



THEORIE-KOLLOQUIUM & SBF/TRR 80

SONDERTERMIN

Mo 18.11., 14:00 UHR, MG 465

The Quest for Room Temperature Superconductivity: an update

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In 1911 Kamerlingh Onnes discovered superconductivity – the vanishing of electrical resistance – in mercury, a simple metal with ‘vanilla’ s-p valence electrons. In the 1930’s transition (with tricky d electrons) intermetallics became the best superconductors, and this class ruled for 50 years. Since 1970, one of the most persistent ambitions of materials physicists has been “room temperature superconductivity.” In 1986 oxides, which had been understood to be terrible for superconductivity, transformed research due to their increase of the highest critical temperature T_c by a factor of five to 125K (or 160 K under pressure), re-energizing the “room temperature” mantra. After a 20 year lull in any increase of T_c , metal hydrides under megabar pressures have again raised the ‘bar’ another factor of two to 260K in 2019 – room temperature in a cold room. Several aspects of this long and winding trail will be introduced and discussed.