Istituto Nazionale di Fisica Nucleare
COMITATO DI COORDINAMENTO DELLA TERZA MISSIONE

INFN and Third Mission
What?
Why?
Who?

Giorgio Chiarelli
INFN Pisa
giorgio.chiarelli@pi.infn.it

FELLINI national meeting 25/2/2020

Layout of this presentation

What is TM?

- Short version for practitioners (by a practitioner)[no theory]

Historical background and perspective

- Will try to convince you that it is not an accident, nor the produce of some politicians
  - Know your time and place

Detailed discussion of the definitions

- What can be done, when, by whom?

INFN...

- Some history of our organization in this area
- How do we support Third Mission activities?

Universities and there mission(s)

The Humboldtian model was imagined for an elitè university, based on

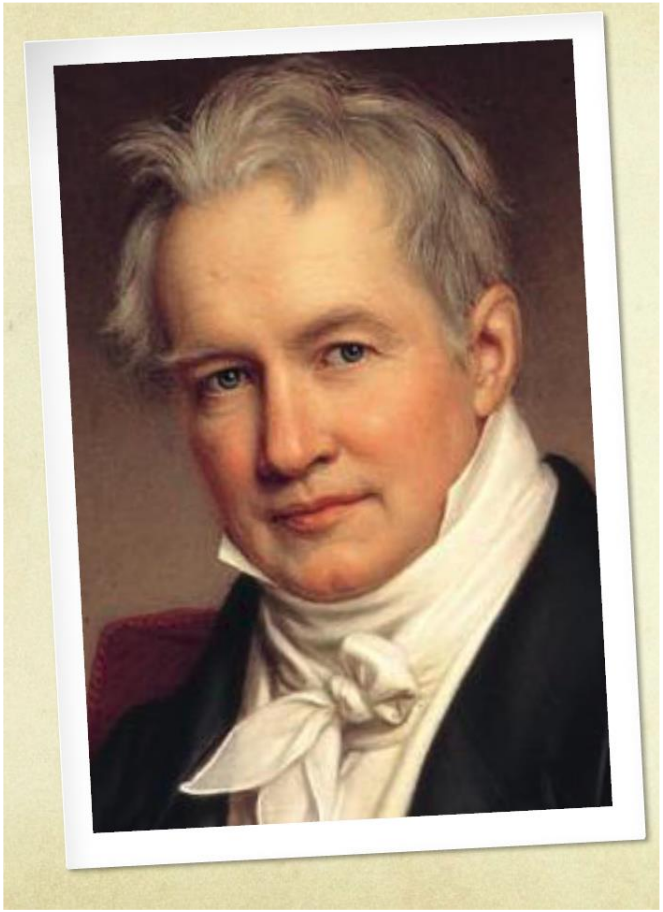
- Education (teaching)
- Research

It dates back to 1810 and exercised its impact well outside Germany

- There was no room for "market oriented" mission
- Its crisis started in the last decades of the XX century
- The emerging role of TM is strictly linked to a change in the role of HEI wrt this model

Anglosaxon world has its own tradition

- Will come back to this point



Wilhelm von Humboldt

Why Third?

It is defined by "exclusion". In the academic world:

- First mission: teaching
- Second Missione: research

} von Humboldt

  - «With many shades of colour and variations of form, and many notable exceptions, there has been a general tendency for universities and their academic staff, engaged as they are with what they perceive as the noble pursuits of education and research, to see themselves as somehow apart from the societies that host them; a very different posture from the intentions of their founders.»(*)

- In recent years an effort with the aim that Research Organization and HigherEducation Institutions come back to be partners of the «host communities»

  - «Third Mission (3M) *should not be seen* as separate from the first two. The *engament with society* that is understood in the first two, finds other ways to express itself. Therefore 3M activities should be seen as part of the Mission of *any Higher Education/Research Organization*»*

(*) EU E3M Project: Green Paper on «Fostering and Measuring Third Mission in HEI

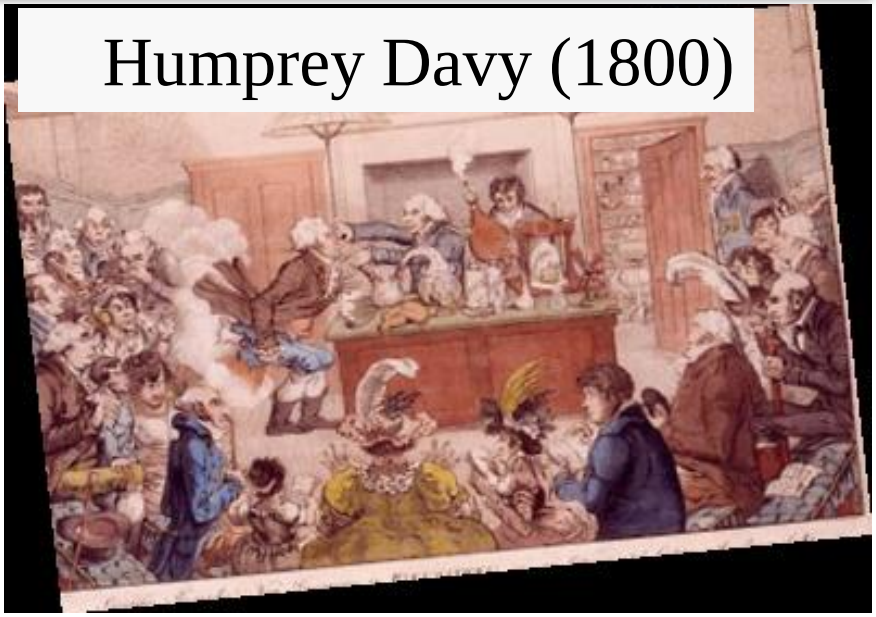
From *Turris Eburnea* to *Citizen Science*

How did we go from
Turris Eburnea
to
Public Engagement?

- Curvy path, diffent roads
- Beware: different countries have different history
  - Take this as a suggestion/warning when looking at proposal/experiences
- Its is utterly important to set actions/choices in the correct historical perspective
  - The *engagement* of intellectuals and academics is intertwined with the culture of a given country

Now let's see how and why
we did this journey

The old time



Second half of the XIX century is the golden age of diffusion of science

- In UK *Nature*
- In Italy *La Natura*

Back then, part of the Scientist's mission was to popularize her/his results

- Charles Darwin
- James Clerk Maxwell

In Italy

- Lessona, Mantegazza

But then the XX century arrived..

Where do we (scientists) come from?
The Age of Extremes (The short Century)

WWI was the first "modern war" in which science had a strong impact on warfare. Just a few:

- Radiotransmission
- X-ray
- Planes
- High power explosives
- Poison gas
- ...

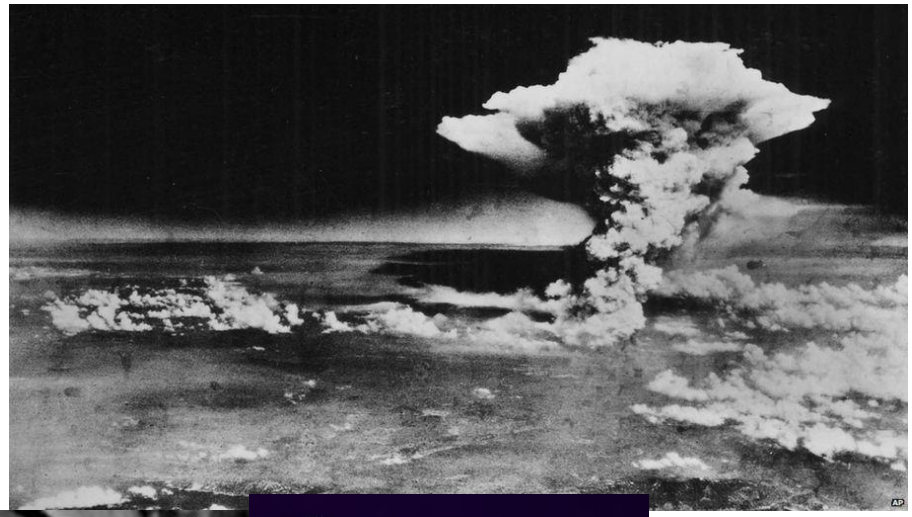
WWII marked by

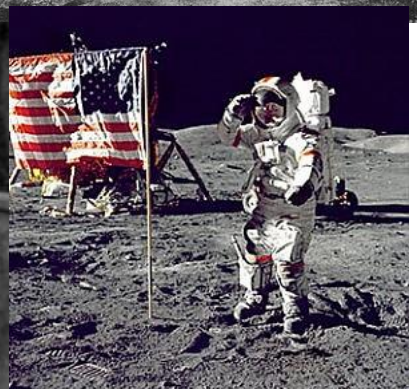
- Radar
- pennicilline
- Planes
- missiles
- Bomb
- ...

Cold War

- ...

In WWI strong links between academic world and military





Even if we do not know, *they* give us money because want something back

Technological and scientific development in XX century are strictly intertwined with the confilicts

WWI: a wide use of the most advanced technological tools:

- From radio (just newborn), to portable X-Ray, from airplanes to poison gas (byproduct of the chemical industry), WWI is defined as the "first technological war"

In WWII a strict relation between science, technology and the military

- The very same end of WWII is marked by physics (A-bomb)

Cold War produced (among many other things) the race for the space (and for the Moon)

- *Sputnik*, *Yuri Gagarin*, *Neil Armstrong* are part of the Cold War

If you are thinking that this is disturbing, it's OK

- However it is the plain truth

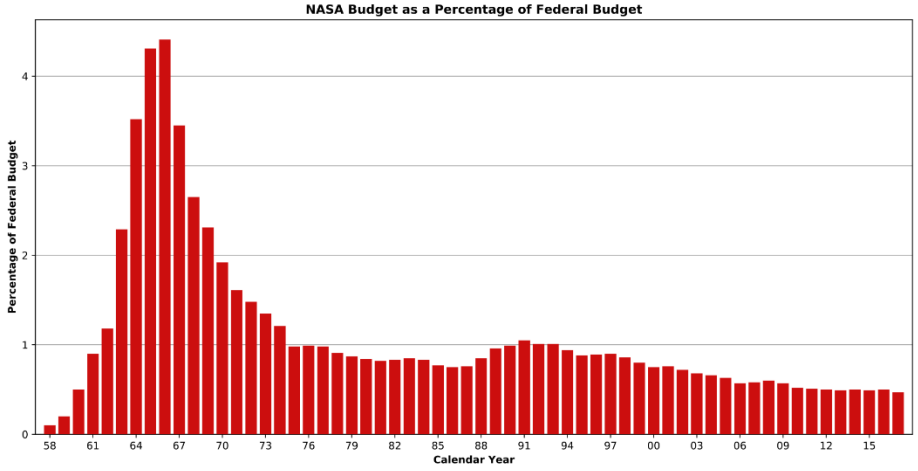
The end of Cold War

The fall of the Berlin Wall (another celebration for 2019) marked the beginning of the end of Cold War

- The end of USSR (1991) was seen as the final end

In 1991 the Superconducting Super Collider started running in serious troubles. In 1993 it was cancelled

NASA budget kept falling (in % of the national budget)



Economics of Science

Science, big or small, needs money, people, and time

- With money you can buy equipment but you need (skilled) people to advance in knowledge
- You need time for those same skilled people, to develop and test ideas.
  You can buy time with money (hiring more people).
  In any case you need to feed the skilled people.

Big science was born in Los Alamos

- Manatthan Project was many things, even a sociological experiment
- Scientists discovered how to get infinite amount of money

Big science is not anymore limited to physics.

Another "big science" is space

- NASA has the biggest budget for non-military
  - Is it really non-military? (dual use)

Genoma project *is* Big Science

The Human Brain Project *is* Big Science

Vision of science...

Science, The Endless Frontier (Vannevar Bush Report, 1945)-- the goose with the golden eggs

New Scientist, 99 (21 April 1983), 142

This has been the paradigm after WWII, until the end of the Cold War. Passing of this vision, is the basis of emerging new, and different requests to scientists, and to the HEI system at large

Paradigm of the «endless frontier»

In July 1945 Vannevar Bush writes a fundamental report for President Roosevelt:

- Science, the endless Frontier
  - It will set the relationship between science and society through the Cold War

Paradigm:

- «give us funds and we will give you power and wealth»

In the ‘80-’90 of the ‘900, model crisis:

- Society asks for (an almost) direct "return"
- Push by the economic crisis of the '70
  - first legislation on patenting (Bayh-Doyle Act, USA, 1980)

What happened?

Early '80's: in UK neoliberism recipes (Thatcherism) hit hard on research

- Funding cuts, brain drain, drop in enrollment...

The answer:

- Royal Society report (*Bodmer Report*), in 1985 set the paradigm of the *Public Understanding of Science*
  - Lack of knowledge in the public creates lack of support
  - The best investment is to educate the public on the value of research
    - If you can do it early on you will target the future leaders

British scientists are the first one to cope with neo-liberism paradigms

- This went global with the end of the Cold War: there is a strong request to science to "give something back"
  - There are many ways to "give something back", but you need to demonstrate the impact of your research on society

Knowlegde Transfer is born!

- CERN KT office dates back to 1999

Let's set the scene

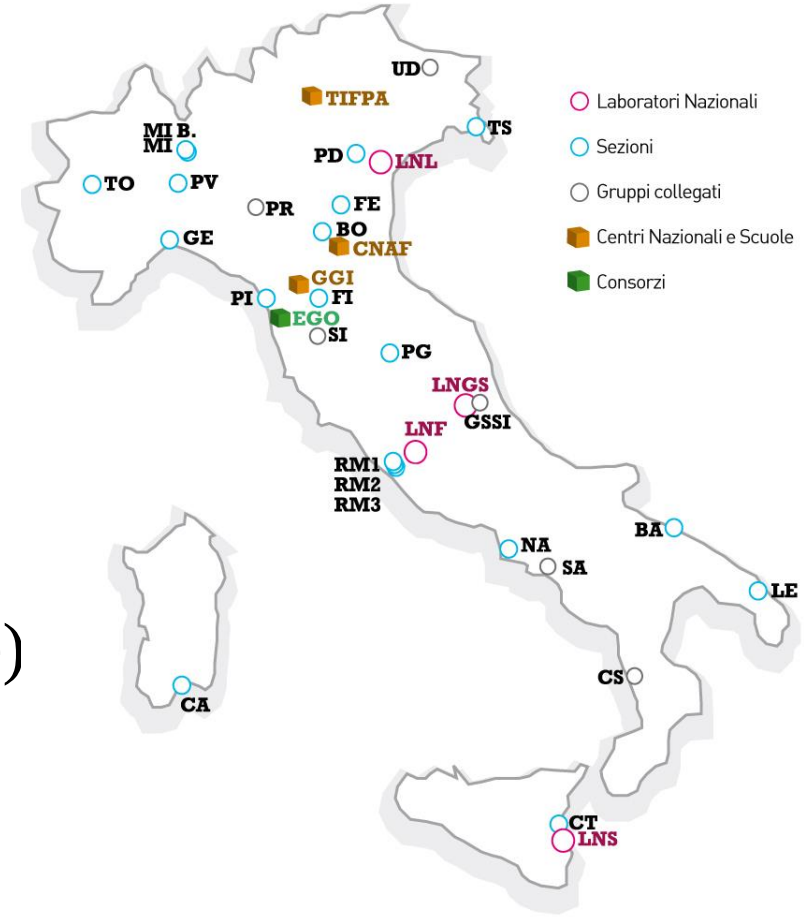
INFN has 4 Labs, 20 local units embedded/strongly linked with Physics Departments.

Strong tradition of activities for High schools

- Mainly top-down
  - Lectures, stages for students etc.

Since early ‘00s Italian MIUR invested in a national project dubbed *PLS* (Programma Lauree Scientifiche)

- Proselitism towards STEM
  - Mixed result, still ongoing
- Mainly driven by Universities
  - Not really aligned with INFN scope/mission which is more to disseminate science through society, but we were involved



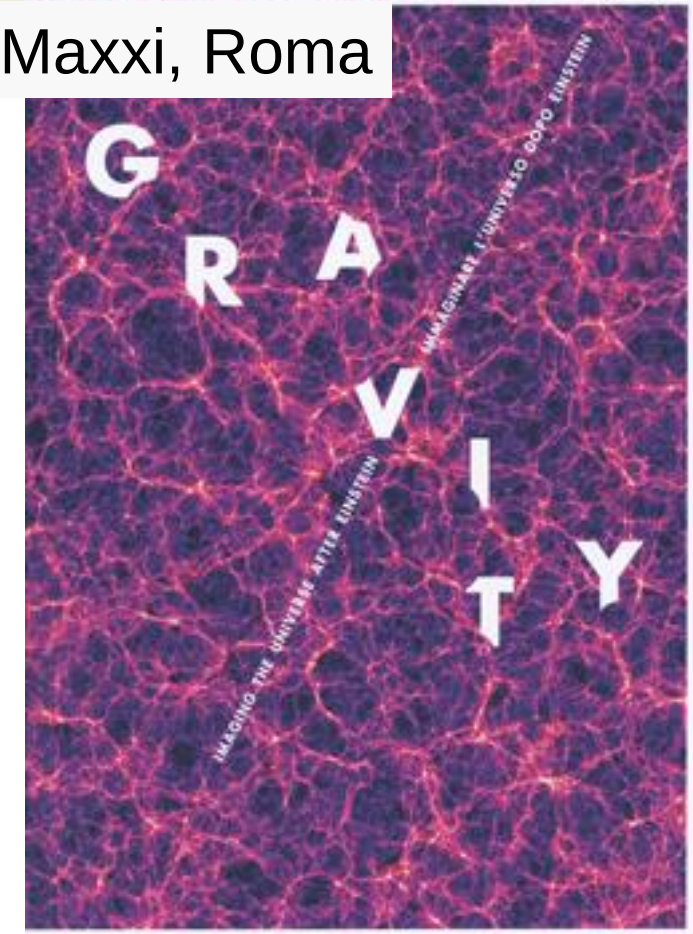
INFN

INFN set up a Communication Office in early ’00

- Over the years it became a reference point for
  - Outside parties (from media to students)
  - Researchers
- W/o entering in the CommOffice activities, beside institutional communication:
  - Large-impact events
    - Exhibitions (Gravity, Uomo Virtuale)
    - Co-production of Rai-scuola Series (national TV)
    - Special events aimed to different targets
    - Coordination of Physics Masterclasses..
    - Asimmetrie (mainly aimed at HS)
  - Participation in International collaboration (IPPOG...)
  - Courses on Science Communication for researchers
- Often the first entry point to INFN..

Recent exhibitions

Maxxi, Roma



02 Dicembre 2017 - 06 Maggio 2018

GRAVITY. IMMAGINARE L'UNIVERSO DOPO EINSTEIN

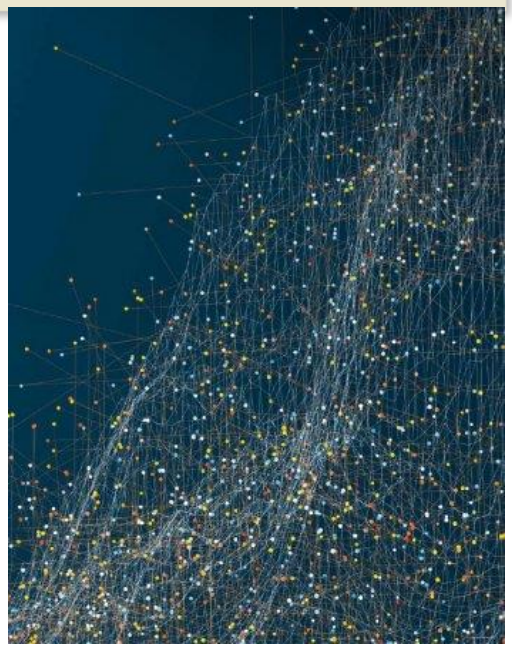
Galleria 4

a cura di Luigia Lonardelli, Vincenzo Napolano, Andrea Zanini

consulenza scientifica: Giovanni Amelino-Camelia

La chiusura della mostra è stata prorogata al 6 maggio 2018

Magazine: Asimmetrie

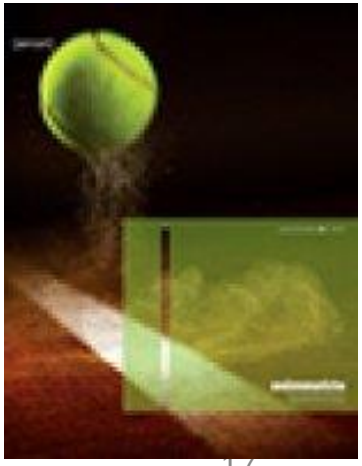


INFN Magazione

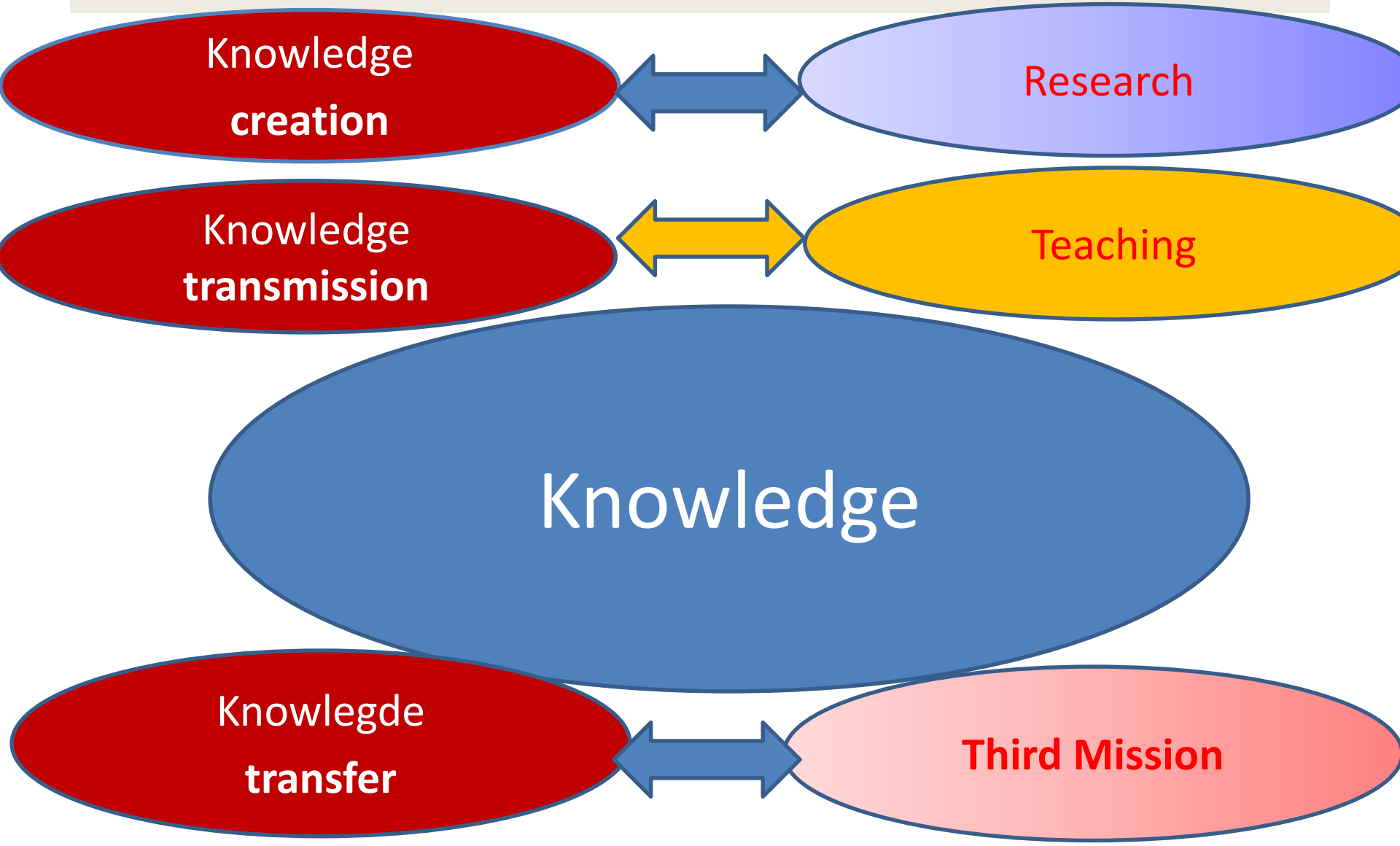
- Editorial Director
  - Antonio Zoccoli (President)
- Managing Director:
  - Catia Peduto
- Editorial staff:
  - Antonella Varaschin
  - Francesca Mazzotta
  - Francesca Cuicchio (infographic)
- Scientific Committee:
  - Enzo Barone (Director), Nicolao Fornengo, Giuliana Galati, Sandra Leone, Paolo Pani, Paolo Valente

Some characteristics:

- Thematic
- Well finished graphic
- Texts with in-depth analyses
  - High School Students
- Sent to all Italian HS
- Paper, Online, and App



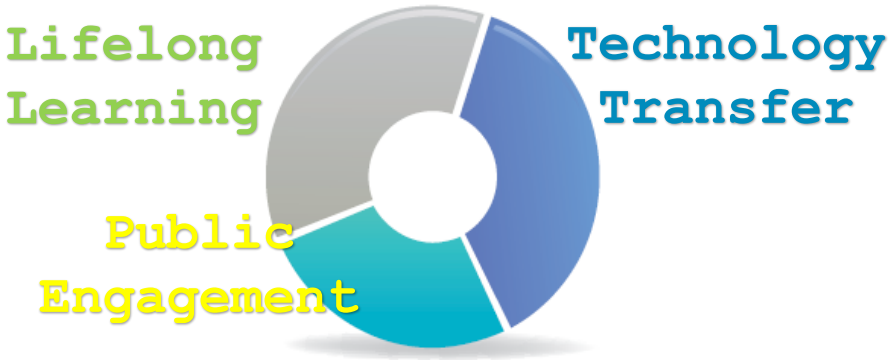
What is Third Mission?



To whom do we transfer?

World «outside» academy:

- Firms
- Politicians
- Civil society groups
- The whole populations



Initially «top-down» process, almost exclusively meant as TT

- Great interest in aspects related to market
  - Industry development, leadership, occupation, GDP(*)
  - More funds for research

Over time, interest towards KT extended beyond market-driven aspects, addressing the broader concept of

- Develoment
  - Social, cultural

Knowledge can address many problems...!

(*) Gross Domestic Product, PIL

What kind of KT?

Knowledge transfer can be related to «manifacture»

- *know-how/technology transfer*
  - Technology Transfer
  - Traditionally through training of skilled workers (PhD etc)

Knowledge Transfer as «education», «(re)training» of people *already outside* the formal *education system*:

- *Human capital*
  - Lifelong Learning (LLL)

Transfer of the new frontier of knowledge
and its application in society at large

- *Public engagement*
  - While often meant as "outreach" it has a much broader meaning
  - *Engagement* is rich of meanings in English
- we will see that PE nowadays sets the paradigm for interaction with society

Technoloy Transfer

Technological KT is of

- Great interest in research community
  - Economic return for University (money back to research)
    - Part of if back to internal actors? (Professors' right etc..)
  - Positive image of research as an engine for economic development
    - Becomes even more interesting in a phase of structural crisis
- Great interest in the private sector
  - Opportunity to move from "incremental improvements" to «market driven» improvements (sometimes to disruptive innovation)
    - Where do you find innovation required by the market?
      - Inside Academia
- At he beginning only SME, later even for large/megalarge firms
  - Disruptive innovation is developed by *outsider*
    - Rethoric of the Silicon Valley "factory garage"
    - Storytelling with a core of truth

How does TT take place?

- Implicit know-how transfer
  - Skilled labour force
- Protection and economic exploitation of intellectual property
  - Patenting
    - License, etc
- Business development/creation
  - Spin-off, start-up...
    - Small enterprises born out of a single idea
  - Incubators
    - Structure helping small enterprises to birth and grow
- We are far from the goose with the golden eggs
  - There is an implicit need to «return» in a direct way economic wealth to the host society
    - This kind of initiative is very often driven by regional needs/local governments/local economic and social fabric

Knowledge Transfer, II
Lifelong Learning, or the *Human Capital*

Changes in the labour market are driven by changes in an economy which is more and more "knowledge driven".

- The time of changes is much shorter than a worker's lifetime. There is the need to re-train more and more workers, especially in period of crisis.

This problem set the need for continuous education in the political and social agenda. A few examples:

- Mandatory continuous education for professionals (doctors, law pratictioners etc)
- Mandatory refresher courses for High School Teachers
- European and national programs to help outplacing of workers in crisis zones
- ...

Continental Europe in general (much more Italy) were late in this process due to lack of tradition/cultural approach

- Push for acceleration

What LifeLongLearning is

We perform many activities

- Refresher courses for High School teachers
- Refresher courses, alone or in collaboration, for example, with the Medical Society (Medical Physics)
- Courses with Opificio delle Pietre Dure for Cultural Heritage specialists
- Re-training of skilled (and non) workers in crisis zones

Recent examples:

- *3DLab course* at LNGS (aimed to students, professionals and personnel from SME of Abruzzo)
- *AggiornaMenti* (refresher for Middle High School teachers)
- *PID (Programma INFN per Docenti) and IdF* (*Incontri di Fisica)*
  - Refresher for High School Teachers
- *Stages* for outside personnel to learn new techniques (eg. CAD, 3D printing etc, Machine Learning etc.)

Remember: Lifelong learning has (usually) a legal definition

- It has to do with the qualification of the workforce
- This definition can vary from situation to situation (EU funds...national/local funds etc.)

KT, III: *Public Engagement*

What is *Public Engagment?* The short answer is

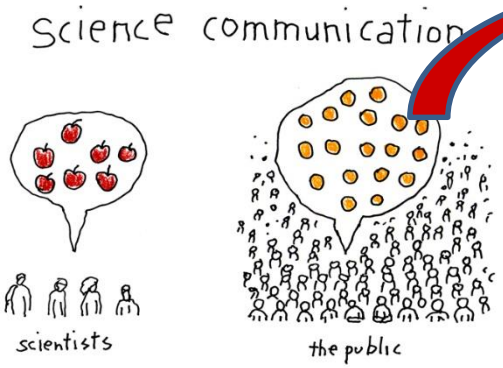
- The «..interactions of experts with non-experts»
  - It implies a two-way relationship, other than that very inclusive

In order to fully understand it, we need a step backward

- In the early '80s, UK science was dealing with a crisis generated by Thachterism recipes/cuts:
  - lack of students, lack of money for research, people escaping from labs due to cuts. There was the chance for a decline
- In 1985 Royal Society publiched the *Bodmer Report* in which outlined the strategy to be followed in order to (re)gain public support. It was based on two assumptions:
  - There is a *knowlegde gap* between scientists and public
  - Public wants to be educated (Public Understanding of Science)

A long story in one slide..

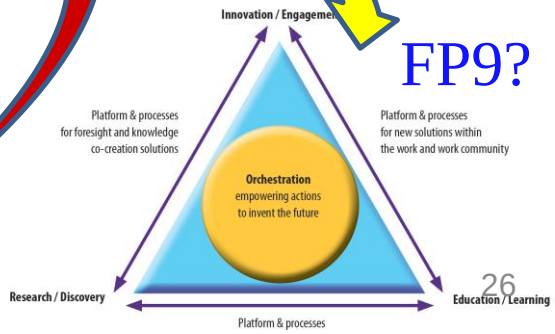
- 1985: Public Understanding of Science



- 2002: Public Engagment in Scienc

- 2011: Responsible Research and Innovation

FP9?



INFN answers to *new* challenges

What did we do?

- Inclusion of TM in our Charter
- Creation of a Tech Transfer Office
  - Set in Amministrazione Centrale
    - Experts on licensing, patents, spin off etc.
- Creation of a National Committe for TT (CNTT)-2012
  - Biasini, Falciano (GE), Lanza, Masullo, Matacotta (UTT), Previtali (chair)
    - Network of local contacts
- Creation of a Coordination Commission for Third Mission (CC3M)
  - August 2016
    - Network of local contact July 2017
- Participation in TM networks (NetVal, APEnet...)
- Recognition of activity for promotion/hiring
  - New rules for exams

These are practices usually found in EU recommendations

- We did it

CNTT

Support to Technology Transfer started in 2011

- TT Office was born (Cino Matacotta, Ilaria Giammarioli, Pierpaolo de Dominicis+Cristina Placido)
  - First period oriented to provide TT (intellectual property, spin-off, collaborative research, Non-Disclosure Agreement..) with necessary internal regulations
- After set-up of CNTT
  - Upgrade of regulations, initiative aimed to explain the value of what we do etc.
  - Launch of dedicated calls (R4I) to bring "ideas" to the readiness level needed for the Market
  - Access to venture capitalists/entrepreneurship funds willing to invest in high-tech
- We now have a wide portfolio of different activities
  - Network of contacts in each unit
  - Dedicated network to Cultural Heritage

https://web.infn.it/TechTransfer/index.php

Some examples

Call Research for Innovation (R4I):

- Two calls already closed:
  - Almost all initiatives acquired/transferred to external partners

Research to Innovation (R2I)

- Network of Italian incubators that will provide opportunities for our SME willing to access CERN-developed technologies (BIC, Business Incubator Centers)

Protocol with Prime Minister Office

- Agenzia per la Coesione Territoriale (Agency for Territorial development) to transfer know-how to SME

Ongoing activities on research in Medical Physics are supported

- Example Spin-Off: Sibylla BioTech

...more on INFN

National Labs have a strong tradition of

- High schools visits (LNL, LNS, LNF, LNGS)
- Programs for HS Teachers
  - Frascati IDF (*Incontri di Fisica*) started in 2001!
- Stage periods for HS students (LNL, LNF)
- General Public

In 2005 we started Physics Masterclasses

  - Today more than 3000 participants among the various inititatives
- This brought us to a closer contact (independent by University activities) with schools
  - HS student stages
  - Request by HST for courses

RadioLab is a nationwide (7-now 11- sites) initiative

- Hands-on measurement of Rn contamination at home/schools etc
  - Started in 2005 (WYP), kept its momentum

Since 2002 we have a web site dedicated to Schools (SxT)

- In 2012 new website, enriched in contents and new editorial board

We explored (mainly through Comm. Office) new ways to tell our science

- tackle the public with special actitivties

New ways to talk Science

Dealing with different publics implies using different languages. Physics can be told in many ways

- L'universo in una scatola (talk with A.Zoccoli+ actor on stage+ music)
- Il Cosmo in un bicchiere (nine designers play with physics concept and ordinary objects)
- FISICHE, FEMMINILE PLURALE Conversazioni di scienza tra donne di scienza tra donne di talento (cond.Serena Dandini, C. Mariotti, V. Fafone, E. Barachini)
- *SPAZIO AL TEMPO I Tutto quello che non avete mai osato chiedere sull'universo* (cond. Neri Marcorè, con A. Masiero, F. Ferroni, G. Fiorillo, jazz: U. Petrilli, letture M.G.Scarcella)

The list can go on for many pages...

What was missing ?

An overall coordinated effort to

- Exploit the (limited) resources at best
  - Increase impact on Italian school system
  - have a clear direction despite the many different initiatives.
    - Do we aim to «best» student?
      or
    - Do we want to bring science to everybody?
  - Overall O(2.5M) students enrolled in Italian HS
- Expand towards different public(s)
  - Yearly (w/o special event) INFN contacts O(60,000) people (0.1% Italian population) but...

Support (strengthen) existing activities

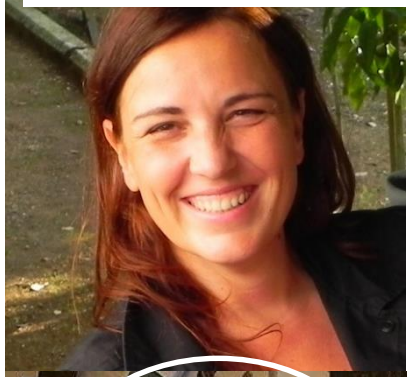
- SxT
- Masterclasses
- RadioLab..
- Participations in Science Fairs..

Link to other Institutions in a close network to enhance the impact on the Italian school system

INFN organization:
Comitato di Coordinamento Terza Missione
CC3M- (2016)- Chair G. Chiarelli

Francesca Scianitti

Uff. Comm



Vincenzo Barone

Franca Masciulli

Giorgio Chiarelli

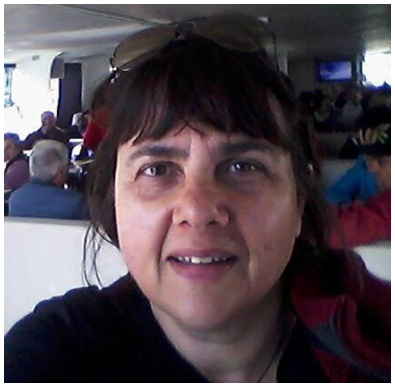
Speranza Falciano

INFN Executive Board

Ezio Previtali

CNTT Chair

Pasquale di Nezza



Maria Rosaria Ludovici from AC follows both Comm.Naz. Trasf.Tecnologico -CNTT- and CC3M

Coordination within INFN

Members of CC3M (ex officio):

- CNTT Chair
- Member of INFN Executive Board
- Representative of Comm. Office

Since late 2017

- One TM contact in each Units
  - Feedback on local initiatives
  - Bottom-up proposal
  - Coordination

First National meeting in Sep. 2017

- Workshop on Hschools activities Novem.
- National Meetings in 2018 and 2019

Call for proposal (budget 2019) in 2018

- First attempt to centrally assign budget to CC3M initiatives

Budget assigned in 2019 and 2020

- Aligned to usual INFN practices in National Scientific commisions

Bari	fabio gargano
Bologna	stefano
Cagliari	viviana fanti
catania	angelo pagano
Ferrara	susanna bertelli
Firenze	adriana nannini
Genova	andrea bersani
Lecce	andrea ventura
Milano S	gianluca alimonti
Milano B	dario menasce
Napoli	carla aramo
Padova	livia conti
Pavia	alessia embriaco
Perugia	elisa manoni
Pisa	sandra leone
Roma 1	giovanni salmè
Roma 2	pino di sciascio
Roma 3	enrico bernieri
Torino	piergiorgio cerello
Trento	christian manea
Trieste	massimo casarsa
Lab Naz Sud	mario musumeci
Lab Naz Gran sasso	roberta antolini
Lab Nazi Frascati	pasquale di nezza
Lab nazionali Legnaro	andrea gozzelino
CNAF	barbara martelli
GSSI	chiara badia
	cecilia pasquinelli

What is the matter of interest?

CC3M deals with initiatives of large (national/regional) impact and/or multistructure. It has budget to:

- Consolidate and coordinate ongoing activities
- Launch new initiatives
  - Pint of Science (PoS)
  - OCRA
  - Fermi Masterclasses
  - SalTo (National Book Fair in Turin)

Some strategic goals:

- Introduce in all activities (self) evaluation mechanisms
  - Possibly performed by external partners
- Differentiate and broaden our public (60K people "touched" every standard year)
  - Joint initiatives with different partners
  - Explore new ways to engage people
  - Connect through different paths

Operation:

- Budget: 300KE since 2017
  - Assigment based as a fraction of the total research budget

Short and partial list

There are many more initiatives than the ones under CC3M

- We are lucky..
- Some common characteristics
  - Wide impact (national/multistructure)
  - Feebdack and peer-review system (ex-ante, in itinere, ex-post)
  - Central support
- I limited myself to the ones running and aimed to students
  - Several are just starting: DARK, INFN_KIDS...
- I will not talk of the IPPOG Masterclass (born in 2005)

I will not talk of Courses organized by UffComm

- Ongoing set of courses launched after a wide survey of INFN research personnel
- Can be interesting for you (increase soft skills with the help of professionals)

Art & Science

First edition in 2016-2018 (EU project, lead by CERN)

Add "Art" to STEM: STEAM movement

- Art and Science mix to produce an innovative way to tackle students interested in art but not in science (and viceversa)
- It is a two-years long activity with a mix of seminars, visits to labs, museums etc. with the aim to produce an art object
  - Group work
- Regional exhibitions of products, and contest, selected winners
  - Stage at CERN (one week), 24 out of 3000

4827 enrolled in 2018-2020 from 90 schools, 200 classes

- 11 exhbitions, 27 winners (globally)
- Final event in Naples, with exhbition hosted by MANN
  - MANN: Museo Archeologico Nazionale di Napoli

2º classificato 2016-2018

Impronte di collisione

Emma Da Re, Alessia Scarpa

*Liceo Scientifico Benedetti di **Venezia***

Venezia 2019-2020

Roma 2019-2020

RadioLab

RadioLab "hands on" activity

- Measuring radon concentration with *simple* instrumentation
- It is a path, to be done in school, at home, in our labs
- Participation to the "International Radon Day"
  - https://web.infn.it/RadioLab/

OCRA

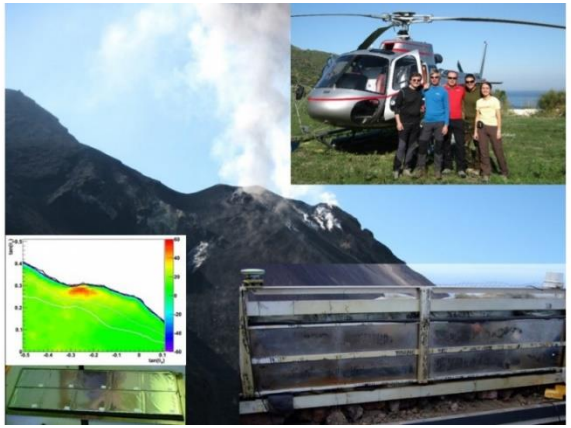
Outreach Cosmic Rays Activities

- Born to create a common initiative out of existing activities
- International Cosmic Day (coordinated by DESY)
  - Selected students participate in a yearly stage

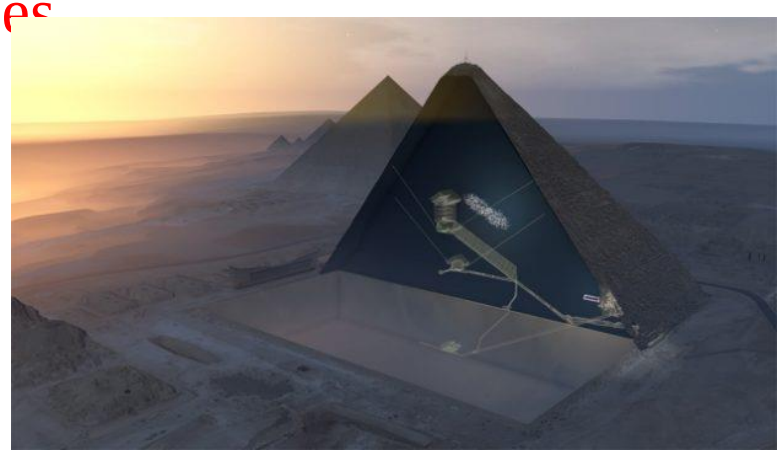
More on OCRA

OCRA is a new experience

- Focus is on the instrument (CR) used to tell science rather than a specific theme
  - CRs are basic for High Schools due to limitation in the use or radioactive sources
  - Cal be used to tell a lot of INFN science
    - Astroparticle
    - Detectors
    - Useful applications (interdisciplinary)
    - ...



- Aim: get together different experiences
  - *low cost* didactic innovative detectors
  - New projects (Auger Masterclass)
  - ....



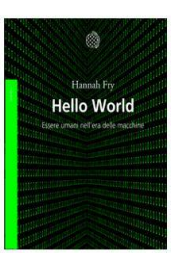
Asimov Award

Born from an idea of F. Vissani:

- Use *popularization* to bring youngsters closer to science

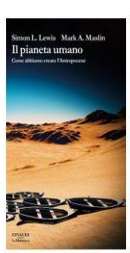
MATEMATICA D'EVASIONE
Claudio Marini

L'URLO DELL'UNIVERSO
Dario Menasce



HELLO WORLD
Hannah Fry

L'ALGORITMO E L'ORACOLO
Alessandro Vespignani



IL PIANETA UMANO
Simone L. Lewis e Mark A.Maslin

2016.Atkins
2017.Burioni
2018.Malvaldi, Herczki
2019. Maffei

PREMIO ASIMOV
4°edizione - 2019

How does it work?

First: five books are selected by a scientific committee

- Scientists, HS teachers etc

Then books are reviewed by students

- Best reviews are winners (3 per region)
- Students vote the best book

Winner announced in April

Event at Salone del Libro in Turin

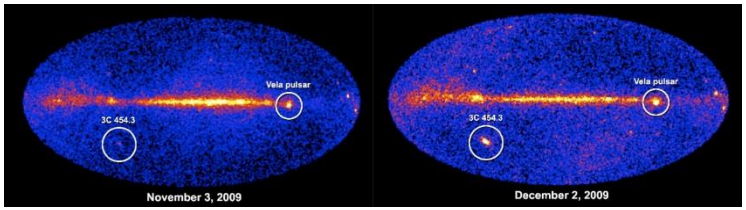
Winner is awarded in a national event

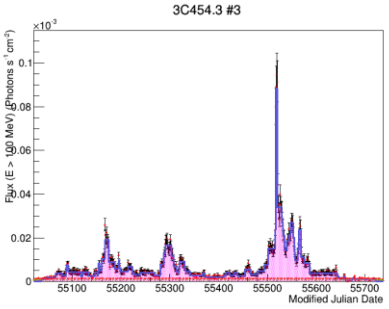
In 2020: 4000 students from 240 schools

Fermi Masterclass

"standard" format:
frontal class in the morning,
exercise after lunch, videoconfering to compare results as closing

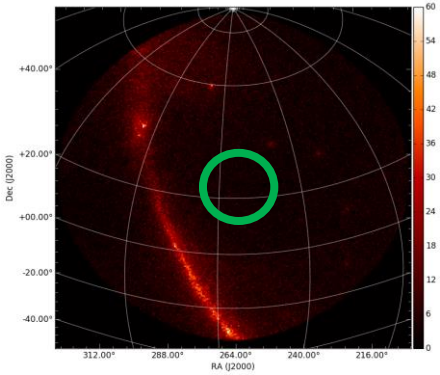
Nel 2017, first edition, main topic the gamma spectrum of the AGN (Active Galactic Nuclei) 3C454.3.

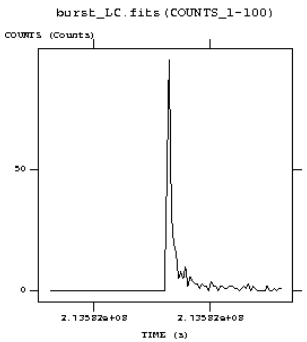


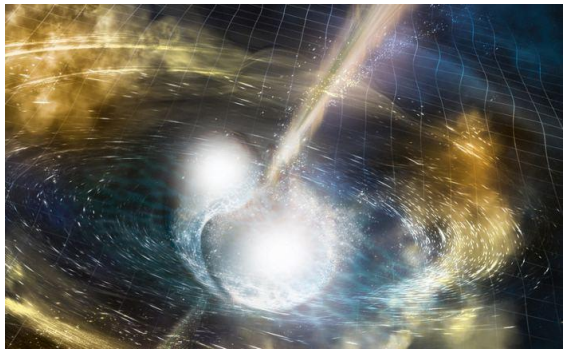


Bari, Perugia, Torino, Trieste+Nova Gorica (Slovenia)

In 2018 study of gamma ray burst (multimesseger astronomy). In this edition videconnection with a senior NASA Scientist



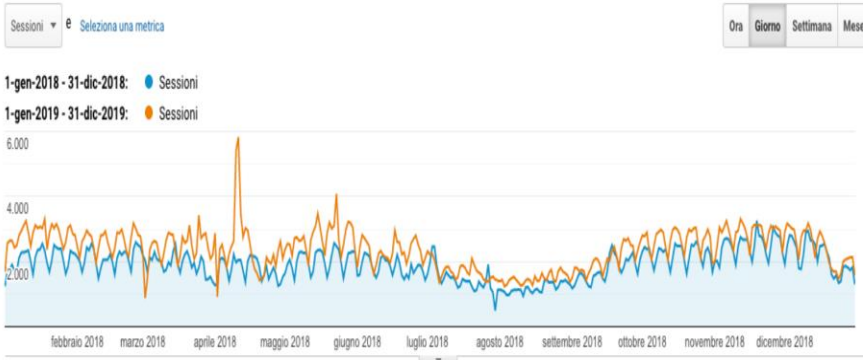




Scienza per Tutti

SxT is the INFN web site for high school pupils. Editorial board made by researchers

- New contents added every 3-4 days
  3.5K cliks/day



Vari aspetti

- *Ask the expert* advice column
- Monthly award
- National yearly award(2020...aperto)
- Thematic paths
- Biographies
- Features
  - 2 minutes wtih...
  - Machines for research (accelerators)
  - Book reviews
- Newsletter

There is a physical activity in fairs:

- Open labs
- Festival di Ferrara
- Salone del Libro Torino (gioco)
- Festival di Genova

Some useful links

- http://scienzapertutti.infn.it/
- https://www.asimmetrie.it/
- http://masterclass.infn.it/
- https://web.infn.it/lab2go/
- https://web.infn.it/RadioLab/
- https://web.infn.it/OCRA/
- https://web.infn.it/RadioLab/
- https://web.infn.it/artandscience/
- edu.lnf.infn.it
  - Incontri di Fisica
  - Incontri di Fisica Moderna
- https://pid.web.roma2.infn.it/
- http://aggiornamenti.to.infn.it/
- https://web.infn.it/CC3M/index.php/it/
  - Qui contatti e rete referenti
- www.infn.it
  - Communication Office

SALONE INTERNAZIONALE DEL LIBRO
Un giorno, tutto questo
10-14 maggio 2018
Lingotto Fiere
31° SALONE INTERNAZIONALE DEL LIBRO DI TORINO

www.asimmetrie.it

Dalla ricerca alla società
Due scoperte da Nobel

Pint of Science 2018
14-16 maggio
matematica
sociologia
biologia
chimica
fisica
astronomia
...e tu quale sceglì?
MR. HYDE
VIA S. FILOMENA 80, CATANIA
OUR BODY
14 MAGGIO ORE 20:30
A CRISPRY SALAD AND A PINT OF GLOWING BEER PLEASE!
UN VIAGGIO NEL MONDO DELLA BIOLOGIA SINTETICA
MASSIMO GALISANO
15 MAGGIO ORE 20:30
ONCOWEB, LA NUOVA BRANCA DELLE FAKE NEWS!
CARLO CASTRUCCIO CASTRACANE
16 MAGGIO ORE 20:30
PASCI DI PARTICELLE AL SERVIZIO DELLA SALUTE
PABLO CERONE
JOYCE IRISH PUB
VIA MONTESANO 46, CATANIA
TECH ME OUT
14 MAGGIO ORE 20:30
QUANTO POSSONO ESSERE PICCOLI I POSTINI?
IVANA DI BARI
15 MAGGIO ORE 20:30
ALLA VELOCITÀ DELLA LUCE ATTRAVERSO I PERCORSI DELL'INNOVAZIONE!
FRANCESCO PRIOLO
16 MAGGIO ORE 20:30
IO, "ROBOT", SONO ABBASTANZA "GRANDE" PER UNA BIRRA?
PAOLO ARENA
THE BOOZER
VIA CAFFI 6, CATANIA
FROM ATOMS TO GALAXIES
14 MAGGIO ORE 20:30
IL GRAFENE: UNA RIVOLUZIONE SCRITTA A MATITA
FRANCESCO TELLERANO
15 MAGGIO ORE 20:30
QUANTO PESANO I FANTASMI?
LUCIANO PANDOLA
16 MAGGIO ORE 20:30
ESPLOSIONI STELLARI: OVVERO COME TI PRODUCO LORO IE NON SOLO CON LE STELLE
MILENA BUFANO
INFN
www.pintofscience.it

INFN

Cheers!
Cheers!
Cheers!

Best Practice

University of Cambridge is the **3M European Champion**

- UoC Has an history of relations with the region and a special focus on the Cambrdigeshire county
  - «This seems to be an aspect related to the role played by the University within the social and economic life of the region, but also related to a peculiar AngloSaxon sense of community that perceives the efforts made by public institutions for Community engagement as an ordinary activity»
    - In Cambridge there is the freedom for individuals to come with proposals and freely pursue their 3M passions

This path to 3M is strongly linked to UoC history:

- In the medieval charter of several English universities (Oxford, Cambridge), the development of the county was part of the academic mission
- This example was inherited, for example, by the *Engaged Universities*, born in the aftermath of the US Civil War (1861-1865)
  - Land in exchange for social-economic development through education

Summary

The traditional mission of Higher Education Institutions is now complemented by

- An active role as a social actor
- A request for accountability of use of resources and choices

Push for change is related to the request from society to improve quality of life

- This definition covers much broader aspects than just economics, therefore nobody in research can (should) retract from this role

Not only the Ivory Tower has gone long ago

- Now citizens want empowerment

Get Involved!

Additional Material

Backup

Readings:

On the historical perspective, some useful readings:

- Vannevar Bush: *Science, the Endless Frontier,* Washington, July 1945
- R.K.Merton *The Sociology of Science*, Chicago 1942, 1973
- Barbara Holland, *Toward a Definition and Characterization of the Engaged Campus*, Metropolitan Universities 2(3), 20-29

On Science and the Cold War there is a very large literature, this book has a wide coverage of different aspects:

- N.Oreske e J.Krige: *Science and Technology in the Globl Cold War,* MIT Press, 2014

On the Third Mission, and the basis for measuring it:

- *Science in Society: a Challenging Frontier*
  www.esf.org
- M. Murphy: *Assessing III Mission Activities*,
  http://arrow.dit.ie/engineduccon/2/
- Green Paper: *Fostering and Measuring III Mission* in HEI *www.e3mproject.eu/docs/*
  - Third Mission Indicator Definition, EU project within the «Leonardo Lifelong Learning Program»
- Jordi Mollart-Gallas et al. *Measuring Third Stream Activities*, 2002 Sussex (Russel Report)
- HEFCE, *Beacons for Public Engagement*, HEFCE 2006/49, webarchive.nationalarchives.gov.uk

An excellent example of "community empowerment":

- https://www.fermilabcommunity.org/

The *triangle of knowledge* and the impact:

- Marku Markula, *The Knowledge Triangle Renewing the University* Culture, in *The Knowledge Triangle*, Pia Lappaneine, Marku Markula eds, 2013

You can find some of them in:

- http://www.pi.infn.it/~giorgio/INFN/3M/
- TT_INFN.pdf (same area) is a contribution by S.Falciano to a collective volume of «policy making» in which our V.P. describes the way INFN TT works.

Does TM collide with CUDOS?

The founding paper on sociology of science is:

The Sociology of Science: Theoretical and Empirical Investigations, Chicago, 1942. In this R.K.Merton describes the set of values on which science is built:

- **communism**:all scientists should have common ownership of scientific goods (intellectual property), to promote collective collaboration; secrecy is the opposite of this norm
- **universalism**: scientific validity is independent of the sociopolitical status/personal attributes of its participants
- **disinterestedness**: scientific institutions act for the benefit of a common scientific enterprise, rather than for the personal gain of individuals within them
- **organized scepticism**: scientific claims should be exposed to critical scrutiny before being accepted: both in methodology and institutional codes of conduct

Somehow innatural for science define "property"