

Infinite towers of 2d symmetry algebras from Carrollian limit of 3d CFT

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In this talk I will consider the Carrollian limit of OPE blocks of scalar primaries, spin-1 currents and the stress tensor in 3d CFT. I will show that these OPE blocks decompose into OPE blocks of towers of $sl(2, \mathbb{C})$ modes labeled by negative integer dimensions. I will discuss two applications of this construction. I will first show that the current-scalar-scalar and stress tensor-scalar-scalar OPE blocks in 3d CFT reduce to $sl(2, \mathbb{C})$ OPE blocks from which towers of conformally soft photon and graviton theorems can be derived. I will then show that the 3d CFT OPE blocks of, respectively, current and stress tensor components dual to positive helicity gluons and gravitons in 4d AdS become $sl(2, \mathbb{C})$ blocks of conformally soft gluons and gravitons which imply the S and w infinity algebras of celestial CFT.