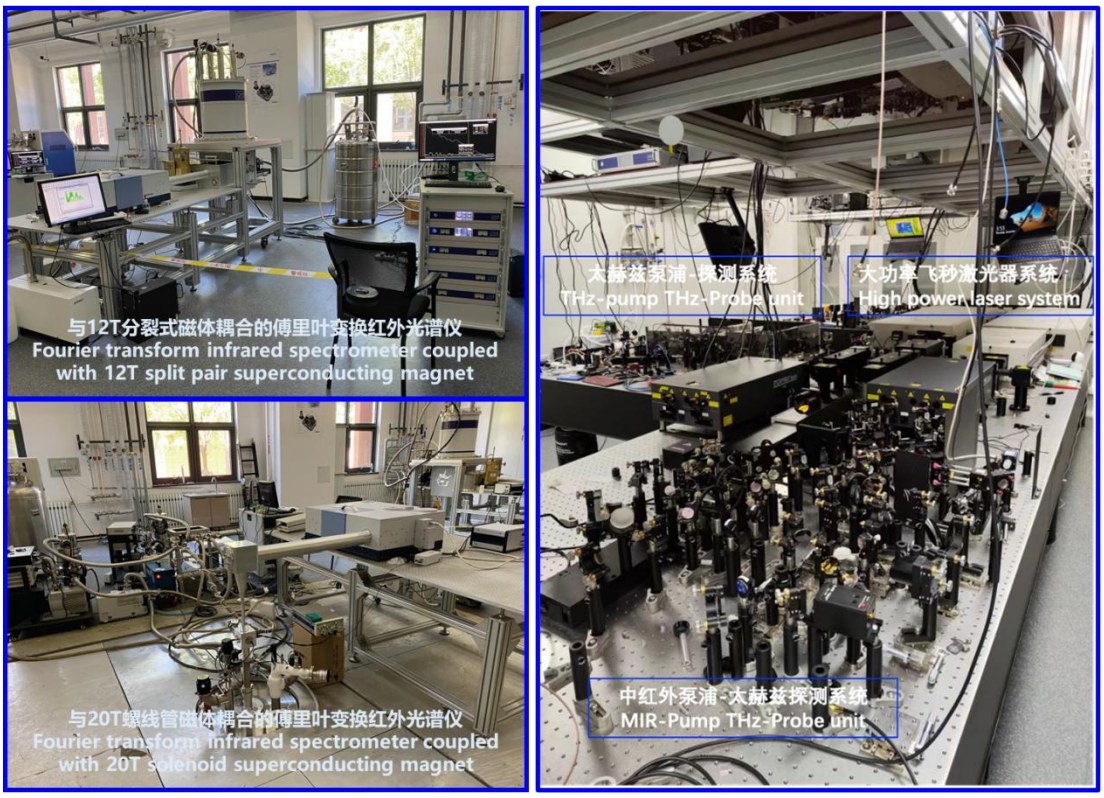
Infrared and terahertz spectra measurement station under extreme conditions



Photos of the experimental station

Magneto-infrared spectroscopy measurement unit mainly includes: (1) the Fourier transform infrared spectrometer coupled with the 12 T split pair superconducting magnet: the energy range of the optical spectra is from 30 to 25000 cm^{-1}, the energy resolution can be 0.15 cm^{-1}, the temperature range of the measured samples is from 4.2 to 300 K, the highest magnetic field is 12 T; (2) the Fourier transform infrared spectrometer coupled with the 20 T solenoid superconducting magnet: the energy range of the optical spectra is from 30 to 25000 cm^{-1}, the energy resolution can be 0.15 cm^{-1}, the lowest sample temperature is 4.2 K, the highest magnetic field is 20 T.

Time resolved terahertz spectroscopy measurement unit is composed of the terahertz time-domain spectroscopy under magnetic field and multiple pump-probe measurement systems. (1) Terahertz time-domain spectroscopy under magnetic field: The available THz spectra in this configuration covers from 0. 1 to 3.5 THz. The

lowest sample temperature is 1.5 K and the maximal magnetic field is 10 T. The magnetic field dependent measurements can be performed in Faraday and Voigt geometry. (2) ultrafast pump-probe spectroscopy: the intense pump beam whose energy could be tuned from near infrared down to mid-infrared (6 – 15 μm) and terahertz frequency (> 1 MV/cm) range by different optical techniques. We can perform different pump-probe measurements using the wavelength tunable lasers in the lab.

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