

**ICAMS Special Seminar**

Thursday, July 4, 10:00 a.m.
Room IC 02-722

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**First-principles-based calculations of caloric effects
in ferroelectrics and multiferroics**

So-called ferro-caloric effects, i.e. a change of temperature under application of an external field, are currently under intense investigation as a potential solution for future solid-state cooling devices, which promise to be more energy-efficient and environmentally-friendly than currently used devices. These effects are particularly strong in ferroic materials close to the ferroic ordering temperatures, where modest fields can lead to huge entropy changes by ordering electric or magnetic dipoles or other orientational degrees of freedom.

Here, I will show how first-principles-based calculations can be used to explore ways for optimizing the caloric response of ferroelectric materials, and I will discuss the possibility to use cross-caloric effects in multiferroics such as strained SrMnO_3 , where the magnetic and ferroelectric ordering temperatures can be tuned to coincide.