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Saugata Basu* (saugata.basu@math.gatech.edu), Department of Mathematics, Purdue University, 150 N. University Street, West Lafayette, IN 47907. *On bounding as well as computing the Betti numbers of semi-algebraic sets.*

In this talk I will survey quantitative and algorithmic results on computing topological invariants (such as the Betti numbers) of semi-algebraic sets, with particular emphasis on semi-algebraic sets defined by quadratic polynomials. I will also mention some recent results for semi-algebraic sets defined by partly quadratic systems of polynomials, which interpolate between similar results known for general semi-algebraic sets and for semi-algebraic sets defined by purely quadratic polynomials. Some of this work is joint with R. Pollack, M.-F. Roy and D. Pasechnik. (Received August 10, 2008)