

实验视频



这部分我们收集并整理了相当数量的电磁学演示实验以及相关的视频材料。期中部分英文发音，英文说明。

本课件在开发过程中选用了一些兄弟院校制作视频或动画，其中一些已找不到出处。也从一些网站下载了一些图片和视频。编者在此对这些课件的开发者，以及相关网站表示诚挚的谢意。这些网站分别是：

<http://www.mit.edu>; <http://www.youtube.com>; <http://www.cctr.net.cn/>。

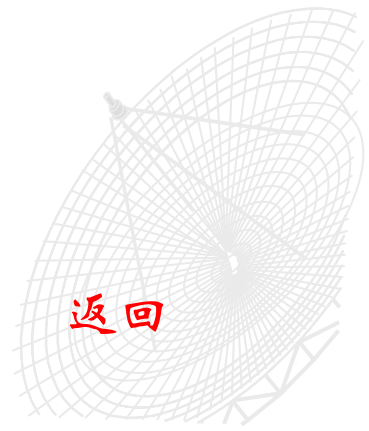
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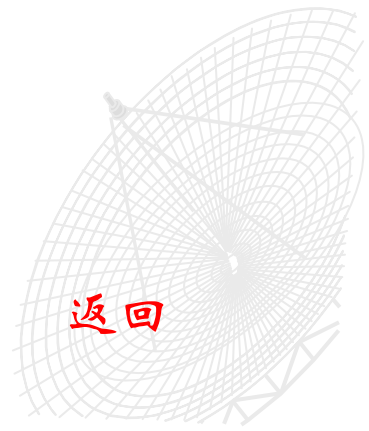




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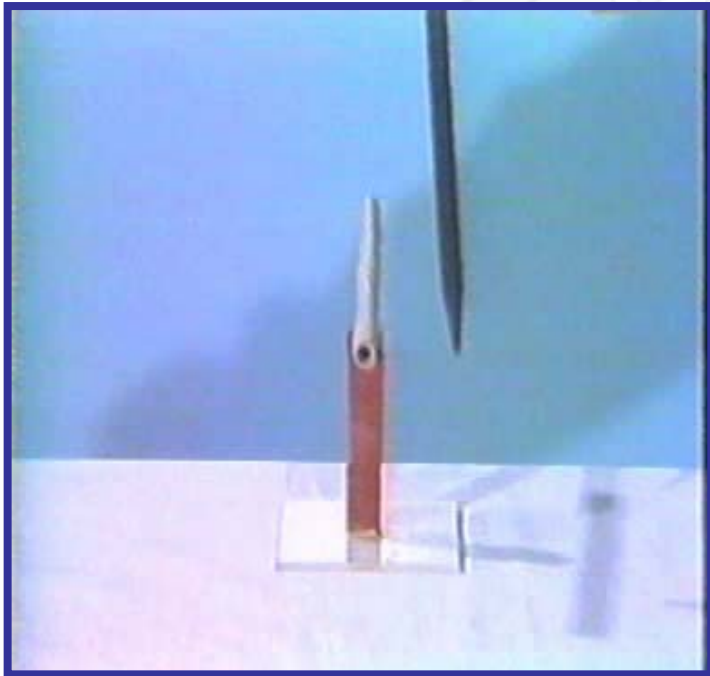
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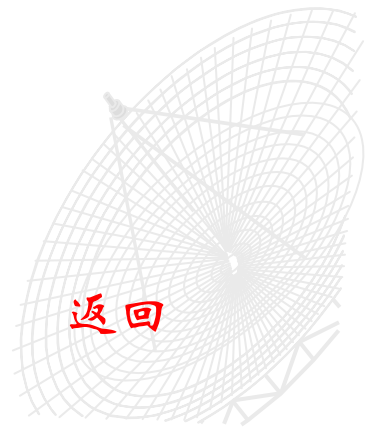
Repulsion and attraction



公元前6世纪希腊学者泰勒斯发现了摩擦起电的现象。用毛皮摩擦过的橡胶棒带负电，用丝绸摩擦过的玻璃棒带正电。

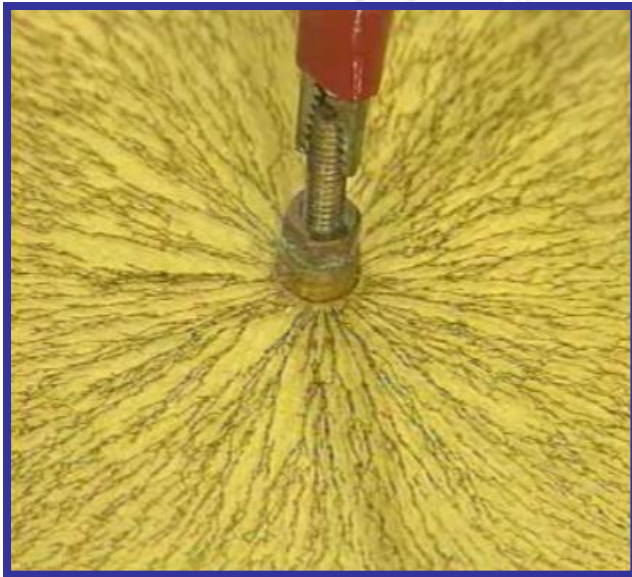
同号电荷互相排斥，异号电荷互相吸引。

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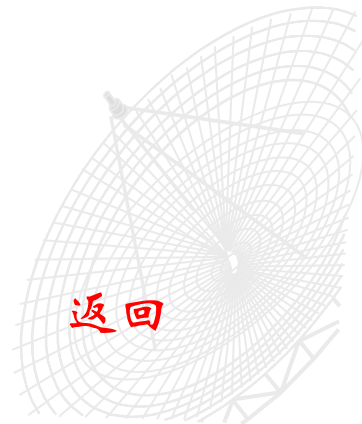
Lines of Electric Field for some typical charged bodies



利用电场线的概念可形象描绘电场在空间的分布情况。电场线的方向代表了电场的方向；电场线的密度代表了电场的强度。

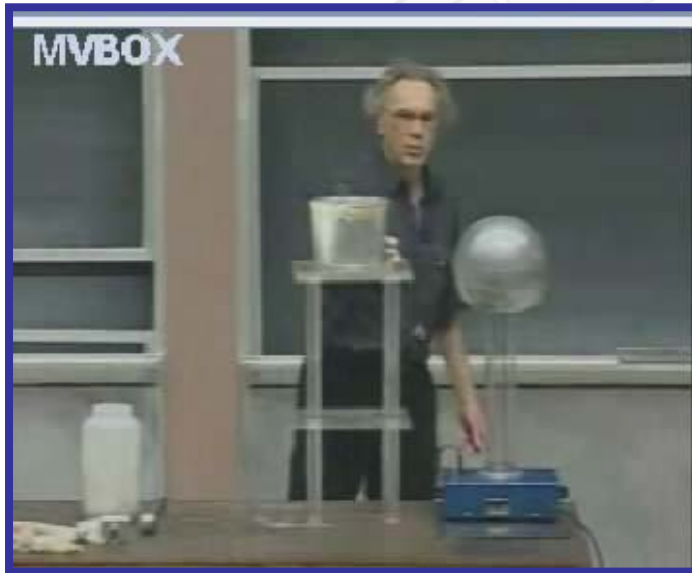
本实验利用绝缘细屑在电场中被极化后沿电场方向排列，从而模拟了几种带电体电场的分布情况。

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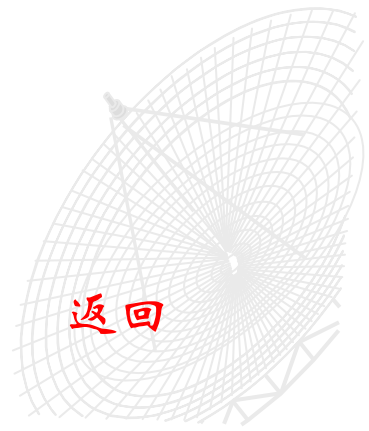
Electrostatic shielding I



A can near Vander Graff generator, if the Vander Graff generator is positive, negative charges will appear on the outer surface of near side of the can, positive charges will appear on the outer surface of farther side of the can, and no charge appear on the inner surface of the can, but the can will keep equipotential.

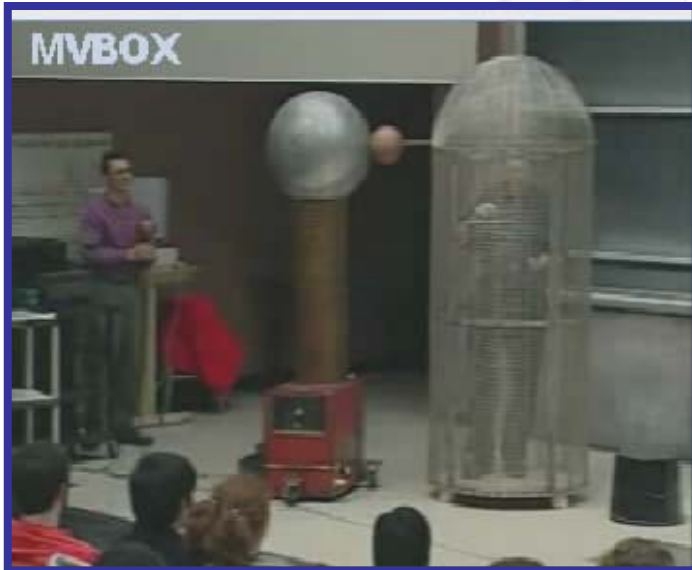
This video comes from Pro. Walter Lewin's Lecture in MIT. His lecture is humor interesting.

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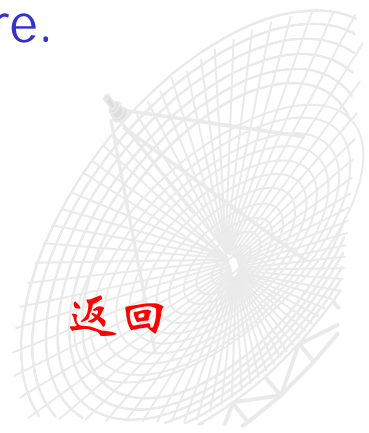
Electrostatic shielding II



This video comes from Pro. Walter Lewin's Lecture in MIT. His lecture is humor interesting.

Walter Lewin carries the a radio which turns on, the speaker is speaking something. When he take the radio into faraday's cage, no sound come out of the radio, at the same time, we can only hear Walter Lewin's lecture.

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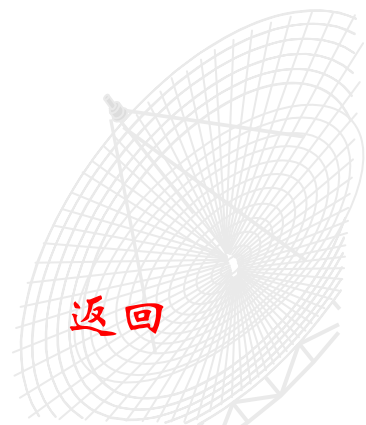
Electrostatic shielding III



Vander Graff generator is charged 100000-200000 Voltages. Walter Lewin get into a metal net which is discharging to the generator. But he is not afraid. He can touch the inner surface of the net and eventually move the charging ball. He is safety. Beause the net is Faraday's cage.

This video comes from Pro. Walter Lewin's Lecture in MIT. His lecture is humor interesting.

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Force between current-carrying wire



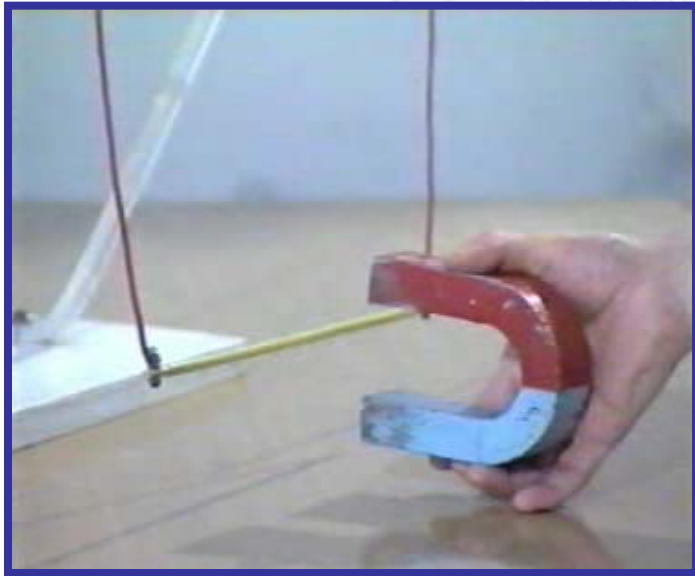
两平行直导线中通以电流时，两导线间有相互作用力。当电流方向相同时，两导线相互吸引；当电流方向相反时，两导线互相排斥。

利用平行电流间的相互作用，可定义电流的单位—安培。

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Ampere's Force



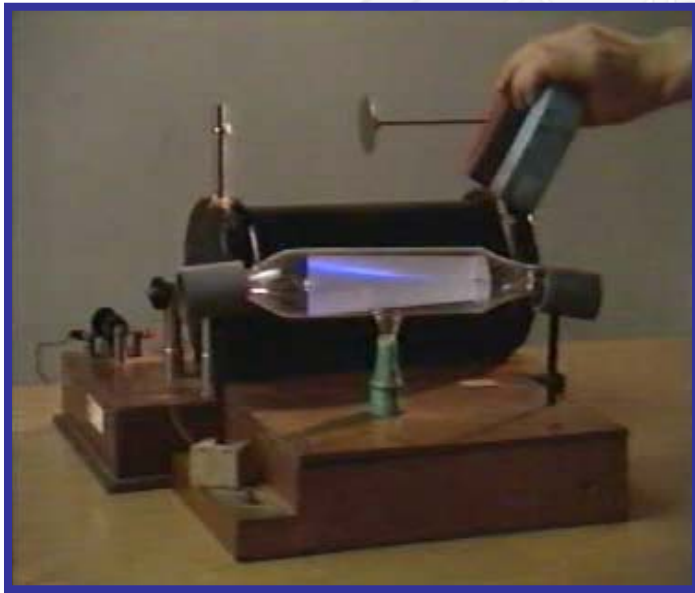
1820年，法国物理学家安培发现了电流与磁场间的相互作用，称为安培力。

微观上讲，安培力是大量运动电荷所受洛仑兹力的宏观表现。

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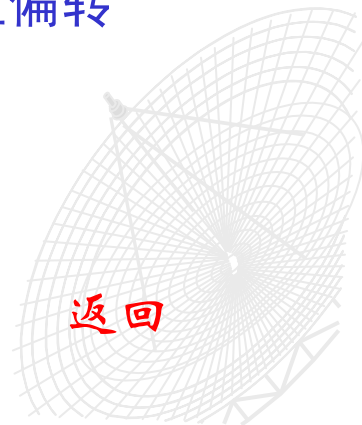
Lorentz Force



磁场中的运动电荷会受到磁力的作用，这种作用力称为洛仑兹力。洛仑兹力的大小和方向与磁场的大小、方向以及运动电荷的速度都有关。

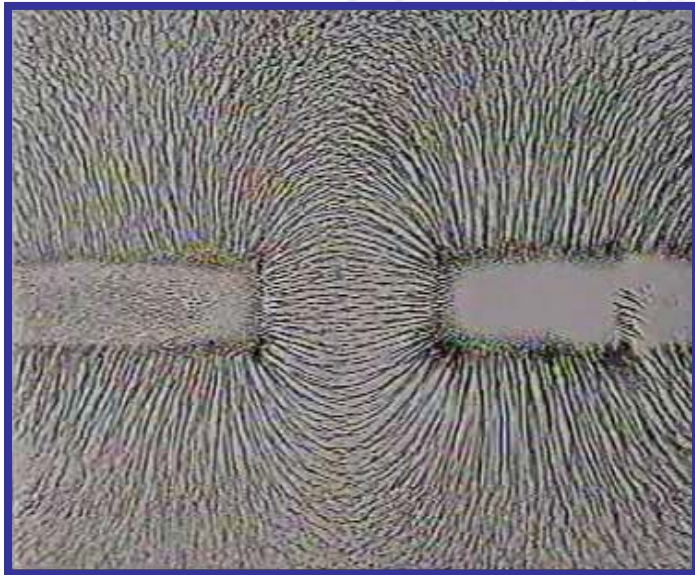
本实验显示了阴极射线（电子束流）在磁场作用下发生偏转的现象。

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Lines of Magnetic Field



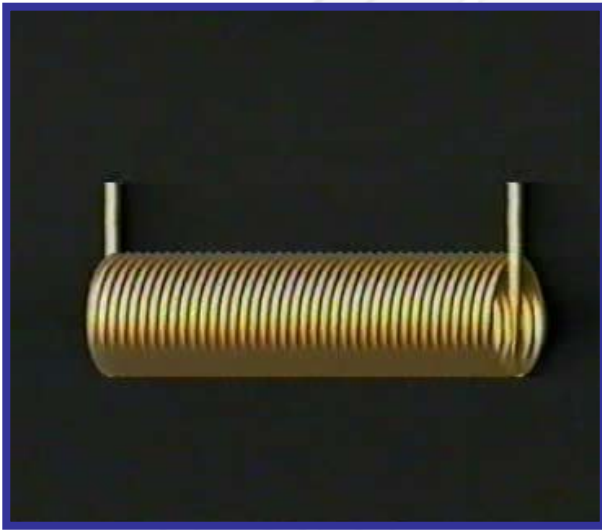
引入磁感应线的概念可形象描绘磁场在空间的分布情况。磁感应线的方向代表了磁场的方向；磁感应线的密度代表了磁场的强度。

本实验利用细小的铁屑在磁场中被磁化后沿磁场方向排列，从而模拟了磁感应线的分布情况。

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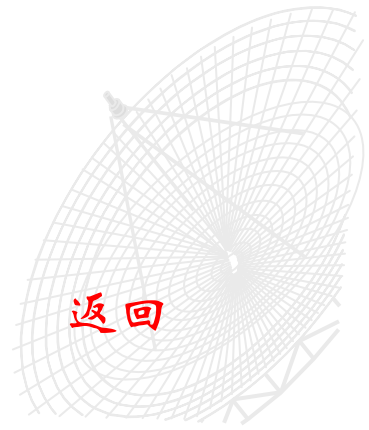


Magnetic field of Solenoid



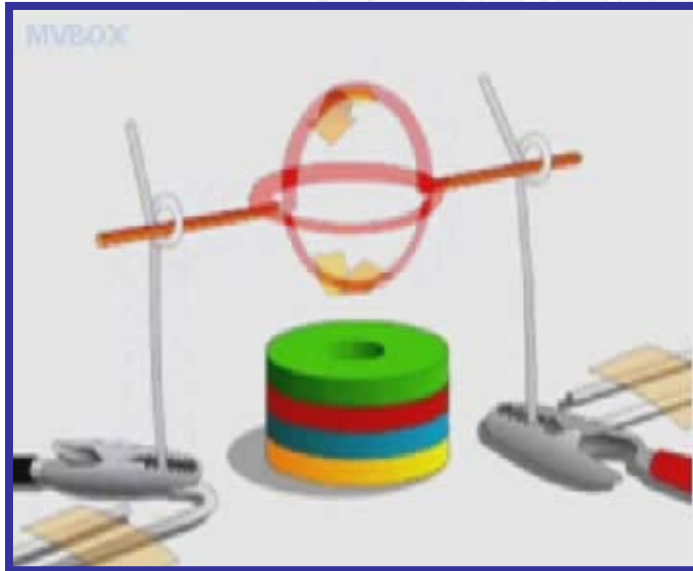
本实验利用细小的铁屑在螺线管的磁场中被磁化后沿磁场方向排列的情况，模拟了螺线管磁场在管内和管外的分布情况。

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Making Motor Yourself



自制电动机 本视频通过演示自制电动机过程介绍了电动机原理。

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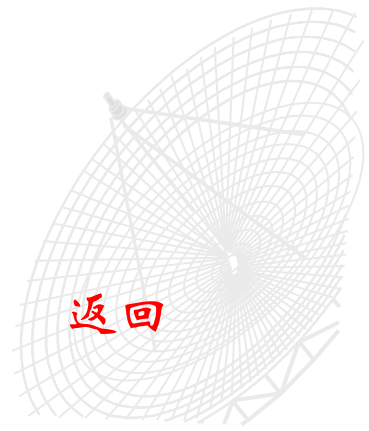


Aurora Borealis (The Northern Lights)



本视频展示了精美的北极光照片。极光是来自外太空的带电粒子进入地磁场时，因螺旋运动集中于北极附近，并与空气分子碰撞而发光的结果。

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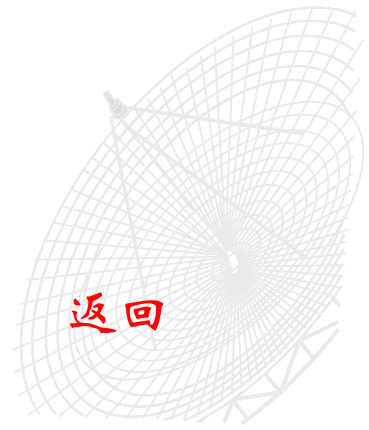


Introduction to MRI



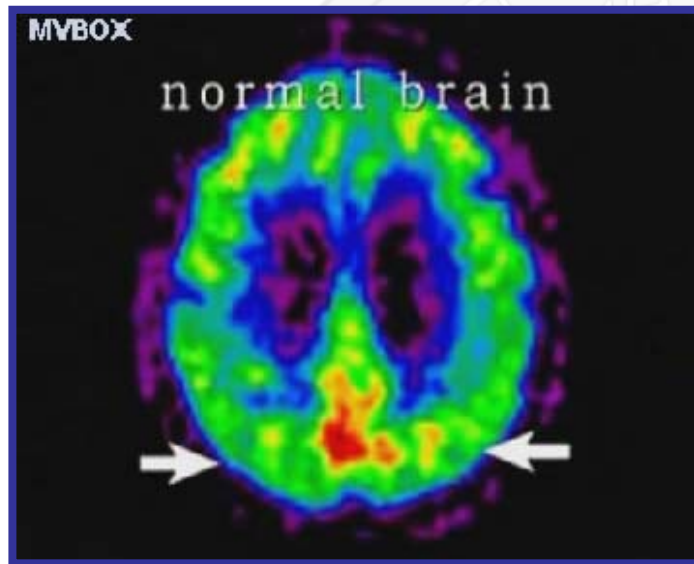
本视频介绍了核磁共振仪的成像原理。

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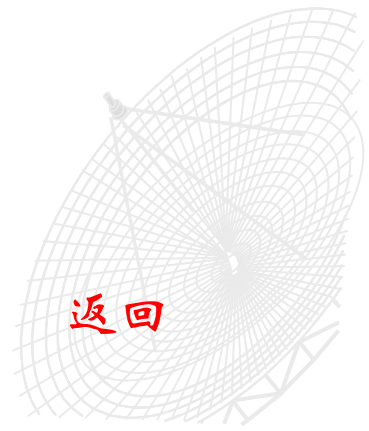


EEG equipment, PET scans and MRI machines



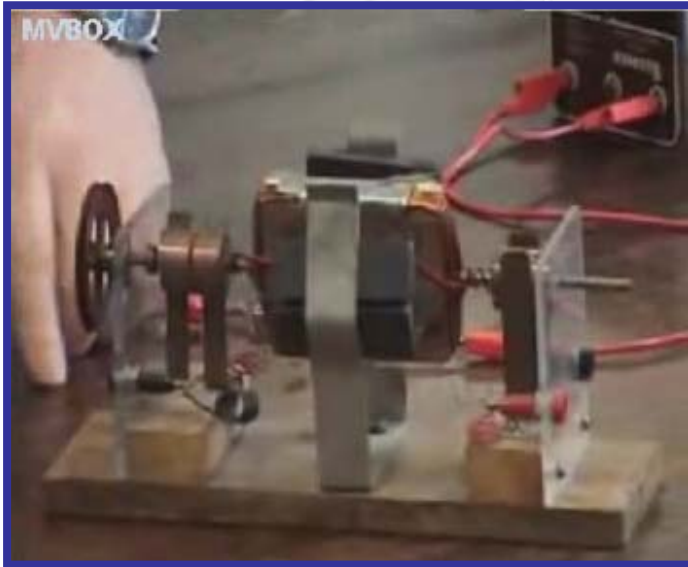
本视频进一步介绍核磁共振仪的成像原理。

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Introduction to generating electricity



本视频介绍发电机原理

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Damped pendulum



本视频介绍电磁阻尼摆原理。当金属摆进出两铁芯形成的磁场空间时，因超过金属板磁通量的变化，在摆中形成涡旋电流。此电流受磁场作用将阻碍摆的进出，从而形成阻尼。

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Curie temperature

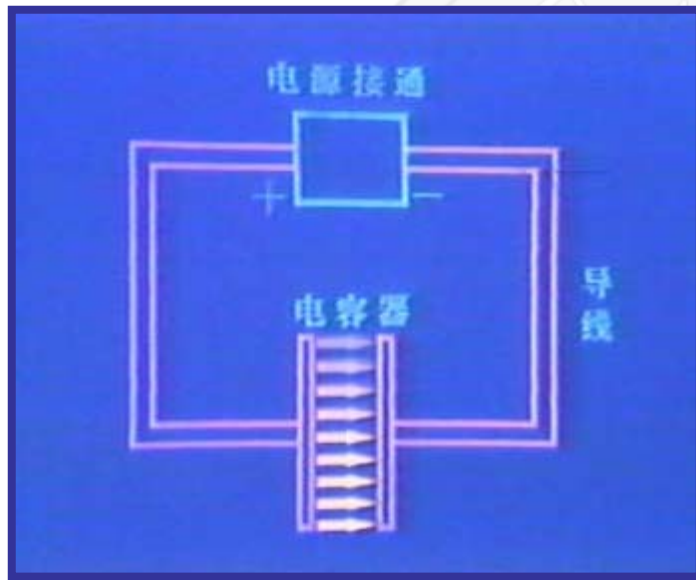


本实验介绍居里点 某磁针
吸附在铁芯上。当被加热到
一定温度时，磁针与铁芯分
离了。说明达到这个温度
时，磁针由铁磁介质变成顺
磁介质，同时磁性消失。这
个温度就是居里点。

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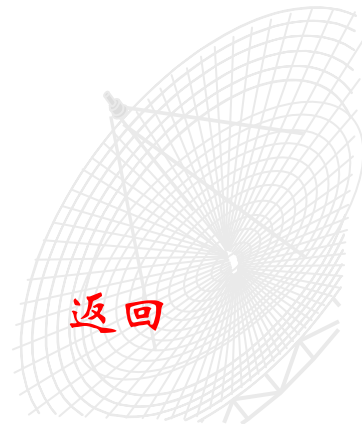


Displacement current



位移电流 本视频介绍位移电流概念，当RC电路由直流电源充电时，导线中有传导电流，电容器极板间无传导电流，灯泡仍然瞬间发光，放电时也是如此。若采用交流电源，则灯泡始终发光。麦克斯韦把电容器中变化的电场定义为位移电流。

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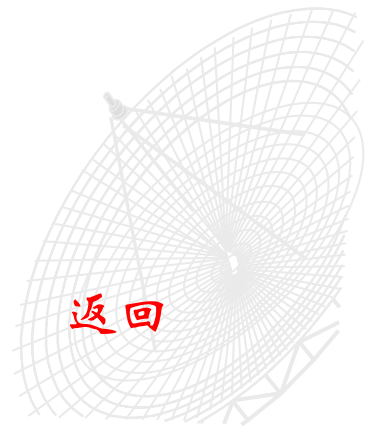


Attack from Infrared Guidance 1



红外制导武器轰炸桥梁。

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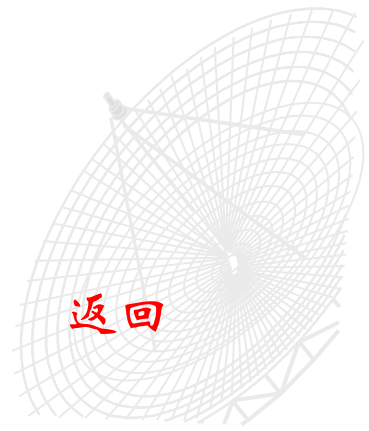


Attack from Infrared Guidance 2



红外制导武器轰炸敌方飞机。

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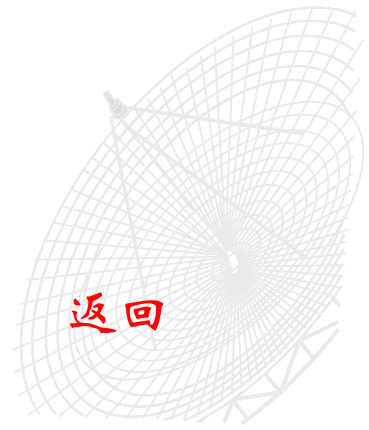


Evidence of dinosaur and human coexistence



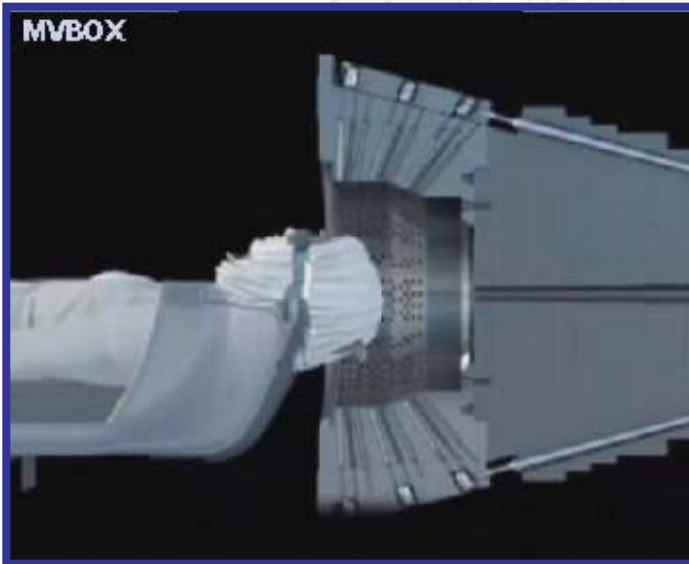
X-光成像的应用 本视频介绍X-光成像鉴别化石年代。通过化石的X-成像照片，科学得出了人类与恐龙曾经同出一个时代。

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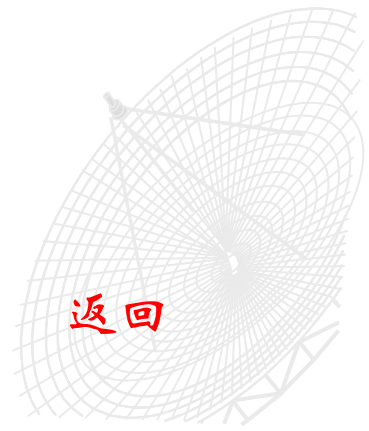


Hubbard's Concept of Gamma Radiation



This video introduces the operation principle of Gamma knife.

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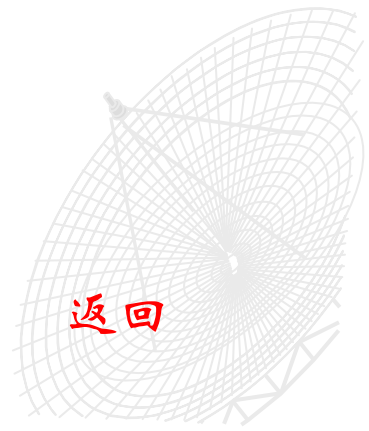


UHN Finding the Answers-Neuroscience Part III



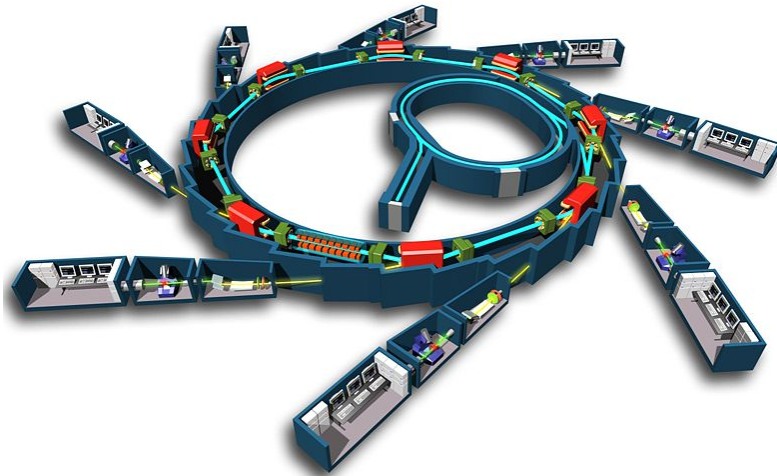
Another video to introduce the operation principle of Gamma knife.

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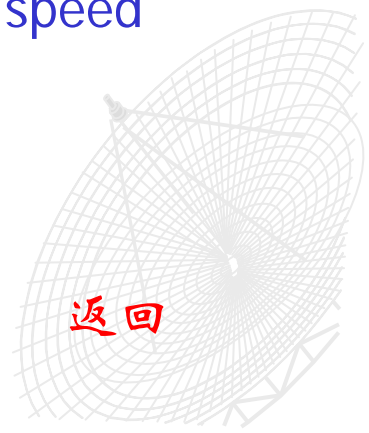


The Large Hadron Collider I



The Large Hadron Collider (LHC) is the world's largest and highest-energy particle accelerator, intended to collide opposing beams of protons or lead ions, each moving at over 99.9999991% of the speed of light.

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The Large Hadron Collider II

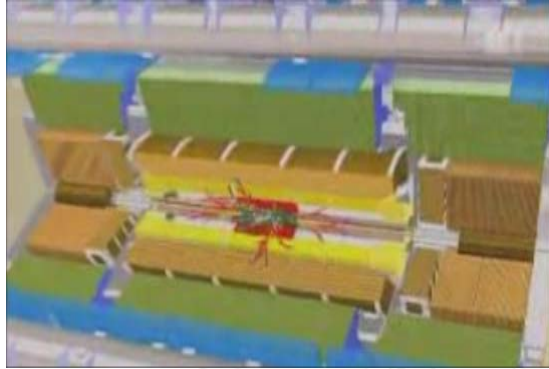


The LHC was built by the European Organization for Nuclear Research (CERN) with the intention of testing various predictions of high-energy physics, including the existence of the hypothesized Higgs boson and of the large family of new particles predicted by supersymmetry. It lies underneath the Franco-Swiss border between the Jura Mountains and the Alps near Geneva, Switzerland.

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The Large Hadron Collider III



It is funded by and built in collaboration with over 10,000 scientists and engineers from over 100 countries as well as hundreds of universities and laboratories.

On 10 September 2008 proton beams were successfully circulated in the main ring of the LHC for the first time. On 19 September 2008, the operations were halted due to a serious fault between two superconducting bending magnets. Owing to the already planned winter shutdown, the LHC will not be operational again until the spring of 2009.

The LHC will be officially inaugurated on 21 October 2008.

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