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**Isaiah P Lankham\*** ([issy@math.ucdavis.edu](mailto:issy@math.ucdavis.edu)), Department of Mathematics, University of California, One Shields Avenue, Davis, CA 95616-6635, and **Alexander I Burstein** ([burstein@iastate.edu](mailto:burstein@iastate.edu)), Iowa State University, Department of Mathematics, Ames, IA 50011-2064. *Combinatorics of Patience Sorting Piles.*

Despite having been introduced in 1962 by C.L. Mallows, the combinatorial algorithm *Patience Sorting* has only recently received significant attention due to the celebrated Baik-Deift-Johansson Theorem, which links Patience Sorting to fields including Probabilistic Combinatorics and Random Matrix Theory.

In this talk we will detail the combinatorics of the Patience Sorting Algorithm by exploiting similarities between it and the famous Schensted Insertion Algorithm for Young Tableaux. This will allow us to define an analog of the Knuth relations and extend Patience Sorting to a bijection between permutations and certain pairs of set partitions. As an application of these constructions we characterize and enumerate the set  $S_n(3 - \bar{1} - 42)$  of permutations that avoid the generalized permutation pattern  $2 - 31$  unless it is part of the generalized pattern  $3 - 1 - 42$ . (Received August 03, 2005)