

## COMMENTS ON THE MOON'S MAGNETISM

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**Abstract.** Various lines of evidence indicate that permanent magnetization of lunar rocks, acquired during the early history of the Moon, is responsible for the weak (tens of gammas) and patchy magnetic field found at the surface of the Moon. It would be necessary to invoke a core dynamo (with all its important implications) in order to account for the inducing field  $\mathbf{B}$  of not less than  $10^3 \gamma$  in which lunar rocks acquired their stable permanent magnetization if no other source of  $\mathbf{B}$  can be found. In this connection we point out that the magnetic effects of high-velocity meteoroid impacts have not yet been ruled out. Indeed, according to rough calculations these effects might not be negligible and detailed studies would be worth carrying out. Shock waves followed by rarefaction waves would spread out into the body of the Moon from the area of impact, first demagnetizing any material shock-heated above the Curie temperature and then, as the material cools rapidly during the passage of the rarefaction wave, re-magnetizing the material to an intensity determined by the background field  $\mathbf{B}$ . The main source of  $\mathbf{B}$  would be the pulse of electric current generated by magneto-hydrodynamic interaction between the electrically-conducting ejecta from the explosion and the weak ambient interplanetary magnetic field.

This 'impact dynamo' hypothesis also has possible implications concerning the magnetism of meteorites.