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Jozef H. Przytycki* (przytyck@gwu.edu), Department of Mathematics, George Washington University, Washington, DC 20052. *Khovanov graph homology as a Hochschild homology of graphs.*

We show that Khovanov homology and Hochschild homology theories share common structure. In fact they overlap: Khovanov homology of a $(2,n)$ -torus link can be interpreted as a Hochschild homology of the algebra underlining the Khovanov homology. In the classical case of Khovanov homology we prove the concrete connection. In the general case of Khovanov-Rozansky, $sl(n)$, homology and their deformations we conjecture the connection. The best framework to explore our ideas is to use a comultiplication free version of Khovanov homology for graphs developed by Y.Rong and L. Helme-Guizon. In this framework we prove that for any unital algebra A the Hochschild homology of A is isomorphic to graph homology over A of a polygon. We expect that this observation (that two theories meet) will encourage a flow of ideas in both directions between Hochschild/cyclic homology and Khovanov homology theories. (Received July 04, 2005)