

## Ultrafast electron diffraction experimental station

Ultrafast electron diffraction experimental station utilizes ultrafast electron diffraction technology combining femtosecond laser and high-energy electron diffraction to achieve extremely fine spatial sensitivity of lattice structure dynamics in sub-picosecond time-scale. It consists of femtosecond laser, ultrafast electron source and diffraction system, sample preparation and surface treatment system, thousand-level clean room and other operational units.

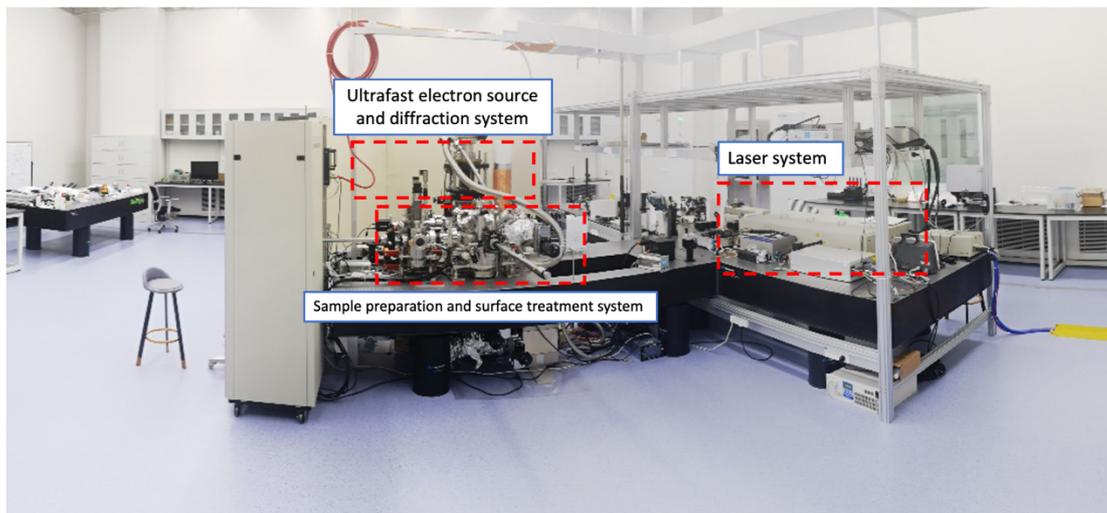


Photo of the experimental station

For the ultrafast electron diffraction system, key merits include electron pulse energy range: 20-100 keV, time resolution:  $\leq 500$  fs, and spatial resolution (from reciprocal lattice):  $\leq 0.005$  Å. Thin film samples with thickness below 100 nm can be studied in electron transmission mode. The variable range of sample temperature is around 15 K to 500 K. Electron reflection mode (ultrafast RHEED) will be available soon in the future. The system is also equipped with a set of sample preparation and surface treatment units, including grinder, vacuum oven, deposition source, low-energy electron diffractometer with Auger electron analyzer, reflective high-energy electron diffractometer, etc., which are convenient for users to perform sample preparation on site as well as in-situ annealing, vapor deposition, sample quality inspection and so on. In addition, the laboratory's ultrafast electron source and femtosecond laser system can also be used for nonlinear optics, micro and nano optical components, terahertz technology and other researches related to all-optical modulation of electrons as well as ultrafast spectroscopy.

### Contact Information:

Dr. Wang, E-mail: [xw@iphy.ac.cn](mailto:xw@iphy.ac.cn).