

Einladung zum

# SFB/TR 49 SEMINAR

- Sondertermin FRANKFURT -

**Mittwoch, 8. Oktober 2014, 14.00 Uhr**

Physikgebäude, Max-von-Laue-Str. 1, Raum 01.101

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## *Berry curvature and the phonon Hall effect*

The discovery of phonon Hall effect in experiment incites interests in the phonon Hall transport. To understand this novel effect, there are two important issues: (1) how to make the phonon feel the magnetic field, and (2) how to calculate the phonon hall conductivity. We showed that in magnetic solids an effective magnetic field acting on phonons naturally emerged in the phonon dynamics, contributing to the phonon Hall effect. We also derived the phonon Hall conductivity which related the phonon Berry curvature to the phonon dispersion. This formula also indicated phonon could possibly display the quantum Hall effect in some topological phonon system. In the low temperature limit, we showed the phonon Hall conductivity was proportional to  $T^3$  in ordinary phonon system.

Reference:

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- L. Zhang, J. Ren, J.-S. Wang, and B. Li, Phys. Rev. Lett. **105**, 225901 (2010).
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