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Tuning unconventional f-electron superconductors

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We discuss recent studies of the CeMIn₅ and PuMGa₅ families of superconductors and argue that there are several "knobs" that can be used to maximize superconducting transition temperature T_c . In particular, the evolution of T_c with structural anisotropy (as measured by the ratio of the tetragonal lattice constants c/a) [Bauer et al., PRL (2004)] and the evolution of T_c with spin fluctuation energy scale (T_{sf}) [Curro et al., Nature (2005)] are emphasized. Prospects for extending these studies to other systems and thereby further enhancing T_c will be considered.

Keywords : plutonium, superconductivity