

EDUCATION, OUTREACH & PUBLIC ENGAGEMENT

CLAIRE ADAM - BOURDARIOS





COVID : MEMORIES, LEGACY & LESSONS ?

KEK50th Openhouse 2021



- Sep 04 & 05, 2021
 - ▶ YouTube Live
 - + niconico (ニコニコ生放送)
 - ▶ Total visitors : ~33k
- cf) : previous (=in-person)
 - ▶ 3000 - 5000 visitors / day

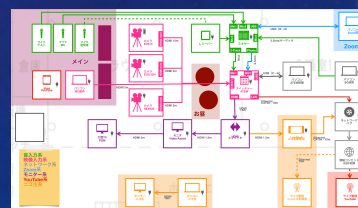
Reached 10x more people than usual



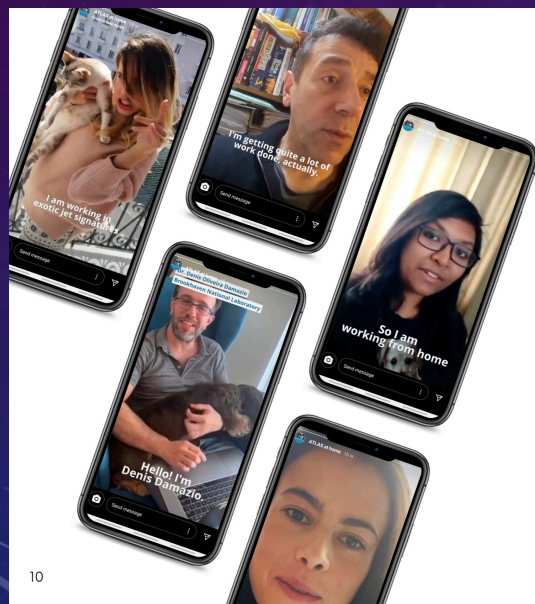
Series of KEK 50th Related Events

- Kick-off Ceremony (Apr. 2021) Anniversary Since 1971
- Public Lectures (Jun. / Jul. / Oct.)
- Openhouse (Sep.)
- Memorial Ceremony (Nov.)
- Memorial Symposium (Nov.)
- KEK Concert (few times a year) → Cancelled
- Echoes of Science and Music (every Nov.) → Cancelled
- KEK Science Cafe (every Fri.) → Cancelled

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COMMUNICATION : THE HUMAN FACE OF HEP



Sharing the human side of ATLAS

Launched a social media campaign sharing short clips from ATLAS people working from home.

Members shared their experience & offered some solidarity during the start of the quarantine.

Format & Features

6 video compilations featuring:

- 22 ATLAS members,
- 2 canines
- 3 felines!

Videos adapted to fit vertical Instagram and square Twitter/Facebook.

(Live) Video

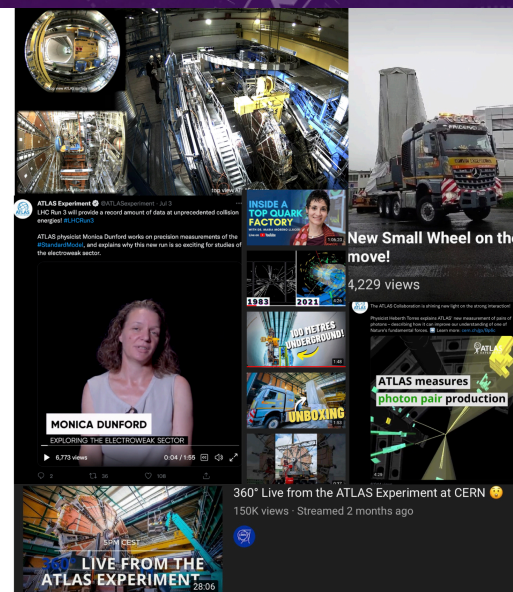
Taking advantage of **algorithm push** for video content from creators. Live videos and events give our audience a change to **engage with us directly**.

Recent examples include the extensive coverage of the ATLAS new small wheel installation and transport:

- Youtube: [360 live event](#) with CERN (160k views)
- Tiktok: Live stream of unwrapping
- Instagram: [Live coverage & Q&A of transport](#)
- multi-platform: 2 post-event Videos of [unwrapping](#) and [descent](#).
- internal events: live stream of descent and section during weekly to unwrapping.

Youtube Live lecture series, [Open Virtual Visits](#) & [LHC Restart](#) & Higgs10 Instagram live

#Physicistsathome



Adapting science to social media

New strategies for COVID

In March 2020, we adopted a completely new social media and content strategy. Focus turned to sharing resources and multimedia, and providing solidarity during start of quarantine period.



ALICE VIRTUAL VISITS



... after years of doing ad-hoc virtual visits with personal laptops or phones

Installed video-conferencing equipment inside the ALICE Run Control Centre (ARC)

+

one fixed camera (to show the speaker) one robot camera (with preset positions showing ARC, big screens, ..)

When CERN returned to "normality" after the first lockdown virtual visits became the norm

Dedicated mobile equipment for cavern visits

- Samsung mobile phone with good camera
- Gimbal (stabilizer arm)
- Headphones paired with the phone



ALICE outreach and educational activities

3



~ 160 virtual visits since 2013
~ 110 virtual visits since September 2020
> 35 countries reached
Some thousands of people

In: English, French, Italian, Spanish, Greek, Portuguese, German, Czech, Russian, Polish

*Obvious benefit :
multilingual !*

Virtual/Open Visits

Longstanding Outreach programme , connecting visitors to ATLAS scientists in the ATLAS control room or in the ATLAS Cavern ([click here](#) to learn more)

Key stats for 2021:

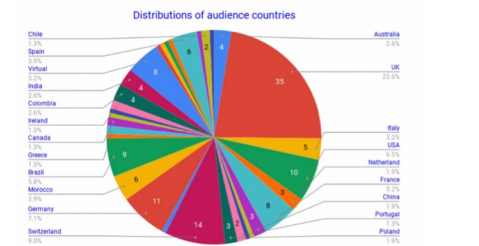
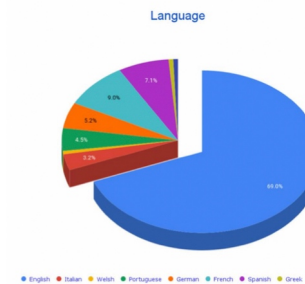
- 155 visits (152 from underground)
- Visits in 33 countries across every populated continent: from Australia to Venezuela!
- Groups range from 10 to 500 visitors, with highly diverse participants

In 2021, launched Open Visits for single visitors to join. 7 held in 2021 on zoom, 4 on Tiktok.

In 2022, ATLAS held its first Open Virtual Visit on Youtube - engaging directly with audience.



Map of participants in 2021 Virtual Visits (excluding Open Visits)



MASTER CLASSES : ADAPT ?

Worldwide Outreach Program

- Organized by IPPOG (International Particle Physics Outreach Group)
- Every year in spring, 7 weeks around March
- 220 research labs from 60 countries
- 2019: 15.000 high school students



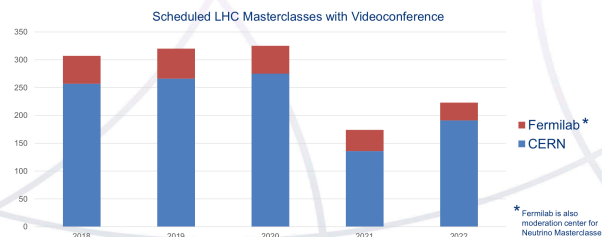
09.07.2022

ICHEP



Coordination: Ken Cecire

Impact of the pandemic on attendance



09.07.2022

ICHEP 2022, Bologna



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Online Version of Masterclasses

- 👍 Reaches more people
 - Open to students without regional restriction
 - Tutors and moderators could engage from everywhere
- 👍 Increased interaction during videocon
 - All students involved via polls
 - Lively discussion and many questions via Q&A function
- 👎 Webinar style lacks personalization
- 👎 Increased coordination and support effort

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*Plan to continue both styles,
but strictly separated*

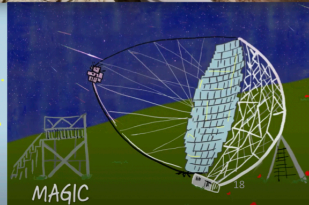
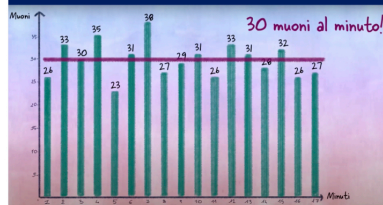
5

NEW SKILLS !?

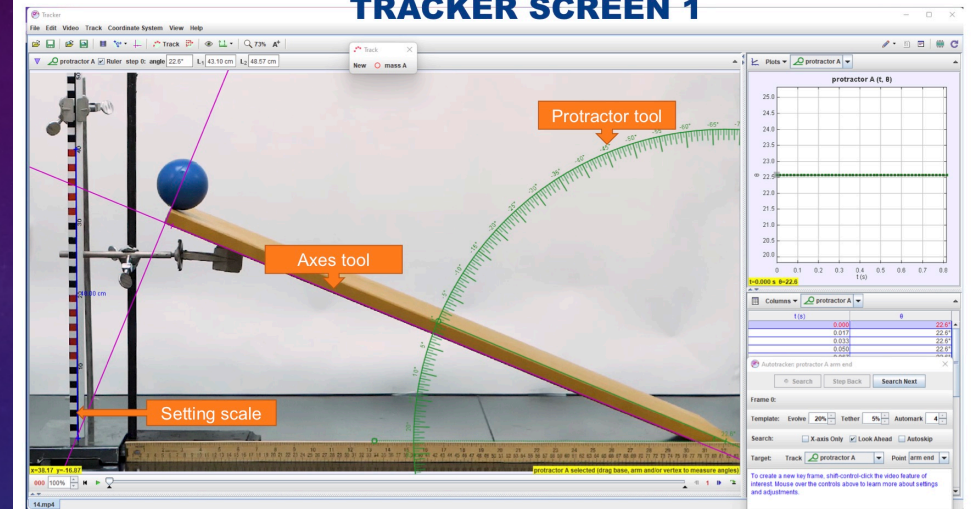
La Fisica tra le Onde – narrative structure



1. Every day situation
2. Question
3. Experiments
4. Explanation and history
5. Current INFN experiments



TRACKER SCREEN 1



Will continue, as online presence is a must + excellent training



Reconnect



THE E&O COMMUNITY
REMAINED CONNECTED
AND IS IN EXCELLENT
SHAPE



30 talks

14 posters

4 round tables

Audience of ~ 40 people
over the full // session

Food for
thought

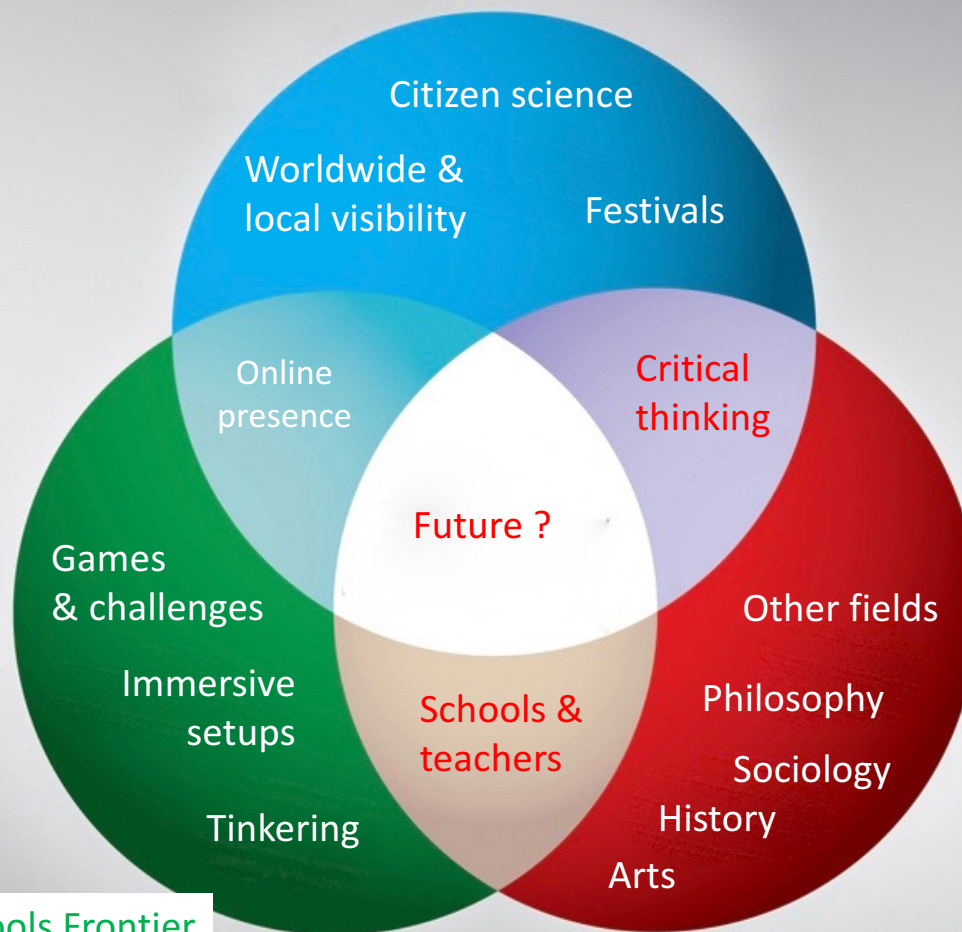


3 FRONTIERS TO WORK ON

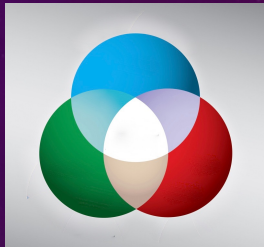
Education & Outreach overview - Claire Adam

XXI Century Tools Frontier

Public Engagement Frontier

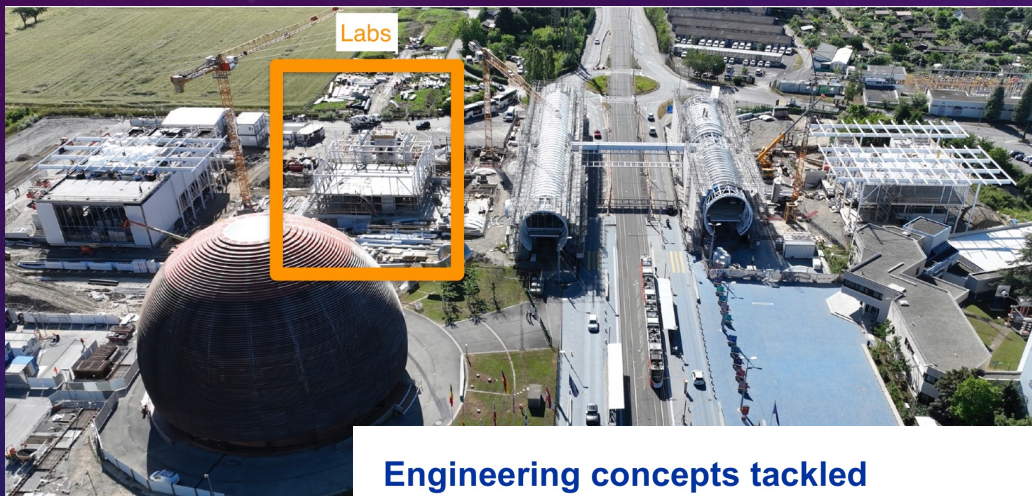


« Science is part of culture » Frontier



XXI Century Tools Frontier

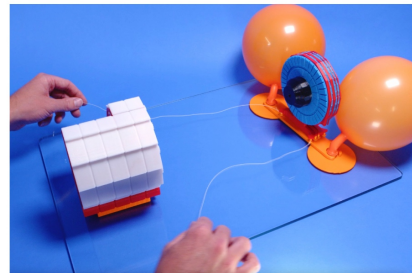
ESCAPE GAMES, TINKERING, HANDS ON



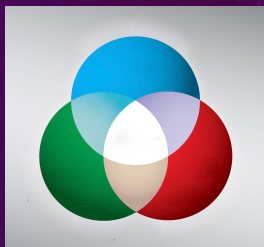
Answer: Air pads!

Engineering concepts tackled

- Design, Build, Test
- Tinkering
- Optimisation (e.g. which air flow rate, how much mass per pad, ...)
- Operator control (e.g. alignment challenge, cooperation challenge, ...)



Game n. 1:
How many meters did
the elevator go down?



XXI Century Tools Frontier

IMMERSIVE EXPERIENCES

HANDS-ON /
DEMOS ACTIVITIES

EDULAB

EXHIBITION AREA

LISTENING TO THE COSMOS

SEEING THE INVISIBLE

THE GIFT OF MASS

FROM RESEARCH TO SOCIETY

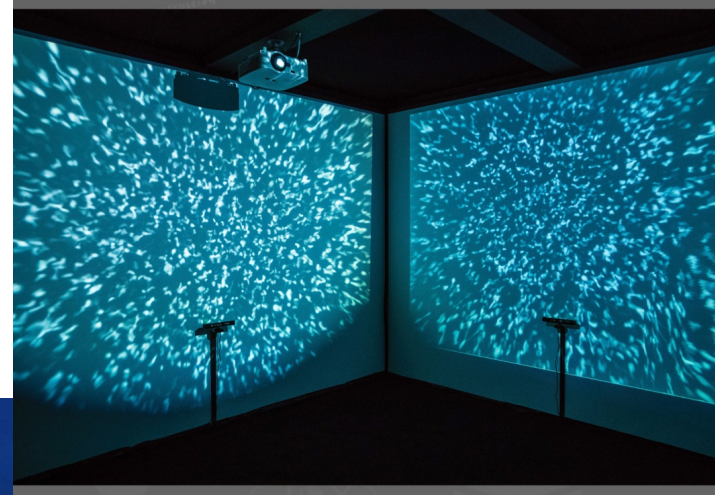
ACCELERATING PARTICLES

Bruno
Touschek
visitor centre
Laboratori Nazionali di Frascati - INFN



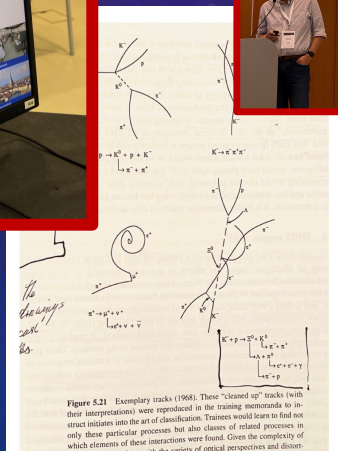
AdA mockup

The gift of mass – art installation

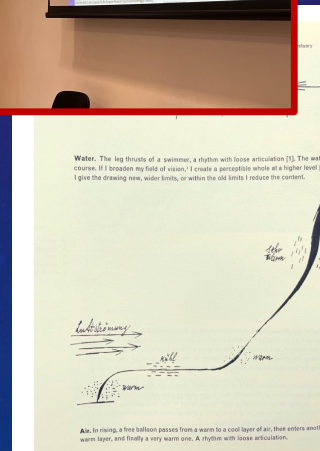




EXPERTS IN « NATURAL SKILLS » : ARTISTS

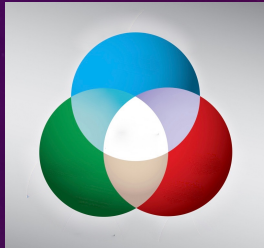


Enrico Fermi, Particle identification training



Paul Klee, Bauhaus lecture notes



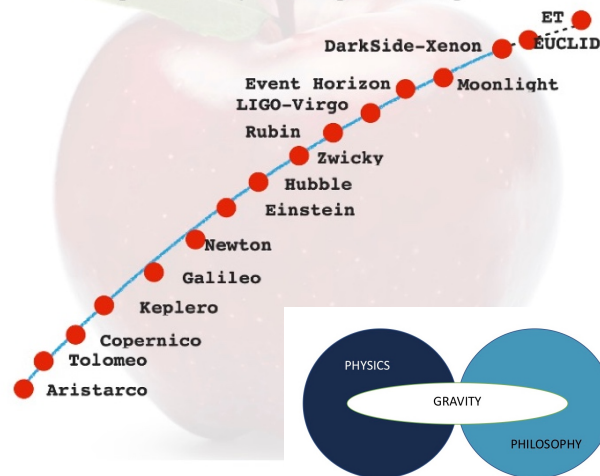


« Science is part of culture » Frontier

EXPERTS IN « DIALOGUES » : PHILOSOPHY & SOCIOLOGY

GRAVITAS

Cultura e scienza nei secoli tra grandi scoperte e grandi enigmi



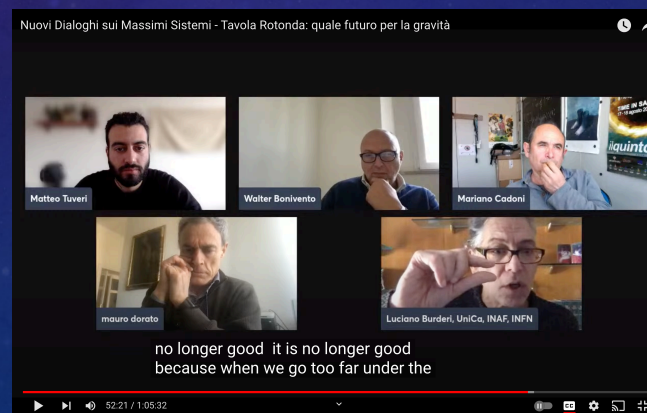
First contest

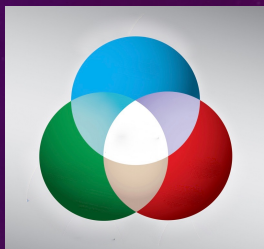
- 120 schools participating
- more than 830 students were involved
- Videos were the preferred media chosen by students (58%)

Reference: *Students' Vision and Representation of*
S. AVVEDUTO, G. DIONISIO, Ilaria DI TULLIO, S. LEONI
DOI: 10.3217/978-3-85125-668-0-17

GENERA UE Project in short

- GENERA Acronym: Gender Equality Network in Physics in the European Research Area
- Horizon 2020 Project ---- Funded under the call GRI.4.2014
„Support to research organisation to implement gender equality plans”
- Sept. 2015 – Aug. 2018
- **Unique selling point: Field-specific approach “from physics for physics”**
- A multidisciplinary approach: partnership composed by European Physics and Sociology Institutions
- Network out of 13 beneficiaries:
 - 11 physics related organizations
 - 2 professional support organizations for evaluation and outreach & valorization
 - More and more observers (2 => 18)





« Science is part of culture » Frontier

EXPERTS IN « WHAT OUR PUBLIC LIKES » = KIDS !

To draw experimental Physics near to kids... INFN

2021 – Energy

10 videos (5 min) on Facebook and Youtube
8-11 years old
YB e FB INFN + RAI Gulp



2022 – Cosmic Rays

5 videos + 5 live streaming Q&A
middle schools + V elementary school



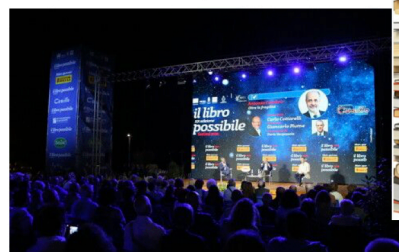
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Cecilia Collà Ruvalo, INFN Communications Office

The Asimov Prize at cultural events and fairs

“Il libro possibile”

Polignano a Mare (7-10/7/2021)



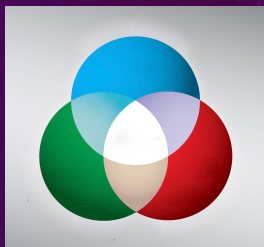
“Turin International Book Fair”
Turin (14-18/10/2021)

Two Cultures, one Prize

After seven successful editions, the Asimov Prize has proved –once more– that the old “Two Cultures” legend (1959 *Rede Lecture* by C. P. Snow) can be today considered as definitively dispelled. Literary intellectuals and scientists are *not* in conflict, as the apparent divide between **Science** and the **Humanities** is now fully outdated by the youngest generations.

Students involved in the Asimov Prize gain a new perception of scientific literature, coming into a fresh-minded contact with science and technology subjects through an **innovative approach** and developing a deep critical and conscious judgment.





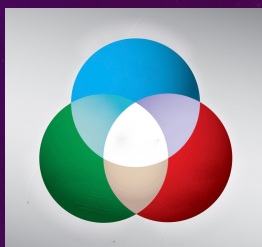
Public Engagement Frontier

TRADITION : FESTIVALS



Education & Outreach overview - Claire Adam








Public Engagement Frontier

STUDENTS + TEACHERS => PARENTS ?



The E.E.E. Project



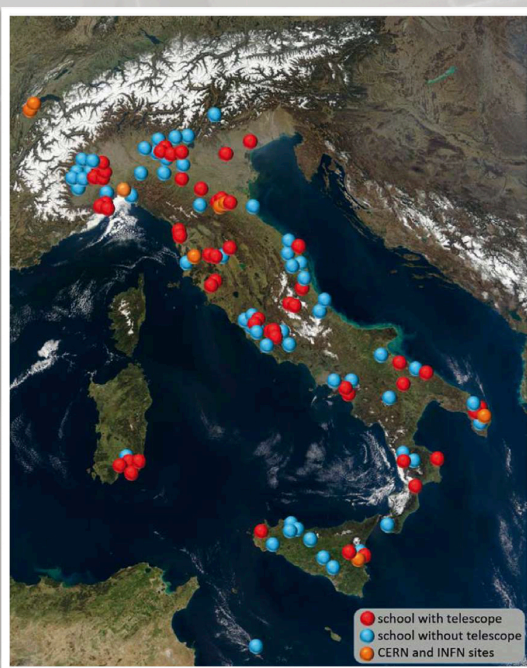
**The Extreme Energy Events Project is a
Centro Fermi & INFN Experiment
with dual role**

- **Cosmic ray experiment:** detection and study of cosmic rays at ground
- **Scientific Education:** involve high school students in all the phases of the experiment

It is constituted by a network of **60 muon tracking telescopes** installed inside **Italian high schools, INFN laboratories, Centro Fermi and CERN.**

Many other High Schools participating **without telescopes**



Hundreds of students working in the EEE experiment each year!




● school with telescope
● school without telescope
● CERN and INFN sites

M. Garbini, ICHEP 2022, Bologna

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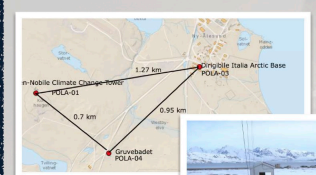
PolarquEEEst




The data collected during the **Polar Quest 2018 mission** have been used to study the cosmic rays flux vs latitude.


Thanks to the collaboration with CNR in 2019 we installed three detectors in the CNR arctic base at NyÅlesund (Svalbard) to study extended air showers at the extreme latitudes.

Data from the PolarquEEEst mission are available for students analyses and are used also in EEE masterclasses.



POLA-01
 POLA-03
 POLA-04

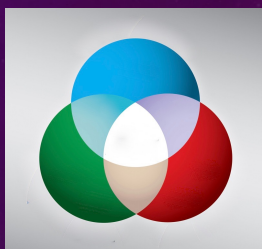




POLA-01
 POLA-03
 POLA-04

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Public Engagement Frontier

AUGER : LOCAL COMMUNITY CONNECTION

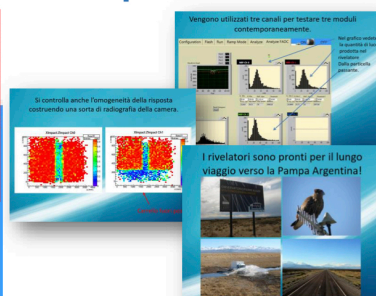
The Upgrade of the Observatory – cooperation with students



The testing phase



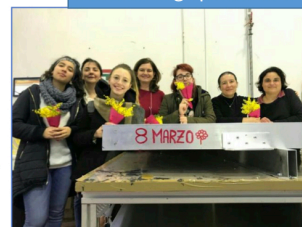
1 or 2 weeks activity



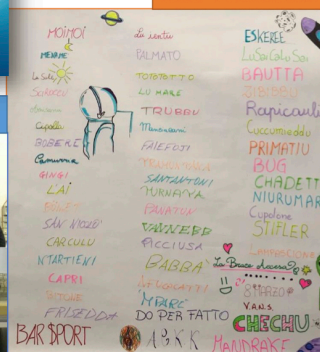
The REPORT: Presentation of the results and their work to the researcher.



Celebrating special DAY

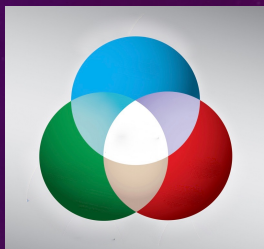


#SSD Nicknames



Every year in November happens the Malargue Day Parade. Students, (pre-)schoolchildren, teachers, nurses, dancers, all kind of sportclubs, gauchos, as well as the Pierre Auger Observatory parade the main street of Malargue!





Public Engagement Frontier

CITIZEN SCIENCE @ EU SCALE !

4 DEMONSTRATORS

Gravitational Wave noise hunting

Deep Sea Hunters

Search for New Particles at the LHC

Interdisciplinary studies with Geoscience and Archaeology

REINFORCE

High-Level Roundtable and Interactive Workshop

Opening Research Infrastructures
How citizens can play an active role in the advance of ground-breaking research?

24th March 2022
15:00 - 16:30 CET

Claudia Fabó Cortes
Project Officer of ECSA
European Citizen Science Association

Emmanuel Tsamellis
Senior Physicist, Head of Relations with Associate Members & Non-Member States (CERN)

Marina Manzoni
Policy Officer at European Commission

Stavros Katsanevas
REINFORCE Project Coordinator

Francesco Mureddu
Director at The Lisbon Council

REINFORCE

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REINFORCE
Research Infrastructures FOR Citizens in Europe

International Training Course
Citizens Support the Optimization of Large Research Infrastructures in Physics

PROGRAMME
July 10th - 15th, 2022
Attica, Greece
<https://indico.ea.gr/event/24/>

Organized by
ELLINOGERMANIKI AGOGI

REINFORCE
REsearch INfrastructures FOR Citizens in Europe

The REINFORCE project

How Citizens can play an active role in ground breaking research ?
9 July 2022
Stavros Katsanevas , REINFORCE Coordinator

© Copyright 2019 – This project has received funding from the European Union's Horizon 2020 project call H2020-SW4-018-2020 funded project Grant Agreement no. 872869

REINFORCE WP2,8,9 and 10 Close Monitoring and impact assesment

CERN/ATLAS

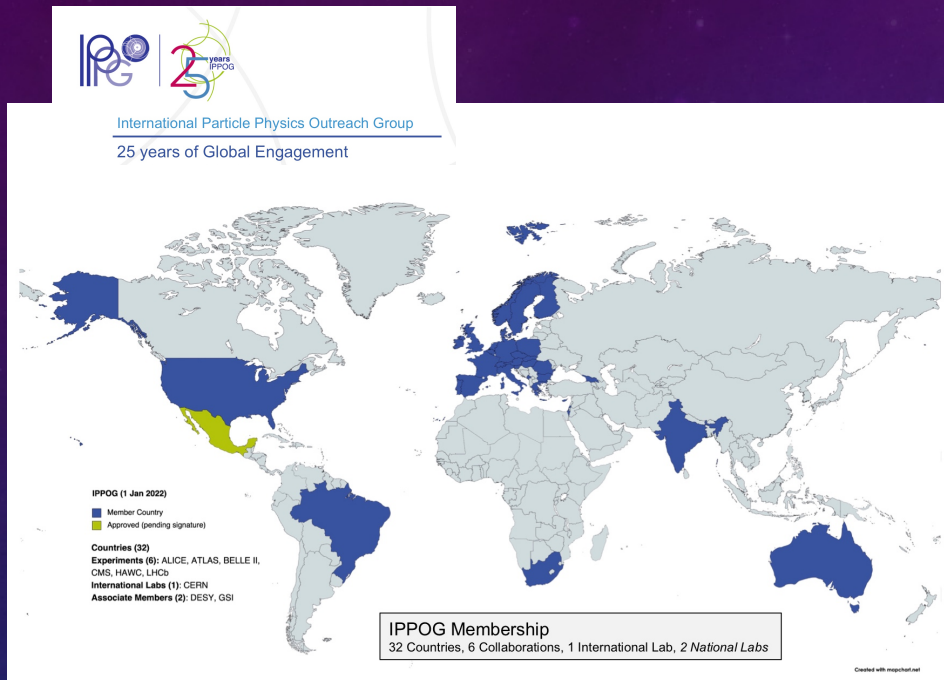
Engagement Metric	Value
Total number of users	1,000
Total number of publications	100
Total number of comments	50
Total number of events	10

EGO/Virgo

Engagement Metric	Value
Total number of users	1,000
Total number of publications	100
Total number of comments	50
Total number of events	10

Challenge to support our scientists complete their r in the Easter Challenge you will have the chance to for the REINFORCE International Training Course this

BEHIND THE SCENES : HOW DOES IT WORK ?



Education & Outreach overview - Claire Adam



The INFN Experience in Supporting and Improving HEP Outreach

Giorgio Chiarelli
INFN-Sezione di Pisa



Scientific Collaboration and education at a global scale

Science and higher education globally distributed, collaborative and multidisciplinary



LA-CoNGA physics

¡SÍ, BUENA BIEN!

WE ARE BACK 😊

BUT...



Communicating the next collider



M Chalmers, CERN, ICHEP 09/07/22

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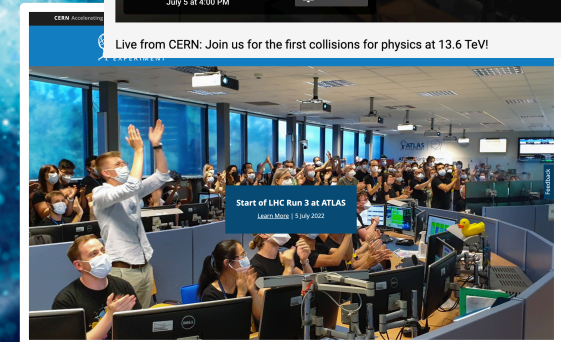
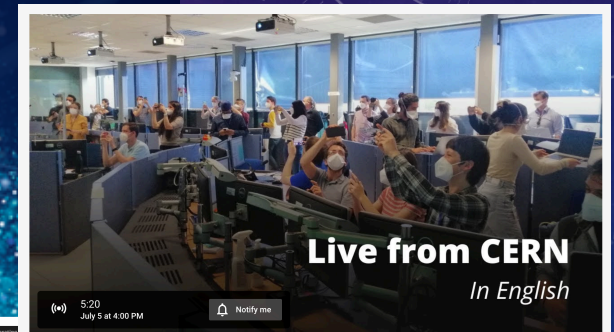
CERN COURIER

July/August 2022 cerncourier.com Reporting on international high-energy physics

THE HIGGS ENIGMA



MARKING 10 YEARS OF DISCOVERY



FUTURE ?

The Higgs "has something to tell us"
Beginning of a new era

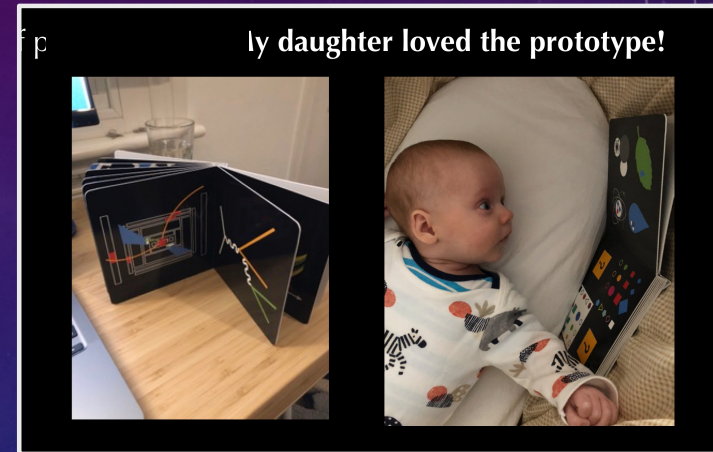
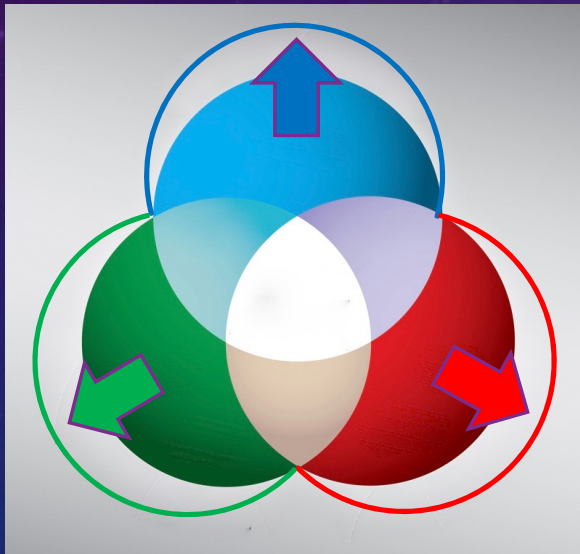


Many challenges ahead of us:

- Sustainability & environment
- Getting young scientists on board & visible
- Trust in science ?
- Worldwide & diverse community

TAKE AWAY MESSAGE :

WHATEVER HAPPENS...
WE'LL BE THERE FOR YOU !



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Particle Physics
for Babies
*Outreach for the youngest
audiences*

Louie Corpe (CERN)
*Outreach round table
activities for young audiences and kids*