

On the thermodynamics of crystals under hydrostatic pressure



Lecturer: **Prof. Michiel Sprik**

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Place: The 3rd Seminar Room, R1 bldg. Suzukakedai campus
(R1棟2F 第三会議室)

Abstract: Viewed on the length scale of macroscopic thermodynamics, what distinguishes a uniform solid under hydrostatic pressure from a liquid is the elastic response to changes of volume. This is a manifestation of solid rigidity. On the other hand, liquids can gain mass by inserting particles. This is much more difficult for solids, one would have to search for the rare vacancy. As a result, the conventional Gibbs-Duhem relation breaks down even under hydrostatic pressure. We show how this relation can be restored by including the number of lattice sites in the set of extensive state variables and then apply the resulting generalized thermodynamics to a compressible lattice gas model to study pressure induced isothermal absorption.

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