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## **Spin fluctuations in cuprates and mechanism of high $T_c$**

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Spin fluctuations represent the lowest established energy scale in cuprates and are crucial for the understanding of anomalous normal state properties and superconductivity in these materials. The memory-function approach to the spin response in the  $t$ - $J$  model will be described, which is able to account for the anomalous scaling at low doping and the crossover to the Fermi-liquid-like behaviour in overdoped systems. Numerical results for small systems and the analysis of experimental NMR relaxation are presented in support of the crossover scenario. Within the superconducting phase the theory reproduces the resonant peak and its dispersion. Obtained spin fluctuations are used as the phenomenological input for the theory of superconductivity within the extended  $t$ - $J$  model, where we show that an important role is played by the next-nearest-neighbour hopping parameter  $t'$ .

*Keywords* : cuprates, spin dynamics, superconductivity