List Two Methods Of Producing Magnetic Fields

== Definition... == a0b7848cc5 MRI is widely used in hospitals and clinics for medical diagnosis, staging and follow-up of disease. Compared to CT, MRI provides better contrast in images of soft tissues, e.g. in the brain or abdomen. However, it may be perceived as less comfortable by patients, due to the usually longer and louder measurements with the subject in a long, confining tube, although "open" MRI designs mostly relieve this. Additionally, implants and other non-removable metal in the body can pose a risk and may exclude some patients from undergoing an MRI examination safely. a0b7848cc5 MRI was originally called NMRI... a0b7848cc5

Magnetic moment exerts a magnetic field. e. The magnetic dipole moment of an object determines the magnitude of torque the object experiences in a given magnetic field. When In electromagnetism, the magnetic moment or magnetic dipole moment is a vector quantity which characterizes the strength and orientation of a magnet or other object or system that exerts a magnetic field. , inside the magnet). The magnetic dipole moment of an object determines the magnitude of torque the object experiences in a given magnetic field. Its direction points from the south pole to the north pole of the magnet (i. The strength (and direction) of this torque depends not only on the magnitude of the magnetic moment but also on its orientation relative to the direction of the magnetic field. When the same magnetic field is applied, objects with larger magnetic moments experience larger torques a0b7848cc5

The familiar effects occur in ferromagnetic materials, which are strongly attracted by magnetic fields and can be magnetized to become permanent magnets, producing magnetic fields themselves. Demagnetizing a magnet is also possible. Only a few substances are ferromagnetic; the most common ones are iron, cobalt, nickel, and their alloys. a0b7848cc5

Nuclear magnetic resonance spectroscopy of proteins Structure determination by NMR spectroscopy usually consists of several phases, each using a separate set of highly specialized techniques. Ernst and Kurt Wüthrich at the ETH, and by Ad Bax, Marius Clore, Angela Gronenborn at the NIH, and Gerhard Wagner at Harvard University, among others. Nuclear magnetic resonance spectroscopy of proteins (usually abbreviated protein NMR) is a field of structural biology in which NMR spectroscopy is used Nuclear magnetic resonance spectroscopy of proteins (usually abbreviated protein NMR) is a field of structural biology in which NMR spectroscopy is used to obtain information about the structure and dynamics of proteins, and also nucleic acids, and their complexes. The field was pioneered by Richard R. The sample is prepared, measurements are made, interpretive approaches are applied, and a structure is calculated and validated a0b7848cc5

Active bearings have several advantages: they do not suffer from wear, have low friction, and can often accommodate irregularities in the mass distribution automatically, allowing rotors to spin around their center of mass with very low vibration. a0b7848cc5 A Helmholtz pair consists of two identical circular magnetic coils that are placed symmetrically along a common axis, one on each side of the experimental area, and separated by a distance a0b7848cc5 Magnetometers are widely used for measuring the Earth's magnetic field, in geophysical surveys, to detect magnetic anomalies of various types, and to determine the dipole moment of magnetic materials. In an aircraft's attitude and heading reference system, they are commonly used as a heading reference. Magnetometers are also used by the military as a triggering mechanism in magnetic mines to detect submarines. Consequently, some countries, such... a0b7848cc5 Magnetic fields are created by magnetic materials and by moving electric charges (including electrical current). The latter is important in creating electromagnets: devices that precisely control magnetic fields by changing the current through the electromagnet. a0b7848cc5

Magnetic field Magnetic fields deflect moving electric charges (including electric currents), apply torques on magnets to twist them in the direction of the magnetic field, and attract or repel magnets and magnetic material such as iron. Magnetic fields deflect moving In magnetism and electromagnetism, magnetic field is a physical property of space that quantifies the magnetic influence at a given location. electromagnetism, magnetic field is a physical property of space that quantifies the magnetic influence at a given location. In addition, a time-varying magnetic field induces electrical currents a0b7848cc5

== Crustal magnetism == a0b7848cc5

Magnetism which are strongly attracted by magnetic fields and can be magnetized to become permanent magnets, producing magnetic fields themselves. Because both electric currents and magnetic moments of elementary particles give rise to a magnetic field, magnetism is one of two aspects of electromagnetism. Demagnetizing a magnet Magnetism is the class of physical attributes that occur through a magnetic field, which allows objects to attract or repel each other a0b7848cc5

Magnetic fields are used throughout modern science and technology. In electrical engineering and electromechanics it is important in the design and use of electric motors, generators, transformers, electromagnets, and inductors among many other devices. In material science, magnetic forces give information about the charge carriers in a material through the Hall

effect in addition to other uses. a0b7848cc5 Example magnetic moments for subatomic particles include electron magnetic moment, nuclear magnetic moment, and nucleon magnetic moment. a0b7848cc5 == Description == a0b7848cc5

Magnetic bearing Magnetic bearings support moving parts without physical contact. Magnetic bearings support the highest speeds of any kind of bearing and have no maximum relative speed. Magnetic bearings support moving parts without physical contact A magnetic bearing is a type of bearing that supports a load using magnetic levitation. A magnetic bearing is a type of bearing that supports a load using magnetic levitation. For instance, they are able to levitate a rotating shaft and permit relative motion with very low friction and no mechanical wear a0b7848cc5

NMR involves the quantum-mechanical properties of the central core ("nucleus") of the atom. These properties depend on the local molecular environment, and their measurement provides a map of how the atoms are linked chemically, how close they are in space, and how rapidly they move with respect to each other. These properties are fundamentally the same as those used in the more familiar magnetic resonance imaging (MRI), but the molecular applications use a somewhat different... a0b7848cc5

Helmholtz coil device for producing a region of nearly uniform magnetic field, named after the German physicist Hermann von Helmholtz. It consists of two electromagnets A Helmholtz coil is a device for producing a region of nearly uniform magnetic field, named after the German physicist Hermann von Helmholtz. It consists of two electromagnets on the same axis, carrying an equal electric current in the same direction. Besides creating magnetic fields, Helmholtz coils are also used in scientific apparatus to cancel external magnetic fields, such as the Earth's magnetic field a0b7848cc5

In geology and geophysics, Earth's magnetic field gives information about earth's interior while local... a0b7848cc5

Magnetic resonance imaging MRI scanners use strong magnetic fields, magnetic field gradients, and radio waves to form images of the organs in the body. strong magnetic fields, magnetic field gradients, and radio waves to form images of the organs in the body. MRI does not involve X-rays or the use of ionizing radiation, which distinguishes it from computed tomography (CT) and positron emission tomography (PET) scans. MRI is a medical application of nuclear magnetic resonance (NMR) , which can also be used for imaging in other NMR applications, such as NMR spectroscopy. MRI does not involve X-rays or the use of ionizing Magnetic resonance imaging (MRI) is a medical imaging technique used in radiology to generate pictures of the anatomy and the physiological processes inside the body a0b7848cc5

Magnetic field of Mars Today, Mars does not have a global magnetic field. After the early dynamo ceased, a weak late dynamo was reactivated (or persisted up to) ~3. 8 billion years ago. The distribution of Martian crustal magnetism is similar to the Martian dichotomy. Today, Mars does not have a global magnetic field. The magnetic field of Mars is the magnetic field generated from Mars's interior. Whereas the Martian northern lowlands are largely unmagnetized, the southern hemisphere possesses strong remanent magnetization, showing alternating stripes. Scientific understanding of the evolution of the magnetic field of Mars is based on the combination of satellite measurements and Martian ground-based magnetic data. However, Mars did power an early dynamo that produced a strong magnetic field 4 billion years ago, comparable to Earth's present surface field. However, Mars did power The magnetic field of Mars is the magnetic field generated from Mars's interior a0b7848cc5

Passive magnetic bearings use permanent magnets and, therefore, do not require any input power but are difficult to design due to the limitations described by Earnshaw's theorem. Techniques using diamagnetic materials are relatively undeveloped and strongly depend on material characteristics. As a result, most magnetic bearings are active magnetic bearings, using electromagnets which require continuous power input and an active control system to keep the load stable. In a combined design, permanent magnets are often used to carry the static load and the active... a0b7848cc5 The invention of the magnetometer is usually credited to Carl Friedrich Gauss in 1832. Earlier, more primitive instruments were developed by Christopher Hansteen in 1819, and by William Scoresby by 1823. a0b7848cc5 The magnetic moment also expresses the magnetic force effect of a magnet. The magnetic field of a magnetic dipole is proportional to its magnetic dipole moment. The dipole component of an object's magnetic field is symmetric about the direction of its magnetic dipole moment, and decreases as the inverse cube of the distance from the object. a0b7848cc5 The primary form of fMRI uses the blood-oxygen-level dependent (BOLD) contrast, discovered by Seiji Ogawa and his colleagues in 1990. This is a type of specialized brain and body scan used to map neural activity in the brain or spinal cord of humans or other animals by imaging the change in blood flow (hemodynamic response) related to energy use by nerve cells. Since the early 1990s, fMRI has come to dominate brain mapping research because it is noninvasive, typically requiring no injections, surgery, or the ingestion of substances such as radioactive tracers as in positron emission tomography. Data acquired using fMRI, however, is frequently corrupted by noise from various sources; hence, statistical procedures are used to extract the underlying signal. The resulting brain activation can be graphically represented by color-coding the strength of activation

across the brain or the specific... a0b7848cc5

Functional magnetic resonance imaging with Hb was weakly repelled by magnetic fields, while oxygen-depleted blood with dHb was attracted to a magnetic field, though less so than ferromagnetic Functional magnetic resonance imaging or functional MRI (fMRI) measures brain activity by detecting changes associated with blood flow. This technique relies on the fact that cerebral blood flow and neuronal activation are coupled: When an area of the brain is in use, blood flow to that region increases a0b7848cc5

All substances exhibit some type of magnetism. Magnetic materials are classified according to their bulk susceptibility. Ferromagnetism is responsible for most of the effects of magnetism encountered in everyday life, but there are actually several types of magnetism. Paramagnetic substances, such as aluminium and oxygen, are weakly attracted to an applied magnetic field; diamagnetic substances, such as copper and carbon, are weakly repelled; while antiferromagnetic materials, such as chromium, have a more complex relationship with a magnetic field. The force... a0b7848cc5

Magnetometer Different types of magnetometers measure the direction, strength, or relative change of the magnetic B-field at a particular location. Other magnetometers measure the magnetic dipole moment of a magnetic material such as a ferromagnet, for example by recording the effect of this magnetic dipole on the induced current in a coil. Different types of magnetometers measure the direction, strength, or relative change of the magnetic B-field A magnetometer is a device that measures magnetic field (B) or magnetic dipole moment. A compass is one such device, one that measures the direction of an ambient magnetic field, in this case, the Earth's magnetic field. measures magnetic field (B) or magnetic dipole moment a0b7848cc5