**Photo-thermal Effects and Its Applications**

Photon induced heat generation within metallic nanostructures has been considered as perfect nanoscale heat source, which impacts on many research areas, such as cancer therapy, thermal imaging, chemical catalysis and photofluidics et al. Our research interests include fabrication techniques of optical absorber with novel functionalities, designing thermally based new functional devices, exploring the influence of heat on the performance of subwavelength optical devices.

**Photo-thermal based nanoparticle transfer** [1]

A large number of Au nanoparticles with designable sizes and good optical properties can be fabricated through one shot at low light power. This method is promising in nanostructures preparation for potential optoelectronics and biology applications.

![Photo-thermal based nanoparticle transfer](image)

**Temperature-based plasmon ruler** [2]

A plasmon ruler that can monitor the interparticle gap distance by measuring the temperature increment is demonstrated. Such a new method may find applications such as biological sensing and imaging, optical storage and photovoltaic technology.

![Temperature-based plasmon ruler](image)

**Photothermal properties of plasmonic waveguides** [3]

Subwavelength waveguides is essential for future high capacity circuits while heat generation within it will put a thermal limit on the integration level. Systematic study of the heat generation and dissipation of the typical subwavelength waveguides will provides a guide for choosing the appropriate waveguide for optical interconnection.

![Photothermal properties of plasmonic waveguides](image)

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**References**