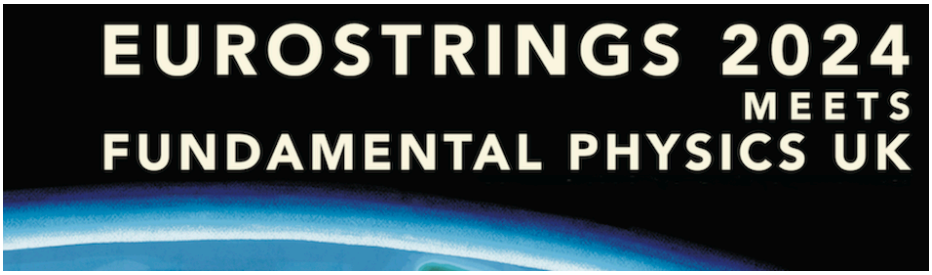

Contribution ID: **53** Type: **Talk in parallel session**

Bootstrapping frustrated magnets: the fate of the chiral $\mathrm{O}(N) \times \mathrm{O}(2)$ universality class

Tuesday 3 September 2024 14:50 (20 minutes)

We study multiscalar theories with $\mathrm{O}(N) \times \mathrm{O}(2)$ symmetry. These models have a stable fixed point in d dimensions if N is greater than some critical value $N_c(d)$. The expectation is that at this critical value $N_c(d)$ a merger between the stable and unstable fixed point occurs and that for $N < N_c(d)$ the fixed points move off into the complex plane. Previous estimates of this critical value from perturbative and non-perturbative renormalization group methods have produced mutually incompatible results. We use numerical conformal bootstrap methods to constrain $N_c(d)$ for $3 \leq d < 4$. Our results show that $N_c > 3.78$ for $d = 3$. This favors the scenario that the models that are physically relevant to the description of frustrated magnets where $N = 2, 3$ and $d = 3$, do not have a stable fixed point, indicating a first-order transition. We also find evidence for the merger-and-annihilation scenario being responsible for the disappearance of this fixed point in the form of the square root behavior of Δ_{SS} as N_c is approached from above. Our result highlights the utility of modern algorithms for the numerical conformal bootstrap.

Link to publication (if applicable)

https://arxiv.org/abs/2405.19411

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Session Classification: Parallel sessions

Track Classification: Bootstrap (CFT, S-matrix) 2