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Searching for the Genes of Unconventional High Temperature Superconductors JIANGPING HU, Purdue University Institute of Physics, CAS — In the past, both curates and iron-based superconductors were discovered accidentally. Lacking of successful predictions on new high Tc materials is one of major obstacles to reach a consensus on the high Tc mechanism. In this talk, we discuss two emergent principles, which are called as the correspondence principle and the selective magnetic pairing rule, to unify the understanding of both cuprates and iron-based superconductors. These two principles provide an unified explanation why the d-wave pairing symmetry and the s-wave pairing symmetry are robust respectively in cuprates and iron-based superconductors. In the meanwhile, the above two principles explain the rareness of unconventional high Tc superconductivity, identify necessary electronic environments required for high Tc superconductivity and finally serve as direct guiding rules to search new high Tc materials. We predict that the third family of unconventional high Tc superconductors exist in the compounds which carry two dimensional hexagonal lattices formed by cation-anion trigonal bipyramidal complexes with a d_f *illingconfigurationonthecationions.Theirsuperconductingstatesareexpectedtobedominatedbythed+idpairingsymmetryandtheirmaximumTcshouldbehigherthanthoseofiron − basedsuperconductors.Verifyingthepredictioncanconvinclyestablishthehigh Tcsuperconductingmech*

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