

Title: Yong Zhang

Speakers: Yong Zhang

Collection: Postdoc Welcome 2021

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Postdoc Welcome

Yong Zhang
Perimeter Institute
Oct. 29, 2021

Ph.D., ITP, CAS, Beijing, Song He
One year postdoc, Uppsala U, Sweden, Oliver Schlotterer
Visiting student for half a year, PI, Freddy Cachazo

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Research Interests

- String amplitudes are derived from moduli-space integrals
- Simplified correlators became important: 1) computational efficiency, 2) but primarily to unravel elegant structures and relations of string amplitudes and their field-theory limit

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Research Interests

- At tree level, the basis of functions can be spanned by Parke-Taylor factors

$$PT(1,2,3,4) = \frac{1}{(z_1 - z_2)(z_2 - z_3)(z_3 - z_4)(z_4 - z_1)}$$

- Algebraically, $PT(1,2,3,4) + PT(2,1,3,4) + PT(2,3,1,4) = 0$
This simple fact already determines the Kleiss-Kuijf relations among tree-level string amplitudes and field theory limit. For example, $(n-1)!$ gauge-theory amplitudes $\rightarrow (n-2)!$ ones.

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Research Interests

- More complicated cases involve the accompanying Koba-Nielsen factor as regulator of the integral

$$KN := \prod_{i < j} |z_i - z_j|^{\alpha' k_i \cdot k_j}$$
- In the support of integration-by-parts,

$$\int KN PT(1234) = \int KN \frac{k_1 \cdot k_3}{k_1 \cdot k_2} PT(1324)$$
- This explains the Bern-Carrasco-Johansson relations. $(n-2)! \rightarrow (n-3)!$
- Further elaboration leads to Kawai-Lewellen-Tye relations, $GR = YM^2$
- Closely related to Cachazo-He-Yuan formulas

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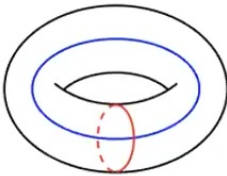
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Research Interests



- Genus-one strings
 $\frac{1}{z_i - z_j} \rightarrow$ doubly-periodic functions on torus

Relations of genus-one integrand leads to double copy of loop integrands in FT limit

- Strings known more than particles, better organized field-theory loop integrands
- Mellin transform, Celestial Amplitudes
- Thanks for your attention.

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