

1135-VC-1895 **Benjamin J. Braun** and **Wesley K. Hough*** (houghw@uww.edu), 800 West Main Street,
UW-Whitewater, Mathematics Department, LT2218, Whitewater, WI 53190. *Discrete Morse
Theory and Poset Homomorphism Complexes*. Preliminary report.

The main idea of discrete Morse theory is to pair cells in a cellular complex in a manner that permits cancellation via elementary collapses, reducing the complex under consideration to a homotopy-equivalent complex with fewer cells. In this talk, we introduce the notion of a homomorphism complex for partially ordered sets, placing particular emphasis on maps between chain posets and the Boolean algebras. We define an iterative discrete Morse matching for these Boolean complexes and provide formulas for enumerating the number of critical cells arising from this matching as well as for the Euler characteristic. We end with a conjecture on the optimality of our matching derived from connections to 3-equal manifolds. (Received September 25, 2017)