

## ICC-IMR International Workshop “Spin Caloritronics 4”

In the period of 2-5 June 2012 we organized an International Workshop on Spin Caloritronics, the 4<sup>th</sup> one in series held in Sendai and the Lorentz Institute of Leiden, see also <http://www-lab.imr.tohoku.ac.jp/~spincaloritronics4/>.

Spin caloritronics is the science and technology of the physical phenomena (and their control) associated with the coupling of charge, spin, and heat currents in nanoscale structures and devices [1]. This meeting was dedicated to reporting new results and general exchange of thoughts concerning the role of the electron's spin in the flow, control, and transformation of heat currents in (mainly) magnetic materials in order to add new functionalities and increase the efficiency of existing thermoelectric technology.

The Organizing Committee consisted of Stéphane Mangin (Nancy), Burkard Hillebrands (Kaiserslautern), Hideo Ohno (RIEC), Eiji Saitoh (IMR), Koki Takanashi (IMR), Kentaro Nomura (IMR), Saburo Takahashi (IMR), Gerrit Bauer (IMR) and Mika Terada (IMR secretary).

The Workshop gave an overview of spin caloritronics and our present understanding of the underlying physics. It covered all aspects of spin caloritronics, such as thermal spin injection, the spin-dependent Seebeck and Peltier effects in metallic nanostructures and tunnel junctions, the spin-Seebeck and spin-Peltier effects, thermal magnetization torques, thermal anomalous and spin Hall effects etc.. Theory, computations, and experiments were represented.

This was the 4<sup>th</sup> of a sequence of conferences that started in 2009 at the Lorentz Institute in Leiden, The Netherlands, followed by an ICC-IMR Workshop in 2010, and another one at the Lorentz Institute in 2011.

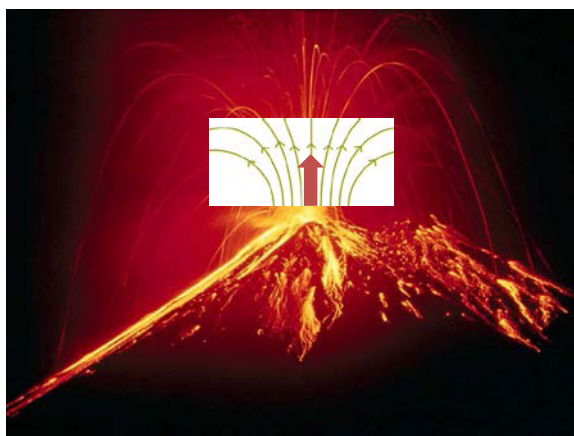


Fig. 1: Logo of Spin Caloritronics 4.

The large number (110) of participants from many different nations (see table) indicated the still growing interest in the topic. Several new and unpublished results were presented at the

workshop, such as the heat-current induced domain wall motion (Parkin) and the reduced damping in the free layer of a magnetic tunnel junction under a temperature difference (Schumacher).

The post session were integrated with the coffee breaks, which led to animated discussions of the posters during the whole workshop.

A 5<sup>th</sup> Workshop on Spin Caloritronics is planned to be held by Ohio State University in May 2013, while the 6<sup>th</sup> one will be organized by the DFG Priority Program in Kloster Irsee (Bavaria) in July 2014.



Fig. 2: Conference dinner with view on Matsushima Bay.

Country	# participants
Canada	2
China	1
France	2
Germany	16
Hong Kong	1
Japan	66
Korea	3
Netherlands	10
Saudi Arabia	1
Spain	1
Taiwan	1
United States	6

### References

[1] G.E.W. Bauer, E. Saitoh & B. J. van Wees, Nature Materials 11, 391–399 (2012)

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