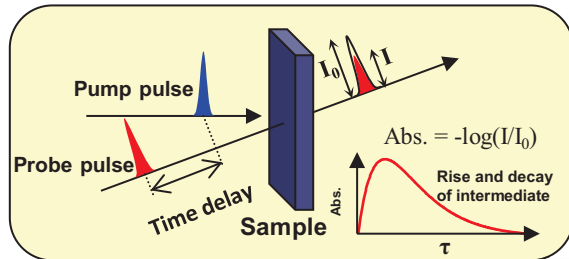
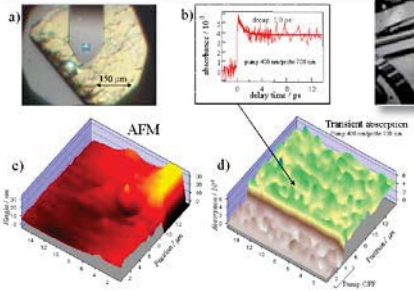


Femtosecond transient absorption to reveal ultrafast process

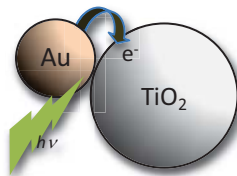


Solar cells (Si, polymer, quantum dots)  
Photocatalyst (semiconductor nanoparticles, water splitting)

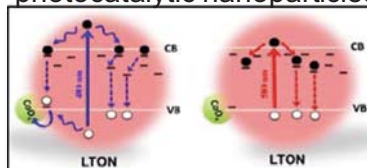
Imaging of excitons in organic solid



Mechanism of plasmon-induced charge transfer



Carrier dynamics in photocatalytic nanoparticles



Time resolved spectroscopic systems are developed using ultrafast lasers with pulse duration of ~100 fs.

These systems are especially customized for measuring devices and materials under operational conditions.

Fundamental studies for the material properties to understand the reaction dynamics are undertaken for the following dynamics in several nanomaterial systems.

1. Charge transfer in organic-inorganic hybrid solar cells such as dye-sensitized solar cells and polymer photovoltaics.
2. Carrier dynamics in photocatalysts that are used for water splitting.
3. Plasmon induced charge separation in gold nanoparticle composites.
4. Exciton fission dynamics relating to a novel solar cell.

Keywords: Ultrafast spectroscopy, Dynamics, Solar cell, Photocatalyst

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