1006-55-153 **Saugata Basu*** (`saugata@math.gatech.edu`), School of Mathematics, Georgia Institute of Technology, Atlanta, GA 30332. *Efficient algorithms for computing the Betti numbers of semi-algebraic sets.*

In this talk I will describe some new algorithms for computing the Betti numbers of semi-algebraic sets. More precisely, I will describe an algorithm for computing the first few Betti numbers of any given semi-algebraic set whose complexity is singly exponential in the dimension. Previously, only the zero-th Betti number was known to be computable in single exponential time. I will also describe a polynomial time algorithm for computing certain Betti numbers of sets defined by quadratic inequalities. (Received February 14, 2005)