1070-03-115 **Kerry Ojakian*** (kerryojakian@gmail.com) and **Manuel Campagnolo**. *Characterizing computable analysis with differential equations.*

I will present joint work with Manuel L. Campagnolo. The functions of Computable Analysis are defined by enhancing the capacities of normal Turing Machines to deal with real number inputs. We consider characterizations of these functions using function algebras, known as Real Recursive Functions (Moore 1996). The function algebras are defined by specifying some basic functions, and closing these functions under composition and other operations (such as setting up a differential equation with functions in the algebra and putting the solution in the algebra). Bournez and Hainry (2006) used a function algebra to characterize the twice continuously differentiable functions of Computable Analysis, restricted to certain compact domains. I will speak about recent submitted work that improves this, finding three characterizations of Computable Analysis, removing the restriction to twice continuously differentiable and allowing unbounded domains. Furthermore, the recent proof uses our "method of approximation" from our earlier work, providing further evidence of our claim that this technique should have wide applicability in work of this kind. (Received February 03, 2011)