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## Research interests

### 2D Coulomb gas

$$\mathcal{P}(z_1, \dots, z_N) \sim \prod_{j>k}^N |z_j - z_k|^\beta e^{-\sum_{i=1}^N Q(z_i)}$$

- $\beta = 2$ : Planar orthogonal polynomials:  $H_n(z), L_n^{(\nu)}(z), \dots$
- $P_n^{(\alpha, \gamma)}(z)$  Jacobi,  $z \in D \subset \mathbb{C}$  ?
- universality: general  $Q$ , classes? Selberg integrals?

### Polynomial ensembles

$$\mathcal{P} \sim \Delta_N(x_1, \dots, x_N) \det[\varphi(a_i, x_j)]_{i,j=1}^N$$

- chGUE + external field: universality at hard edge
- chGUE: hard (soft) edge spacing  $\approx$  bulk spacing
- describe QCD phase transition