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### **TBD - Fe-based Superconductors**

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While there is broad consensus that superconductivity in Fe based superconductors is due to an unconventional, most likely purely electronic pairing, many important aspects of both, normal and superconducting state are still unexplored. For example the role of orbital degrees of freedom for the normal state electronic properties, nematicity, and pairing is discussed very controversial. It is not clear whether nesting or the proximity to Lifshitz points are crucial for superconductivity. Moreover, the broad variety of properties found for different systems raises the question about the generic phase diagram of these systems. In my talk I will focus on anomalous state properties of Fe-based superconductors. Based on new NMR data I will discuss the origin of nematic order addressing again the apparent differences in FeSe and BaFe<sub>2</sub>As<sub>2</sub>. The role of orbitals will be emphasized including the possibility of formation of “orbital polarons”. Moreover, highly unusual temperature dependencies of the electronic structure as revealed from our recent ARPES measurements will be presented. A possible connection to well-known anomalous T dependencies of both, magnetic and structural properties will be discussed. Work done in collaboration with S-H. Baek, S. Borisenko