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## **P-kernels, IC bases, and Kazhdan-Lusztig polynomials**

In 1992 Stanley introduced, for any locally finite poset  $P$ , the concept of a  $P$ -kernel. This concept includes as special cases several interesting objects, such as Kazhdan-Lusztig polynomials and the local intersection cohomology Poincaré polynomials of toric varieties. In 1994 Du introduced the concept of an IC basis. Examples of IC bases are the Kazhdan-Lusztig bases of Hecke algebras of Coxeter groups and of  $q$ -Schur algebras, as well as the canonical bases of quantized enveloping algebras and of quantum linear groups.

In this talk we show that any  $P$ -kernel corresponds to an IC-basis and, under some mild hypotheses, conversely. We also characterize, given a Coxeter group  $W$  partially ordered by Bruhat order, among all  $W$ -kernels the one corresponding to the Kazhdan-Lusztig basis of the Hecke algebra of  $W$ . Finally, we show that this  $W$ -kernel factorizes as a product of other  $W$ -kernels, that these provide a solution to the Yang-Baxter equations for  $W$ , and we compute explicitly the IC bases corresponding to them.