1054-35-270 **Jonathan J Sarhad*** (jjs@math.ucr.edu), 1055 W. Blaine St. #28, Riverside, CA 92507. *A Solution to the Nonlinear Poisson Boundary Value Problem via a Newton-imbedding Prodedure.* Preliminary report.

This presentation considers the semilinear boundary value problem given by the Poisson equation, $-\Delta u = f(u)$. Under suitable assumptions on the domain, and the forcing term f, the Newton-imbedding procedure yields a continuous solution. This study is inspired by an independant work which uses this procedure to solve the Poisson problem, assuming in particular, that f' maps the Sobolev space $H^1(\Omega)$ to the space of Hölder continuous functions $C^\alpha(\bar{\Omega})$. In the first part of the presentation, we show that if Ω is a domain in $\mathbb{R}^{n>2}$, then any mapping of $H^1(\Omega)$ to $C^0(\bar{\Omega})$, the space of continuous functions, via composition with a real function, is constant. In this case, f is linear and the scope of the procedure, in higher than two dimensions, is reduced to linear equations. In the second part of the article, we show that with weaker assumptions on f' , the procedure works, producing a continuous solution when $n = 3$. (Received September 15, 2009)