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Seminaires du LPTM , Universite de Cergy Pontoise

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Domaines : cond-mat

Titre : *The magnetocaloric effect : history and perspectives*

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Résumé : *The magnetocaloric effect, i.e., the change of temperature induced by an adi- abatic change of an external magnetic field was discovered by Warburg in 1881 during his investigations of iron. Subsequently, back in 1933, cooling by adia- batic demagnetization of paramagnetic salts was the first method to reach tem- peratures below 1 K. Until today, adiabatic demagnetization remains the method of choice to cool solids to the milli-Kelvin range or below. In addition, cooling by adiabatic demagnetization at intermediate temperatures (Kelvin-range) is un- der discussion for space applications and future linear colliders. Such applica- tions would benefit from more efficient materials. On this background, we re- view recent ideas how to go beyond single-ion systems, and exploit interactions between magnetic moments of dipolar or Heisenberg nature to enhance mag- netocaloric properties. Specifically, we discuss the enhanced magnetocaloric effect observed in geometrically frustrated magnets and close to field-induced quantum phase transitions.*
