

**Center for Quantum Science and Engineering (CQSE)  
&  
National Center of Theoretical Sciences (NCTS/TPE)**

**Joint Seminar  
April 16, 2010 (Friday)**

Time: April 16, 2:30pm ~ 3:30pm

Title: Plasma Engineering, Modeling, and its Applications in Materials Processing

Speaker: Prof. Chengche Hsu (徐振哲)

Dept. of Chemical Engineering, NTU

Place: Rm716, CCMS & New Physics Building, NTU

**Abstract**

Plasma processes have attracted considerable attention in the past decades due their wide applications in electronic device manufacturing, materials processing, bio-engineering, and surface modification. Plasmas that are most widely used in materials processing include low and atmospheric pressure plasmas.

In this presentation, low and atmospheric pressure plasmas will be briefly introduced. Examples of plasmas used in materials processing, bio-engineering, and surface treatment will be given. The key characteristics of plasmas will be described. Recent research activities in diagnostic study and numerical simulation of atmospheric pressure plasma jet will be presented. The goal is to study how the operating parameters influence the plasma reactivity and its neutral temperature. The effect of the diffusion of the ambient air on the plasma characteristics is assessed. Numerical simulation is performed to compare with the experimental results and good agreement is found. Finally, the use of this plasma jet for materials processing, namely zinc oxide thin-film deposition and niobium oxide nanowire fabrication, will be presented. The process implication using plasmas of this type for materials processing will be discussed.

