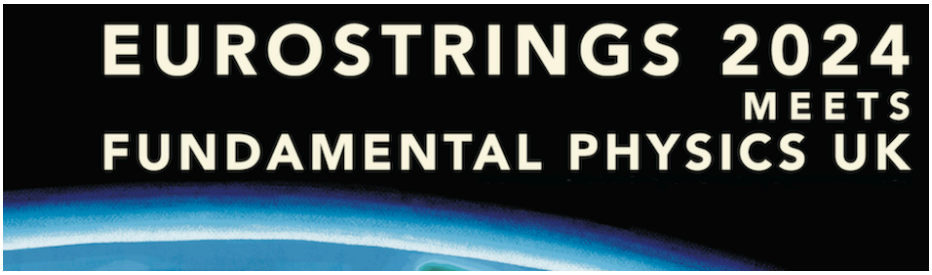

Contribution ID: **122** Type: **Talk in parallel session**

Classifying large N limits of multiscalar theories by algebra

Friday 6 September 2024 14:30 (20 minutes)

We apply our previously developed approach to marginal corrections in QFTs with multiple scalars, which shows that one-loop RG flows can be described in terms of a commutative but non-associative algebra, to various vector, matrix and tensor models in 4D. We show that the algebra can be used to identify the useful scalings of the couplings for taking the large N limit.

Using this method, we classify all large N (and M) limits of models such as $O(N)^3$ and the bifundamental model $O(N) \times O(M)$. The algebra identifies these limits without diagrammatic or combinatorial analysis. For a model with M $SU(N)$ adjoint scalars the limits are the standard 't Hooft limit, a ´multi-matrix limit´, a large M finite N limit and two intermediate cases with extra symmetry and no free parameters. The algebraic concepts of subalgebras and ideals are used to characterise the limits. These new limits are yet to be explored at higher loop orders.

Link to publication (if applicable)

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Session Classification: Parallel sessions

Track Classification: Formal QFT 1