

# **SU(N) and O(N) Representation Theory at non-integer N**

*Friday 28 June 2024 10:00 (45 minutes)*

The standard representation theory for SU(N) and O(N) groups are defined at positive integer N. However, cases of non-integer N are often encountered, e.g. when studying dimensional regularization, evanescent operators, conformal bootstrap, etc. A natural continuation to non-integer N (such as  $N=3.99$ ) is to take the one at infinitely large integer N. This contains representations with arbitrarily high ranks, which must appear ("specialize") as representations with valid ranks when N is taken to be an integer. This specialization map is complicated to work out for the O(N) group. In this talk, I will introduce a very efficient new algorithm through clipping the Young diagram. I also clarify that the Racah-Speiser algorithm in textbooks is for a completely different task, which cannot achieve what our new algorithm does.

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