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Laser Nano Trapping, Laser Nano Ablation, Laser Nano Spectroscopy, Photochemistry, Physical Chemistry

Laser trapping and ablation of nano material are nonlinear optical and photochemical phenomena and their studies attract many scientists and engineers due to their high potential in future bio/nano science. We are extending the following topics by collaborating with many laboratories in Taiwan, Japan, Brunei, and Belgium.

(a) How to observe and analyze laser trapping dynamics of nanoparticles?

Reflection micro spectroscopy of laser trapping dynamics of nanoparticles
Reflection micro spectroscopy of laser trapping-induced crystal growth of amino acid
Development of a new microscope with two objective lenses enabling three-dimensional analysis of trapping dynamics
Optical resonance enhancement of dye-doped nanoparticles

(b) Ultrashort laser pulses can trap nanoparticles more efficiently compared to conventional laser trapping

Drag and release dynamics of nanoparticles studied by double train experiment of femtosecond laser pulse
Immobilization time analysis of a single nanoparticle trapped by femtosecond laser pulses (with Univ. Brunei)
Efficient trapping and succeeding ejection dynamics of nanoparticles (with KULeuven Belgium, Univ. Brunei)

(c) Let's explore new laser-induced phenomena of supramolecular and biomolecular systems

Femtosecond laser-induced formation of amyloid fibrils of several protein (with Kobe Univ., Nara Institute, IMS Japan)
Laser trapping-induced assembling of supramolecules (with Prof. W.S. Chung in NCTU, Tokyo Tech)