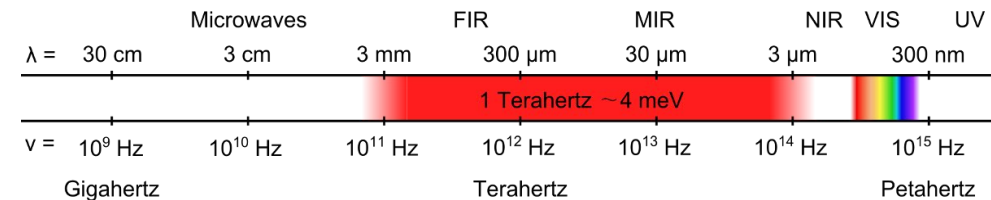


Instrumentation for ultrafast broadband spectroscopy for resonant magnetic and phononic excitations

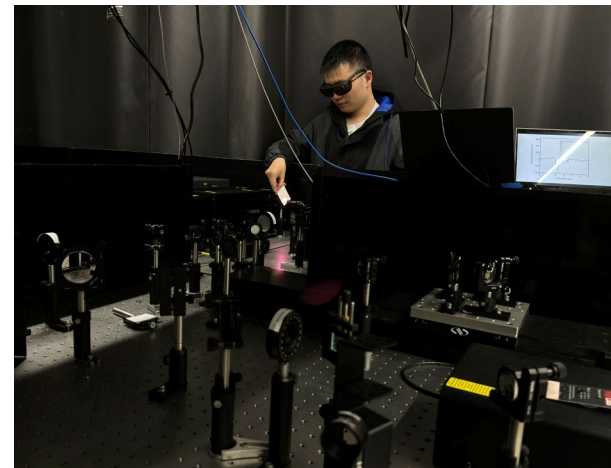
Jun Xiao, University of Wisconsin-Madison

Light is a powerful probe of materials. By probing materials with light of different wavelengths and different directions of the electric and magnetic fields, researchers can study how atoms are arranged, how they vibrate, how they produce magnetism, and how all of these aspects of a material work together.

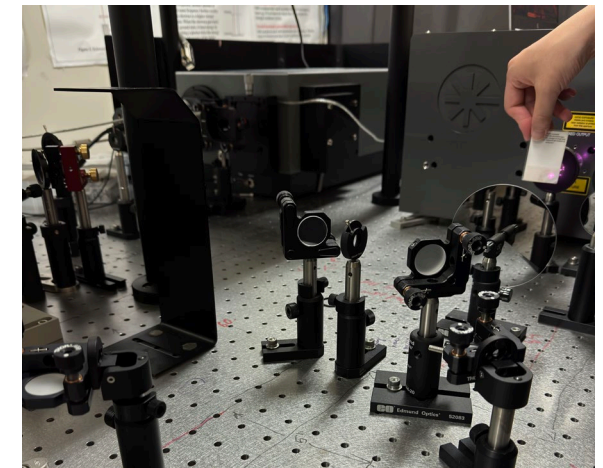
Researchers in Wisconsin MRSEC IRG 2 have developed instrumentation to use light to study magnetism, vibrations, and their couplings in thin crystal membranes as they are pulled and bent. These phenomena cover a range of wavelength from nanometers to millimeters and they respond in as little as 10^{-15} s (a femtosecond). The instruments developed by IRG 2 cover this entire range of wavelengths and timescales, making them a powerful suite of tools for MRSEC research.



Electromagnetic spectrum: IRG 2 instrumentation covers the range of wavelength / energy indicated here.



An ultrafast THz, near- and mid-infrared spectroscopy system developed by IRG 2



An ultrafast visible to near infrared spectroscopy system developed by IRG 2