

Time: Friday 20th January, 2023 12:45-13:45
Place: RoomS 312 (Science Hall)
Title: The Riemann hypothesis and tachyonic off-shell
string scattering amplitudes
Speaker: Carlos Castro Perelman (Research Scholar, Ronin Institute,
Mont Claire, New Jersey, USA)

The study of the 4-tachyon off-shell string scattering amplitude $A_4(s, t, u)$, based on Witten's open string field theory, reveals the existence of poles in the s-channel and associated to a continuum of complex "spins" J . The latter J belong to the Regge trajectories in the t, u channels which are defined by $-J(t) = -1 - 1/2 t = \beta(t) = 1/2 + i\lambda$; $-J(u) = -1 - 1/2 u = \gamma(u) = 1/2 - i\lambda$, with $\lambda = \text{real}$. These values of $\beta(t)$, $\gamma(u)$ given by $1/2 \pm i\lambda$, respectively, coincide precisely with the location of the critical line of nontrivial Riemann zeta zeros $\zeta(z_n = 1/2 \pm i\lambda_n) = 0$. It is argued that despite assigning angular momentum (spin) values J to the off-shell mass values of the external off-shell tachyons along their Regge trajectories is not physically meaningful, their net zero-spin value $J(k_1) + J(k_2) = J(k_3) + J(k_4) = 0$ is physically meaningful because the on-shell tachyon exchanged in the s-channel has a physically well defined zero-spin. We proceed to prove that if there were nontrivial zeta zeros (violating the Riemann Hypothesis) outside the critical line $\text{Real } z = 1/2$ (but inside the critical strip) these putative zeros don't correspond to any poles of the 4-tachyon offshell string scattering amplitude $A_4(s, t, u)$. We finalize with some concluding remarks on the zeros of $\sinh(z)$ given by $z = 0 + i\pi n$, continuous spins, non-commutative geometry and other relevant topics. (<https://doi.org/10.1140/epjc/s10052-022-10429-3>)

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日時: 1月20日(金) 12:45-13:45

場所: 理学館 S312 号室

題目: Riemann 仮説とタキオン性オフシェル弦楽器散乱振幅

演者: Carlos Castro Perelman (Research Scholar, Ronin Institute,
Mont Claire, New Jersey, USA)

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