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Non-trivial role of interlayer cation states in iron-based superconductors[1] ROSER VALENTI, DANIEL GUTERDING, HARALD O. JESCHKE, Institute for Theoretical Physics, Goethe University Frankfurt, Frankfurt a.M., Germany, J. K. GLASBRENNER, Department of Computational and Data Sciences, George Mason University, Fairfax VA, E. BASCONES, Instituto de Ciencia de Materiales de Madrid, ICMM-CSIC Madrid, Spain, I. I. MAZIN, Code 6393, Naval Research Laboratory, Washington, DC — Unconventional superconductivity in iron pnictides and chalcogenides has been suggested to be controlled by the interplay of low-energy antiferromagnetic spin fluctuations and the particular topology of the Fermi surface in these materials. Under this assumption, one would expect the large class of isostructural and isoelectronic iron germanide compounds to be good superconductors, but they aren't. In this talk we will argue that superconductivity in iron germanides is suppressed by strong ferromagnetic tendencies, which surprisingly do not originate from changes in bond-angles or bond-distances with respect to iron pnictides, but are due to changes in the electronic structure in a wide range of energies happening upon substitution of atom species (As by Ge and the corresponding spacer cations) [1]. We will discuss the implications of these results in the general context of Fe-based superconductors. [1] D. Guterding, H.O. Jeschke, I.I. Mazin, J.K. Glasbrenner, E. Bascones, R. Valenti arXiv:1610.08626

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