1060-57-151 **Shaun R Harker*** (sharker@math.rutgers.edu). *Discrete Morse Theory for Homology Computation.*

Discrete Morse Theory for Homology Computation

Morse theory was developed in a discrete setting by Robin Forman, who defined discrete Morse functions on cell complexes and showed one could construct a smaller complex – the *Morse complex* – built only out of the so-called *critical cells* of the complex. Moreover, this smaller complex is guaranteed to have the same homology as the original complex. We have developed algorithms to find such discrete Morse functions and also algorithms to quickly evaluate the boundaries of chains in the Morse complex. This gives us another method of computing homology. (Received March 29, 2010)