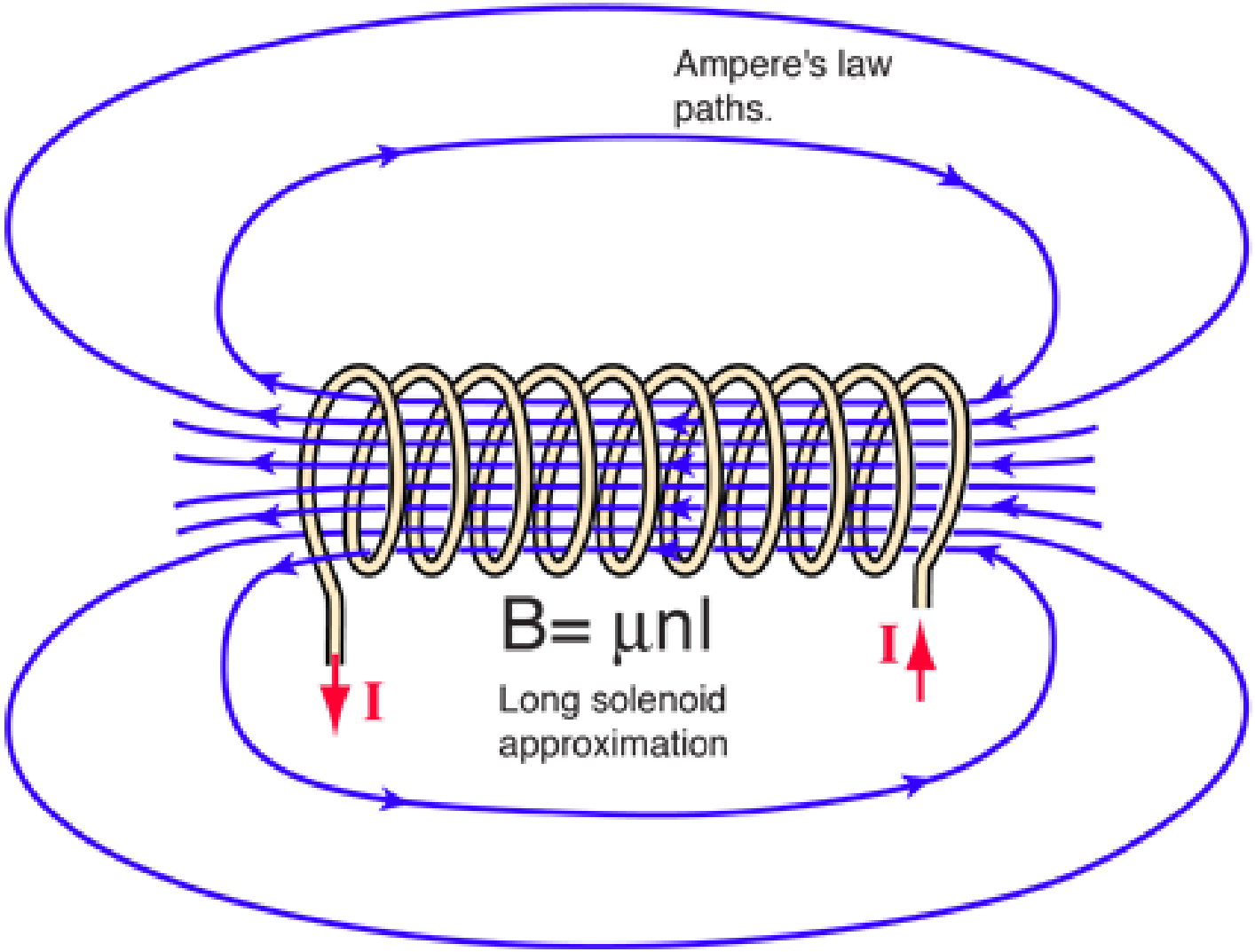
Lecture 30 Slides
Phys 313 Fall 2026

Solenoid Magnet



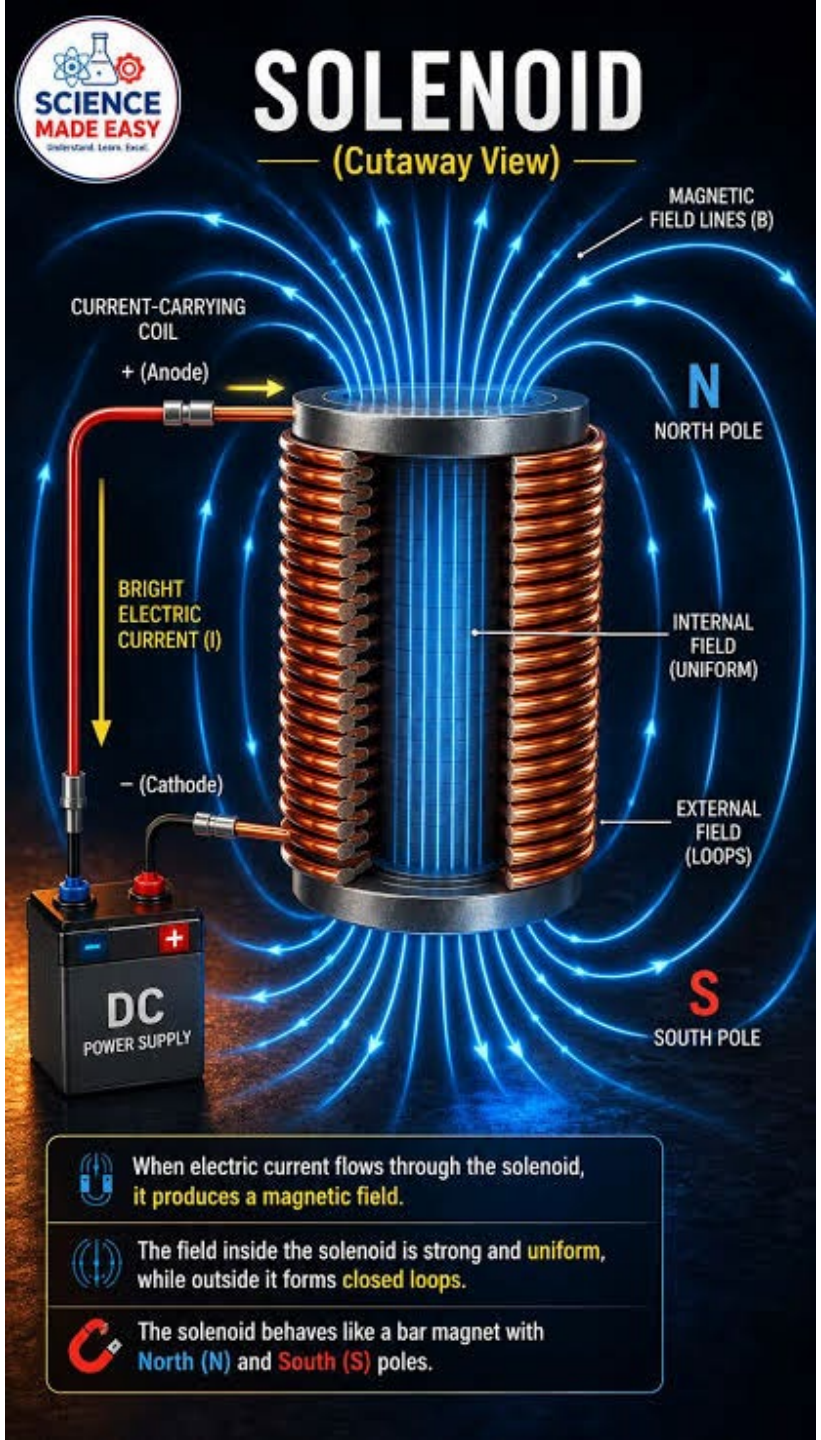
The magnetic field is concentrated into a nearly uniform field in the center of a long solenoid. The field outside is weaker and the lines representing the magnetic field are further apart.

http://hyperphysics.phy-astr.gsu.edu/hbase/magnetic/solenoid.html

SCIENCE MADE EASY

SOLENOID

(Cutaway View)



When electric current flows through the solenoid, it produces a magnetic field.

The field inside the solenoid is strong and uniform, while outside it forms closed loops.

The solenoid behaves like a bar magnet with North (N) and South (S) poles.

MRI Superconducting Solenoid



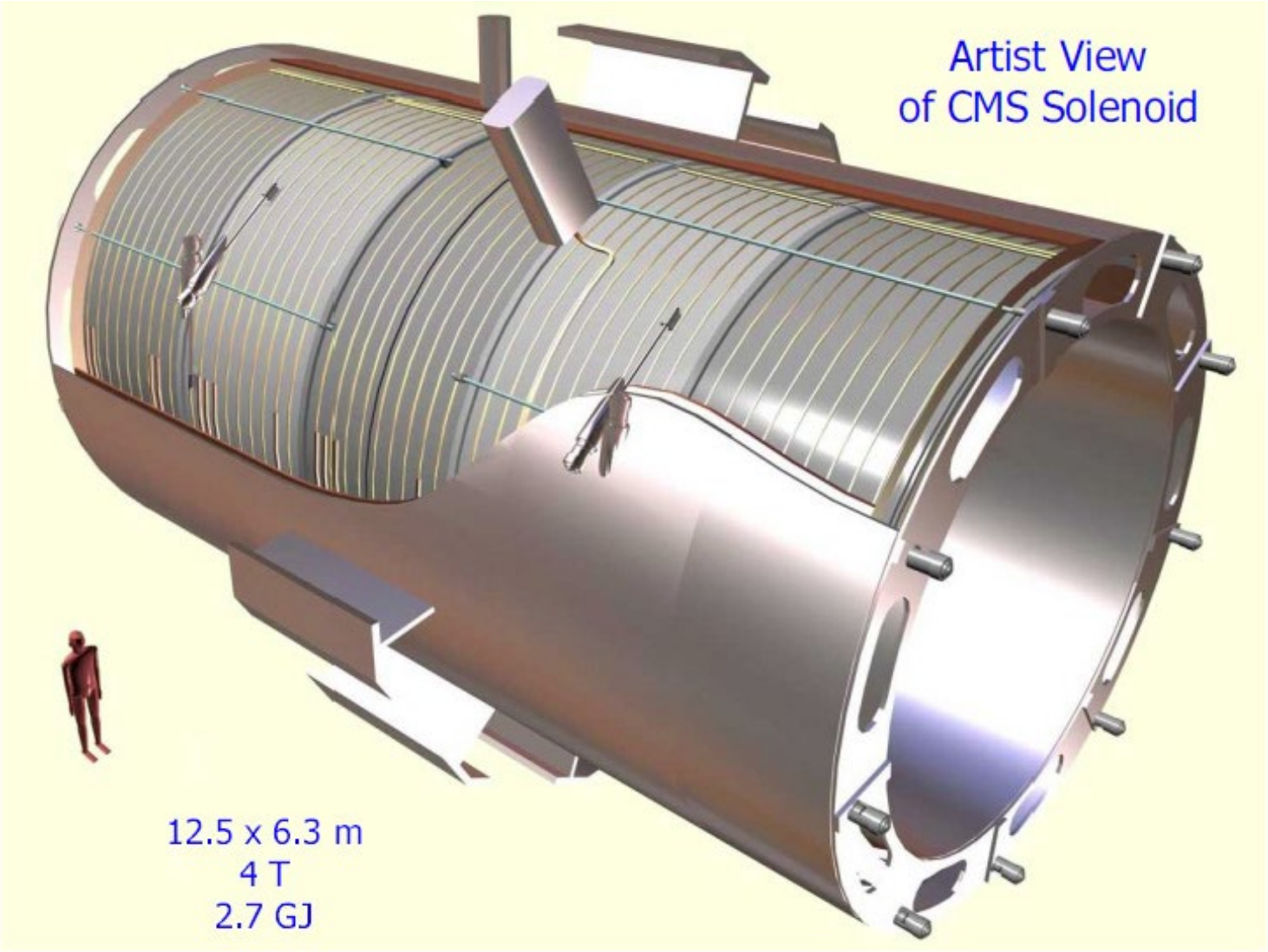
MRI Superconducting Solenoid



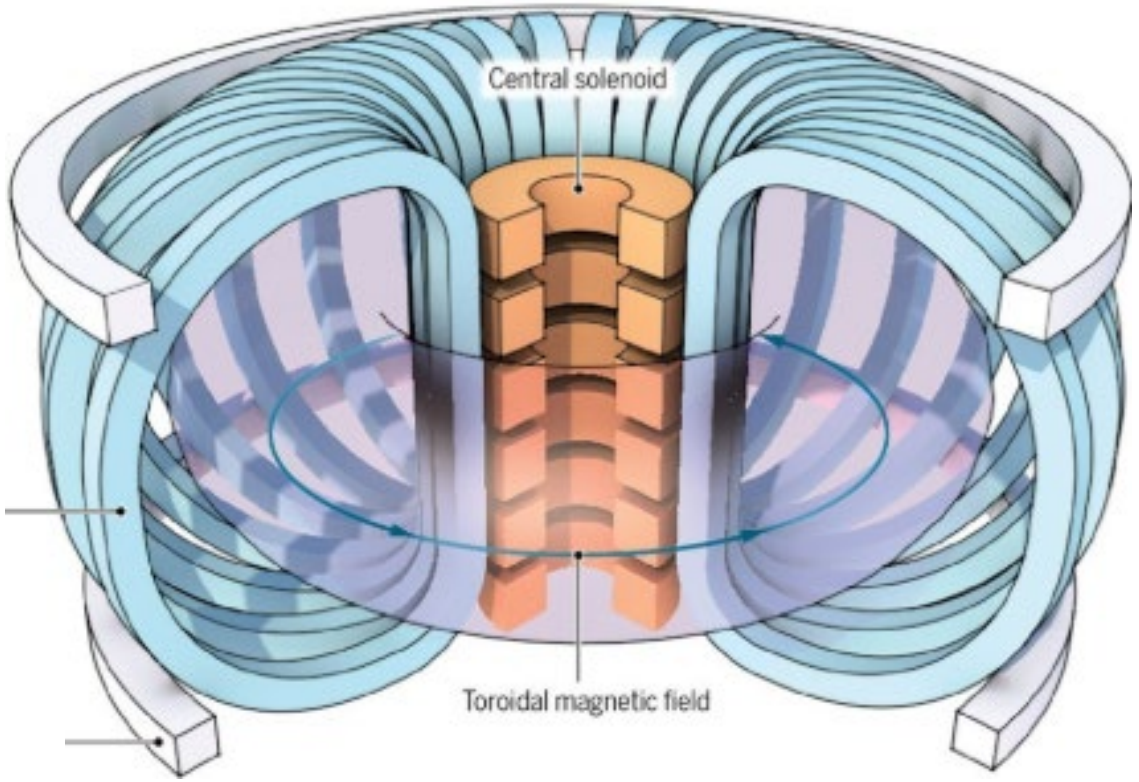
https://mriquestions.com/superconductive-design.html

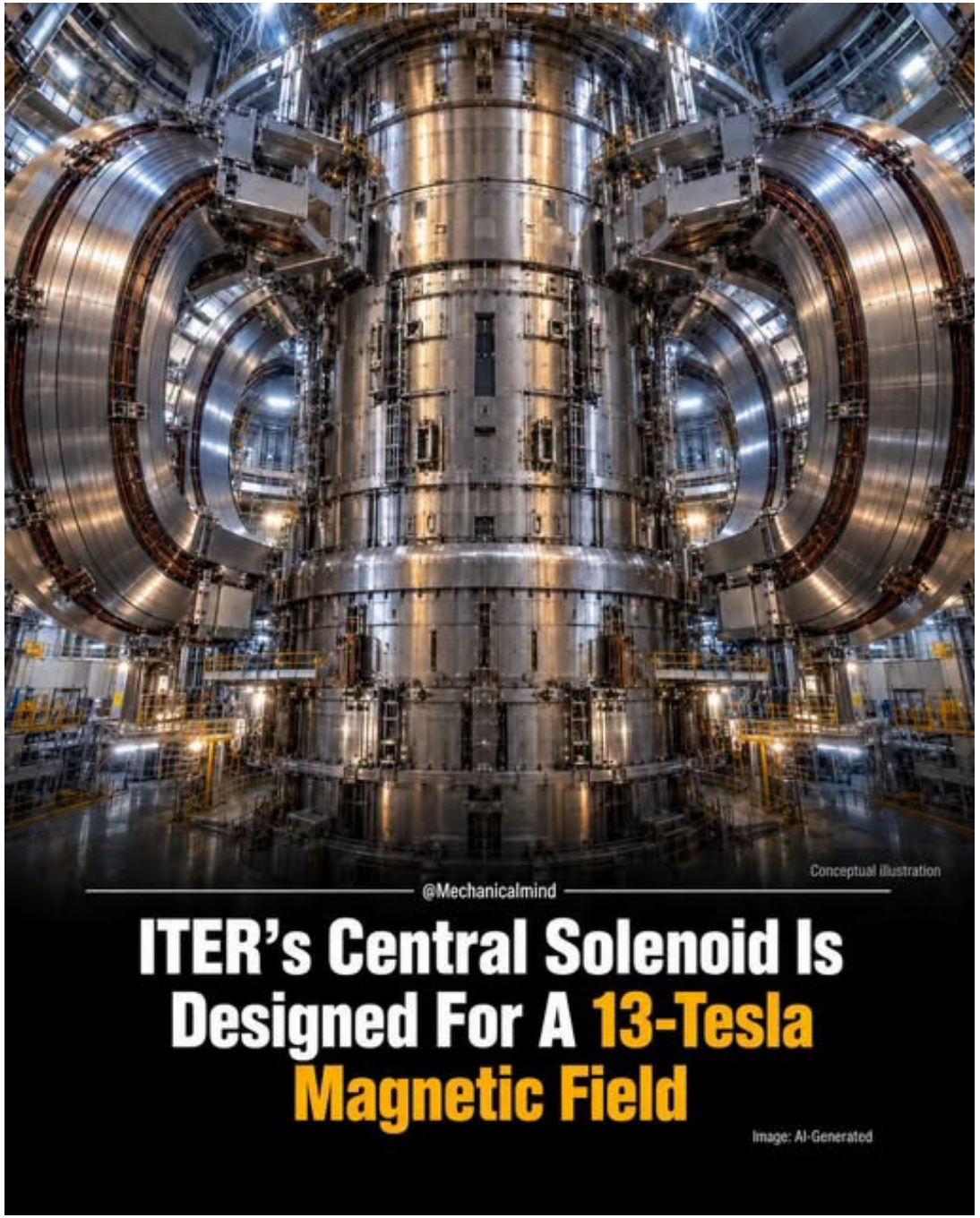
The CMS Detector at CERN





https://newsline.linearcollider.org/wp-content/uploads/2011/05/CMS-solenoid-magnet.jpg


Central solenoid
Toroidal magnetic field


Conceptual illustration
@Mechanicalmind
ITER's Central Solenoid Is Designed For A 13-Tesla Magnetic Field
Image: AI-Generated