



HEPscape!

The high energy physics escape room

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<https://web.infn.it/hepscape/en/>

<https://www.instagram.com/hepscape/>

<https://www.facebook.com/hepscape>





Outreach & communication



for students



for teachers



internships and visits to laboratory



websites, journals and social media



exhibitions

What is an Escape Room?

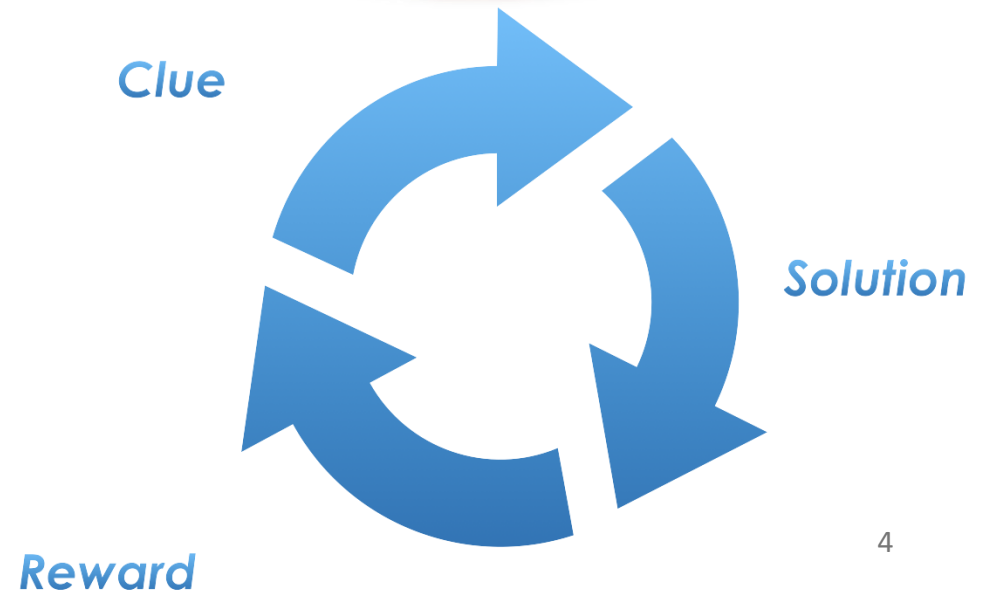


- An escape room is a treasure hunt indoor, with clues hidden in a room
- In principle people should be trapped in the room until they find all the clues and manage to open the door within a given time limit
- The clues are chained one after the other
- A facilitator can guide the team and help them to proceed if they are stuck

- Escape rooms have become popular among teenagers, as well as a team building exercise among co-workers

Escape Room as an outreach tool

- The **theme** of the room can be historical, scientific or investigative → one can use the theme of the room as a teaching environment
- The solution of a puzzle release the next clue in a dynamic and **rewarding** way → immediate feedback and learning experience
- Escape rooms have been adopted also for **scientific teaching**, see for example [here](#)
- The idea is not to teach every single detail of the topic, but rather to inspire curiosity, transmit our passion and show that science is fun and cool



Escape Room Methodology

Activity diversified
by age

Parallel concepts, autonomy
and mastering technique

Higher involvement
w.r.t. frontal teaching

Out-of-the-box
thinking

External stimulation
and challenges

Team work

Advanced skills: organization,
memorization, logical thinking,
patter recognition,
compartmentalization.

4Cs: Critical thinking,
Cooperation, Creativity,
Communication

Modern learning requires the 4C skills



Escape rooms require critical thinking and thinking out-of-the-box, collaboration, communication within the team, try new approaches → they make use of the 4C

- CERN open days 2019, escape room by A. Apollonio et al. at P4
- CERN CMS high school students' stage escape game by D. Barney et al.
- There are other examples of escape rooms on physics, for example [here](#)



Escape room "Operate the LHC"

P4.22 · Play · Point 4 - LHC

You're the engineer-in-charge of the LHC control room. Before your shift ends, you will have to accelerate the two particle beams, maintain their trajectories with powerful magnets, and make the beams collide. Will you successfully complete the LHC run? Maybe find new particles? Play this escape room to find out.

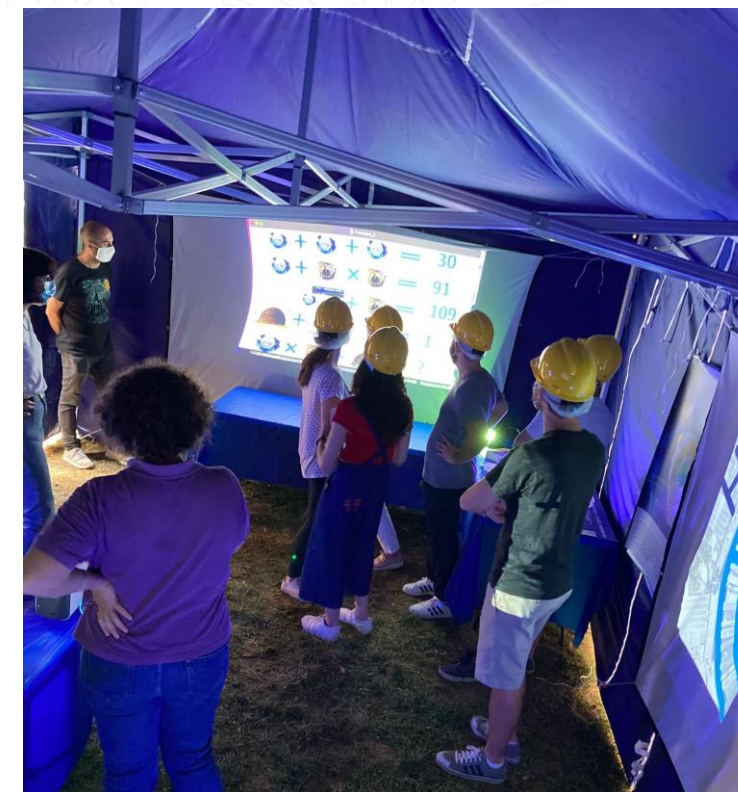


Recommended age

12

the HEPscape! project

- In 2021 a group from INFN Rome participated to a call for proposals for outreach initiatives and built the escape room called HEPscape!
- Initially it was presented at the European Researcher's Night and then to Genova Science festival and many more events since then
- <https://web.infn.it/hepscape/en/>
- We now have 3 kits: in Rome, Padova and Perugia



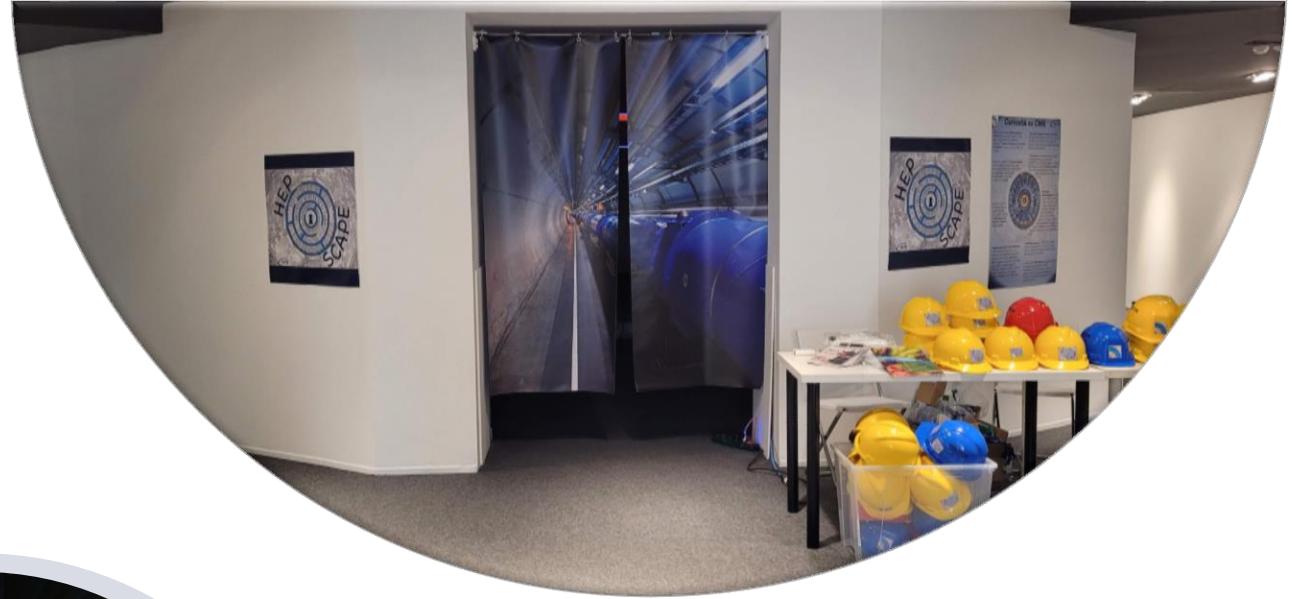
HEPscape story

- HEPscape simulates a visit to one of the LHC experiments
- The visitors are told that they are going underground, and so they must wear the safety helmet.
- They enter the control room, but something breaks, there's an alarm sound, and they must understand how the LHC and the detectors work in order to restart it

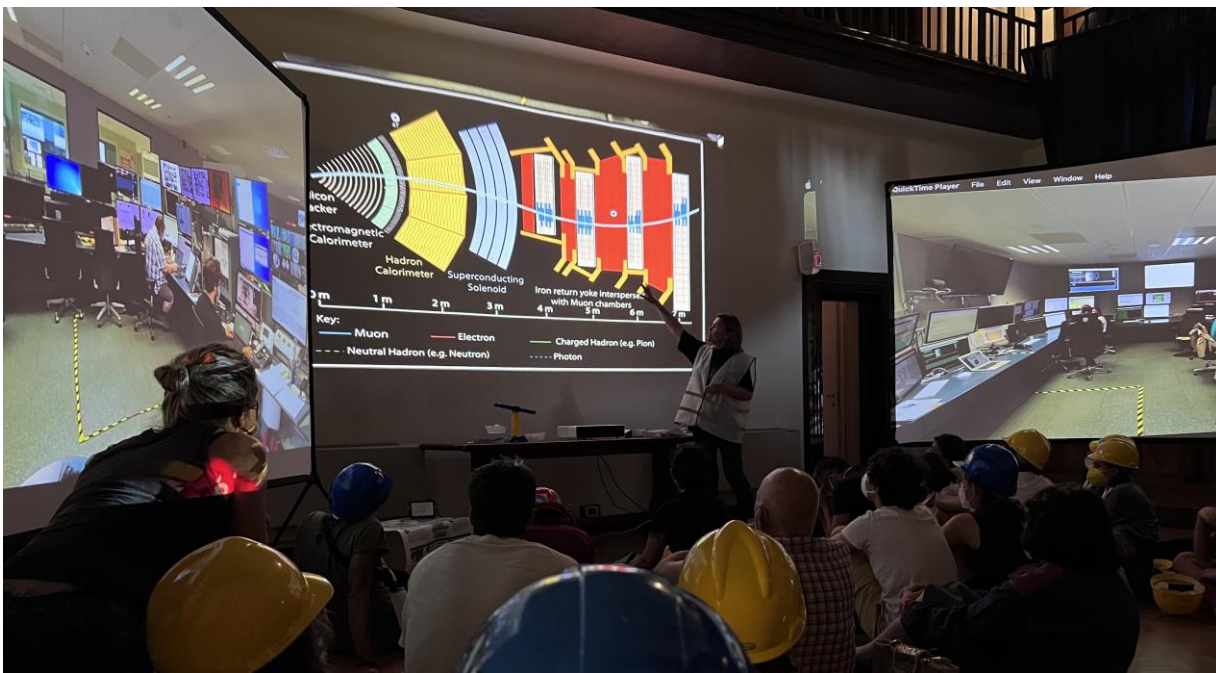


HEPscape Set-up

- HEPscape can be installed indoor in a room 6x6 m²
- The material can fit in a small van
- Outside the main room we install a desk with the helmets
- A group can be as large as 25-30 visitors (one school class)
- The activity lasts ~ 40 minutes







Bologna - ICHEP - 2023



Valle d'Aosta – in a school for La Thuile Conference - 2024



ERN - Roma - 2021

Adaptable to different locations



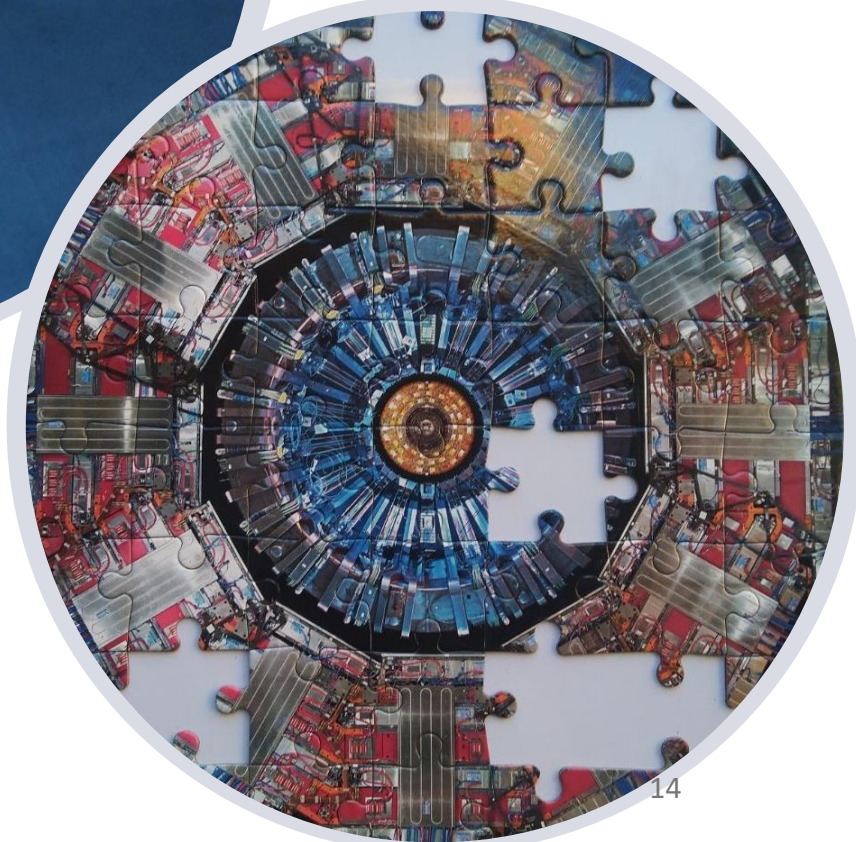
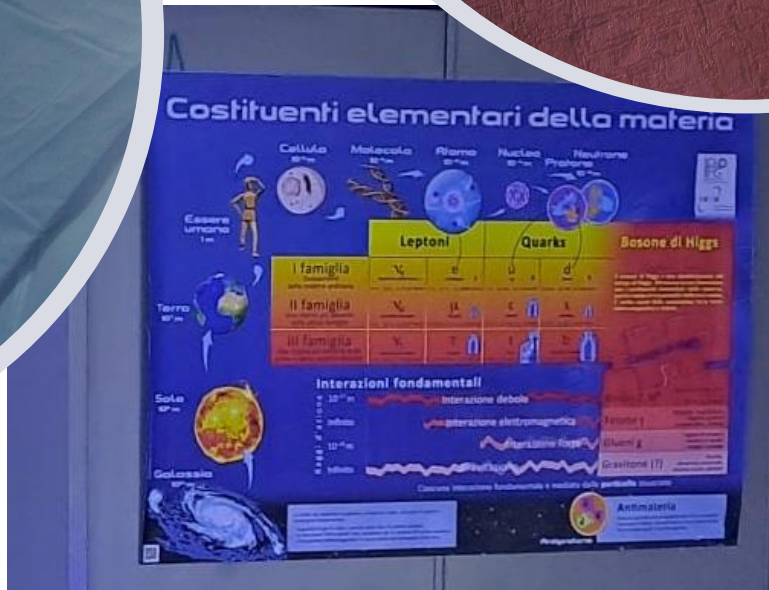
Frascati – OpenLabs -2023



The HEPscape room

- We have 3 projectors and many LED lights
- The visitors play games and quizzes. The clues are hidden in the room. The posters and books in the room contain all the information needed to solve the games.
- The games are adaptable to the age of the group: 3 age groups: kids (6-8), juniors (9-12), adults (13+).
- If the group is small (10-15 people) and if they are older, they can play autonomously, and the guide only tells a bit about the scientific content. Otherwise, the guide has a more active role.
- During the activity, we give a badge that visitors can keep, and on the back of the badge, there is a QR code that leads to our website with more information about particle accelerators.





behind the scenes



- The 3 projectors are controlled by a PC with a video wall.
- There are 6 LED lights that are used to guide the visitors' attention and are controlled via Bluetooth from a tablet.
- To operate the escape room, at least 3 people are needed per shift (a guide, an assistant, and a director).
- It takes 5-10 minutes to reset the games between shifts.





The group facilitator: learning to communicate

- The people who run the escape room are physics students, graduates, doctoral candidates, and young researchers.
- Thanks to this activity, they learn to speak in public about the science they work on, using simple terms understandable by the public, and to communicate their passion.

HEPscape exit: social media and satisfaction test

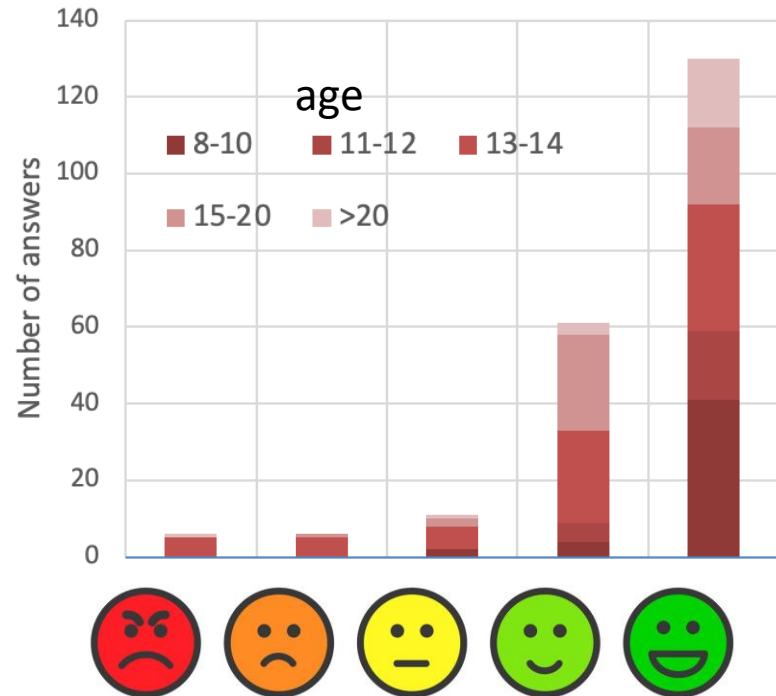
- photo and Instagram photo boot: [@hepscape](#)
- Satisfaction test: age, score, free comment



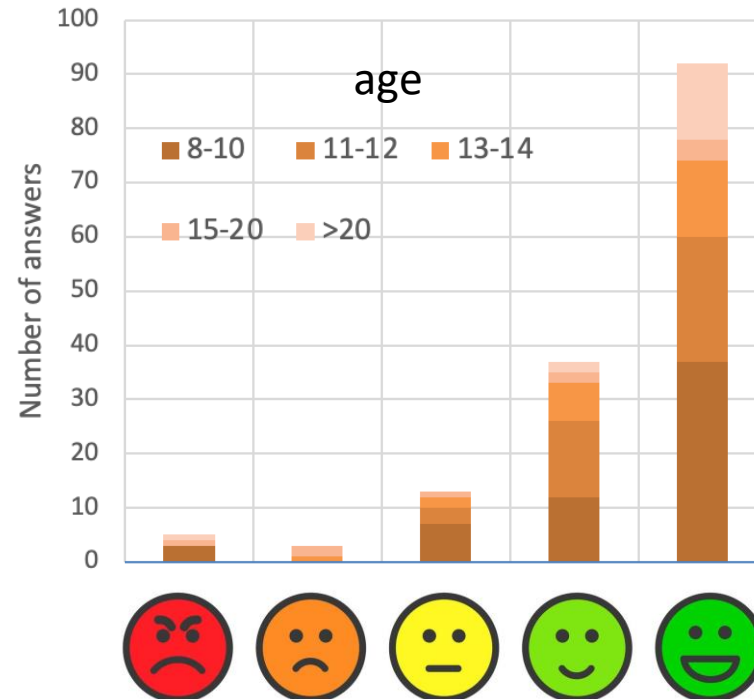
Satisfaction test results

4,4

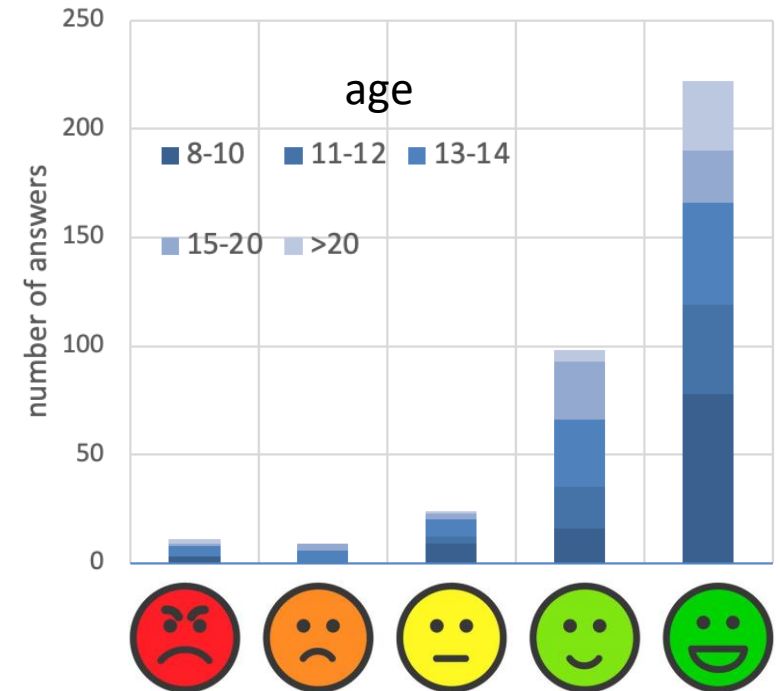
schools



mixed groups



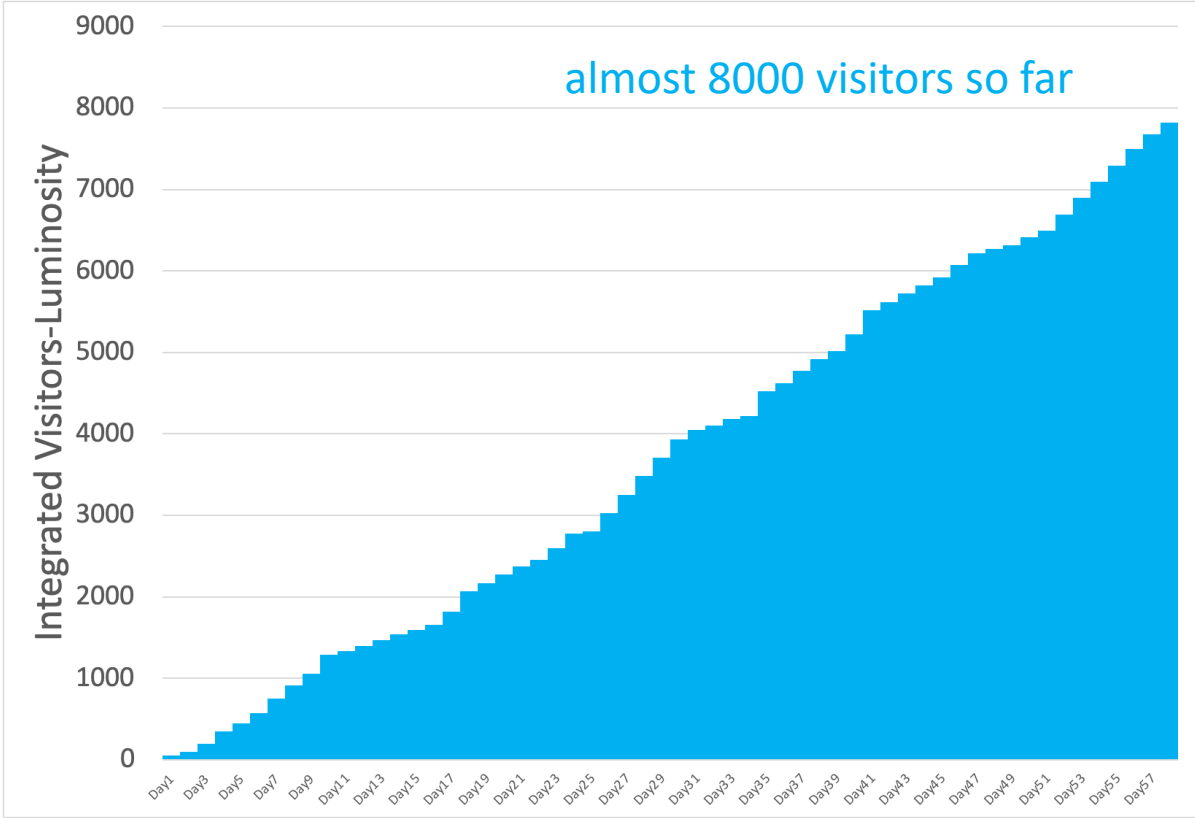
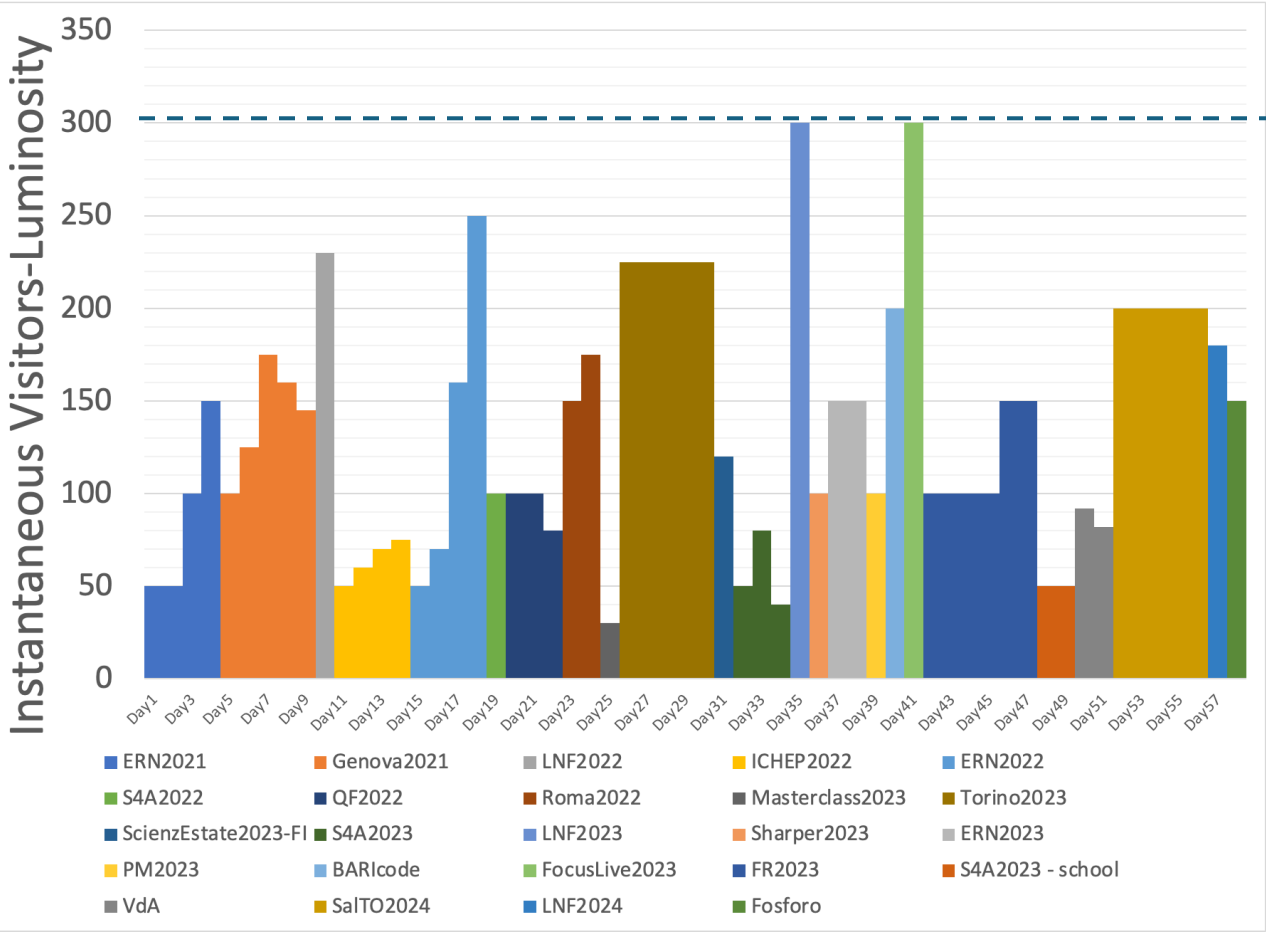
total



New results from Torino book festival 2024
with new videos, and more autonomous games

Types of events and number of visitors

Types of events: ERN, science festivals or other fairs, open day, outreach activity associated to a conference



We can host an average of 150-200 visitors/day, with peaks of 300 visitors/day during the ERN



How to increase the diversity of our visitors

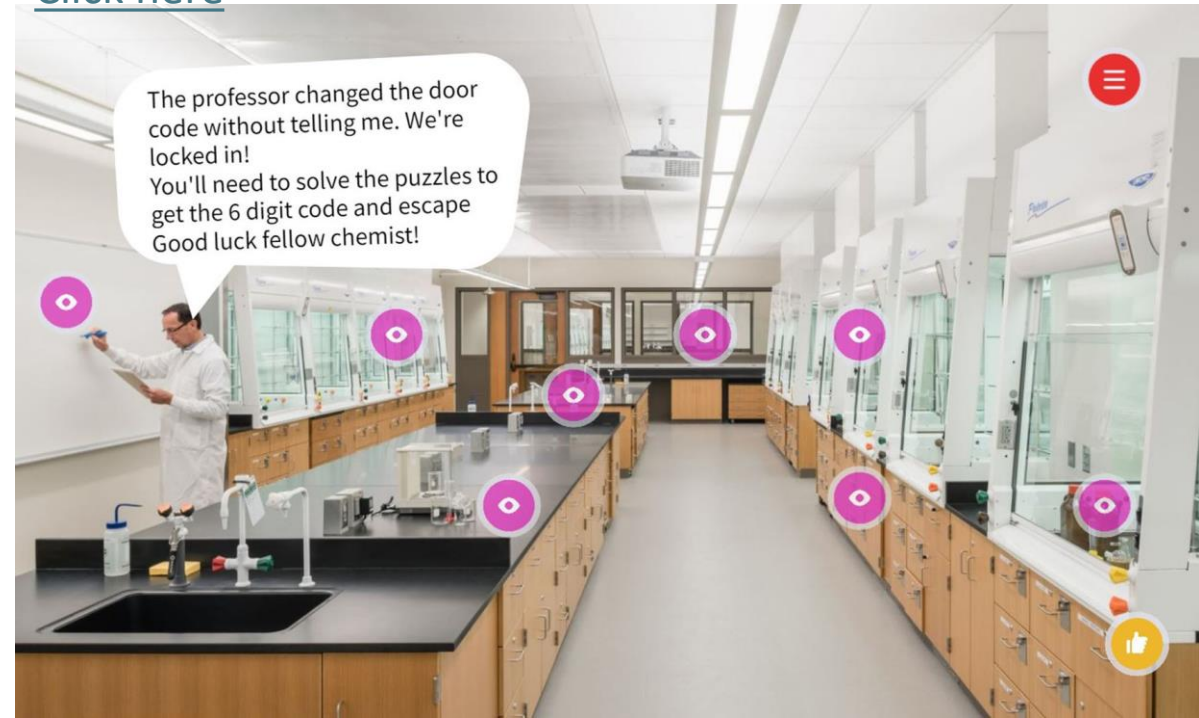
- Take the activity in other regions, smaller cities, far from universities
- Translate into other languages
- Language of signs
- We would like to make a network of interested institutes and share games and ideas
- A team from Finland has presented HEPscape in Finland
- We have presented it to the IPPOG group

Possible developments

- Develop web-based escape room
- Develop a kit for the escape room at school
- Escape room 3D (virtual)



[Click here](#)



[click here](#)





Contact us if you are interested: hepscape@lists.infn.it