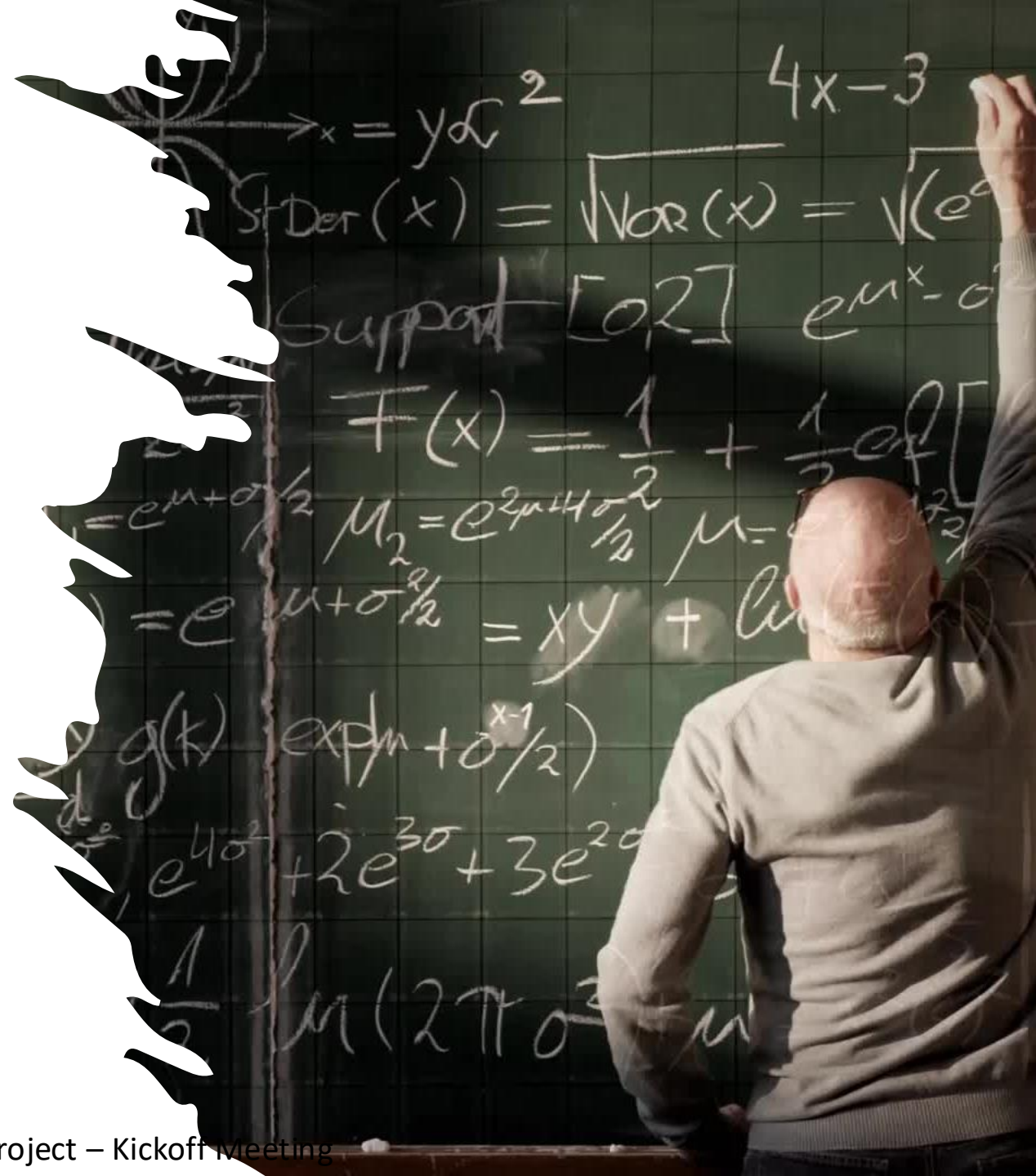


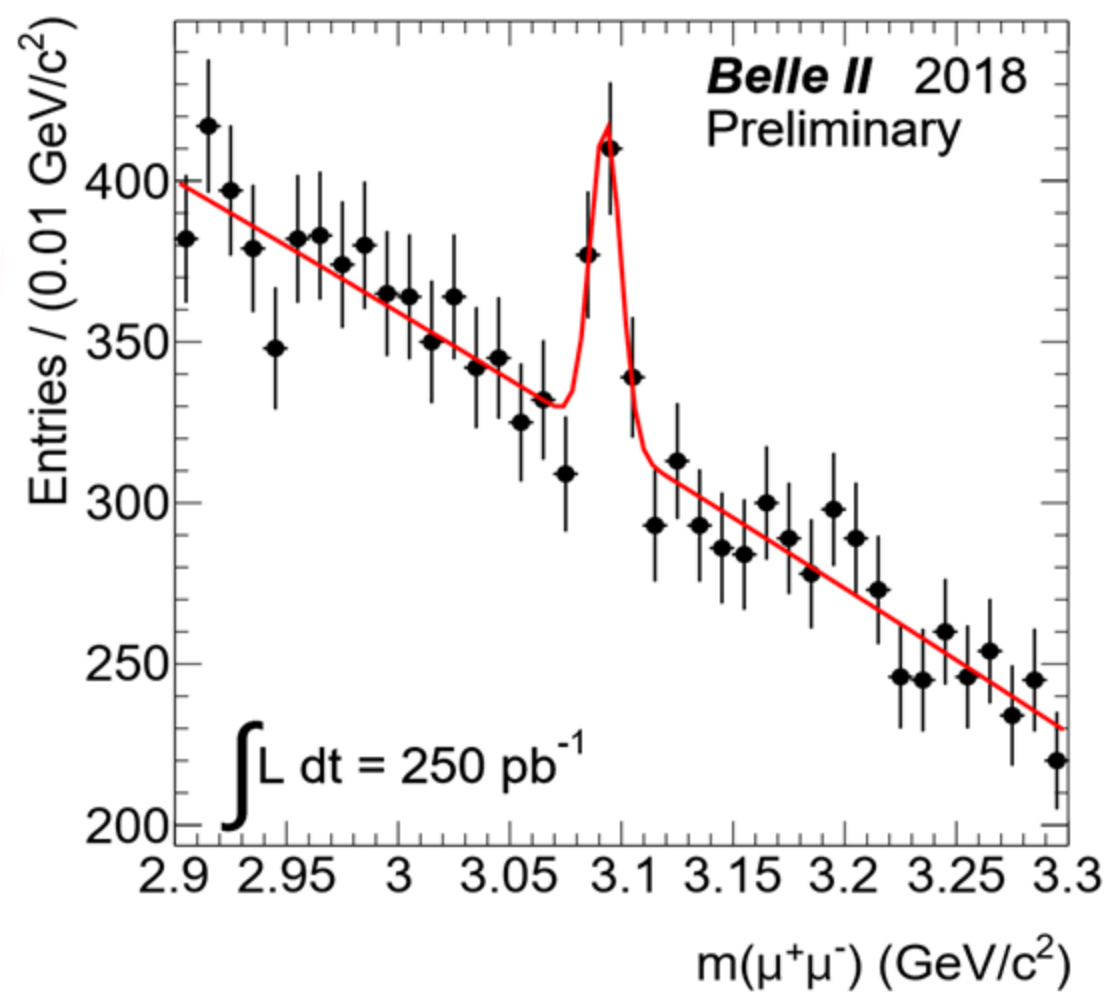
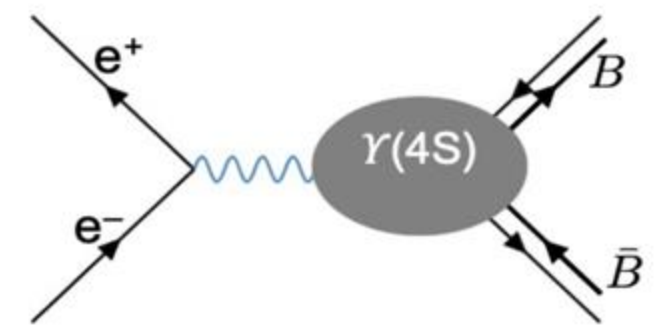
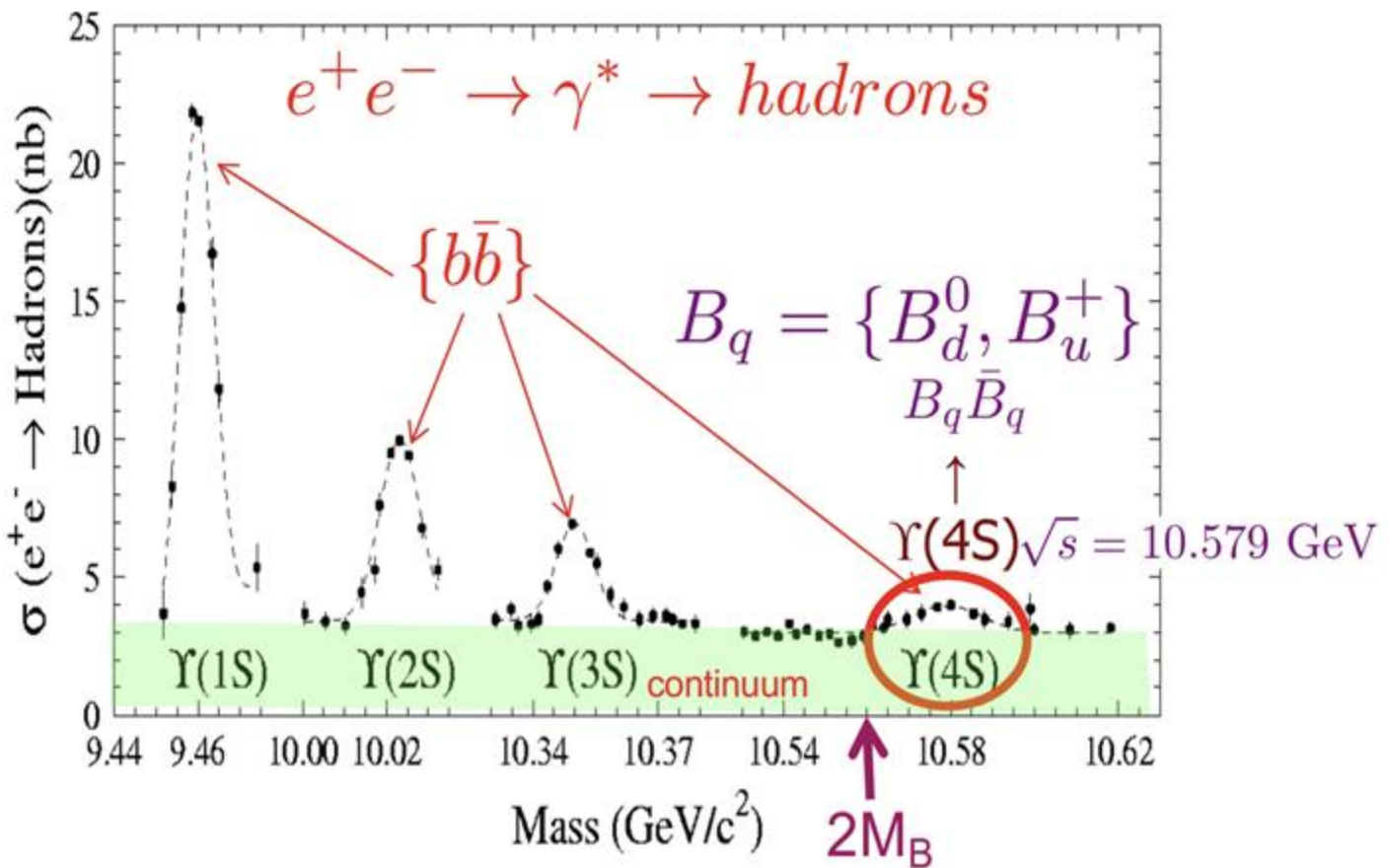
BELLE II VR AND ITS POSSIBLE EVOLUTIONS FOR OUTREACH USE

A. Budano – antonio.budano@infn.it

Introduction

- Modern physics is often difficult to deal with for students, especially in school, because it is far removed from everyday experience.
- An important communication barrier is that it's not possible anymore to observe by eye the particle physics phenomena. The researcher in fact needs to rely on graphs or histograms to observe them.





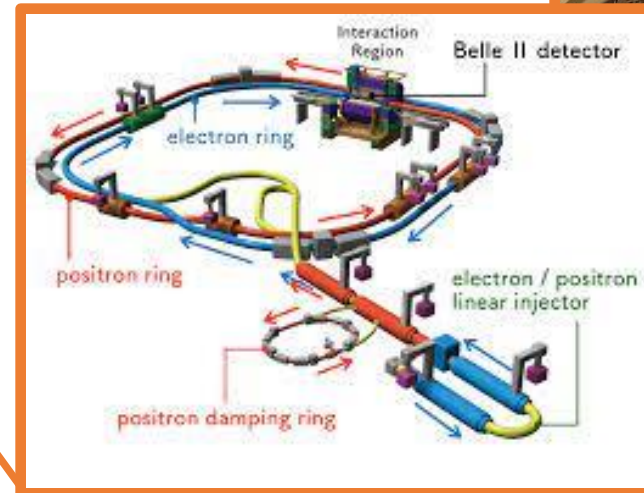
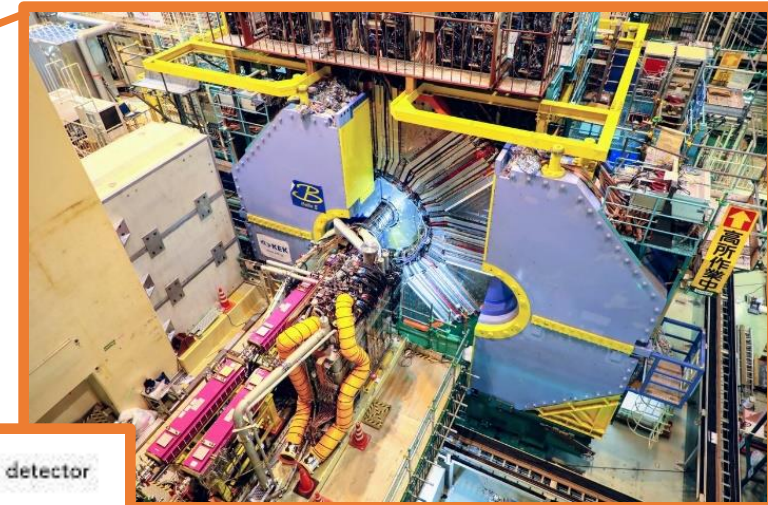
Virtual Reality System

- The Virtual Reality system is a new technology that, through a dedicated device, permits the user to have an immersive experience in a simulated environment at 360 degrees and to interact with the 3D world.
- We have created an immersive experience inside one of the most important particle physics experiments nowadays: **Belle II Experiment**

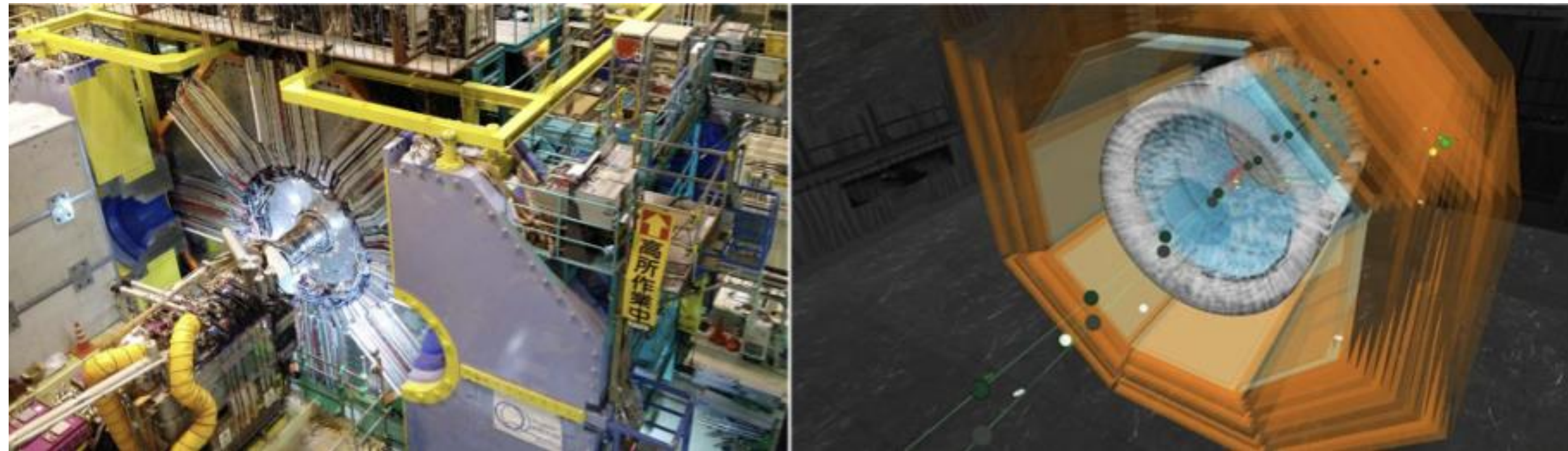


Belle II Experiment

- The Belle II international collaboration has been carrying out, since 2018, a particle physics experiment in Japan at the KEK laboratory in Tsukuba.

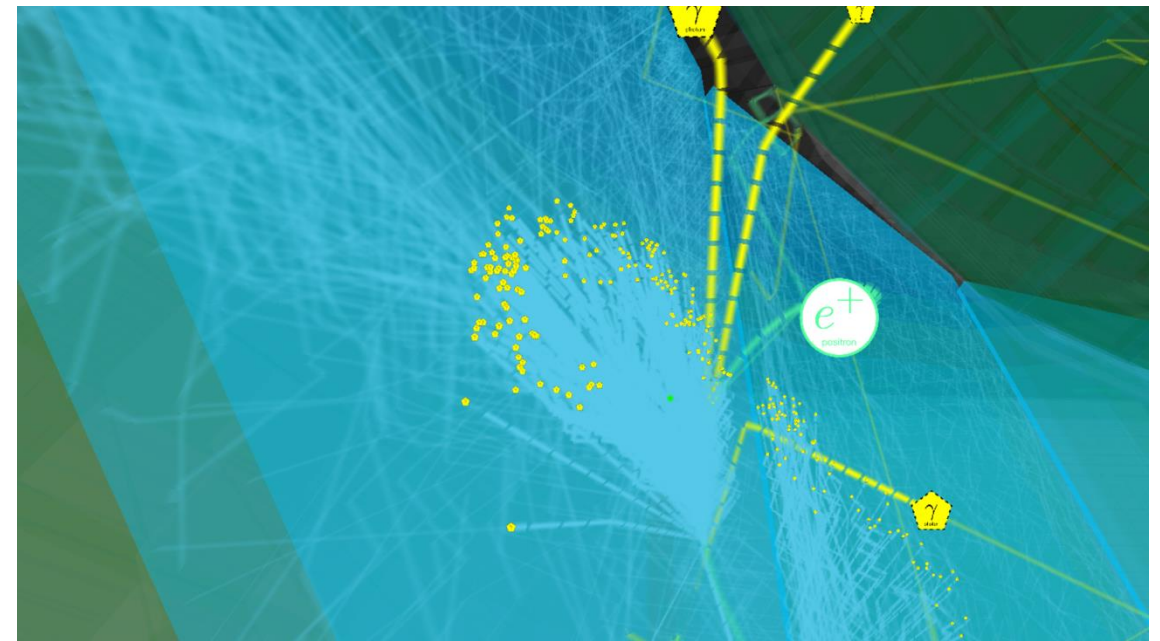
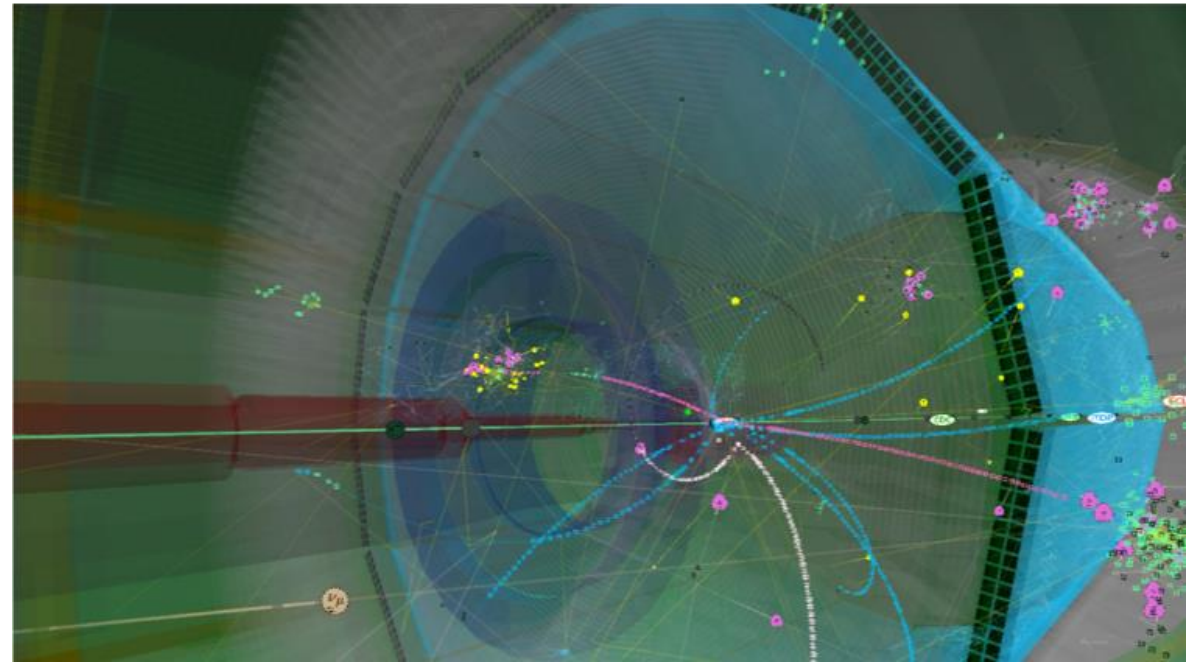
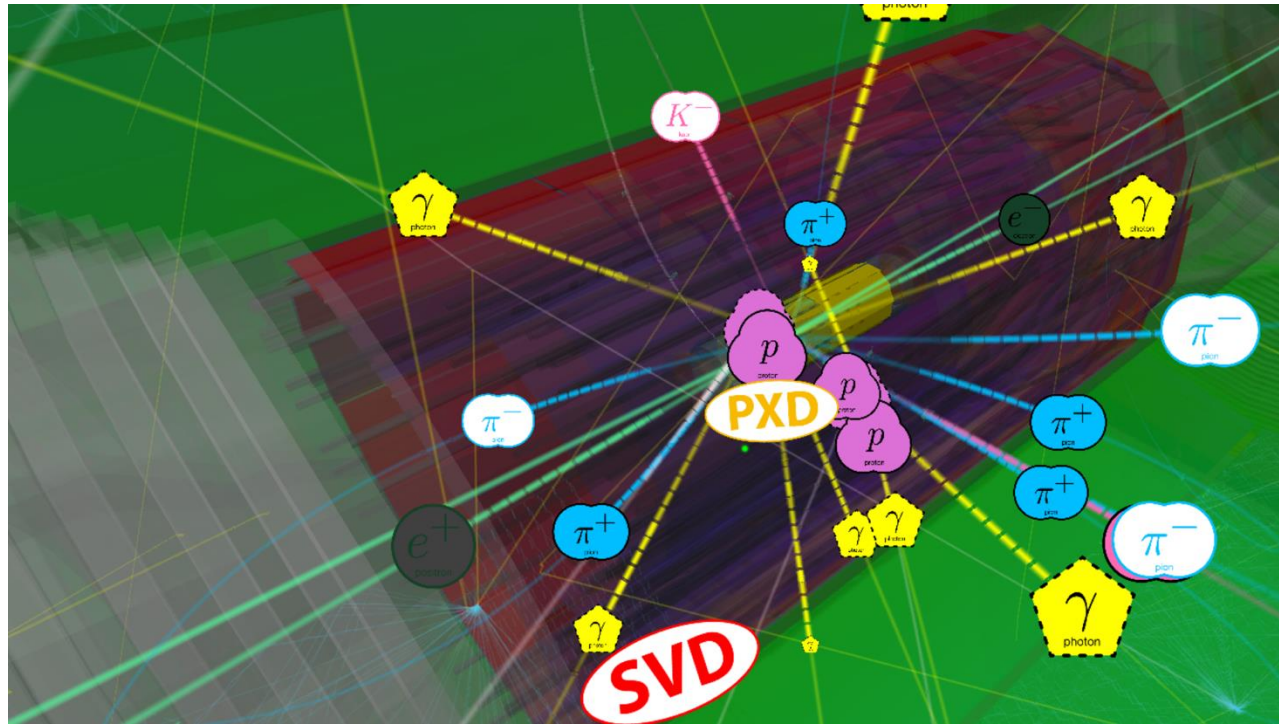


Virtual Reality App



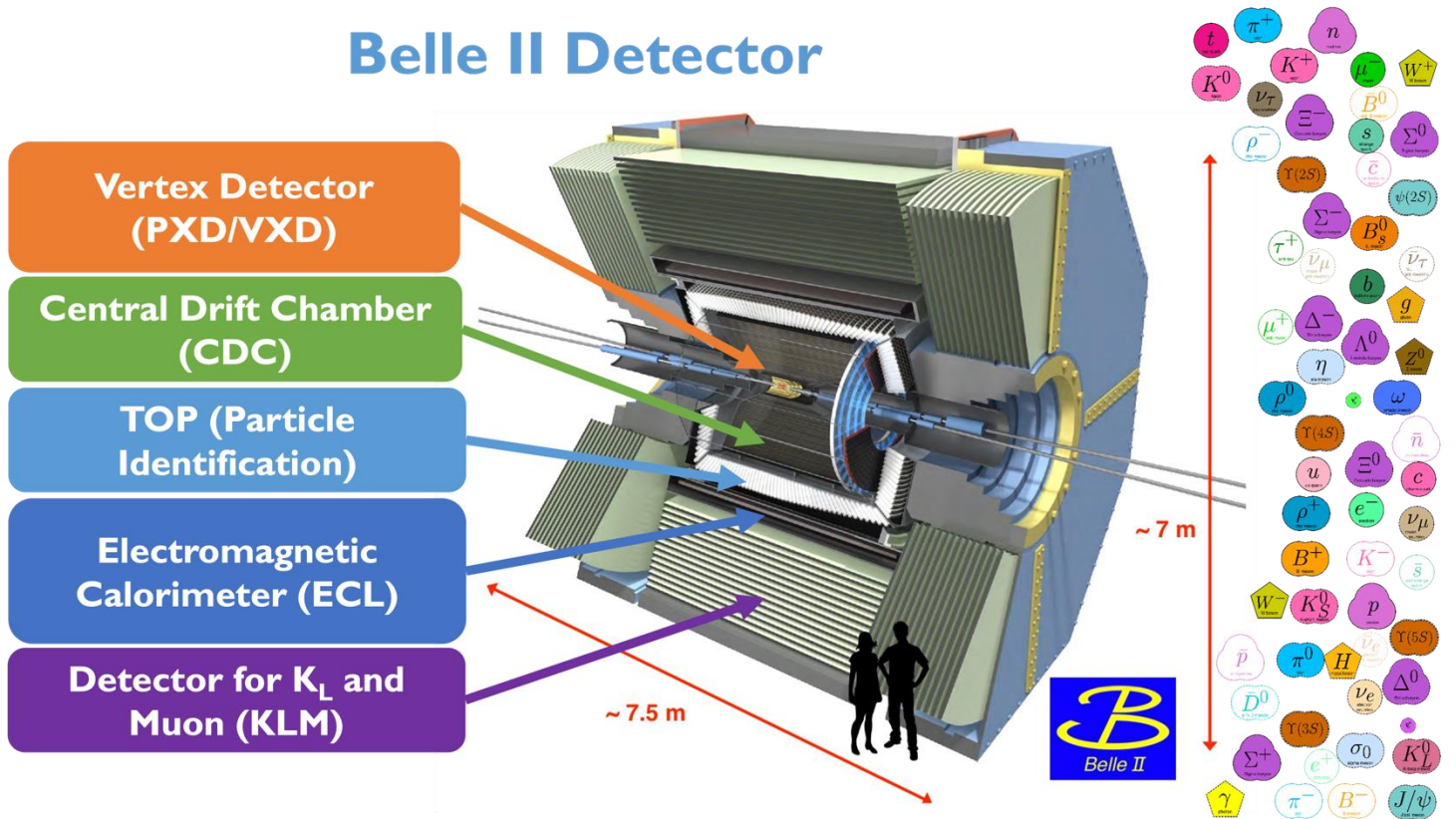
App is written with Unity Platform developed by Virginia Tech Institute for Creativity, Arts and Technology, Virginia Tech Department of Physics, Virginia Tech School of Education

Virtual Reality App



Activity with school

- The activity we built is based on a first theoretical part that is used to introduce students to particle physics and how an accelerator and detector work, and a more practical part through the use of the VR application.



Activity with school

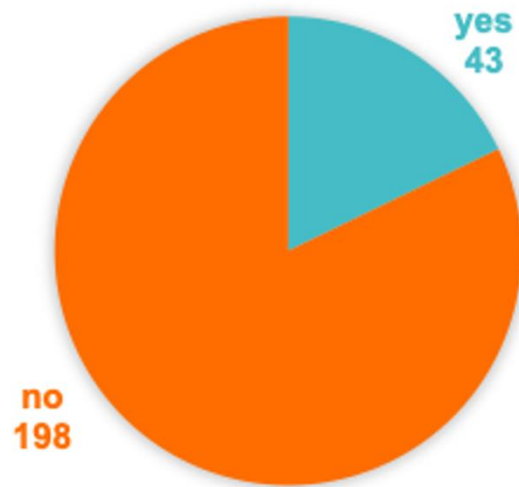
- We carried out the activity with 10 scientific high school classes where we collected feedback on satisfaction through pre and post activity questionnaires and questions aimed at understanding which particle physics topics we were able to convey to the students.



A. Budano - JENNIFER3 project – Kickoff Meeting

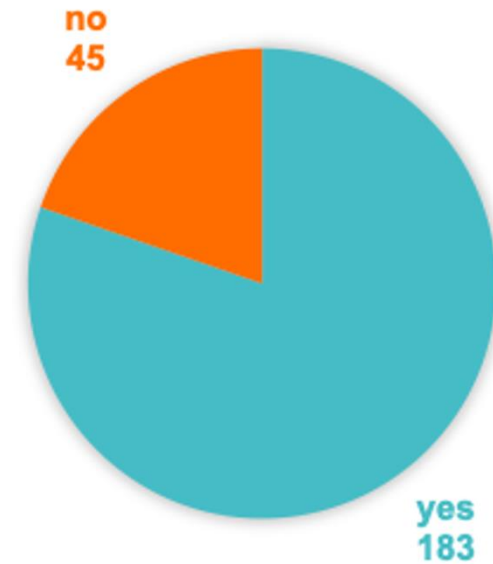
BEFORE THE ACTIVITY

If a friend of yours asked you what a particle physics experiment does, would you try to give them an answer?

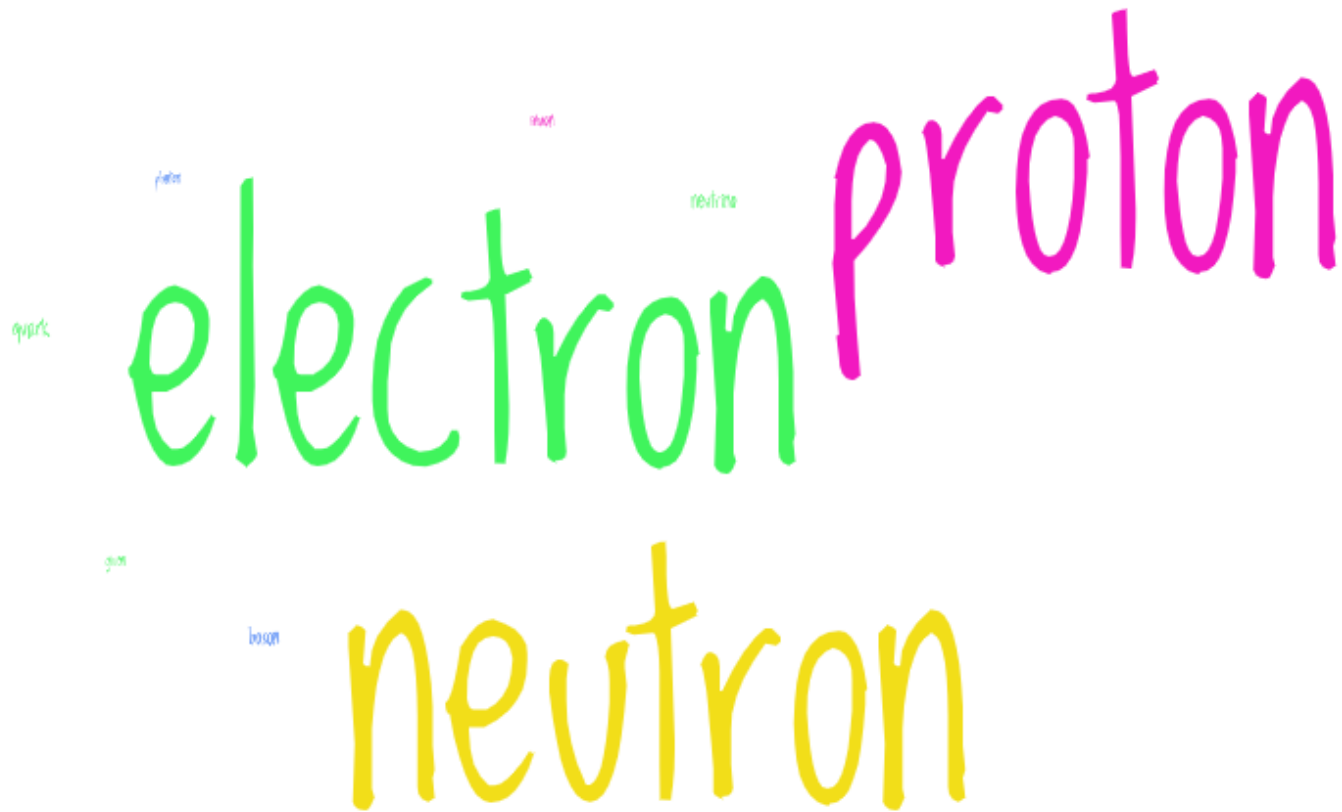


AFTER THE ACTIVITY

Would you now try to give an answer to your friend who asked you about the particle physics experiment?

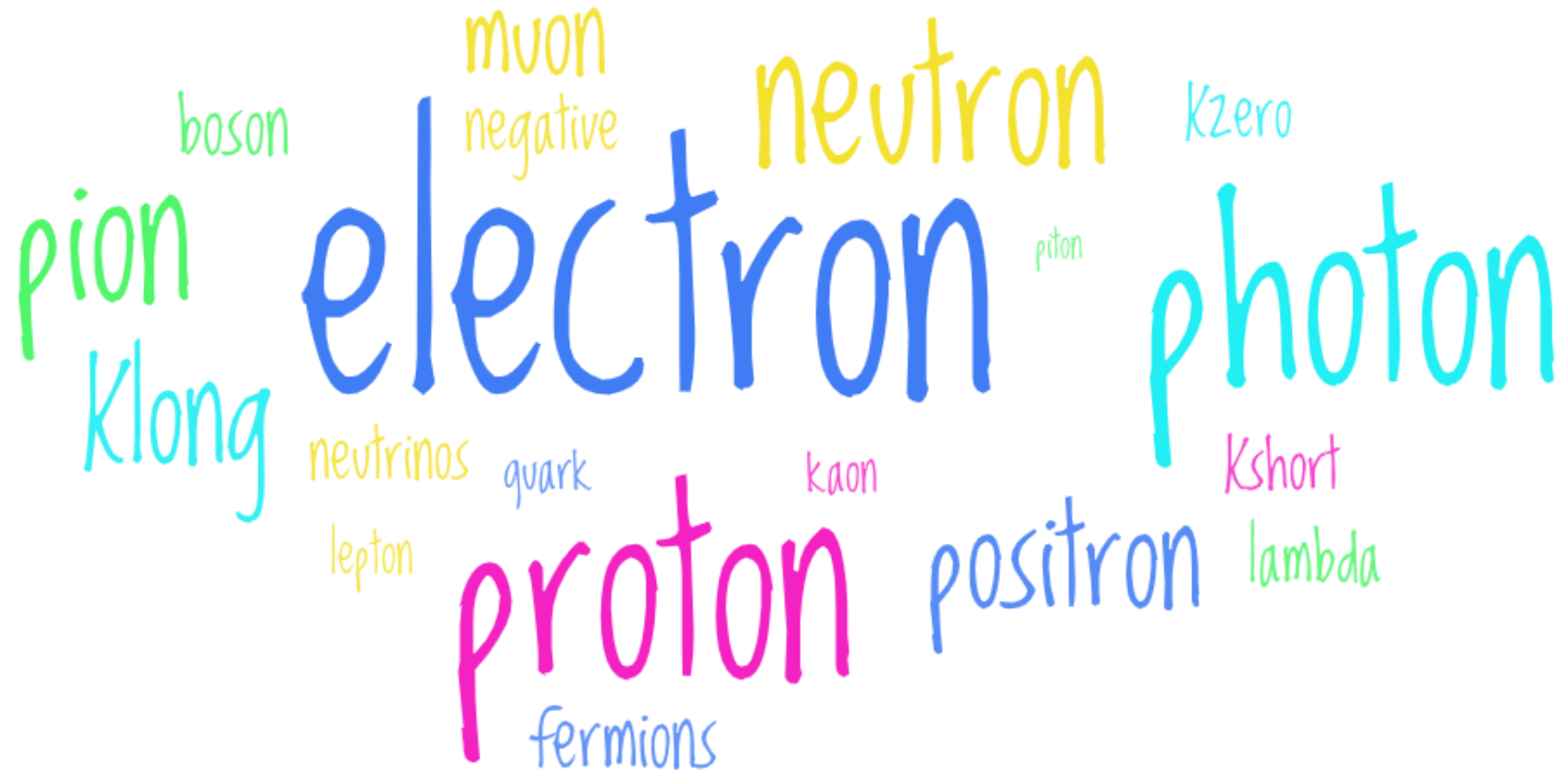


“Which particles do you know?” before the activity



A word cloud featuring three prominent particle names: 'electron' in green, 'proton' in pink, and 'neutron' in yellow. The words are arranged in a roughly triangular pattern. 'electron' is on the left, 'proton' is on the right, and 'neutron' is at the bottom center. Several smaller, faint words are scattered around the main terms, including 'quark', 'photon', 'neutrino', 'boson', and 'gluon'.

“Tell me the name of a particle that comes to your mind right now?”



Conclusion

- Belle II VR is one of first applications in the particle physics field, it replicates in a 3D simulated world the Belle II experiment which operates in Japan at KEK laboratory.
- We have built a teaching activity that takes advantage of Belle II VR application to bring students into a particle physics experiment. The activity has been proposed to 10 scientific high school classes where we collected feedback on satisfaction through pre and post questionnaires
- The result of the questionnaires showed us the activity had very positive feedback. Students appreciated the theoretic part and the part through the use of the VR application.
- The greatest appreciation was shown toward the researchers who carried out the activity mainly appreciating their passion in explaining concepts far from their basic knowledge.
- In conclusion, the structured activity proposed to the students was very positive and greatly appreciated by the teachers as well. Through the interaction we had with the teachers, we are improving the way we convey some modern physics concepts and will replicate the activity next year as well.

Contact us

vr@roma3.infn.it
www.roma3.infn.it/vr

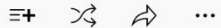
The application is free and can be downloaded from:
<http://www1.phys.vt.edu/~piilonen/VR/>

Steam Store:



Virtual Reality Lab

8 video • 777 visualizzazioni • Ultimo aggiornamento in data 12 feb 2021









Il Virtual Reality Lab è un laboratorio della sezione INFN di Roma Tre che, attraverso diversi sistemi di Realtà Virtuale, supporta le attività di ricerca, di didattica e divulgazione. Con il software di Realtà Virtuale dell'esperimento Belle II, scopriremo insieme come funziona un rivelatore di particelle, immergendoci nel mondo dell'infinitamente piccolo.

Per maggiori informazioni:
<http://www.roma3.infn.it/vr/>



INFN Edu Physics

ISCRIVITI

- 1  **Realità Virtuale promo**
INFN Edu Physics 1:02
- 2  **L'esperimento Belle II**
INFN Edu Physics 1:06
- 3  **Il rivelatore Belle II**
INFN Edu Physics 1:55
- 4  **La sezione d'urto**
INFN Edu Physics 1:05
- 5  **La rivelazione delle particelle**
INFN Edu Physics 2:31
- 6  **Il decadimento di particelle**
INFN Edu Physics 3:39
- 7  **Ricostruire gli eventi**
INFN Edu Physics 0:59
- 8  **L'effetto Cherenkov**
INFN Edu Physics 1:26



Tutti i Software > Educativi > Belle II in Virtual Reality

Belle II in Virtual Reality

Hub della Comunità

 **Belle II in Virtual Reality**
Exploring subatomic particle physics

Interactive subatomic particle physics simulation of the Belle II experiment in virtual reality

TUTTE LE VALUTAZIONI: 9 recensioni degli utenti

DATA DI RILASCIO: 5 mar 2018

SVILUPPATORE: Zachary Duer, Tanner Upthegrove...
EDITORE: Virginia Tech Institute for Creativ...

Etichette popolari definite dagli utenti per questo prodotto:
Educativi VR +