1135-55-2387   **Gregory Henselman*** (`greg.henselman@gmail.com`), 2600 South Street, Apt 3F, Philadelphia, PA 19146. *Morse-Witten Theory for Real Operators.* Preliminary report.

Accelerated by applications in mathematical physics from the late 20th century, the interaction of the theories of Morse and Hodge in smooth geometry has propelled remarkable advances in geometric topology over the past four decades. Progress in this domain has considerably outpaced parallel investigations in combinatorial topology, where several of the most basic questions regarding spectral analysis of discrete Morse structures remain outstanding. The present talk introduces a discrete Morse-Witten theory for real-linear operators, a direct extension of the Morse-Witten theory for CW complexes pioneered by Forman in the late 1990's. Time permitting, we will discuss some consequences for spectral analysis of cellular spaces, the surprisingly categorical underpinnings of the Morse-Witten complex, and several future directions. No prior knowledge of Morse-Witten theory will be assumed, smooth or otherwise. (Received September 26, 2017)