

# **The magnetocaloric effect: history and perspectives**

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The magnetocaloric effect, i.e., the change of temperature induced by an adiabatic change of an external magnetic field was discovered by Warburg in 1881 during his investigations of iron. Subsequently, back in 1933, cooling by adiabatic demagnetization of paramagnetic salts was the first method to reach temperatures 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 under discussion for space applications and future linear colliders. Such applications would benefit from more efficient materials. On this background, we review recent ideas how to go beyond single-ion systems, and exploit interactions between magnetic moments of dipolar or Heisenberg nature to enhance magnetocaloric properties. Specifically, we discuss the enhanced magnetocaloric effect observed in geometrically frustrated magnets and close to field-induced quantum phase transitions.