ANTIMATTER

HST2026 Study Group 2 - “Star group”
Shiny and Brilliant!

Curriculum & Classroom Connections

Highlight potential connections to the various curriculums and your individual teaching practices

1. Chile for 15 to 17 yrs
   Characteristics of particles and antiparticles
   Cosmos: Theories of the origin of the universe

1. Kyrgyzstan
   15- 16 yrs = introduction to antimatter via Big Bang.
   17-18 yrs= particle physics (annihilation and physics applications in med)

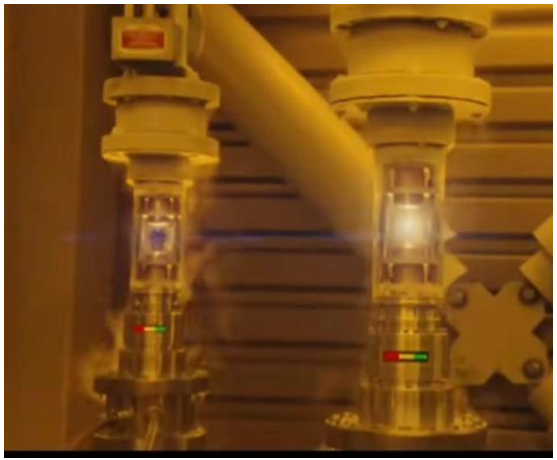
1. France (for 12 yrs to 15yrs)
   atom composition and opportunities for future.
   Maths are useful for physics and can show us things we don’t imagine (like positron)

2. Brazil (14–17 years old)
   Curriculum: Evaluate technological applications of radiation and their impacts on society.
   Activity: Explain PET scans and show how CERN's fundamental research led to medical applications.

3. Colorado, USA for 5 to 14 year olds Colorado has an initiative to include quantum in curriculum K-12 and electrons and positrons are quantum objects.

Potential Students' Conceptions & Challenges

Illustrate elements of the topic that might obstruct a successful introduction in the classroom



From Angels and Demons movie (2009) - (c)

Potential Misconceptions

"dark matter" and "antimatter" are synonyms (B)

Positrons have no mass because "anti"matter is equivalent to antigravity(B)

Annihilation is "magical destruction or disappearance"(P)

Antimatter is the "ultimate fuel or weapon" (P)

Students regard the particle as solid, making it difficult to imagine an antiparticle.(G)

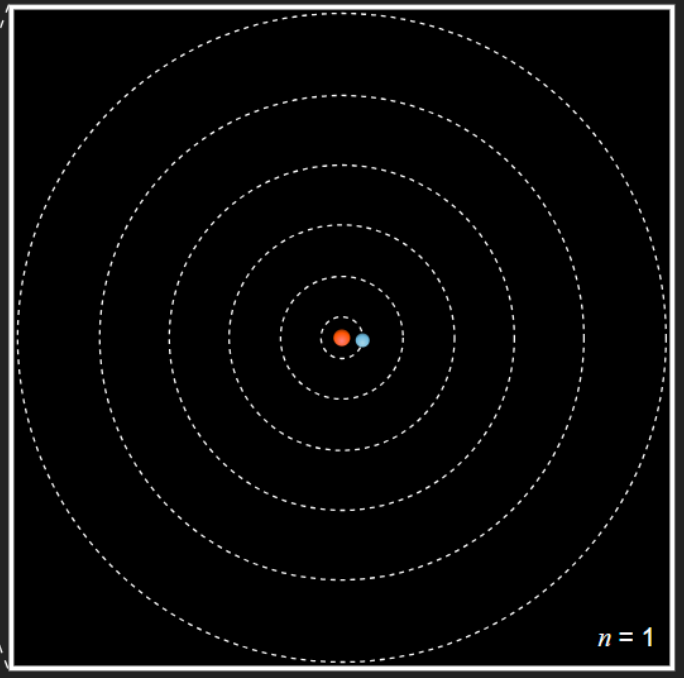
Why we had slightly more matter than antimatter in the early universe (G)

Physics can't explain everything yet (G)

If bananas are radiating positrons, why can't we see small expansions (M)

Are PET scans safe? (M)

próton
elétron
fóton



Modelo Experimento

Clássico
- Bola de Bilhar
- Bolo de Passas
- Sistema Solar Clássico
- Bohr
- de Broglie

Quântico
- Schrödinger

Rápido
Normal
Lento

Branca Monocromática

380 nm

UV

Transições

Espectrômetro (fótons emitidos / nm)

UV Visível IV

Buenos Aires

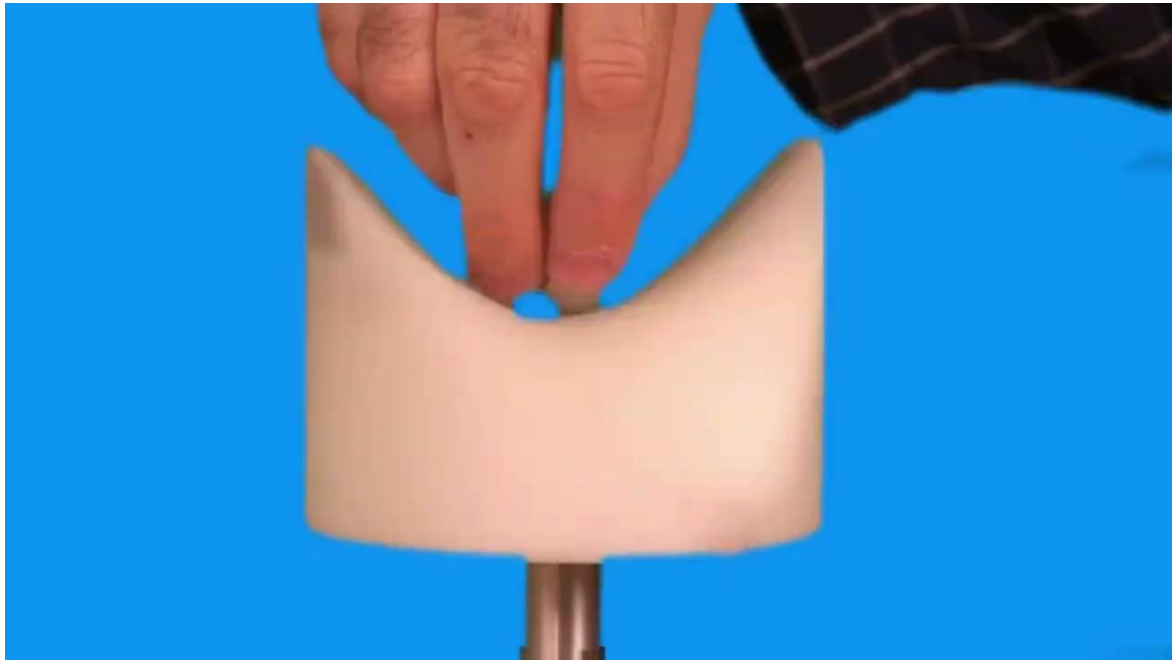
SOUTH AFRICA

Best Practice Example

I) BIG BANG

II) Positron’s discovery

III) Paul trap



MERCI BEAUCOUP