Alexander E Hoffnung* (alex@math.ucr.edu). A categorification of Hecke algebras.

Given a Dynkin diagram and the finite field $F_q$, where $q$ is a prime power, we get a finite algebraic group $G_q$. We will show how to construct a categorification of the Hecke algebra $H(G_q)$ associated to this data. This is an example of the Baez/Dolan program of “Groupoidification”, a method of promoting vector spaces to groupoids and linear operators to spans of groupoids. For example, given the $A_2$ Dynkin diagram, for which $G_q = SL(3,q)$, the spans over the $G_q$-set of complete flags in $F_q^3$ encode the relations of the Hecke algebra associated to $SL(3,q)$. Further, we will see how categorified relations of the Hecke algebra correspond to incidence relations in projective plane geometry. (Received September 14, 2008)