A 2-complex with semi-flow has a corresponding dual directed graph. In this talk, I will explain how to obtain from this information a polynomial invariant that is independent of homotopy equivalences preserving the semi-flow. Under certain conditions, we show that this is analogous to McMullen’s Teichmueller polynomial, and computes the monodromy entropies of the fundamental group of the complex. This work is joint with Yael Algom-Kfir and Kasra Rafi. (Received January 28, 2015)