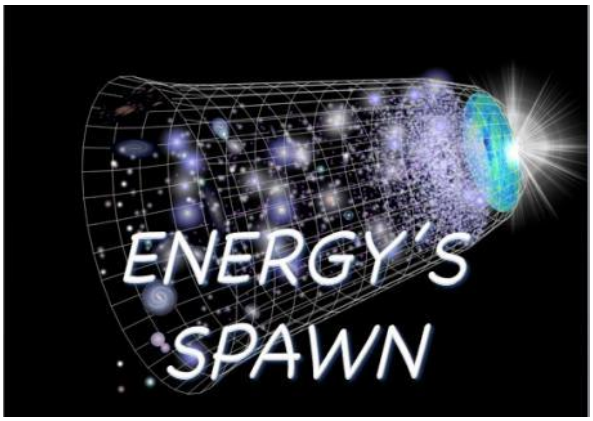
ANTIMATTER EXPLOSIONS



8. ANTIMATTER EXPLOSIONS

This image, from CERN, stands for the propositions that: (1) energy and mass are interchangeable quantities (which can be transformed into each other); and (2) when energy is converted to mass, it always does so by producing 50% matter particles and 50% antimatter particles.

About a gram of antimatter is “on the loose” in *Angels & Demons*. While that doesn’t sound like much, the destructive power of a single gram of antimatter is extremely significant.

The question becomes: Is it possible to create that much antimatter in a particle accelerator (or elsewhere)? Another way of asking the question is: How much antimatter has ever been created in the history of CERN?

We get the answer to that question from CERN itself.

Only small - very small - quantities of antimatter are produced in particle accelerators (sometimes referred to as “atom smashers”). That’s even true in the biggest accelerator which exists today - the LHC (the Large Hadron Collider) at CERN.

If CERN used all of its accelerators to only make antimatter, the company could produce no more than about one-billionth of a gram in a year. If CERN were asked to produce one gram of antimatter - the amount made by Vetra in the story - it would take ... about ... a billion years.

In fact, the total amount of antimatter which CERN has produced in its entire history ... is ... less ... than ten nanograms. Translated into something everyone can understand, that would be enough energy to power a sixty-watt light bulb for about four hours.

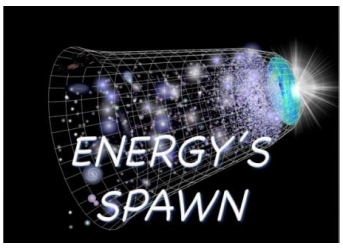
Antimatter explosions, thus, are not the same as nuclear explosions. In the former, antimatter annihilates when it touches matter. In the latter, a chain reaction causes the explosion.

Fortunately, antimatter cannot be used as a weapon because there just isn’t enough to use for that purpose. But if it ever could happen ... as proposed in the film, *Angels & Demons* ... watch out!!

See Alignments to State and Common Core standards for this story online at:
http://www.awesomestories.com/asset/AcademicAlignment/ANTIMATTER-EXPLOSIONS-Angels-Demons

See Learning Tasks for this story online at:
http://www.awesomestories.com/asset/AcademicActivities/ANTIMATTER-EXPLOSIONS-Angels-Demons

Media Stream



ANTIMATTER EXPLOSIONS

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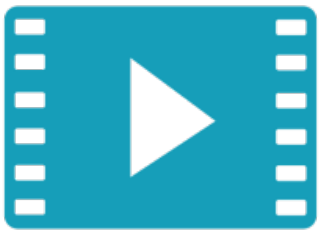

Superconducting Magnets Inside Hadron Collider

Video clip produced by, and online courtesy of, CERN.

PD

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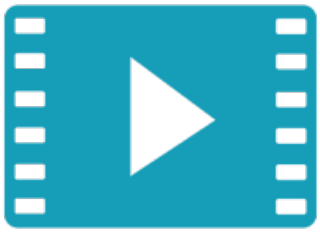

Superconducting Magnets Inside Hadron Collider, Part 2

Video clip (from February 2000) produced by, and online courtesy of, CERN.

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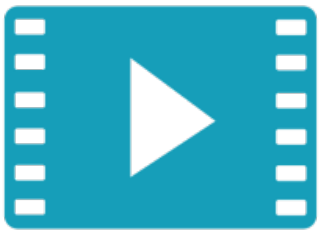

Superconducting Magnets Inside Hadron Collider, Part 3

Video clip (from February 2000) produced by, and online courtesy of, CERN.

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View this asset at:
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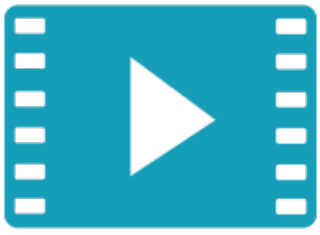

Flash of Antimatter

Video clip, from 2000, online courtesy CERN.

PD

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