

Seminarreihe Materialforschung & Physik

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**“Brillouin Scattering and its
Application to the Study of Different
Materials”**

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Jakob-Haringer-Strasse 2a, JAK2AOG1.33

The Brillouin effect is the inelastic scattering of light by acoustic phonons in a dense medium. Brillouin spectroscopy is a technique often used to investigate the elastic properties of condensed matter. Measuring Brillouin scattering does not require mechanical contact with the sample, and the measurements can be performed on sample volumes as small as 10^{-5} mm³. For these reasons, Brillouin spectroscopy is the method of choice to investigate the elastic anisotropy of small and delicate optically transparent materials, such as organic compounds and bio-materials, as well as high-pressure syntheses, which are available only in very small amounts. Brillouin scattering, in combination with the diamond anvil cell, makes it possible to measure, in situ at high pressure, the full elastic tensor of phases found in the deep interior of Earth and other planetary bodies. It is an excellent experimental technique to test various possible mineralogical models of Earth's mantle by comparison with different proposed seismological velocity models. In this talk, the principles behind the method and the experimental setup will be presented. In addition, a range of applications of Brillouin spectroscopy to the investigation of oxides and silicates important to geophysics and materials sciences as well as an example of the mechanical properties of protein crystals will be discussed.