

# Strongly correlated cage compounds as thermoelectrics

## Invited talk

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**By:** S. Paschen

**From:** Institute of Solid State Physics, Vienna University of Technology, Austria

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**Where:** Dubrovnik, Croatia

**Abstract:** Thermoelectric materials are of interest for applications in waste heat recovery because they can convert temperature gradients into electrical power. The ideal thermoelectric material combines a high electrical conductivity and thermopower with a low thermal conductivity. In this regard, the intermetallic type-I clathrates show promise with exceedingly low lattice thermal conductivities. We have recently succeeded to incorporate cerium as guest atom into the clathrate crystal structure [1]. In many simpler intermetallic compounds, this rare earth element is known to lead, via the Kondo interaction, to strong correlation phenomena including the occurrence of giant thermopower values at low temperatures. Indeed, we observe a 50% enhancement of the thermopower compared with a rare-earth-free reference material. Importantly, this enhancement occurs at high temperatures and we suggest that a 'rattling' enhanced Kondo interaction underlies this effect.

[1] A. Prokofiev, A. Sidorenko, K. Hradil, M. Ikeda, R. Svagera, M. Waas, H. Winkler, K. Neumaier, S. Paschen, *Nature Mater.* 12, 1096 (2013).

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