

# Workshop on Representation Theory, Geometry & Combinatorics

Organizer: Mark Haiman

Monday June 2–Friday June 6, 9:30–5:00pm, Bechtel 120ABC

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**Jonah Blasiak**, UC Berkeley

*Cyclage, catabolism, and the affine Hecke algebra*

It is well-known that the ring of coinvariants  $\mathbb{C}[y_1, \dots, y_n]/\langle e_1, \dots, e_n \rangle$ , thought of as a  $\mathbb{C}\mathcal{S}_n$ -module with  $\mathcal{S}_n$  acting by permuting the variables, is a graded version of the regular representation of  $\mathcal{S}_n$ . However, how the decomposition of this module into irreducibles is related to multiplication by the  $y_i$  remains a mystery. We describe a promising approach to this problem that uses a subalgebra of the affine Hecke algebra and its canonical basis. This subalgebra has a cellular subquotient which is a  $q$ -analog of the ring of coinvariants and, conjecturally, has cellular subquotients that are  $q$ -analogs of the Garsia-Procesi modules. This viewpoint makes it transparent how the combinatorics of these representations are related to cyclage and gives some hints that may lead to a better understanding of catabolism.