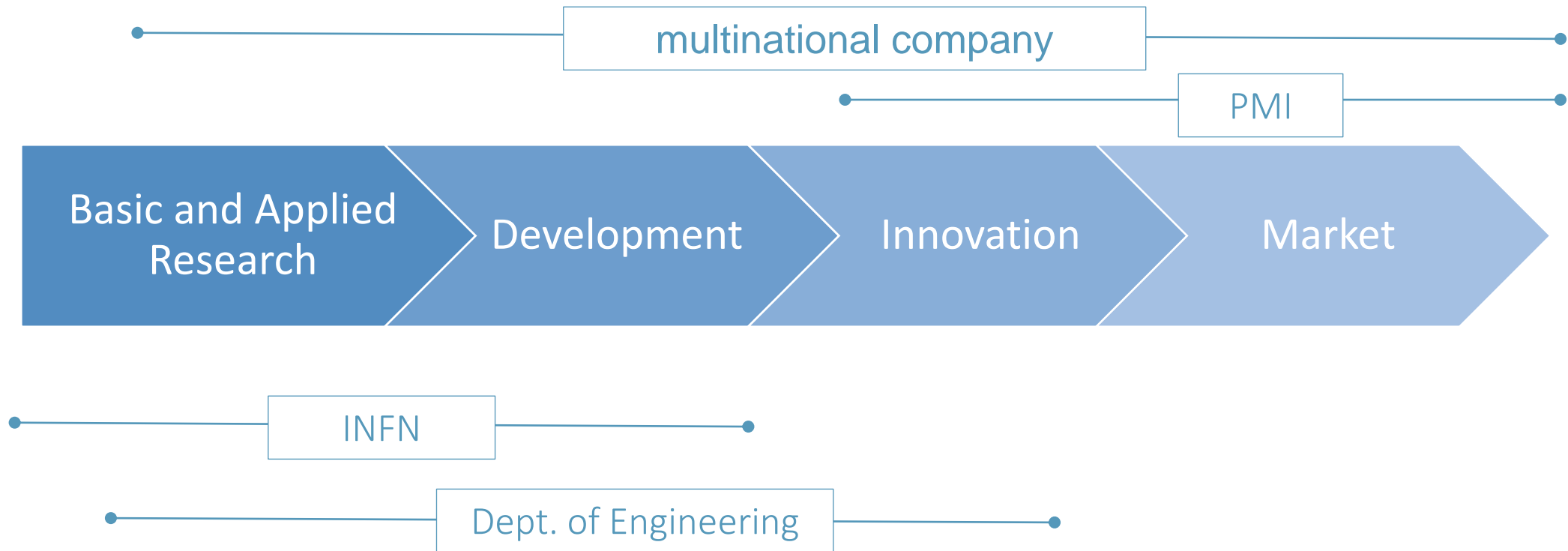
Detector per la rivelazione di raggi X emessi dal decadimento di elementi transuranici.



## RADON-222

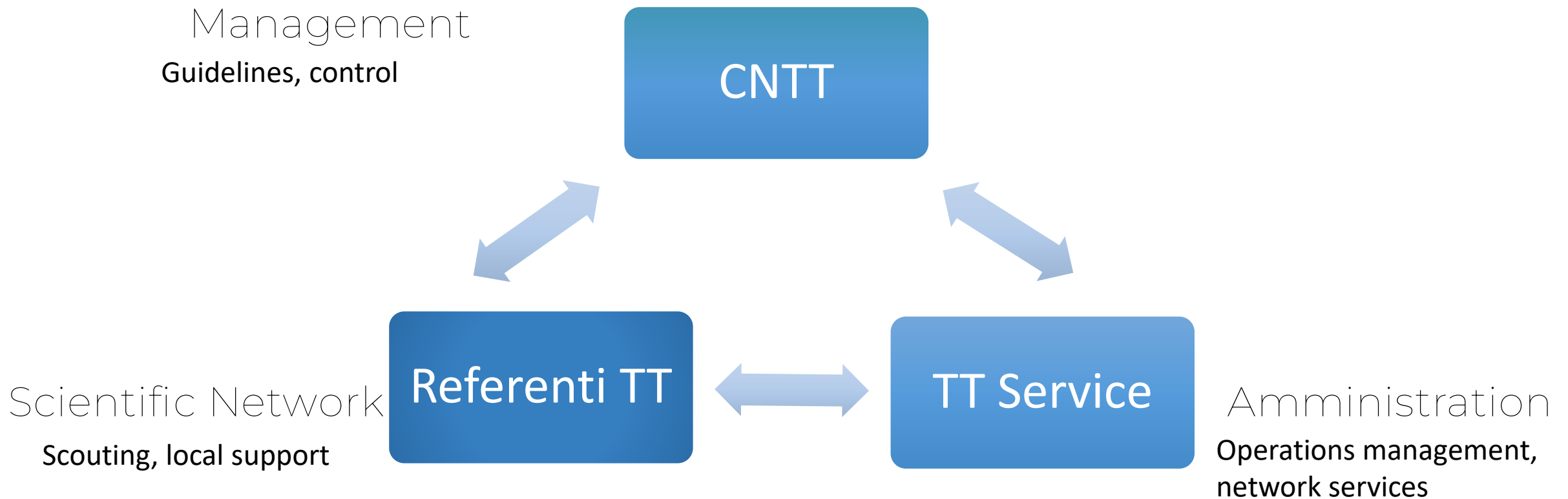
Rivelatore compatto per il monitoraggio online dei livelli di concentrazione di Radon 222 in ambienti indoor.

# From research to market



# TT INFN Organization

TT structures are responsible for managing the interactions between INFN-generated knowledge and the organizations that economically exploit it



- Mariangela Cestelli Guidi (Chair) LNF
- Cecilia Voena (CSN5, Medical, CERN KT) Sez. Rm1
- Luca Latronico (CSN2, ASI) Sez. Torino
- Iaia Masullo (CSN5, Acceleratori) Sez. Napoli
- Giorgio Keppel (Acceleratori, Materiali) LNL
- Agostino Lanza (CSN5, CERN Heptech) Sez. Pavia
- Alessandro Lonardo (CSN5, Calcolo) Sez. Rm1
- Mario Musumeci (PM, INFN-E) LNS
- Ilaria Giammarioli (STT) AC



# AC, Direzione Servizi alla ricerca



## Servizio Trasferimento Tecnologico



**Ilaria Giammarioli**  
ilaria.giammarioli@Inf.infn.it  
Responsabile



**Pier Paolo Deminici**  
pier.paolo.deminici@Inf.infn.it



**Simona Mancuso**  
simona.mancuso@Inf.infn.it



**Diego Tonini**  
diego.tonini@Inf.infn.it



# The network of 28 Local Referrers for TT

The Network is made up of Referents present at each Institute location.

They work closely with the research community, identifying among the scientific activities those having a possible TT orientation, or a possible commercial interest.

The Network of Referents reflects the capillary spread of INFN facilities throughout Italy: locally, **the Referents are INFN's point of contact with the business and innovation reality of the territories.**

TT Referents are invited to facility councils and support the Directors in matters related to technology transfer at the sites



# The tools: regulations



Disciplinary TT (2024)



Disciplinary Spin-off (2017)

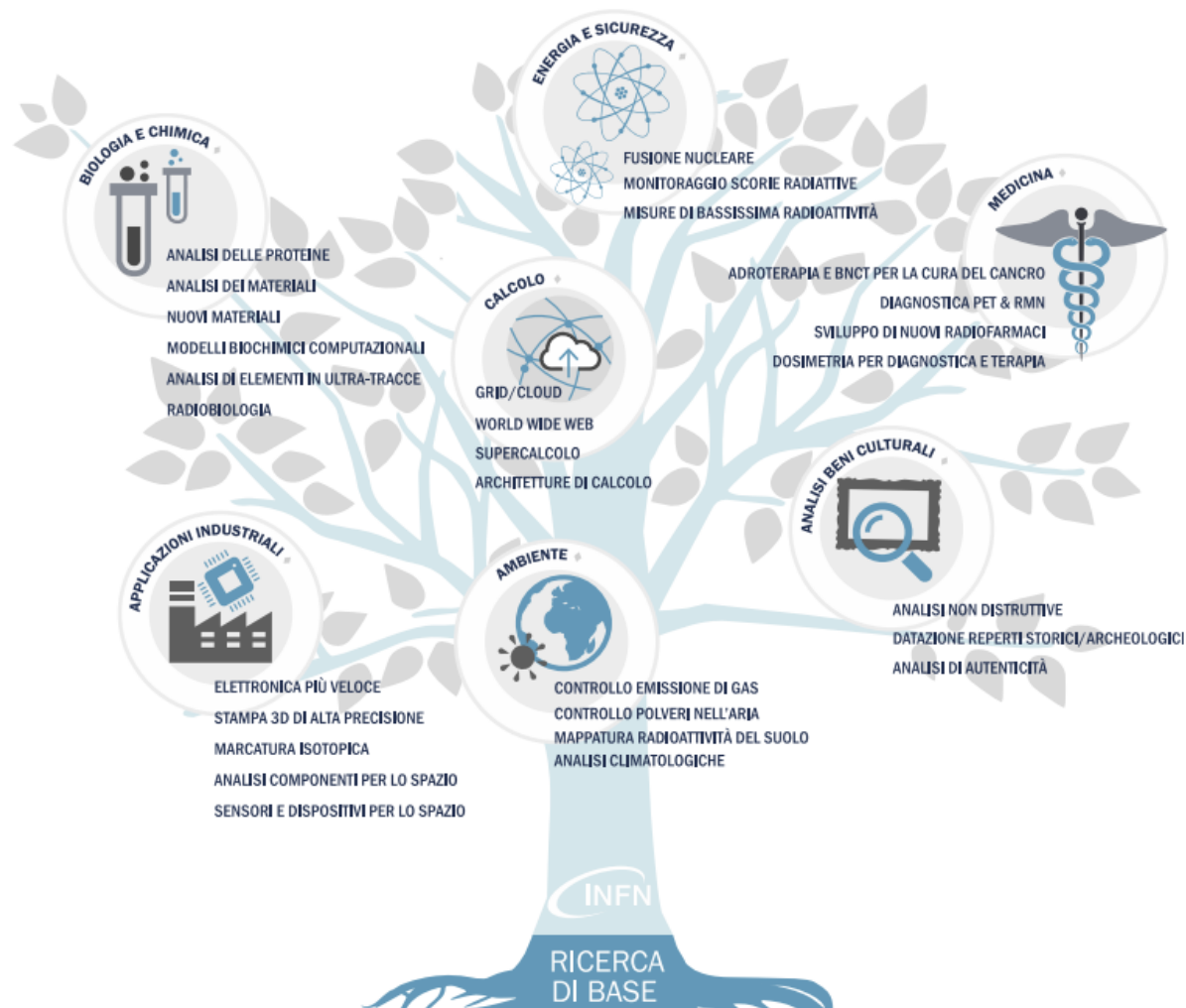
# Training

- Basic and advanced level
- Multimedia content (pills)
- Dissemination of managerial culture and business skills



<https://istnazfisnucl.sharepoint.com/sites/TrasferimentoTecnologico>

# Attività di trasferimento tecnologico ... *in numeri*



2013 | 2023

- **555** Contratti Stipulati
- **393** Partner
- **49** Licenze concesse
- **335** Domande di priorità per brevetto depositate
- **46** Progetti *Proof of Concept* finanziati, di cui 30 interamente da INFN attraverso la call *Research For Innovation (R4I)*
- **5** Spin-off riconosciuti

attualmente

- **118** famiglie di brevetti attive, che corrispondono a **347** brevetti totali



**IBYLLA** BIOTECH S.R.L.

TRAILBLAZING IN RATIONAL DRUG DISCOVERY

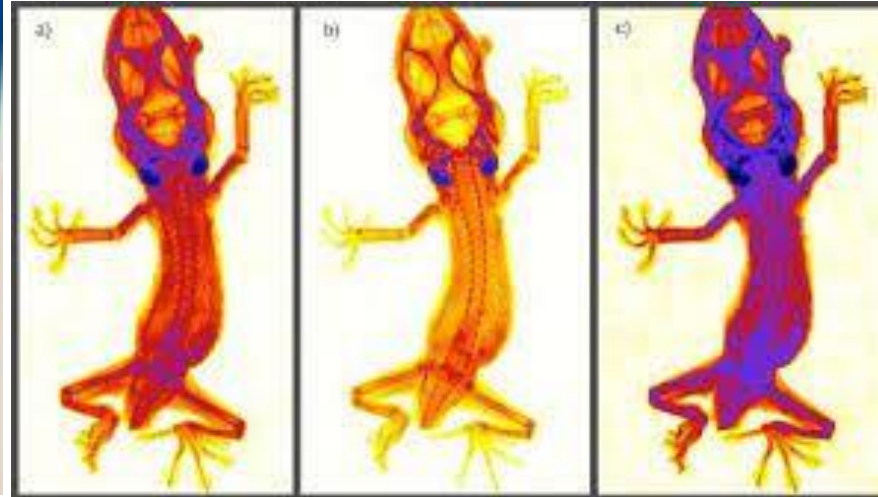
■ **Platform for in-silico drug discovery.**

**innovative algorithms** derived from advanced mathematical methods of theoretical physics to **transformative drug discovery protocols.**

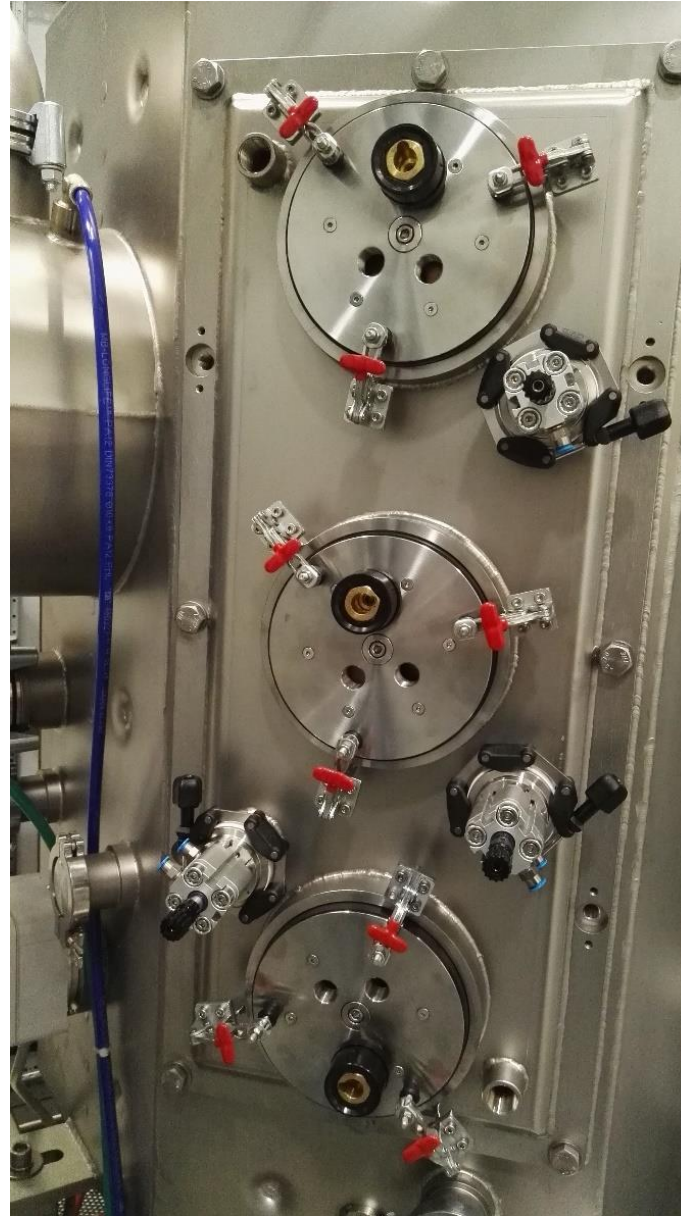
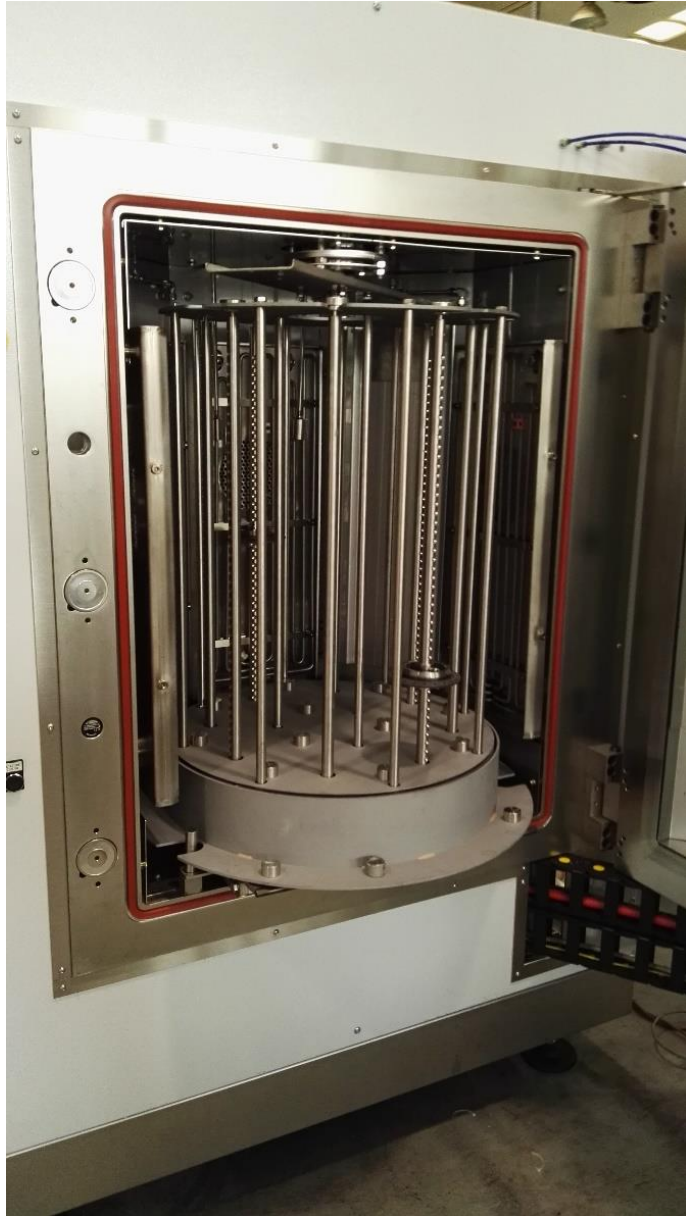
1° round 2.5 M€  
2° round 15 M€



# TT Spin-off



# R&D on hard coating - collaborazione Eurollis spa





# R&D materiali duri - collaborazione Eurolls spa



# R&D materiali duri - collaborazione Eurolls spa





# Master

Per maggiori informazioni  
<https://surfacetreatments.infn.it>

[keppel@infn.it](mailto:keppel@infn.it)





Contacts:



[tto@lists.infn.it](mailto:tto@lists.infn.it)