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**Novel High Efficient Cooling Device Based on a Combination of Physical Processes** ALEX MISCHENKO, NEIL MATHUR, Department of Materials Science, Cambridge University, UK — The design of a novel and highly efficient cooling device is presented. It comprises several electrocaloric elements whose working temperatures vary across the device. These elements are separated by thermoelectric heat switches (Peltier devices). The heat switches are open when driven by a sufficiently large forward current. In the absence of this current the heat switch is closed and conducts heat passively. A reverse current enhances heat flow. This active mode of heat transfer increases the efficiency of the entire device. Simulations will be presented using electrocaloric elements and thermoelectric heat switches with realistic properties. UK patent pending.

Alexander Mischenko  
Department of Materials Science, Cambridge University, UK

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