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Spin Caloritronics with Magnetic Insulators

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Spin Caloritronics is the science and technology devoted to the control of the electron spin with heat in nanoscale structures and devices [1]. It is a subdiscipline of the fields of spintronics, magnetism, and thermoelectrics. A specialized conference series celebrates its 10th edition [2].

Magnetic insulators, especially yttrium iron garnet (YIG), have been crucial material for spin caloritronics since the discovery of the spin Seebeck effect in the YIG/Pt system [3]. YIG is a ferrimagnet with record-high magnetic quality, but a complex crystal structure with a large unit cell. Inelastic neutron scattering experiments [4] interpreted by atomistic simulations [5] are essential for an understanding of spin caloritronic effects.

I this talk I will review the field with emphasis on new developments.

1. G.E.W. Bauer, E. Saitoh, and B. van Wees, *Nature Mater.* **11**, 391-399 (2012).
2. Spin Caloritronics X, Groningen (The Netherlands), May 20-24, 2019, spincal2019.webhosting.rug.nl
3. K. Uchida et al., *Nature Mat.* **9**, 894–897 (2010).
4. A. J. Princep et al., *npj Quantum Mater.* **2**, 63 (2017) and references therein.
5. J. Barker and G.E.W. Bauer, *Phys. Rev. Lett.* **117**, 217201 (2016) and in preparation.

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