1092-68-98 **L. Egri**, **P. Hell**, **B. Larose*** (benoit.larose@concordia.ca) and **A. Rafiey**. *Space complexity of list H-coloring: a dichotomy.*

The Dichotomy Conjecture for constraint satisfaction problems (CSPs) states that every CSP is in P or is NP-complete (Feder-Vardi, 1993). It has been verified for conservative problems (also known as list homomorphism problems) by A. Bulatov (2003). We augment this result by showing that for digraph templates H, every conservative CSP, denoted LHOM(H), is solvable in logspace or is hard for NL. More precisely, we introduce a digraph structure we call a circular N, and prove the following. if $\mathbf{A}(H)$ denotes an algebra whose term operations are the conservative polymorphisms of the digraph H, then the following conditions are equivalent: (1) the variety generated by $\mathbf{A}(H)$ admits only the Boolean type; (2) the variety generated by $\mathbf{A}(H)$ is congruence k-permutable for some k; (3) the digraph H contains no circular N. If one of these conditions holds then the problem LHOM(H) is solvable in logspace, otherwise it is NL-hard. Moreover, we show that the presence of a circular N can be decided in time polynomial in the size of H. (Joint work with L. Egri, P. Hell and A. Rafiey.) (Received August 01, 2013)