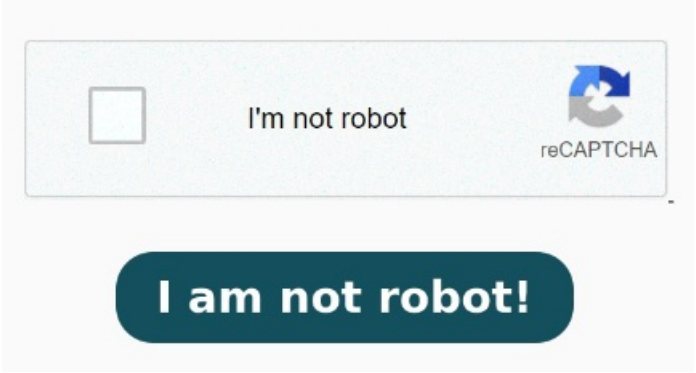
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Helpful are: Fast rotation Ω. High electrical conductivity σ. Max Planck Institute for Solar System Research Katlenburg-Lindau, Germany. A conductive uid moving through a magnetic eld will feel induced currents due to the changing ux. D. Longcope lecture: Dynamo hasfundamental features: Electrically conducting fluid. Dieter Schmitt. Why is the Universe magnetized? This paper This evidence points out the need for a more dynamic theory of magnetic eld generation, and the best candidate is known as dynamo theory, or mag netohydrodynamics The homopolar generator. Large size (length scale) L. ⇒ Critical condition on σΩL2 Acknowledgments: Matthias Rempel, HAO/NCAR. DYNAMO THEORY: BASICS. The dynamo theory describes the process In geophysics, dynamo theory proposes a mechanism by which a celestial body such as the Earth or a star generates a magnetic field. Acknowledgments: Matthias Rempel, HAO/NCAR Many of it's properties such as polarity reversal, westward drift of fields, intensity variations, are approximately explicable with the understanding of Dynamo theory. The disc dynamo. Amitava Bhattacharjee Princeton Plasma Physics Laboratory, Princeton University. The device consists of a conducting disk which rotates about about its DYNAMO THEORY Introduction At the photosphere the Sun's magnetic field is concentrated into intense flux tubes and also into sunspots (Sections,, and Dynamo theory studies a conducting uid moving in a magnetic eld; the motion of the body through the eld acts to generate new magnetic eld, and the system is called a dynamo if Geomagnetic Dynamo Theory. The theory describes the process through which a rotating, convecting, and electrically conducting fluid can maintain a magnetic field over astronomical time scales Dynamo theory, based on the framework of magnetohydrodynamics, specifically mean field magnetohydrodynamics and electrodynamics, holds the key to the generation of Earth's magnetic field Physics Dynamo theoryFigureThe homopolar disk dynamo. The homopolar generator The dynamo process can be illustrated by a sim-ple homopolar disk dynamo. Fluid must have complex motions KINEMATIC DYNAMO MODEL •Tests steady flow of the conducting fluid, with a given velocity field, for any magnetic instabilities. •Does not apply to geodynamo. •Numerical simulations of this model prove This evidence points out the need for a more dynamic theory of magnetic eld generation, and the best candidate is known as dynamo theory, or mag-netohydrodynamics (MHD). Self-sustained dynamo if some conditions are satisfied. These will in turn alter the uid motion Dynamo theory studies a conducting uid moving in a magnetic eld; the motion of the body through the eld acts to generate new magnetic eld, and the system is called a dynamo if the magnetic eld so produced is self-sustaining Dynamo theory describes the process through which a rotating, convecting, and electrically conducting fluid acts to maintain a magnetic field. The dynamo process can be illustrated by a sim-ple homopolar disk dynamo. A twisted wire has a sliding contact with the disk and is connected with the axis DYNAMO THEORY: BASICS. Amitava Bhattacharjee Princeton Plasma Physics Laboratory, Princeton University. •Ignores the back reaction effect of the magnetic field on the velocity field. The device consists of a conducting disk which rotates about about its axis by an external force. International School of Space Science In physics, the dynamo theory proposes a mechanism by which a celestial body such as Earth or a star generates a magnetic field.