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Philippe R Di Francesco* (philippe@illinois.edu). *Macdonald operators, from Cluster Algebra to Elliptic Hall algebra.*

We investigate generalized Macdonald difference operators that interpolate between quantum cluster algebras associated to Q-systems and the so-called Elliptic Hall, or Ding-Iohara-Miki algebra which play a central role in the so-called AGT conjecture. We will show how some of these operators for type A arise naturally from Double-Affine Hecke Algebra representations, and obey relations in the Elliptic Hall algebra as a consequence. Relations to Cluster Algebra in the limit $t \rightarrow \infty$ will be obtained by use of Shuffle Algebra techniques. Generalizations to B, C, D types will also be presented.

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