Talk was videotaped and may be on the web.

$$\#\{\text{crossingless matchings of } 2m \text{ pts}\} = C_m$$
($\{\ldots\} =: P_m$)

We have $R : P_m \circlearrowleft$ rotation.

$$(P_m)^{R^d} = \{M : R^d(M) = M\}$$

q-analogue of catalan:

$$[k]_q := 1 + q + \ldots + q^{k-1} = \frac{q^k - 1}{q - 1}$$

$$C_m(q) := \frac{1}{[m+1]_q} \frac{[2m]_q \cdots [m+1]_q}{[m]_q \cdots [1]_q}$$

e.g. $C_3(q) = q^6 + q^4 + q^3 + q^2 + 1$

Thm Peterson Pylyavskyy Rhoades 2008.

$$|P_m^{R^d}| = C_m(\zeta_{2m}^d) \qquad \zeta_{2m} := \frac{2\pi i}{2m} \text{ // exp.}$$

Pf on $\mathbb{C}[P_m]$, $|P_m^{R^d}| = \mathrm{tr}(R^d)$, so we want to diagonalize R.

"$(P_m, R, C_m(q))$ satisfies the cyclic sieving phenomenon"

Thm (Folklore)

$$[(\mathbb{C}^2)^{\otimes 2m}]^{SL_2} \sim \mathbb{C}(P_m).$$

and the isomorphism agrees with rotations, up to $(-1)^m$.

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similarly, take G any complex semi-simple, $V(\lambda)$ a miniscule rep., study

$$(V(\lambda)^{\otimes m})^G \circlearrowleft R$$

1. Find a basis which is permuted by R, up to signs.

2. Diagonalize R.

use "affine Grassmannians"

use "quivers"