A three solution theorem for singular nonlinear elliptic boundary value problems

Abstract

In this talk we will discuss the concept of fixed point index and see how it can be applied to obtain multiple solutions for singular boundary value problems. We establish a three solution theorem for singular elliptic equation of the form $-\Delta u = \frac{f(u)}{u^\beta}$ in Ω, $u = 0$ on $\partial\Omega$ where Ω is a bounded domain in $I\!R^N, N \geq 1$ with a smooth boundary $\partial\Omega$. Here $f : [0, \infty) \to [0, \infty)$ is a C^1 function in $[0, \infty)$ with $f(0) > 0$ and $\beta \in (0, 1)$. This is a joint work with R.Shivaji and Eunkyung Ko.