# ICNFP XI International Conference on New Frontiers in Physics



# PER me si va ne la fisica recente

Particle Escape Room

Simone Venturini, for the outreach group Physics4Teenagers

University of Pavia - INFN Pavia









Progetto MUR diffusione della cultura scientifica

Il contagio della Fisica





physics4teenagers@unipv.it

https://fisicapaviaeducational.it/phys4teens

Invited talk at SIF 2021

#### seminars

upgrade courses

stuepnts teachers

freshman stage

TEuropean Researchers Night

o guidance

astronomical observations



#### **Escape room**

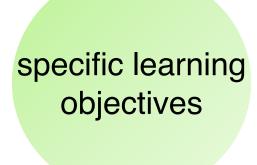
noun [c] /i skeip ru:m/

Live-action <u>team-based</u> game where players discover clues, <u>solve puzzles</u>, and solve tasks in one or more rooms in order to <u>accomplish a specific goal</u> - usually escaping from the room - in a limited amount of time (Nicholson, 2015)

#### **Escape room**

noun [c] /i skeip ru:m/

Live-action <u>team-based</u> game where players discover clues, <u>solve puzzles</u>, and solve tasks in one or more rooms in order to <u>accomplish a specific goal</u> - usually escaping from the room - in a limited amount of time (Nicholson, 2015)



Alice Veldkamp et al. Escape education: A systematic review on escape rooms in education, Educational Research Review, 31, 2020

#### **Escape room**

noun [c] /i skeip ru:m/

Live-action <u>team-based</u> game where players discover clues, <u>solve puzzles</u>, and solve tasks in one or more rooms in order to <u>accomplish a specific goal</u> - usually escaping from the room - in a limited amount of time (Nicholson, 2015)

high success rate

specific learning objectives

Alice Veldkamp et al. Escape education: A systematic review on escape rooms in education, Educational Research Review, 31, 2020

#### **Escape room**

noun [c] /i skeip ru:m/

Live-action <u>team-based</u> game where players discover clues, <u>solve puzzles</u>, and solve tasks in one or more rooms in order to <u>accomplish a specific goal</u> - usually escaping from the room - in a limited amount of time (Nicholson, 2015)

high success rate

specific learning objectives

positive learning experience

#### **Escape room**

noun [c] /i skeip ru:m/

Live-action <u>team-based</u> game where players discover clues, <u>solve puzzles</u>, and solve tasks in one or more rooms in order to <u>accomplish a specific goal</u> - usually escaping from the room - in a limited amount of time (Nicholson, 2015)

high success rate

specific learning objectives

positive learning experience

soft skills developement

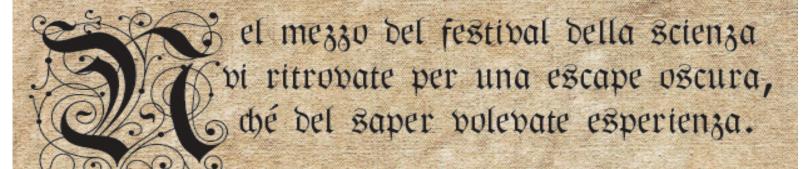
#### **Science Festival**

Genova, 21 October - 1 November 2021

"Maps"

Our activity

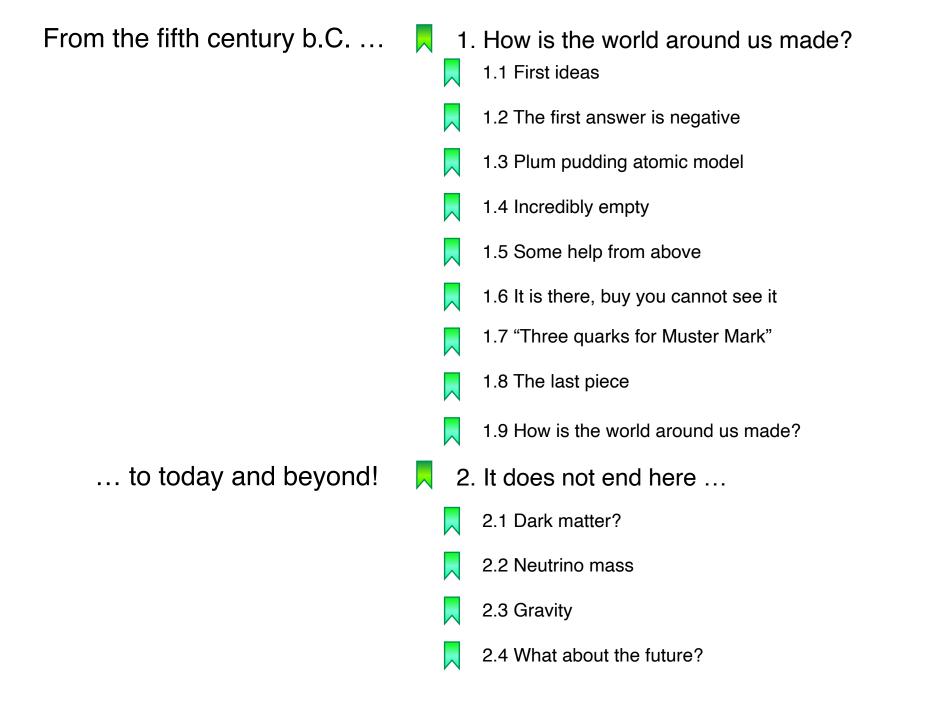


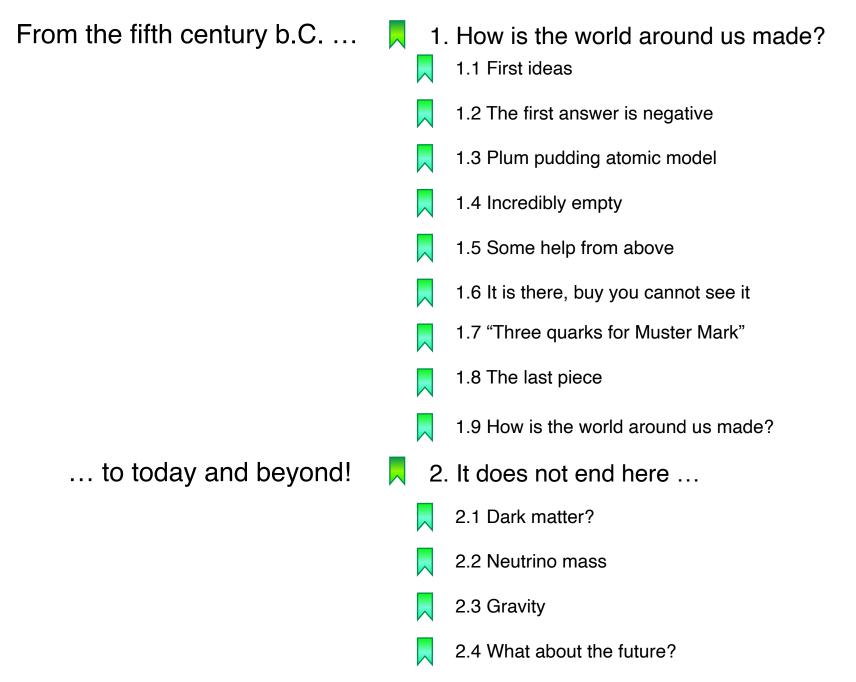


Ahi quanto a dir qual'era è cosa dura esta escape room pavese, aspra e forte de di fisica scaccia la paura!

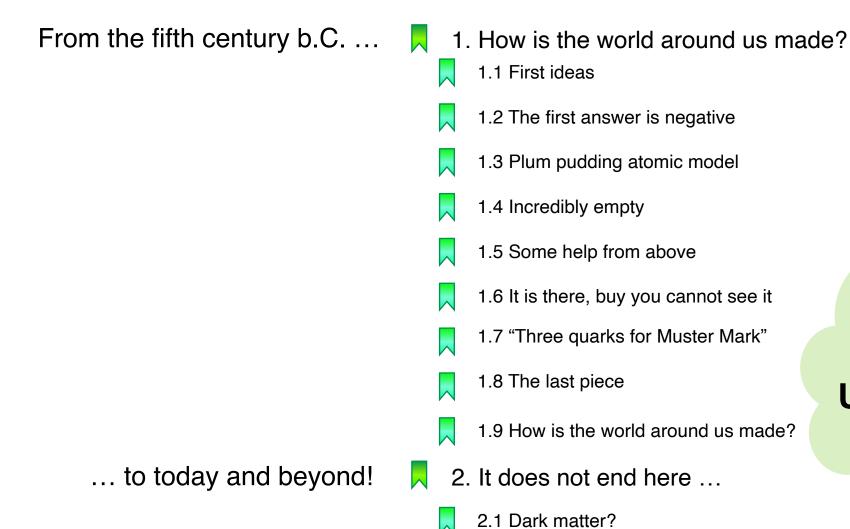
Tant'è amara che poco è più morte; ma per capir bene che vi trovai, spiegherò alcune cose ch'i' v'ho scorte.

To non ti so ben dir se ne uscirai tante n'avrai di prove a quel punto che la verace via suderai.





The complete guide is available (in italian) at this link



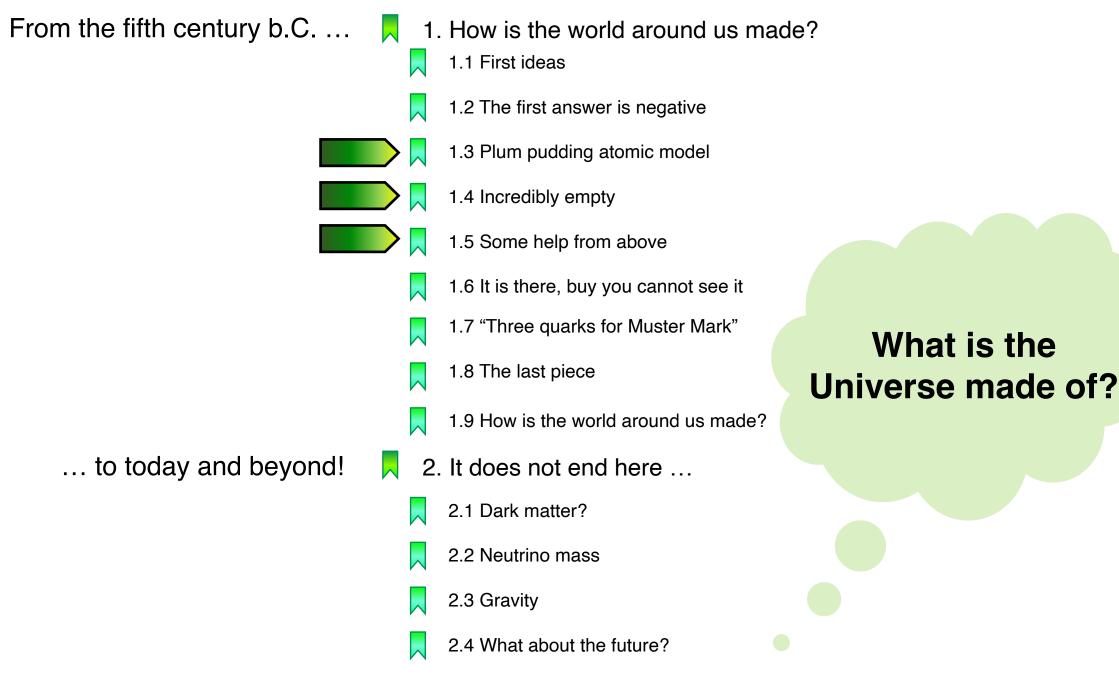
# What is the Universe made of?

The complete guide is available (in italian) at this link

2.4 What about the future?

2.2 Neutrino mass

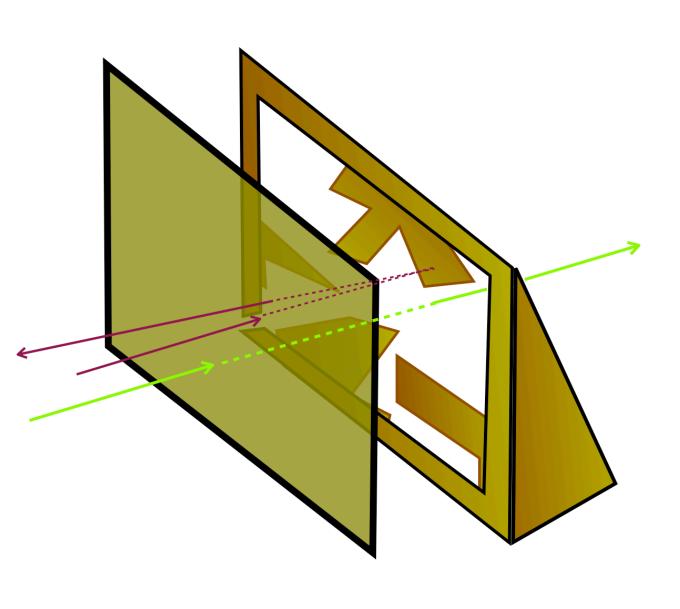
2.3 Gravity



What is the

The complete guide is available (in italian) at this link

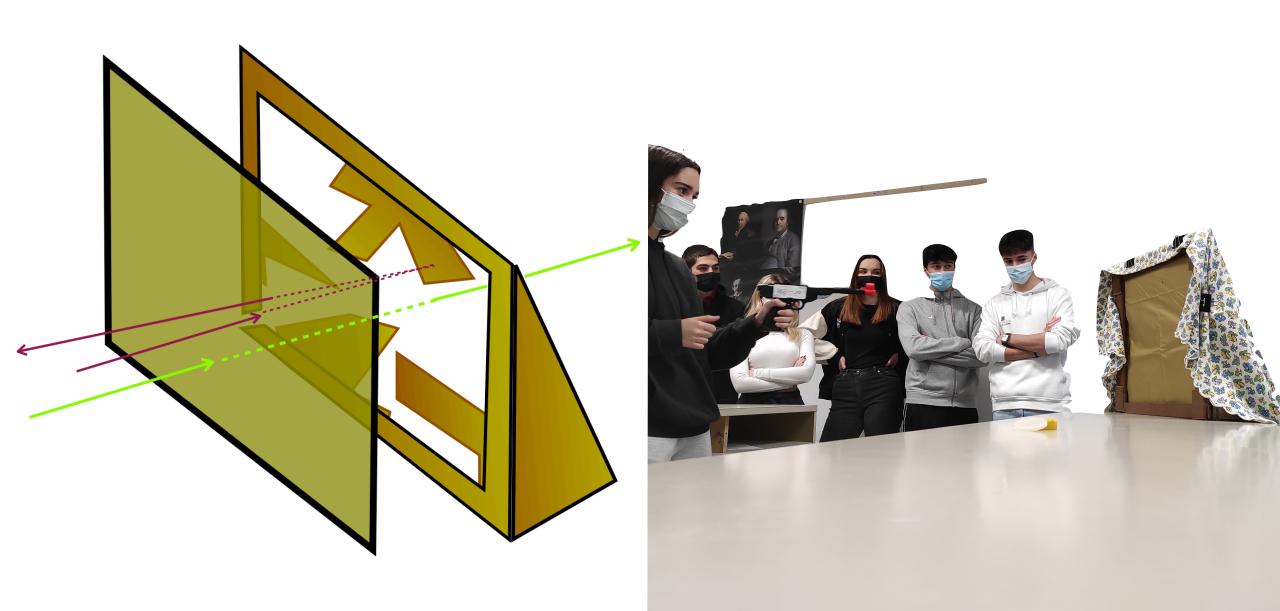
#### Incredibly empty: Rutherford experiment







#### Incredibly empty: Rutherford experiment



## Some help from above: cosmic rays



#### A help from above: cosmic rays



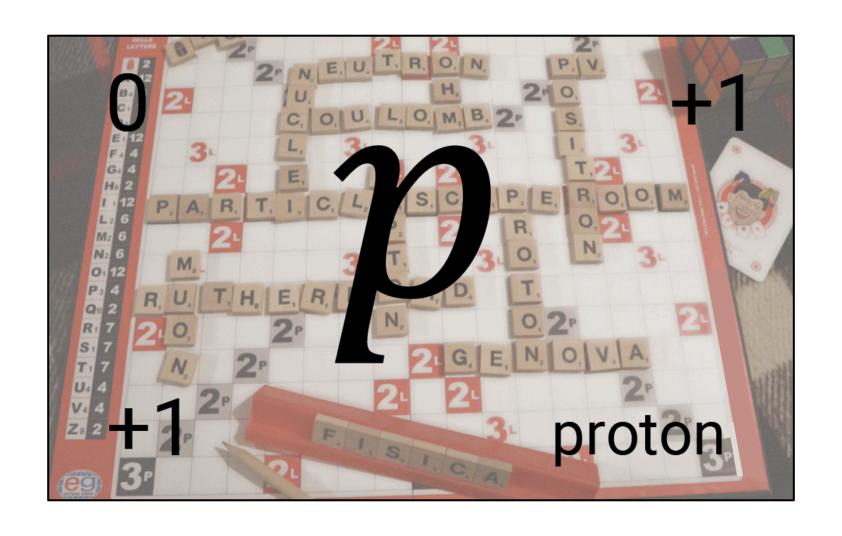
#### A help from above: cosmic rays



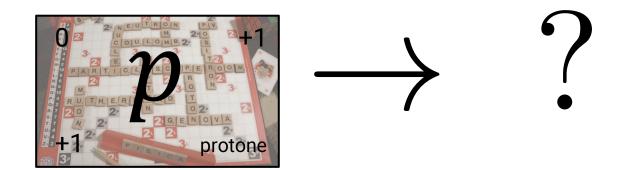
lt is there, but you cannot see it: the neutrino

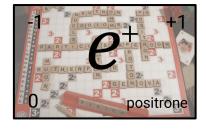
 $p \rightarrow ?$ 

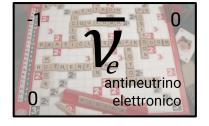
#### It is there, but you cannot see it: the neutrino



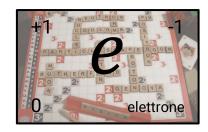
#### It is there, but you cannot see it: the neutrino

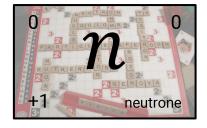


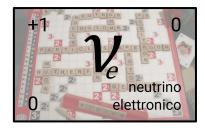








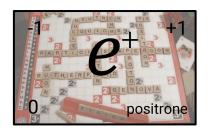


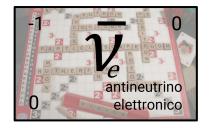


#### It is there, but you cannot see it: the neutrino

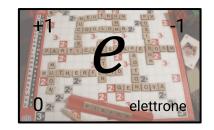


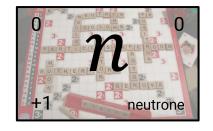


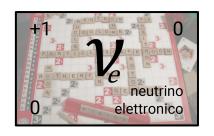












Charge is conserved

Leptonic number is conserved

Barionic number is conserved

# **The Standard Model**

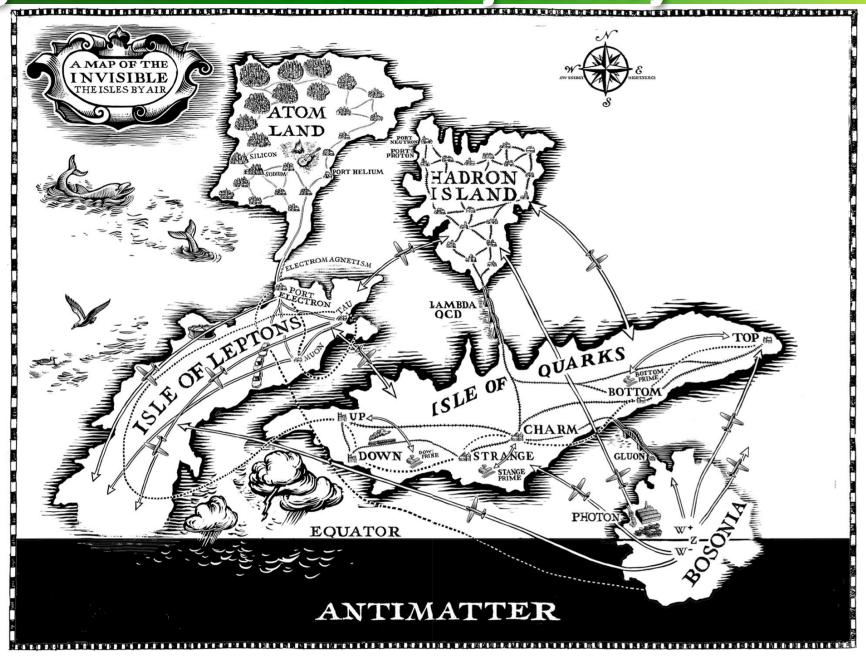


# **The Standard Model**

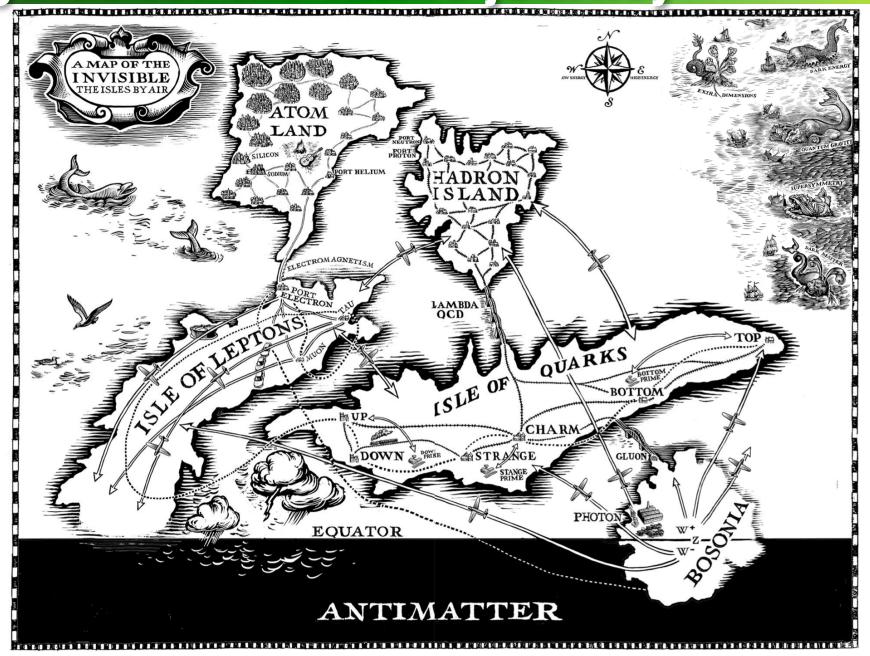


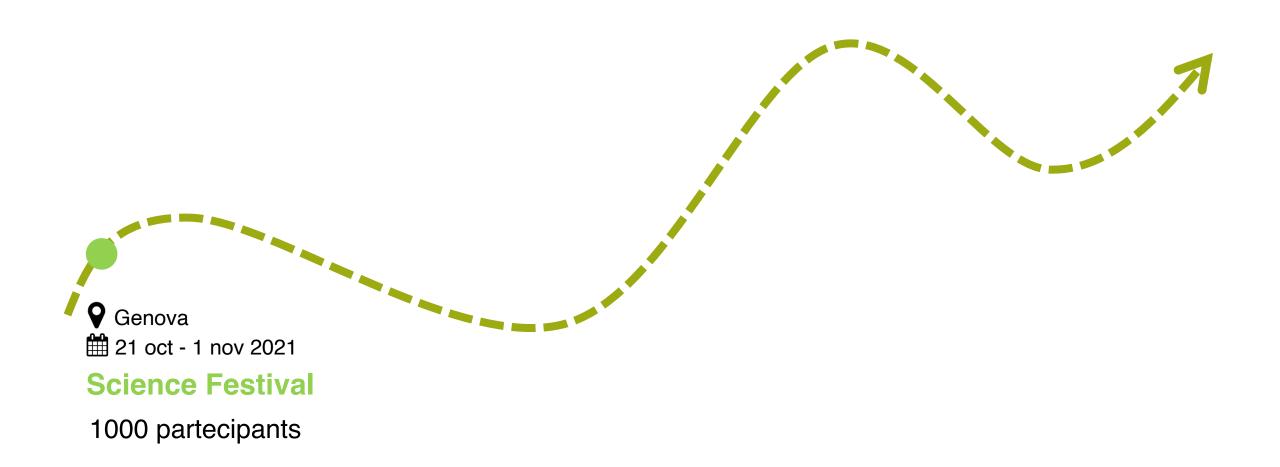


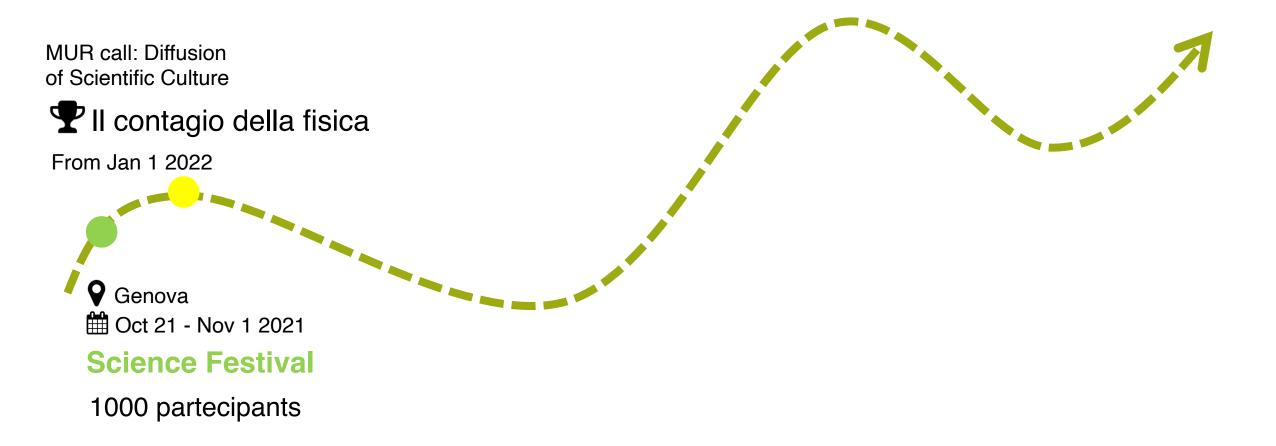
# A new guide for the future journey



## A new guide for the future journey





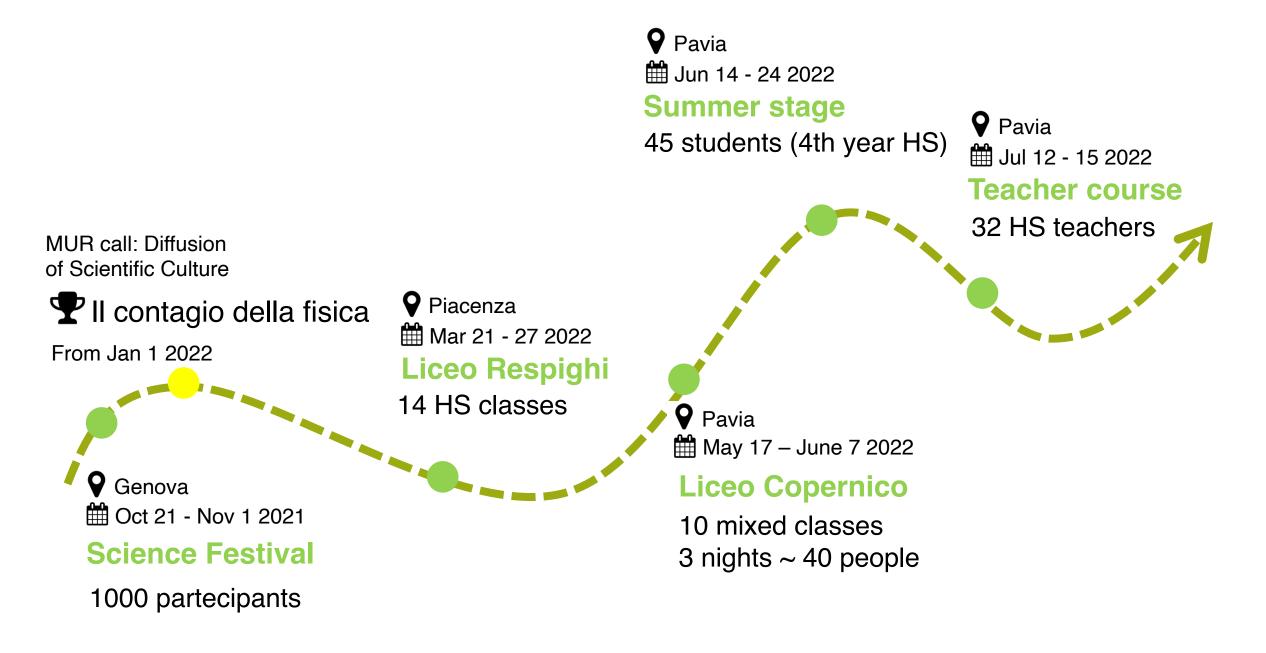


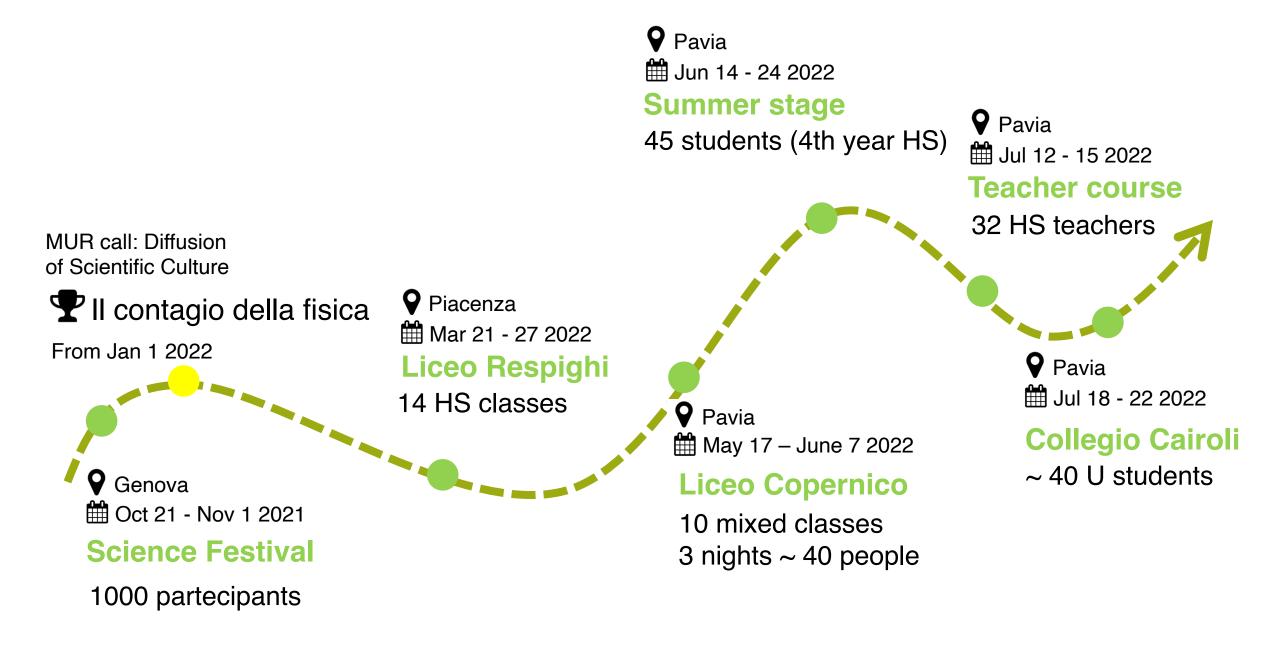


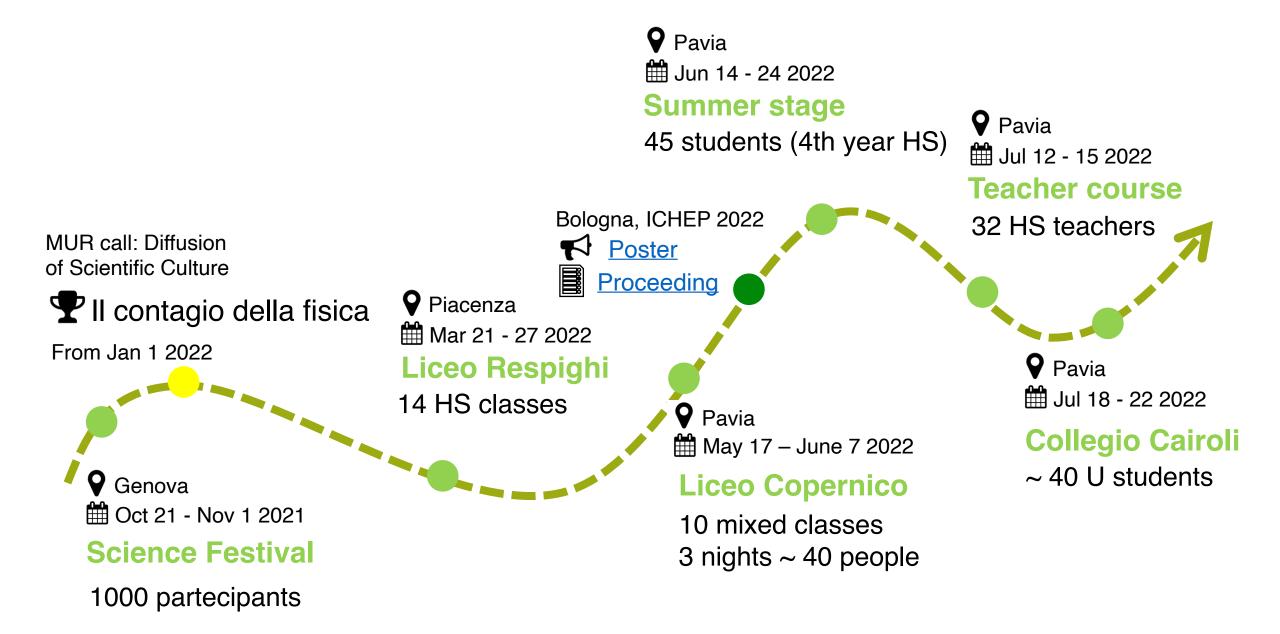


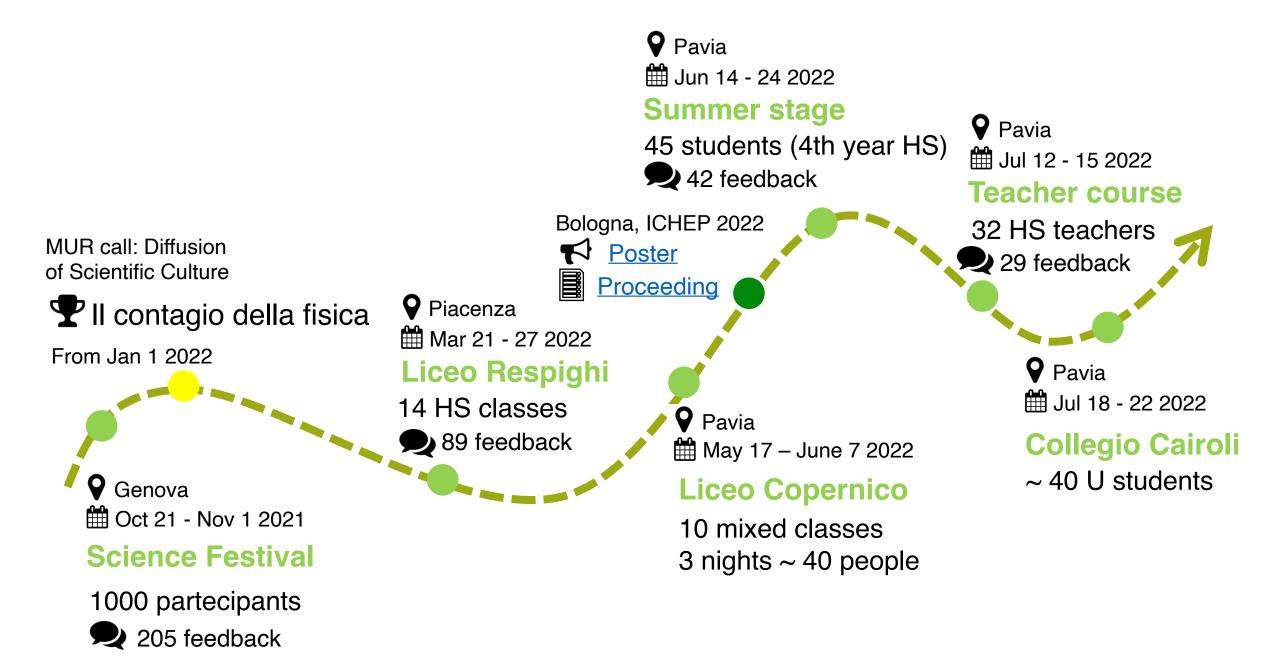


MUR call: Diffusion of Scientific Culture **P**iacenza TII contagio della fisica Mar 21 - 27 2022 From Jan 1 2022 Liceo Respighi 14 HS classes Pavia May 17 – June 7 2022 **Liceo Copernico** Genova **M** Oct 21 - Nov 1 2021 10 mixed classes **Science Festival** 3 nights ~ 40 people 1000 partecipants







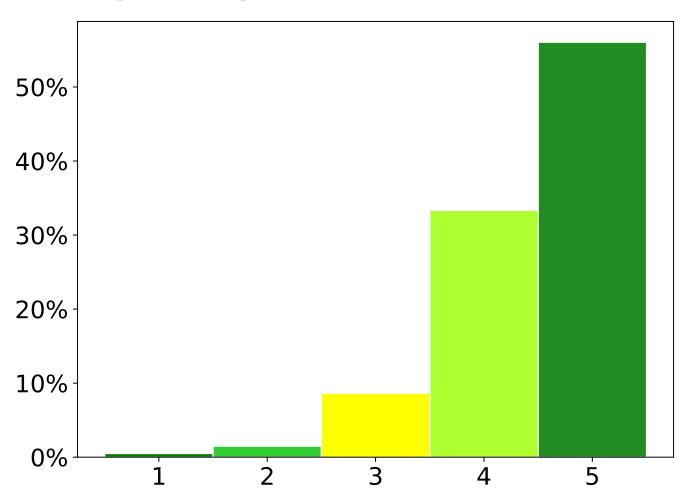




# How useful was the escape room to deepen your previous knowledge?

1: totally useless

5: enlightening

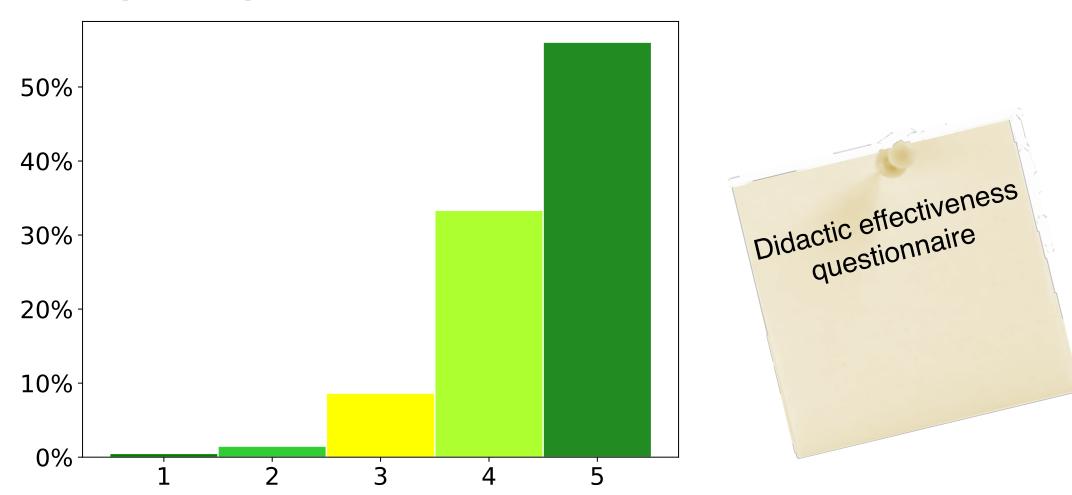




# How useful was the escape room to deepen your previous knowledge?

1: totally useless

5: enlightening

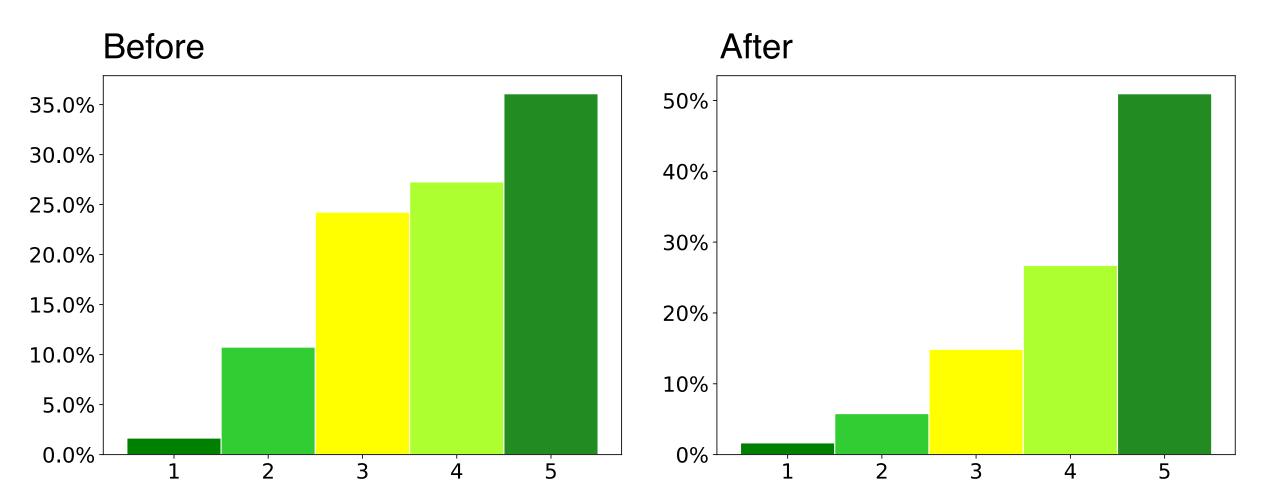




# Before participating were you interested in the content? Are you interested in the content now?

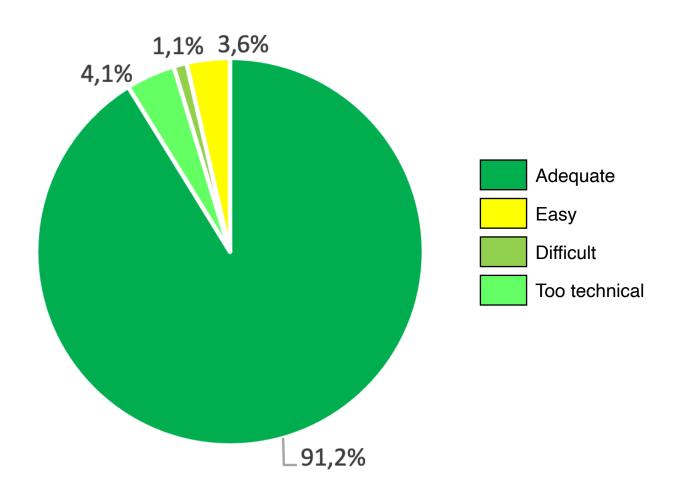
1: not interested at all

5: very interested



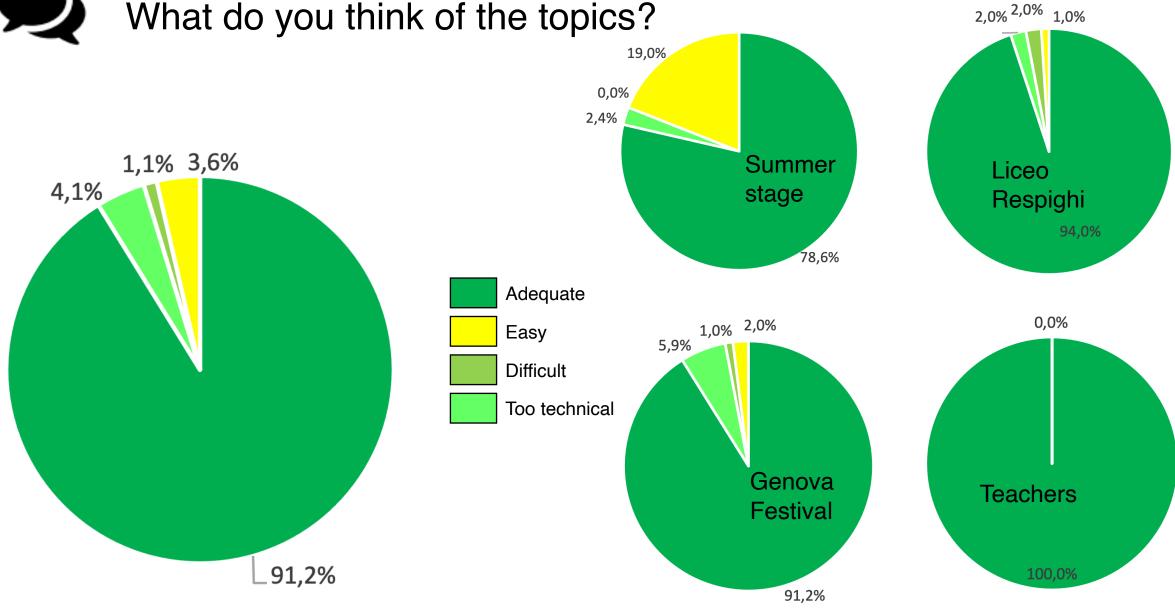


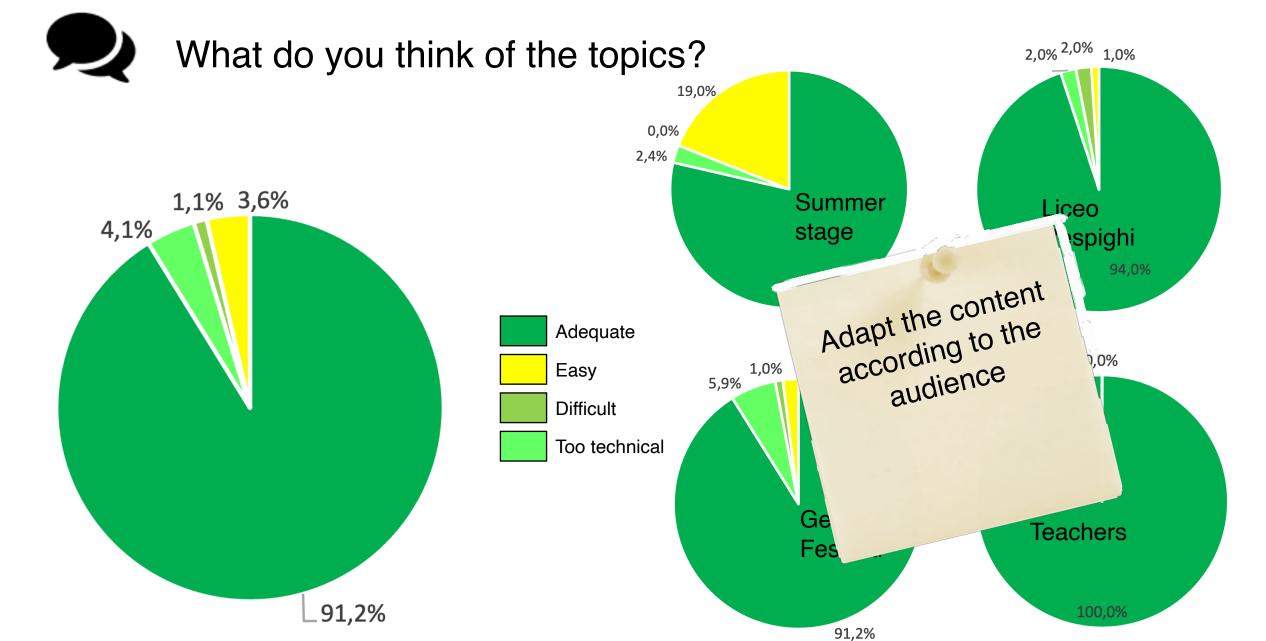
## What do you think of the topics?





What do you think of the topics?

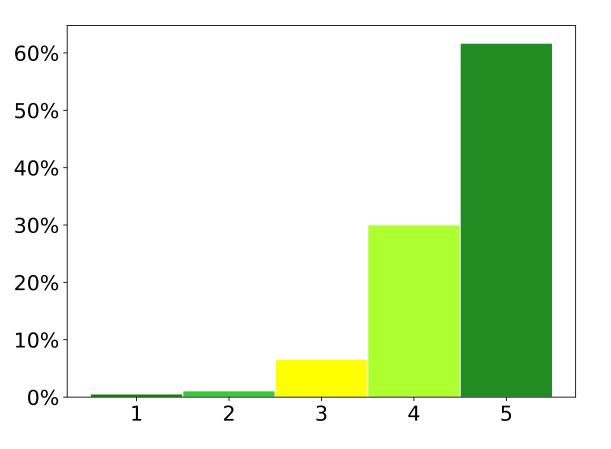






# From 1 (very bad) to 5 (excellent):

how do you evaluate the format?

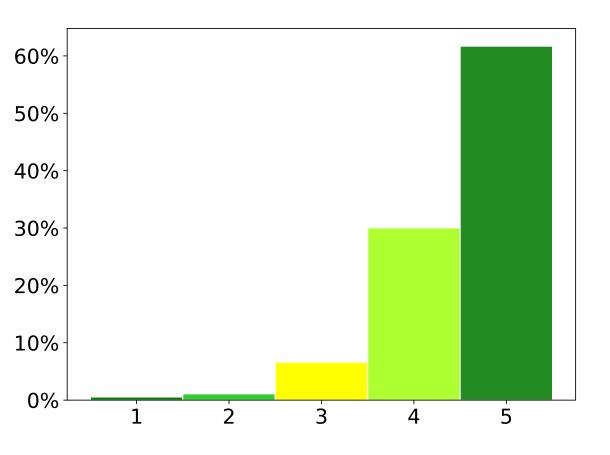


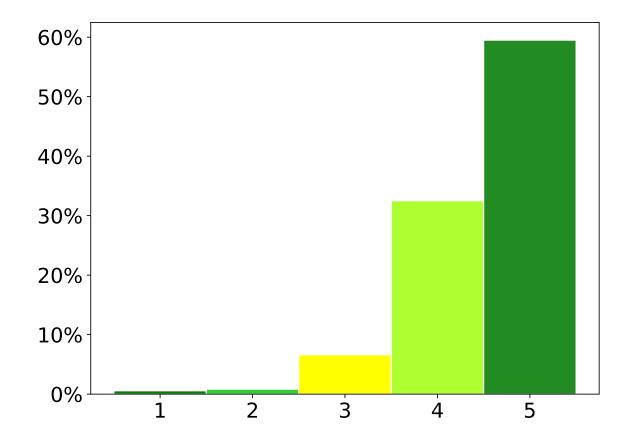


#### From 1 (very bad) to 5 (excellent):

how do you evaluate the format?

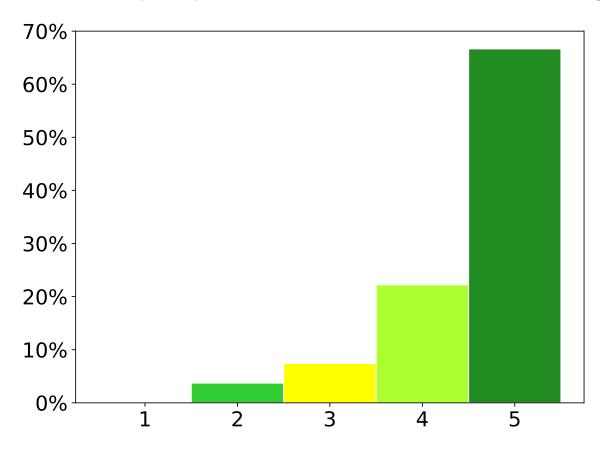
how do you evaluate the experience?





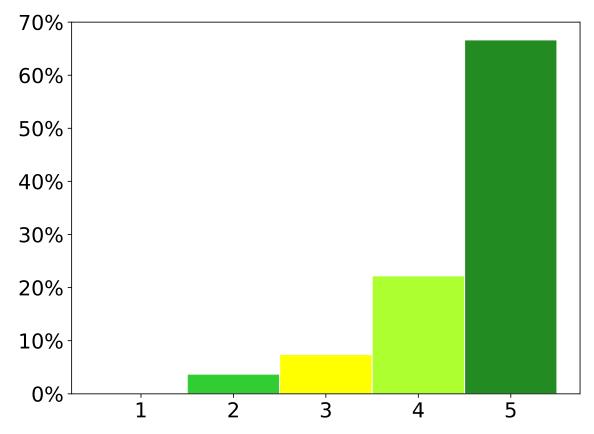


# Do you think this proposal could be useful to your students?





#### Do you think this proposal could be useful to your students?



Are you interested/available to host the activity in your school/city?

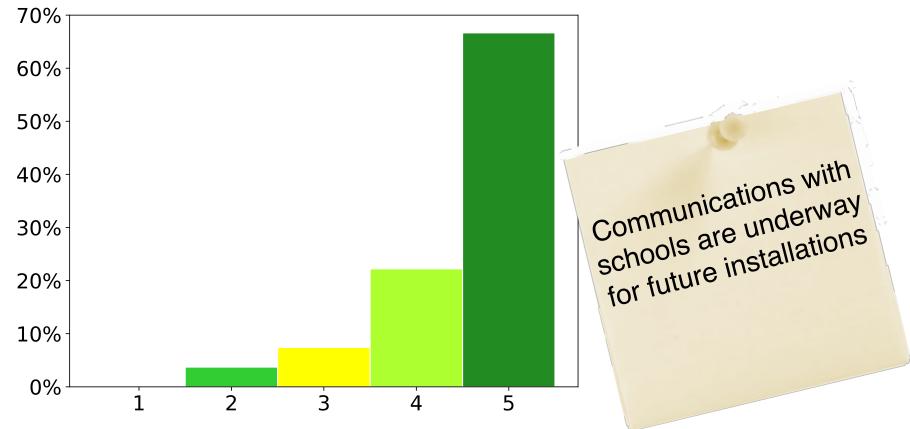
**55.6%** Yes, I think it is feasible

**40.7% Yes**, but with logistical/organizational difficulties

**3.7% No**, it is not a useful/suitable proposal



#### Do you think this proposal could be useful to your students?



Are you interested/available to host the activity in your school/city?

**55.6%** Yes, I think it is feasible

40.7% Yes, but with logistical/organizational difficulties

**3.7%** No, it is not a useful/suitable proposal



too few clues and too little interactive

make it more interactive

allow students to have more initiative

more pratical experiments

not everyone could always see the effect of the experiments

more games, to better learn

keep it set up in Pavia for a long time.

too many people in my group

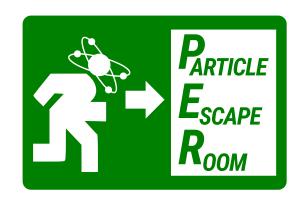
The 'escape room' - format has been widely appreciated



- The 'escape room' format has been widely appreciated
- The results obtained so far are more than satisfactory



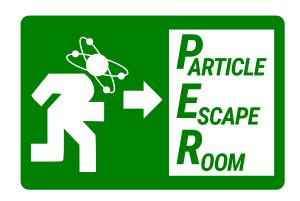
- The 'escape room' format has been widely appreciated
- The results obtained so far are more than satisfactory



#### In future...

Didactic effectiveness questionnaire (pre- and post- Physics test)

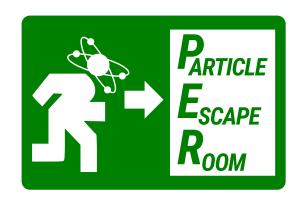
- The 'escape room' format has been widely appreciated
- The results obtained so far are more than satisfactory



#### In future...

- Didactic effectiveness questionnaire (pre- and post- Physics test)
- Limit the number of partecipants and adapt the experience according to the audience

- The 'escape room' format has been widely appreciated
- The results obtained so far are more than satisfactory



#### In future...

- Didactic effectiveness questionnaire (pre- and post- Physics test)
- Limit the number of partecipants and adapt the experience according to the audience
- Need more interactive puzzles

- The 'escape room' format has been widely appreciated
- The results obtained so far are more than satisfactory



#### In future...

- Didactic effectiveness questionnaire (pre- and post- Physics test)
- Limit the number of partecipants and adapt the experience according to the audience
- Need more interactive puzzles

# Thanks for your attention TEENAGERS