Thermal diode: what else can it do besides rectifying heat flux by phonons?

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About one decade ago, thermal diode model was proposed to rectify heat flux due to phonons. A great progress has been achieved in this rapid developing field, including the experimental realization of solid-state thermal rectifier, mainly due to available nanotechnology. Hundreds of papers have devoted to this interesting device.

In this talk, I will give an overview of last years' development in this direction. Emphasis will be given on the extension of thermal diode concept to control other energy forms including but not limited to, elastic energy, acoustic waves, heat by other carriers like electrons, novel thermoelectric materials/devices etc.