First-Principles Combinatorial Design of Transition Temperatures in Multicomp50input congurations, ca
ter epansion6 stant of the solid exhibiting these phenomena. The qest

$_C$'s, such as high-temperature superconductors or room-temperature ferromagnetic semiconductors, characterizes much of contemporary materials science. The ability to intentionally grow in the laboratory different structural realizations of substitutional alloys, even in defiance of thermodynamical equilibrium, has opened up the challenging prospect of attaining special T_C's by manipulating the growth parameters. Indeed, the realization that transition temperatures can be controlled by alloying two or more component materials has spurred considerable interest in materials engineering of metal alloys [1], multicomponent superconducting alloys [4], ferromagnetic semiconductors alloys made of both magnetic and nonmagnetic components [2], ferroelectric alloys [3], etc. Interestingly, the transition temperature of the combined, multicomponent system rarely follows a constituent-average, linear behavior. Instead, T_C is often determined by the [illegible] in the system. Numerous attempts [5,6] have already been made to grow $Ga_{1-x}Mn_x$

(.) Ca [illegible] *a* [illegible] *a* [illegible] *a* [illegible]
a [illegible] *a* [illegible].

structures represent a range of Mn concentrations and layer orientations. We then use the calculated $\{T_C^{\mathrm{LDA}}(\ _{\mathrm{input}})\}$ to determine the coefficients of Eq. (1). We include in the ture of the random alloy can be exceeded by growing digital heterostructures on currently unsuspected substrate orientations. Since it is often easier to grow