From Low T_c to Room T_c in Cuprate- and Pnictide-Like Superconductors

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It is demonstrated that high critical temperature T_c of superconducting transition in optimally doped cuprates and pnictides is provided by Cooper pairing of mobile charge carriers in conducting charge (C) stripes due to delocalized, in-plane, charge-transfer (CT) excitons, propagating in semi-insulating spin (S) stripes, adjacent with C-ones. This conclusion is a result of detailed analysis of in-plane resistive, neutron and optical experimental data in cuprates and pnictides with doping ranged from undoped to optimally doped cases. The crucial rise of T_c in cuprates due to excitons is preceded by moderate rise of T_c due to phonons as a result of partial dielectrization of electron energy spectrum at normal-state magnetic (SDW) phase transition. This transition is accompanied by both formation of SDW-gap (pseudogap) at symmetrical parts of the Fermi surface and stripe structure in conducting planes. The picture is consistent with Little-Ginzburg (LG) exciton mechanism of high-T_c superconductivity (HTSC), in planar geometry of Ginzburg HTSC-sandwich: insulator-metal-insulator. The new way to accelerate immediately experimental search for room-T_c superconductivity in similar complex transition-metal compounds with higher energy of CT-transition in AF-ordered layers is pointed out.