

# A Universal Asymptotic Formula for OPE Coefficients

Alexander Maloney<sup>\*</sup>

[alex.maloney@mcgill.ca](mailto:alex.maloney@mcgill.ca)

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Two dimensional conformal field theories are among the most important quantum field theories: they describe important statistical and condensed matter systems near criticality, and – while not exactly solvable – many exact techniques can be used which are not available in higher dimensions. For example, Cardy used modular invariance to derive a universal asymptotic formula for the high energy density of states. I will describe an analogous universal asymptotic formula for the operator product expansion coefficients of any two dimensional CFT. This formula unifies all previous asymptotic formulas for CFT structure constants, including those derived from crossing symmetry of four point functions, modular covariance of one-point functions and higher genus modular invariance. Moreover, this formula is valid at finite central charge, whereas previous results were derived only in the large central charge limit. The crucial ingredient in the derivation is Teschner's crossing kernel, which gives analytic control over the structure constants even though the conformal blocks are only known perturbatively. We will describe applications to holographic theories as well as the relationship with eigenstate thermalization and chaos.

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<sup>\*</sup>Department of Physics, McGill University, 3600 rue University, Montréal, QC H3A 2T8, CANADA