TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

Monday, April 16, 2018, 2:40 p.m.

Free boundary problems as integro-differential equations

by Nestor Guillen

University of Massachussetts at Amherst

Abstract: It is a well known fact that the Dirichlet-to-Neumman map for an elliptic operator yields an integro-differential operator on the boundary of the domain. As it turns out, one can consider a non-linear analogue of this map to describe free boundary conditions in terms of a non-linear non-local operator satisfying a comparison principle. The end result is that a large class of free boundary problems correspond to a (degenerate) parabolic integro-differential equation on a reference submanifold, making it possible to approach free boundary regularity via non-local methods. Based on joint works with Russell Schwab, Jun Kitagawa, and Hector Chang-Lara.