

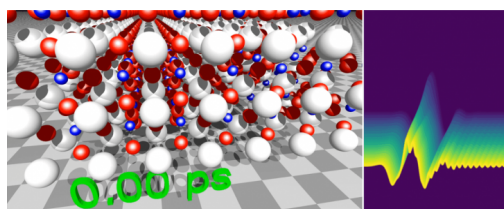
HERCULES at the Swiss Light Source



In the week of April 1-5 PSI hosted 20 PhD students and postdocs taking part in the [HERCULES 2019 school](https://www.psi.ch/science/facility-newsletter) on Neutron and Synchrotron Radiation. They attended lectures and performed two days of practical courses at several beam lines of the Swiss Light Source. This renowned 1-month school allows students, postdoctoral and senior scientists from European and non-European universities and laboratories to learn about Neutron and Synchrotron Radiation methods. The school covers a broad range of disciplines including Biology, Chemistry, Physics, Materials Science, Geosciences and Industrial applications.

Read more: <https://www.psi.ch/micmag/hercules-school-2019-at-the-sls>

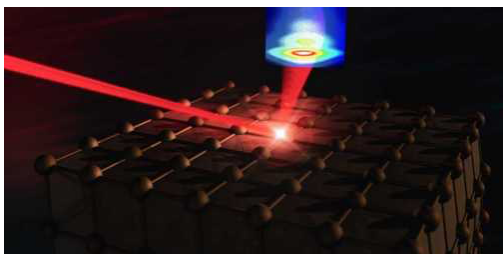
Terahertz-driven phonon upconversion in SrTiO₃



Direct manipulation of the atomic lattice using intense long-wavelength laser pulses has become a viable approach to create new states of matter in complex materials. Conventionally, a high-frequency vibrational mode is driven resonantly by a mid-infrared laser pulse and the lattice structure is modified through indirect coupling of this infrared-active phonon to other, lower-frequency lattice modulations. Here, we drive the lowest-frequency optical phonon in the prototypical transition metal oxide SrTiO₃ well into the anharmonic regime with an intense terahertz field. We show that it is possible to transfer energy to higher-frequency phonon modes through nonlinear coupling. Our observations are carried out by directly mapping the lattice response to the coherent drive field with femtosecond X-ray pulses, enabling direct visualization of the atomic displacements.

Read more: <https://www.psi.ch/micmag/terahertz-driven-phonon-upconversion-in-srtio3>

A new twist on a mesmerizing story



The Einstein–de Haas effect, first demonstrated more than a century ago, provides an intriguing link between magnetism and rotation in ferromagnetic materials. An international team led by ETH physicist Steven Johnson now established that the effect has also a central role in ultrafast processes that happen at the sub-picosecond timescale — and thus deliver fresh insight into materials that might form the basis for novel devices.

Read more: <https://www.psi.ch/lno/a-new-twist-on-a-mesmerizing-story>