String Theory and Scattering Amplitudes Workshop Talk Schedule

Events for:
Monday, January 9th - Friday, January 13th

Monday, January 9th

9:30am **Nima Arkani-Hamed, I - SCGP 102**

Title: The S Matrix for Massive Higher Spins and the Challenge of UV Completion

10:30am **Coffee Break - SCGP Cafe**

11:00am **Nima Arkani-Hamed, II - SCGP 102**

Title: The S Matrix for Massive Higher Spins and the Challenge of UV Completion

12:00pm **Lunch - SCGP Cafe**

2:15pm **Nathan Berkovits, I - SCGP 102**

Title: Introductory Review of the Pure Spinor Formalism

3:30pm **Tea Time - SCGP Lobby**

4:00pm **Nathan Berkovits, II - SCGP 102**

Title: New Developments in the Pure Spinor Formalism

Tuesday, January 10th

9:00am **Ruben Minasian, I - SCGP 102**

Title: One loop counterterms

Abstract: I'll review some higher-derivative one-loop couplings in string/M-theory and their relation to anomalies, the role played in string dualities, as well as supersymmetry and (generalised) geometric interpretation.

10:00am **Coffee Break - SCGP Cafe**

10:30am **Ruben Minasian, II - SCGP 102**

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11:30am **Lunch - SCGP Cafe**

1:00pm **SCGP Weekly Talk: Nathan Berkovits - SCGP 102**

Speaker: Nathan Berkovits

Title: String Theories and Scattering Amplitudes

Abstract: Over the last 15 years, several new formalisms of string theory have been developed which compute scattering amplitudes of supersymmetric Yang-Mills and supergravity in four and ten dimensions. In addition to the conventional RNS superstring formalism whose foundations have been recently strengthened by Witten and Sen, new formalisms have been developed such as the d=4 twistor string, the d=10 Mason-Skinner string, and the d=10 and AdS_5xS^5 pure spinor superstring. In this Colloquium, an introduction will be given to these different formalisms and their scattering amplitudes, and some speculations will be made on their relationships to each other.

2:30pm **Ron Donagi - SCGP 102**

Title: Super-moduli of super-Riemann surfaces

3:30pm **Tea Time - SCGP Lobby**

Wednesday, January 11th

9:30am **Carlos Mafra, I - SCGP 102**

Title: Recursive string tree-level amplitudes: kinematic factors

10:30am **Coffee Break - SCGP Cafe**

11:00am **Carlos Mafra, II - SCGP 102**

Title: Recursive string tree-level amplitudes: alpha' expansion

12:00pm **Lunch - SCGP Cafe**

2:15pm **Oliver Schlotterer - SCGP 102**

Title: Closed-string tree-level integrals and amplitude relations in heterotic string theory

3:30pm **Tea Time - SCGP Lobby**

4:00pm **Massimo Bianchi - SCGP 102**

Title: Glimpses of black-hole formation/evaporation in ultra-planckian string collisions

Abstract: We revisit possible glimpses of black-hole production in ultra-planckian string collisions. We compare previous results by ACV, using the optical theorem, the resummation of ladder diagrams, and the AGK cutting rules, with recent study by at very high final-state multiplicity. We argue that some apparent tension between the two approaches disappears once the results by DGILS are reinterpreted in terms of suitably defined infrared-safe cross sections. Under that assumption, the typical final state produced in an ultra-planckian collision does indeed appear to share some properties with those expected from the evaporation of a black hole of mass $\sqrt{s}$, although no compelling sign of thermalization is seen to emerge at this level of approximation.

Thursday, January 12th

9:30am **Dan Israel - SCGP 102**

Title: One-loop BPS Amplitudes in Heterotic Flux Compactifications

10:30am **Coffee Break - SCGP Cafe**

11:00am **Arnab Rudra - SCGP 102**

Title: Type I/Heterotic Duality and M-theory amplitudes

Abstract: Almost twenty years ago, Horava and Witten considered M theory on an orbifold and elucidated the interrelationships between various theories with ten-dimensional N = 1 supersymmetry. In this talk we will consider a variety of tree level and one loop Feynman diagrams describing four graviton and four gluon amplitude in eleven-dimensional supergravity in a Horava–Witten background compactified on a circle. The goal will be to investigate the relationships between the same amplitudes in the E8 × E8 and SO(32) heterotic string theories and the type I and type IA superstring theories. We will see that the M theory amplitudes accounts for a number of perturbative and non-perturbative aspects of low order higher derivative terms in the low energy expansion of string theory amplitudes, which are expected to be protected by half maximal supersymmetry from receiving corrections beyond one or two loops. We will also discuss the manner in which type I/heterotic duality may be realized for certain higher derivative interactions that are not so obviously protected. For example, our considerations suggest that t8t8R4might receive no loop corrections beyond one loop. For this to be consistent with type I/heterotic duality, D-instanton contributions in the type I SO(32) theory and in the heterotic Spin(32)/Z2 theory appear to play an essential role. Reference: arXiv:1604.00324

12:00pm **Lunch - SCGP Cafe**

2:15pm **Anastasia Volovich - SCGP 102**

Title: Landau Singularities from the Amplituhedron

3:30pm **Tea Time - SCGP Lobby**

4:00pm **Dhritiman Nandan - SCGP 102**

Title:

Friday, January 13th

9:30am **Lionel Mason, I - SCGP 102**

Title: An introduction to ambitwistor strings

Abstract: I will introduce ambitwistor strings, explaining how CHY formulae for amplitudes can be obtained for a variety of theories. I will also try to explain how they relate to older ambitwistor ideas of Claude LeBrun and to the twistor-string theories of Witten, Berkovits and Skinner. I will give a brief introduction to their use in extending the CHY formulae to loop amplitudes.

10:30am **Coffee Break - SCGP Cafe**

11:00am **Lionel Mason, II - SCGP 102**

Title: TBA

12:00pm **Lunch - SCGP Cafe**

1:15pm **Eduardo Casali - SCGP 102**

Title: On the null origin of the Ambitwistor String

2:15pm **discussion/break - SCGP 102**

2:30pm **Savdeep Sethi - SCGP 102**

Title: DBI from gravity

3:30pm **Tea Time - SCGP Lobby**