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Recent developments in Molecular Magnetism

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Two hot topics in this area are highlighted namely the design of new multifunctional magnetic materials, and the study of mononuclear single-molecule magnets. In the first topic I will present the attempts to design materials exhibiting coexistence of superconductivity and magnetism using a chemical approach [1]. In the second topic I will show that single-molecule magnets based on lanthanides provides the opportunity to tune quantum tunneling effects and to use these systems as qubits in quantum computing [2]. Finally, I will highlight the relevance of these magnetic systems in molecular spintronics.

[1] E. Coronado, C. Martí-Gastaldo, E. Navarro-Moratalla, A. Ribera, S. J. Blundell, P. J. Baker Nature Chem. 2010, 2, 1031.

[2] F. Luis, M. J. Martínez-Pérez, O. Montero, E. Coronado, S. Cardona-Serra, C. Martí-Gastaldo, J.M. Clemente-Juan, J. Sesé, D. Drung, T. Schurig, Phys. Rev. B 2010, 82, 060403 R.