

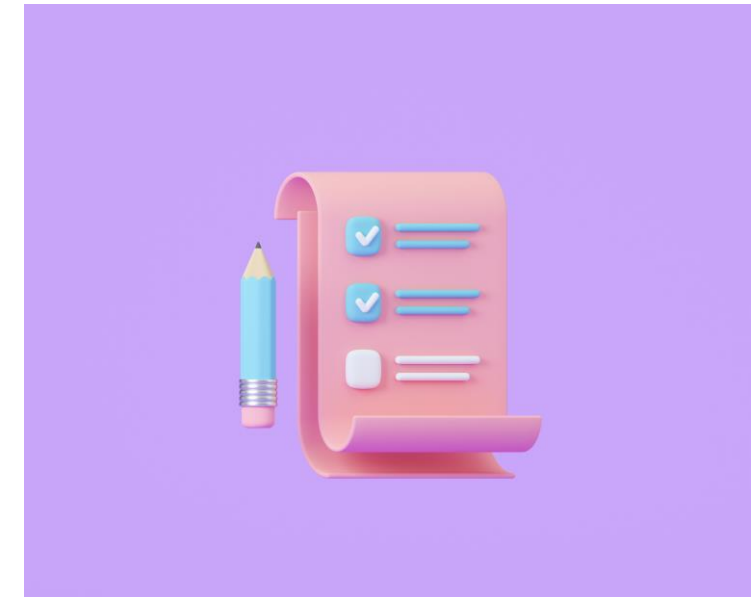
Σωματιδιακή φυσική και CERN στην τάξη

Γιώτα Χατζηδάκη

08/05/2024

Το do list όταν γυρίσετε στην Ελλάδα!

- **Μοιραστείτε την εμπειρία σας με συναδέλφους/μαθητές/φίλους και το γενικό κοινό!**
- **Οργανώστε δραστηριότητες στην τάξη σας ή το σχολείο σας!**
- **Οργανώστε συναντήσεις μεταξύ σας!**
- **Οργανώστε επισκέψεις στο CERN με τους μαθητές σας!**



Τι μπορείτε να κάνετε στην τάξη σας

Educational resources database – για την τάξη σας

Ιστοσελίδα στην οποία μπορείτε να βρείτε ιδέες για πειράματα, βίντεο και άλλο υλικό σχετικό με το CERN

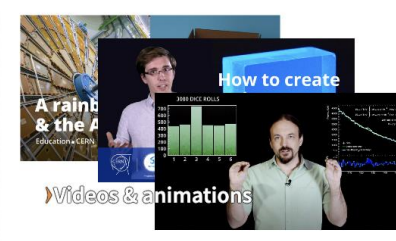
HOME ALL RESOURCES ACTIVITY TYPE AGE GROUP AUDIENCE CONTACT US

Educational Resources

Here you will find a collection of educational resources developed in the framework of education and outreach activities at CERN.

Whether you're a student, a teacher, or simply someone with a curious mind, these resources are designed to spark your interest by bringing you closer to the physics and technology of CERN. You will also find material that can aid you in preparing for, enjoying, and following up on a visit to CERN, or engaging with it online if you cannot visit us physically.

So, whether you're looking to enhance your classroom experience, satisfy your curiosity about the universe, or you simply want to learn something new and exciting, these educational resources will guide you on your educational adventure.



Particle Identities



PARTICLE IDENTITIES

Take the personality quiz to find out which particle fits you best.

OPEN ACCESS
Phys. Educ. 52 (2017) 034001 (9pp)

PAPER
iopscience.org/ped

Let's have a coffee with the Standard Model of particle physics!

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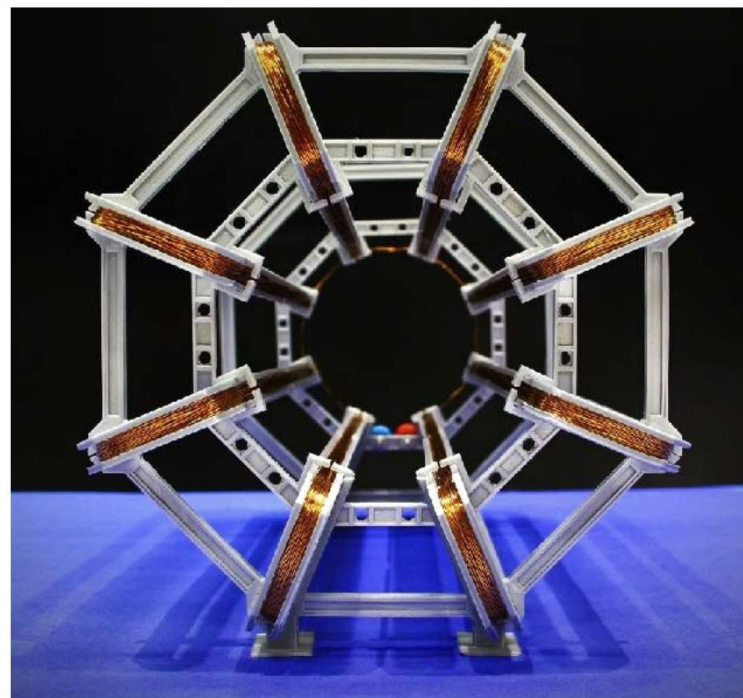
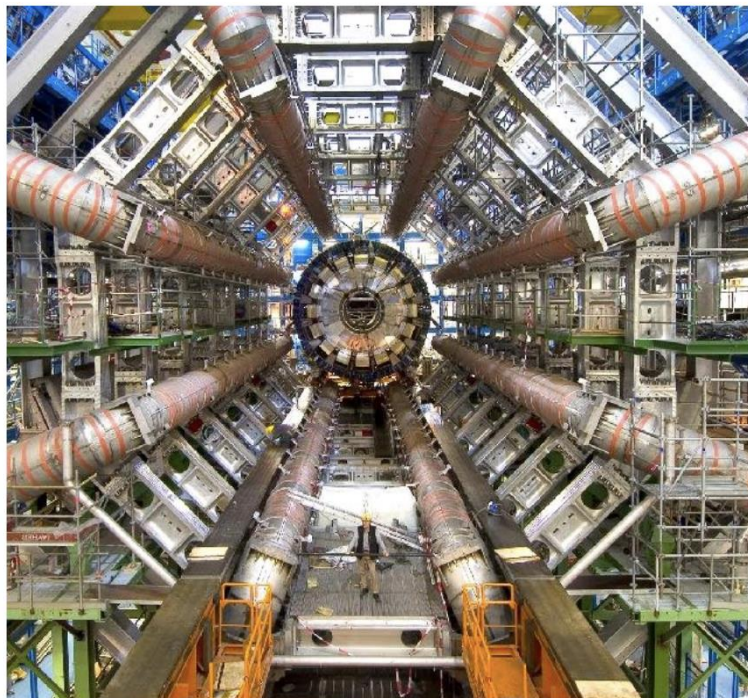
Abstract
The Standard Model of particle physics is one of the most successful theories in physics and describes the fundamental interactions between elementary particles. It is encoded in a compact description, the so-called 'Lagrangian', which even fits on t-shirts and coffee mugs. This mathematical formulation, however, is complex and only rarely makes it into the physics classroom. Therefore, to support high school teachers in their challenging endeavour of introducing particle physics in the classroom, we provide a qualitative explanation of the terms of the Lagrangian and discuss their interpretation based on associated Feynman diagrams.

1. Introduction
The Standard Model of particle physics is the most important achievement of high energy physics to date. This highly elegant theory sorts elementary particles according to their respective charges and describes how they interact through fundamental interactions. In this context, a charge is a property of an elementary particle that defines the fundamental interaction by which it is influenced. We then say that the corresponding interaction particle 'couples' to a certain charge. For example, gluons, the interaction particles of the strong interaction, couple to colour-charged particles. Of the four fundamental interactions in nature, all except gravity are described by the Standard Model of particle physics: particles with an electric charge are influenced by the electromagnetic interaction (quantum electrodynamics, or QED for short), particles with a weak charge are influenced by the weak interaction (quantum flavour dynamics or QFD), and those with a colour charge are influenced by the strong interaction (quantum chromodynamics or QCD). Contrary to the fundamental interactions, the Brout-Englert-Higgs (BEH) field acts in a special way. Because it is a scalar field, it induces spontaneous symmetry-breaking, which in turn gives mass to all particles with which it interacts (this is commonly called the Higgs mechanism). In addition, the Higgs particle (H) couples to any other particle which has mass (including itself). Interactions are mediated by their respective interaction particles: photons (γ) for the

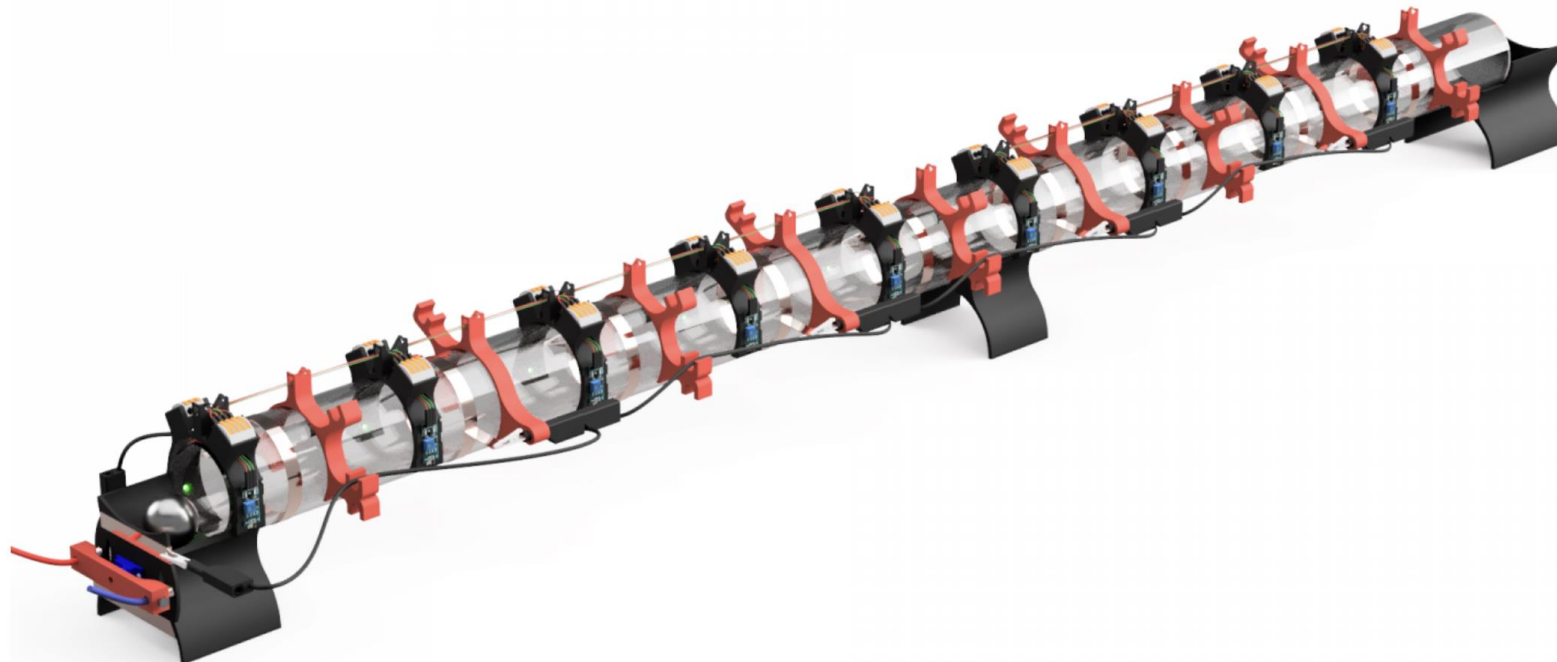
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ATLAS Magnet Model



3D-printable LINAC





Digital PET Learning Module

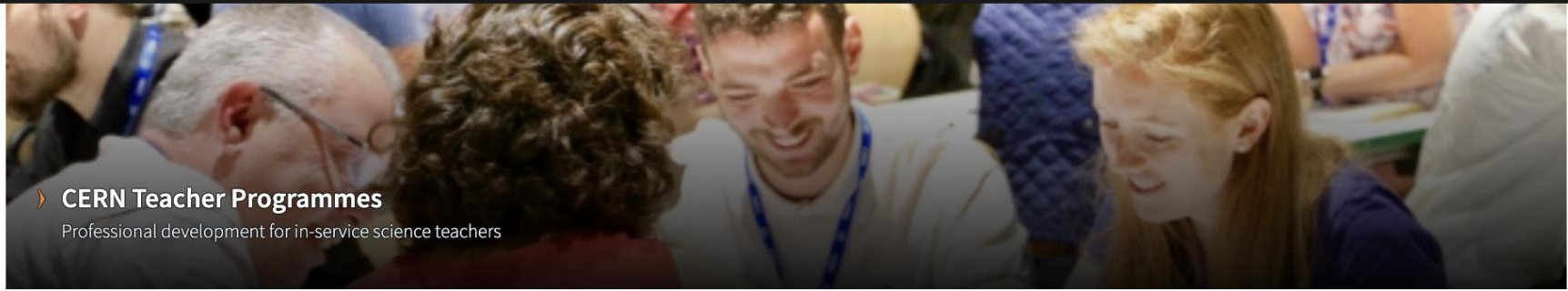
Help saving our virtual patient using PET (Positron-Emission-Tomography)!

Author: CERN PER team

Age group: 16+

*Το διδακτορικό μου είναι στην αξιολόγηση και τον σχεδιασμό Learning Modules
Ψάχνω καθηγητές λυκείου από την Ελλάδα για πιθανή συνεργασία*

Προγράμματα καθηγητών και μαθητών



› **CERN Teacher Programmes**
Professional development for in-service science teachers



› **Beamline for Schools**
Competition for teams of high-school students



› **CERN-Solvay Education Programme**
Online learning and high-school student camp



› **Physics Education Research**
Research results and modern physics education resources



› **High-School Student Internships**
Job shadowing opportunities



› **University Student Opportunities**
From undergraduates to doctoral students

Επισκέψεις σχολείων στο CERN

Μπορείτε να οργανώσετε επίσκεψη του σχολείου σας στο CERN, κλείνοντας εργαστήρια, guided tours και επίσκεψη στις εκθέσεις.

Μπορείτε να κλείσετε ημερομηνία επίσκεψης το νωρίτερο 9 μήνες πριν

Τα σλοτς κλείνουν σχεδόν αμέσως, οπότε πρέπει να κάνετε αίτηση νωρίς!!!

Διαβάστε τις οδηγίες προσεκτικά!

Κάνετε αίτηση με επίσημο email σχολείου!





