

SYMPOSIUM: 4

Title: Raw Materials for Refrigeration		
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Abstract		
<p>The search for alternatives to cooling cycles based on volatile hydrofluorocarbons is motivated by two factors: the impact of high global warming potential (GWP) gases on the environment and by the prospect of increased device efficiency. The importance of both factors is heightened by the growing use of cooling devices across the globe.</p> <p>The resulting refrigeration research landscape is multidisciplinary, since alternative cooling methodologies such as solid-state (multiferroic) materials involve engineering challenges including the cyclic use of magnetic fields (magnetocalorics), strain/pressure (elastocalorics and barocalorics) and electric fields (electocalorics) and the use of secondary heat exchange fluids. Significant raw materials challenges arise, for example the reduced use of rare earth elements in the magnetocaloric cycle, or the reduced use of lead in the electrocaloric cycle, or the formability and manufacturability of the refrigerant material.</p> <p>This symposium will bring together multiferroic, thermoacoustic, and conventional gas-based compression refrigeration experts working in areas ranging from fundamental research to end-user product development. The symposium will examine the future of efficient cooling through the lens of raw material use, and provide a forum for a fully integrated discussion of a highly multidisciplinary field.</p>		