1067-03-729 **Kerry Ojakian*** (kerryojakian@gmail.com). *A characterization of computable analysis on unbounded domains using differential equations 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). Bournez and Hainry (2006) used a function algebra to characterize the twice continuously differentiable functions of Computable Analysis, restricted to certain compact domains. In our CCA paper of 2008, we developed a different function algebra that also yields Computable Analysis, still limited to twice continuously differentiable functions of Computable Analysis, restricted to certain compact domains. In recent work, we improve our result, 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 (Archives paper of 2008), providing further evidence of our claim that this technique should have wide applicability in work of this kind. (Received September 14, 2010)