



**Department of Mathematics and Statistics**

**COLLOQUIUM**

**Tuesday, November 25<sup>th</sup>, 2014**

4:00 – 5:00 pm, Adel Mathematics Bldg., Room 164  
(refreshments at 3:45)

**Ryan McPeck**

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M.S. Thesis Talk: Variational characterizations of sign-changing solutions of sublinear elliptic boundary value problems.

Abstract

We consider *sublinear* elliptic boundary value problems of the form

$$\Delta u + f(u) = 0.$$

An example nonlinearity that we use is  $f(u) = s \tanh u$ , where  $s = f'(0)$  is used as a bifurcation parameter. Our main goal is to investigate the underlying variational structure of the problem, whereby an algorithm for approximating solutions might suggest an existence proof. In Neuberger's PhD thesis, it is proven that for the superlinear problem, there exists a sign-changing exactly-once solution of minimal energy. This was obtained via a min-max argument. We consider here in the sublinear case various subsets of Hilbert space whereby a min-max argument might provide the existence of a sign-changing solution.

ACGT Seminar: Tuesdays 12:45 – 1:45 pm, AMB 164.

Applied Math Seminar (AMS) and Friday Afternoon Undergraduate Mathematics Seminar (FAMUS) will not be held this week due to the Thanksgiving holiday break.