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Thermodynamics seen through a diffraction experiment

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Crystallography and diffraction experiments with bright radiation sources offer much more that a structure solution and refinement. Structural data collected as function of pressure, temperature, electric or magnetic field, under laser radiation or in any other in-situ conditions provide with a unique information on the thermodynamics of various processes in solids. In the lecture I illustrate this statement with diffraction probes of phase transitions and Landau thermodynamics, with estimates of relative stability of different polymorphs based on atomic displacement parameters, and with a special focus on thermodynamic of gas adsorption by porous solids seen through a diffraction experiment.

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