MAR16-2015-000870

Abstract for an Invited Paper
for the MAR16 Meeting of
the American Physical Society

What Makes the $T_c$of $FeSe/SrTiO_3$ so High ?[1]

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Raising the superconducting transition temperature to a point where applications are practical is one of the most important challenges in science. In the history of high Tc superconductivity there are two landmark events: the discovery of copper-oxide superconductor in 1986, and the discovery of iron-based superconductor in 2006 For the Fe-based superconductors the record of T_c was $55K$[1] until 2012. In the interface system composed of an one unit cell thick FeSe film grown on the TiO_2 terminated (001) surface of $SrTiO_3$ an anomalously large superconducting-like energy gap was seen by scan tunneling microscopy for [2]. Later ARPES works show the gap opening temperature can reach nearly the liquid nitrogen boiling temperature [3-7]. More recently several FeSe-related bulk and thin film high T_c systems have be discovered. This talk reviews some of the recent experimental [7] and theoretical [8] progresses in the study of the mechanism for high temperature superconductivity in this interface system. It offers the author's personal view of why $T_c$is so high and how to further increase it [910]. References:

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10. Much of the contents of this talk are stimulated by the collaborative work with Z-X Shen and his ARPES group members and T. Deveraux and his group members.

[1]DHL was supported by the U.S. Department of Energy, Office of Science, Basic Energy Sciences, Materials Sciences and