Abstract Submitted
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The Dilemma of the High-Spin Persistence Into the Mbar Range of Some Ferric-Metal Oxides[1] MOSHE P. PASTERNAK, GREGORY KH. ROZENBERG, ERAN GREENBERG, WEIMING XU, MARK NIKOLAEVSKY, Tel Aviv University, School of Physics & Astronomy — The fate of the strongly correlated $d-d$ Mott-Hubbard (MH) insulators at extreme conditions of pressure is determined by two main reactions: (i) correlation breakdown due to broadening leading to bands overlap of the *empty-filled* band resulting in metallization consequently loss of magnetic moment, and, (ii) spin crossover due to the augmented *crystal-field* (10Dq $\sim r^{-5}$) which in the case of the Fe^{3+} - oxides results in S =5/2 $>S$ =1/2 transition. The experimental observation of these high pressure phenomena using Diamond-Anvils-Cells and the experimental methods of resistance and ^{57}Fe Mössbauer effect at varying (P,T) and Synchrotron XRD at RT. This presentation will focus on the recent discovered cases of some $Fe^{3+}MO$ where the *high-spin* state prevails into the Mbar region; showing no signs of correlation breakdown. The persistence of correlated, HS states to such pressures cannot be explained. This will be preceded by a short introduction to the experimental methods and cases of pressure-induced spin-crossover or MH transitions.

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