

## *Seminar in Nonlinear Systems*

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### *Function Spaces with Norms Given by Capacities of Level Sets and the Regularity of Solutions of some PDE's*

Tuesday, November 29, 2005

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Peirce 218

*Abstract:* Motivated by an algorithm for the solution of PDE's of the form  $u_t = Lf(u)$ , where  $f : R \mapsto R$  satisfies  $0 \leq (x - y)(f(x) - f(y)) \leq (x - y)^2$  and  $L$  is a linear operator generating a semigroup which is contractive in  $L^1$ , we are led to ask for what normed spaces the triangle inequality becomes an equality:  $\|u - f(u)\| + \|f(u)\| = \|u\|$  (an obvious example is  $L^1$ ). We show that, with certain small restrictions, all such spaces have  $u$  constructed as an integral of set functions of the level sets of  $u$ , and that these set functions are capacities in a sense which is slightly generalized from the usual definition.

Refreshments provided