NYU-ECNU Institute of Mathematical Sciences at NYU Shanghai

PDE/ANALYSIS SEMINAR

Topic: **The Existence of Positive Ground State Solutions for the Nonlinear Kirchhoff Type Equations in $\mathbb{R}^3$**

Speaker: **Prof. Gongbao Li**

Time: 14:30-16:30, 13 December 2013

Venue: Room 379, Geography Building, 3663 Zhongshan Road North, Shanghai (华东师范大学中山北路校区，地理楼 379 室)

ABSTRACT OF THE TALK

In this talk, we study the following nonlinear problem of the Kirchhoff type with pure power nonlinearities:

$$\begin{cases} -\left(a+b\int_{\mathbb{R}^3}|Du|^2\right)\Delta u+V(x)=|u|^{p-1}u, & x\in\mathbb{R}^3, \\ u\in H^1(\mathbb{R}^3), \quad u>0, & x\in\mathbb{R}^3, \end{cases} \tag{1}$$

where $a, b>0$ are constants, $2<p<5$ and $V:\mathbb{R}^3\to\mathbb{R}$. Under certain assumptions on V, we prove that (1) has a positive ground state solution by using a monotonicity trick and a new version of global compactness lemma. Our main results especially solve problem (1) in the case where $p\in(2,3]$, which has been an open problem for the Kirchhoff equations.

BIOGRAPHY

Gongbao Li is professor of Mathematics at Central China Normal University in Wuhan.