

Abstract Submitted
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Charge ordering and ferroelectricity in magnetite DANIEL KHOMSKII, II.Physikalisches Institut, Universität zu Köln — Magnetite Fe_3O_4 is one of the most fascinating material in solid state physics. Besides being the first magnetic material known to the mankind, it is also the first example of an insulator-metal transition in transition metal oxides – the famous Verwey transition [1]. One usually connects this transition with the charge ordering of Fe^{2+} and Fe^{3+} . However the detailed pattern of CO in Fe_3O_4 is still a matter of debate. Another aspect, which is not so widely known and which did not yet receive sufficient attention, is that below T_V , besides being completely spin polarised, magnetite apparently is also *ferroelectric* (FE) [2]. Thus it seems that magnetite, besides being the first magnetic material and the first transition metal oxide with an insulator-metal transition, is also the first *multiferroic* material. Using the idea of a coexistence of site-centred and bond-centred charge ordering [3], I suggest a novel type of ordering in magnetite which explains the observed FE in Fe_3O_4 and which agrees with the structural data.

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