

HUMBOLDT UNIVERSITÄT ZU BERLIN



**Institute of Physics and Institute of Mathematics
Theoretical High Energy and Mathematical Physics Groups**

Quantum Field Theory Colloquium

**Tuesday, January 8th, 2019
3.15 pm**

**Prof. Dr. Lance Dixon
(SLAC)**

*Bootstrapping Amplitudes in Planar $N=4$
Super-Yang-Mills Theory*

Please notice the unusual location, exceptionally in the Erwin Schrödinger Zentrum!

Abstract: In the planar limit of a large number of colors, $N=4$ super Yang-Mills theory is integrable, and remarkable advances have been made in determining operator anomalous dimensions and more to all loop orders. In this talk I'll describe recent progress in constructing scattering amplitudes in this theory to high loop order. Planar $N=4$ amplitudes are dual to light-like polygonal Wilson-loops, and are only nontrivial for six or more gluons. The spaces of functions to which the amplitudes belong are so restrictive that only a few constraints are needed to simply write down the answer, through seven loops in the six-gluon case and four loops in the seven-gluon case. The results are multi-variate functions of the kinematics, which can be analyzed in various limits in order to study how high loop order amplitudes factorize. One can also extrapolate from weak to strong coupling, and compare with the AdS/CFT dual description available there.

Coffee and cookies will be offered half an hour before the start of the colloquium.

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