

1154-05-1457      **Eric Stucky\*** ([stuck127@umn.edu](mailto:stuck127@umn.edu)), 1920 S 1st St., #506, Minneapolis, MN 55454. *Cyclic Sieving, Necklaces, and Bracelets.*

In their celebrated 2004 paper, Reiner, Stanton, and White define and collate examples of the “cyclic sieving phenomenon” (CSP). Notably, the classical analogue of the  $q$ -binomial coefficient exhibits a CSP with respect to the long cycle  $(1\ 2\ \dots\ n)$  acting on subsets of  $[n]$ .

In this talk, we interpret these  $q$ -binomial coefficients as exhibiting a “secondary” CSP. For instance, for  $\binom{n}{k}$  with  $(k, n) = 1$ , the action of the long cycle is free. This immediately yields a proof that the (Mahonian) rational  $q$ -Catalan numbers are polynomials in  $q$ . Then, using necklaces with specified bead-counts as our model for rational Catalan objects, we observe a  $q = -1$  phenomenon and generalize it in some circumstances to cyclic sieving phenomena of higher order. (Received September 15, 2019)