Scattering Theory and Currents on the Conformal Boundary

Tom Banks

Nati-Fest, September 16, 2016

Birthday
Quantum Gravity S Operator not in Fock Space
Currents on the Conformal Boundary
BMS Spectrum: Fourier Dual of the Boundary
Operator Valued (Half) Measures on the Null Cone
The Fuzzy Spinor Bundle: UV/IR Beyond AdS/CFT

HAPPY BIRTHDAY NATI

- Nathan Seiberg has Been Many Things

Nati Revealing the Wonders of SUSY
Gauge Theory to the Worl


BREAKTHROUGH PRIZE
PHYSICS

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- But Always The Most Creative and Productive Physicist of His Generation

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- Throws Doubt on Claim that S matrix is large radius limit of CFT Correlators.

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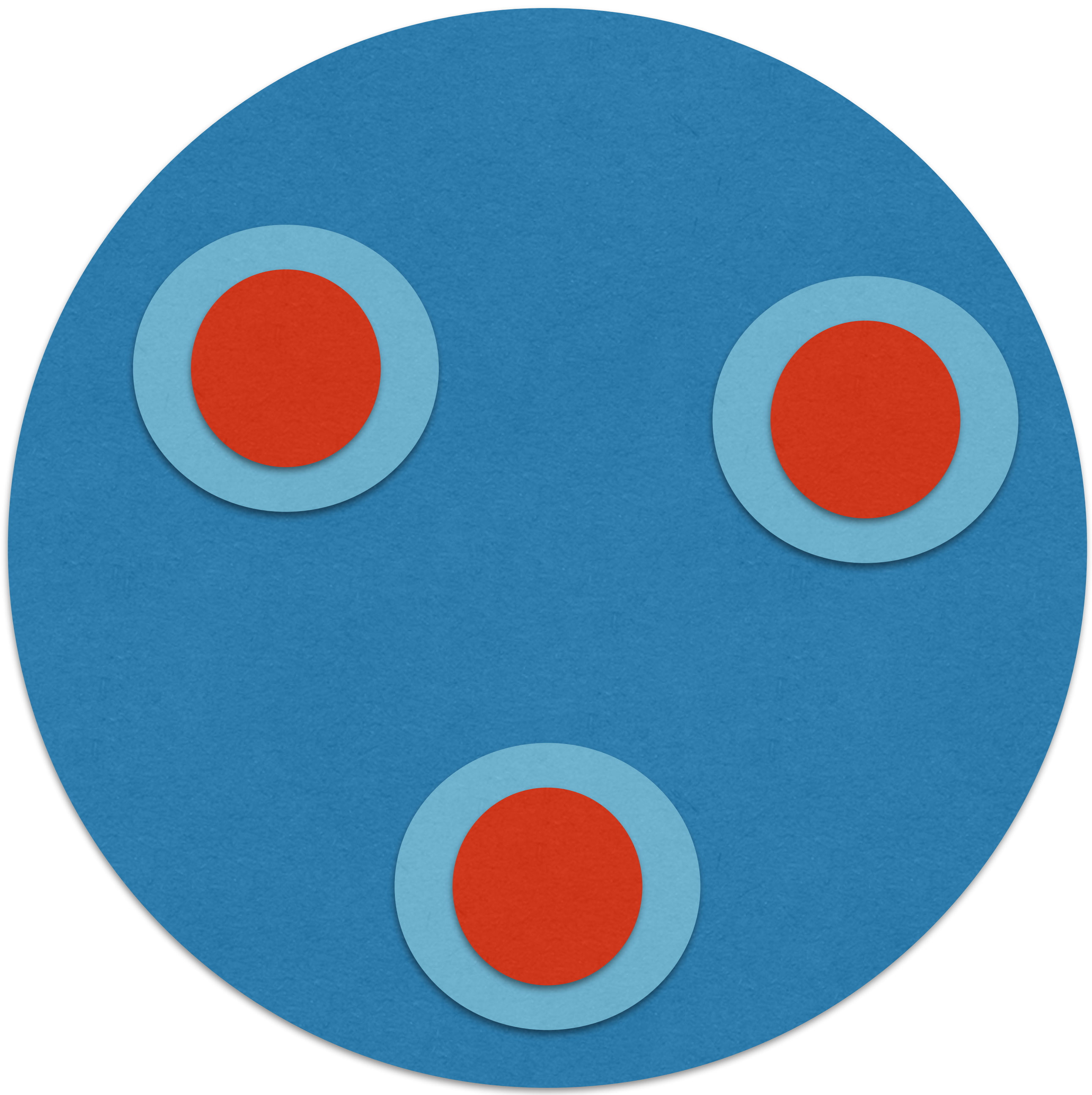
- S Maps AGS Algebra on Negative Null Cone to That on Positive Null Cone $SQ^- = Q^+ S$.

Exclusive Sterman Weinberg Jets

- Support of $Q(P)|jet\rangle$ for $p_+ > 0$ is a finite number of spherical caps with finite opening angle.



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- Detailed definition of annuli requires finite area diamond cutoff.

Fuzzy Spinors and Finite Diamonds - TB, Kehayias, Fischler

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- Same model, with N kept finite leads to model of stable dS space. Constraint defining particles explains dS temperature. Thermalization of localized states in time $t > N$

HST and Compactification

- Compactifications to 4D with minimal SUSY, classified by superalgebras

$$[\psi_i^A(P), \psi_B^{\dagger\, j}(Q)]_+ = \delta_i^j \delta_B^A Z(P, Q).$$

$$[Z(P, Q), \psi_i^A(R)] = \sum_S f(P, Q, R, S)\psi_i^A(S).$$

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- Discrete set of possibilities, so no continuous moduli. Easy to understand how approximate continuous moduli can exist when length scales $\gg L_P$. In process of understanding string theory limits where "cycle shrinks to zero". Key seems to be fractional winding numbers for fuzzy manifolds, but details of the rules are unclear.