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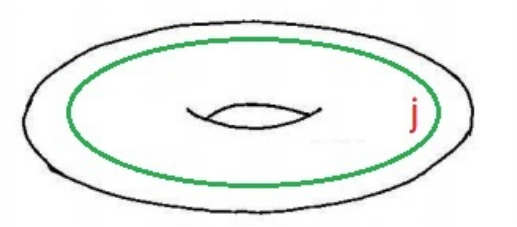
on leave from Harvard U.

Physics	*Geometry*	*Rep. Theory*
0d, 1d IM	Symplectic/Poisson	$U(\mathfrak{g})$
2d CFT	Hyperbolic/Teichmuller	$U(\hat{\mathfrak{g}}), \mathcal{W}(\mathfrak{g})$
3d TQFT	Topology	$U_q(\mathfrak{g})$, Skein
(4,5,6)d SYM	Algebraic Geometry	$U_q(\hat{\mathfrak{g}}), U_{q,t}(\hat{\hat{\mathfrak{g}}})$

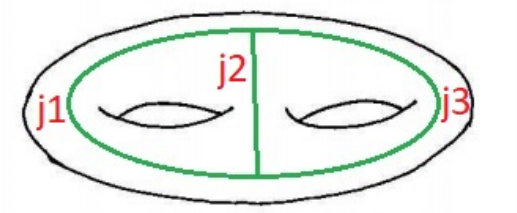


Macdonald polynomials $P_j(x)$ with parameters q, t

Evaluation: $x = t^{\frac{1}{2}}$ special point, $P_i\left(t^{\frac{1}{2}}\right)$ factorizes

Symmetry: $P_j\left(t^{\frac{1}{2}} q^{\frac{i}{2}}\right)$ w.r.t. exchange (i, j)

Modularity: provide $SL(2, \mathbb{Z}) \simeq MCG(\Sigma_1)$ representations



Polynomials $P_{j_1, j_2, j_3}(x_{12}, x_{13}, x_{23})$ with parameters q, t
Evaluation: ✓ Symmetry: ✓ Modularity: ✓ $MCG(\Sigma_2)$