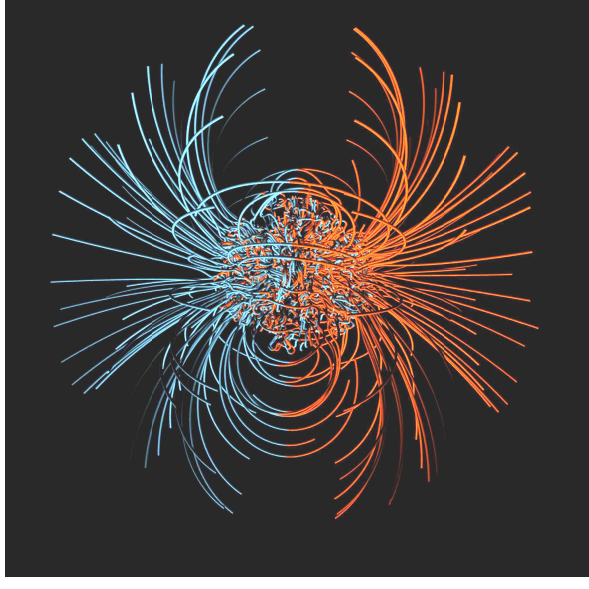
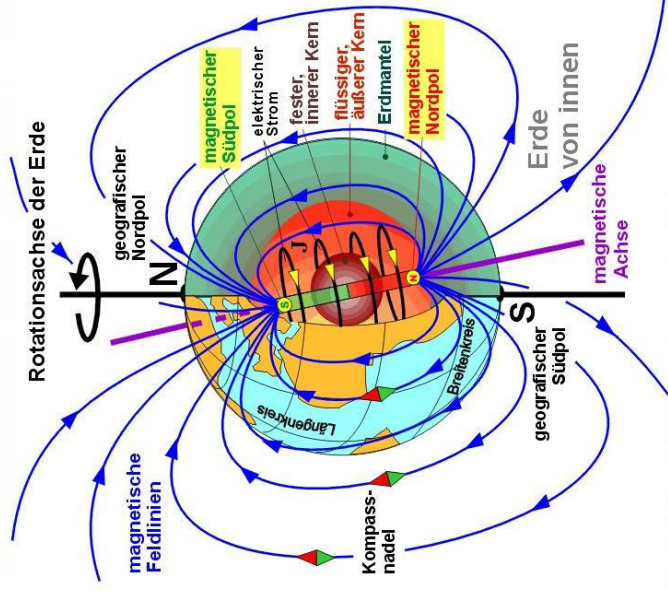
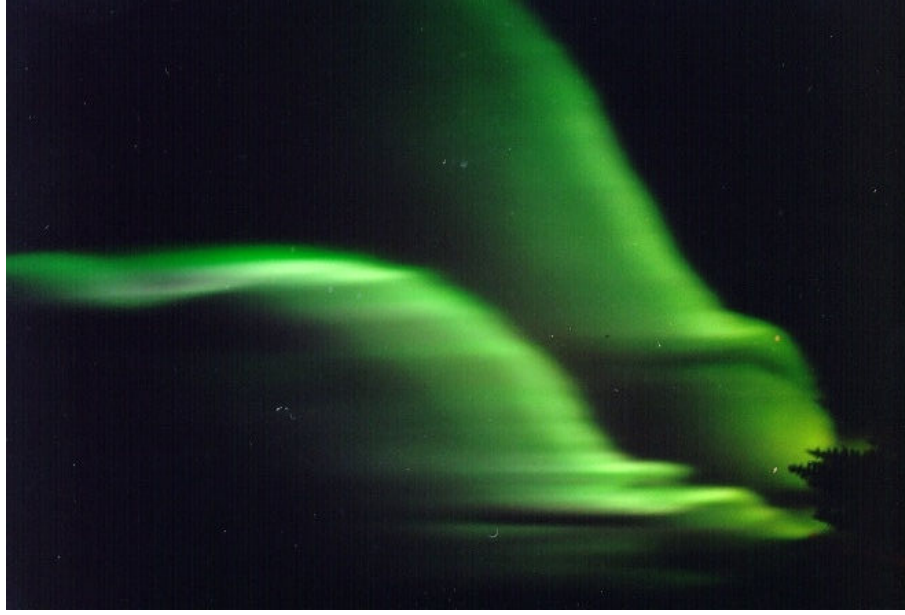


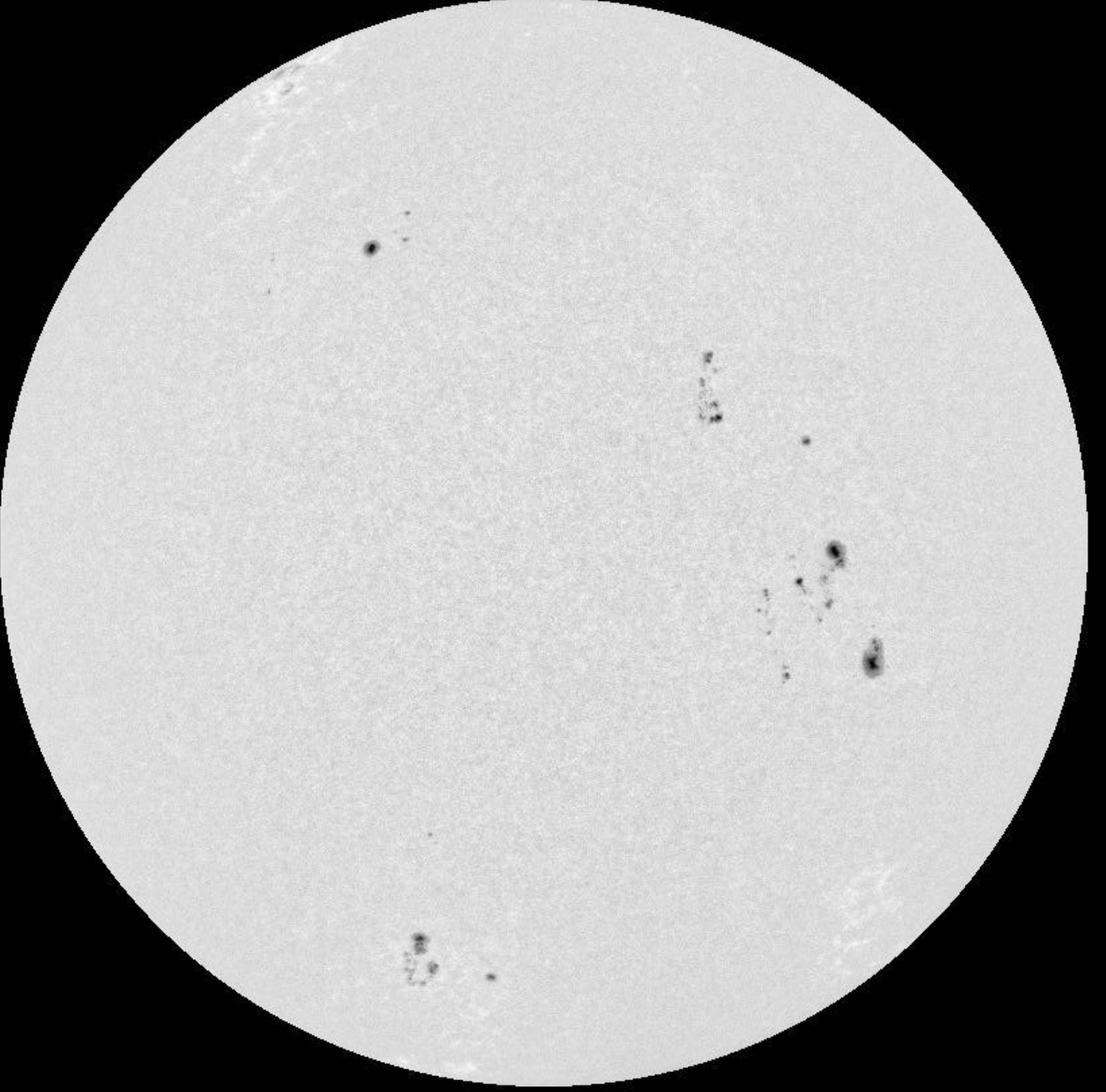
1. Introduction

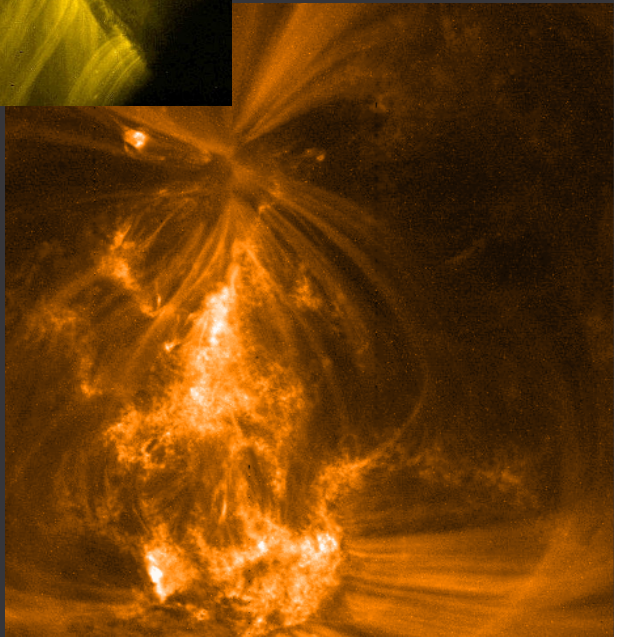
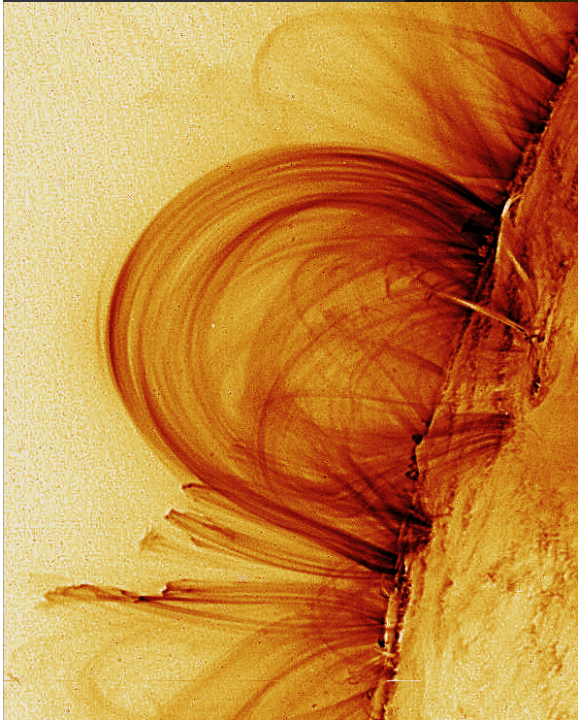
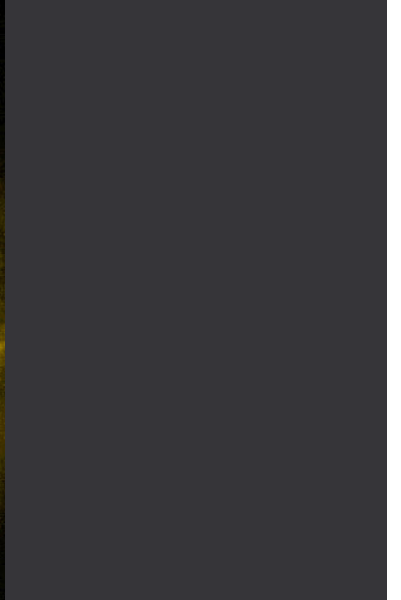
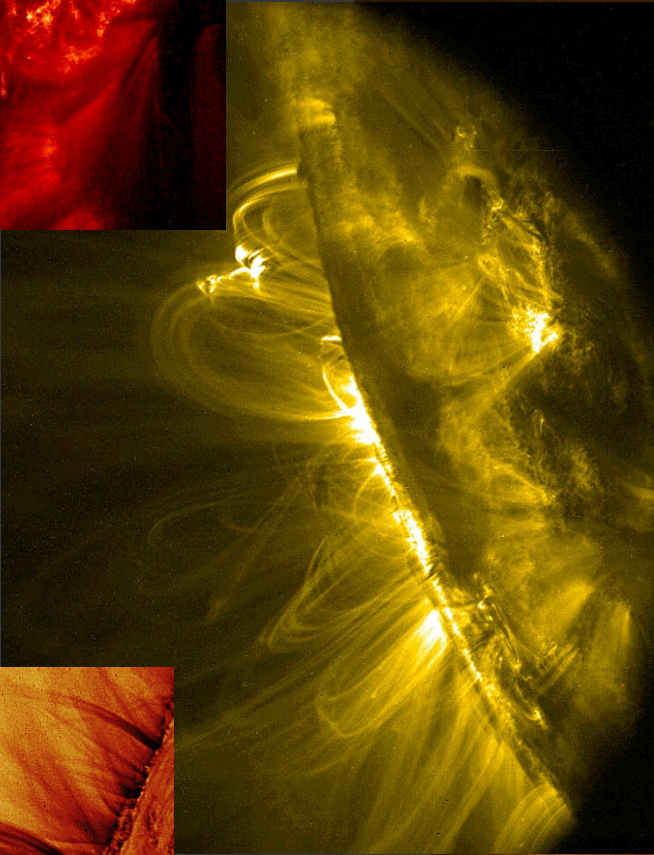
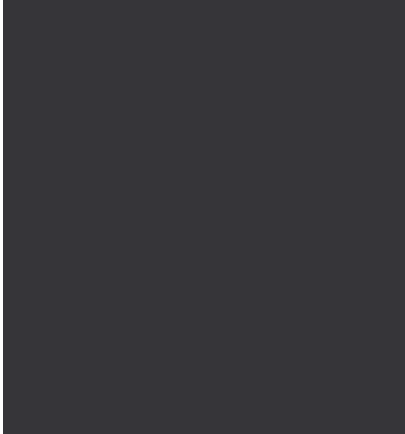
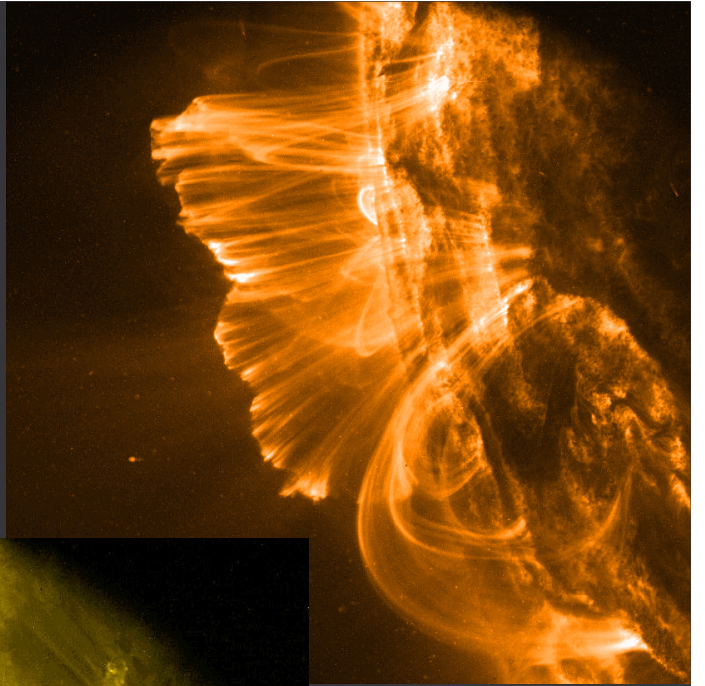
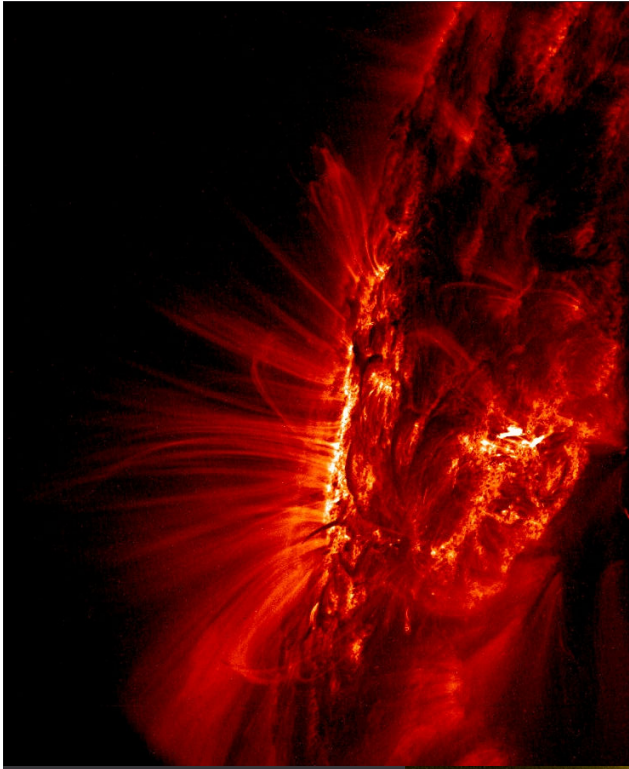
1.1 Magnetism

Earth's magnetic field



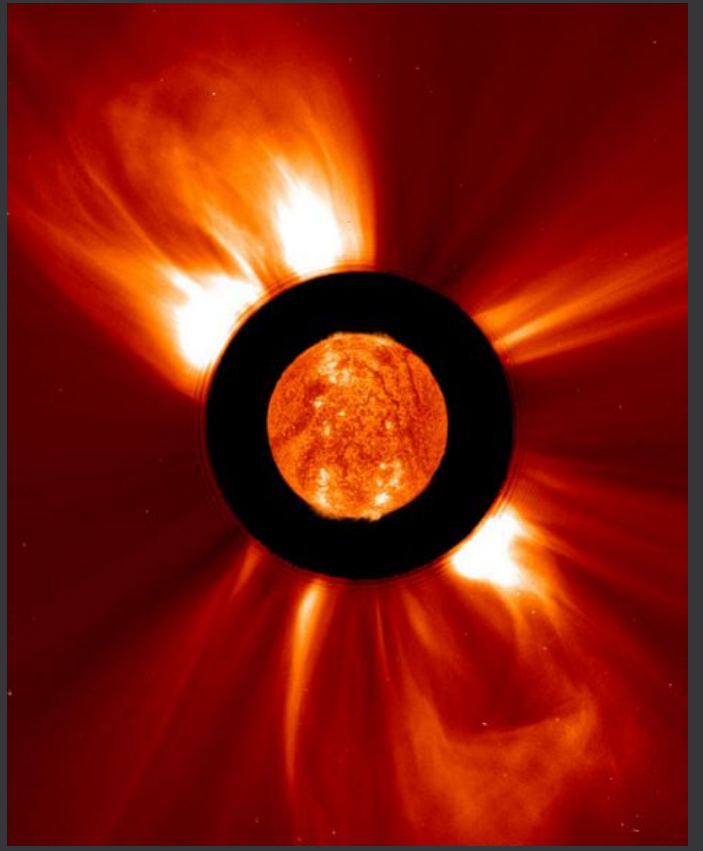
Sun's magnetic field



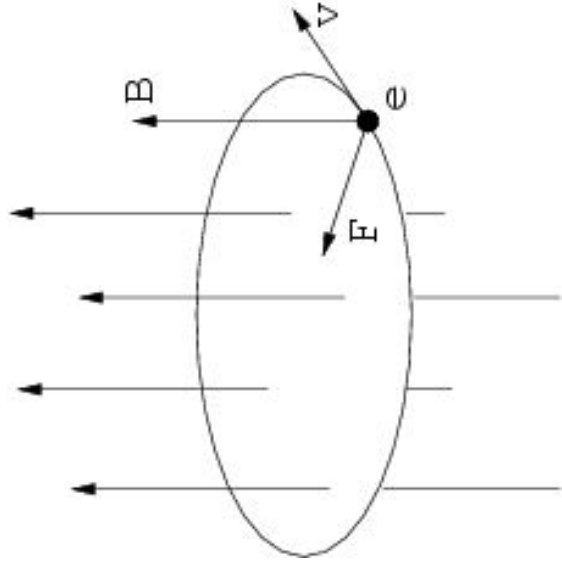




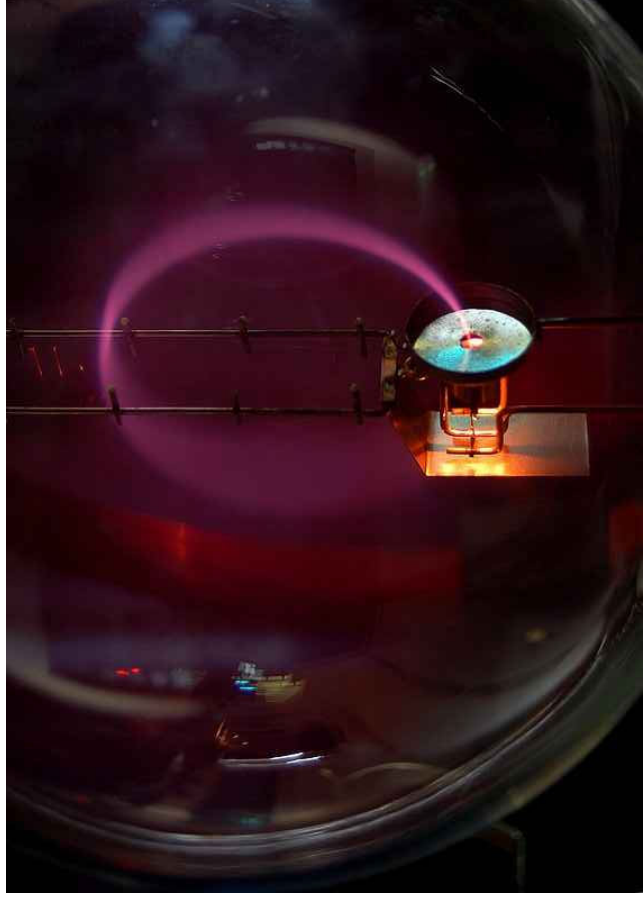
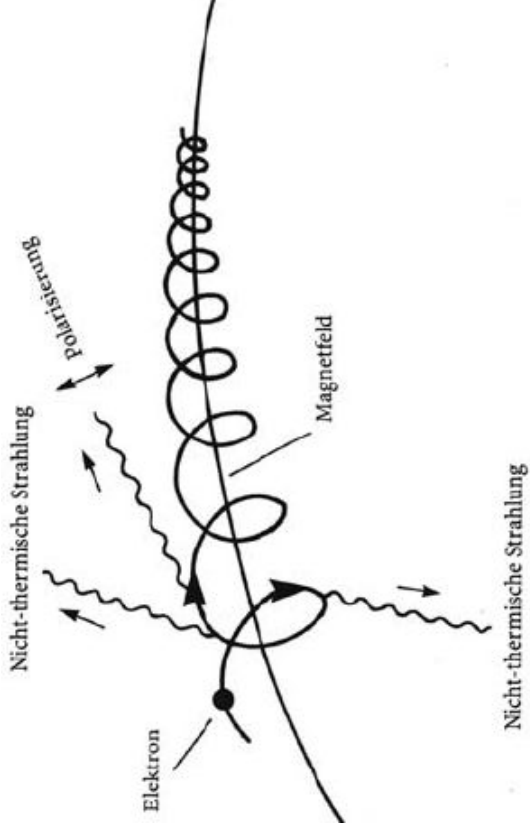
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1.2 Magnetic force on moving charge

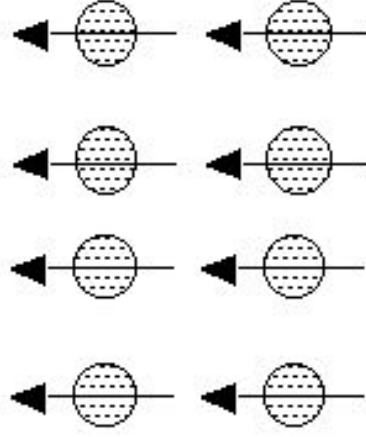


$$\vec{F} = \frac{e}{c} \vec{v} \times \vec{B}$$

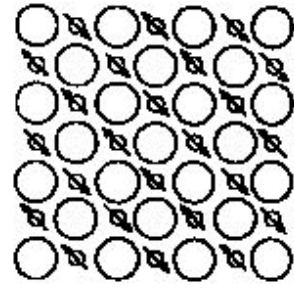


1.2 Magnetization of matter

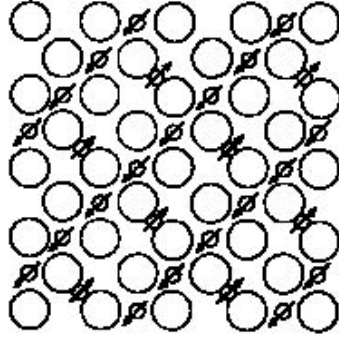
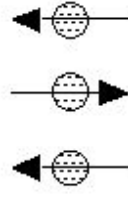
parallel alignment



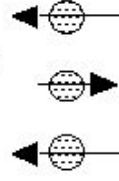
Ferromagnetism



Antiferromagnetism

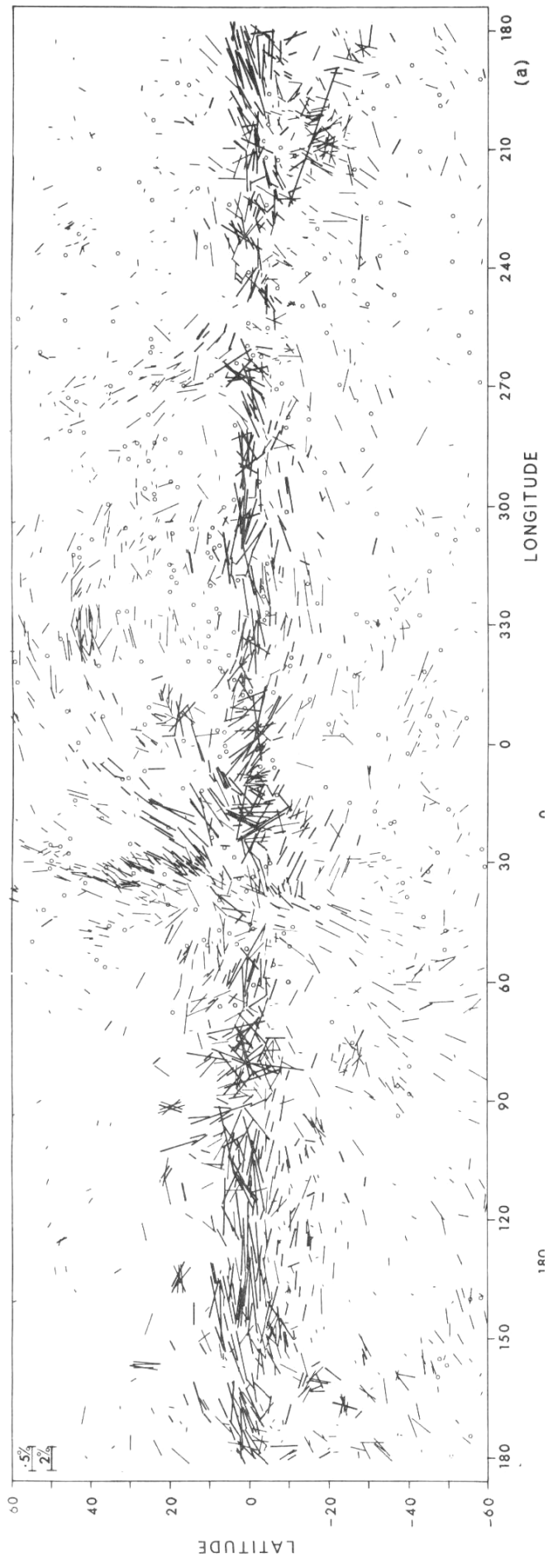


Ferrimagnetism



1.2 History

early evidence for magnetic field in the Milky Way: polarization of starlight



Mathewson & Ford (1970)



diffuse
magnetized
gas
filaments

