Patrick Kerner

$\Delta p \cdot \Delta q \geqslant \frac{1}{2}\hbar$

Max-Planck-Institut für Physik
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Outline

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- Concept of String Theory:

From Point Particle to String
The String Spectrum
Emergence of Gravity
Scattering Amplitudes

Compactifications
T-Duality, D-branes, SM

- Applications:

Gauge/Gravity Duality

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Fluxes, Moduli Stabilization

Fluxes and Geometry

- Applications:

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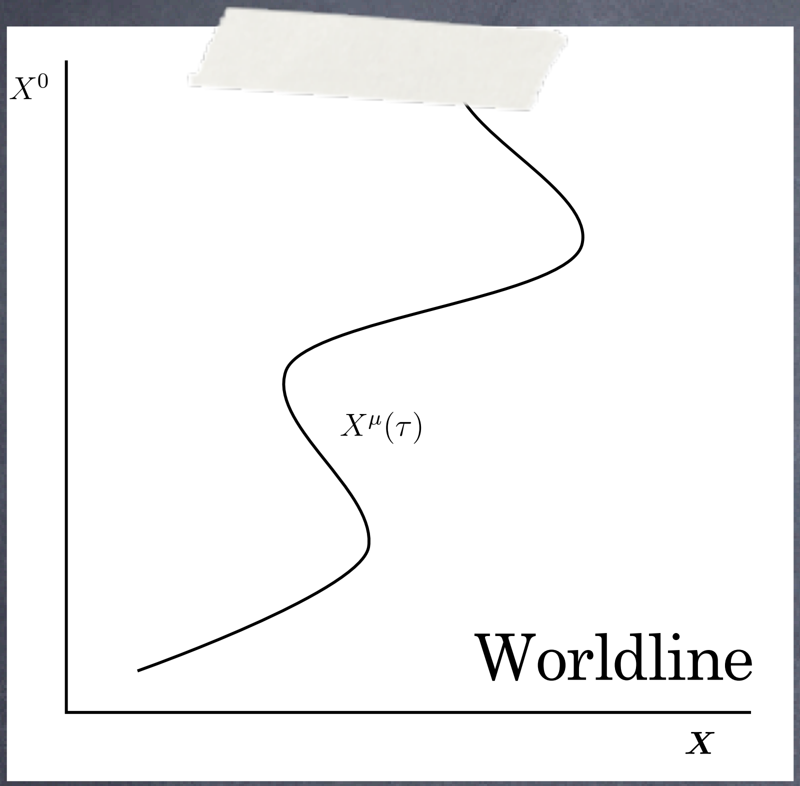
String Cosmology

From Particles to Strings

From Particles to Strings

Point Particle



From Particles to Strings

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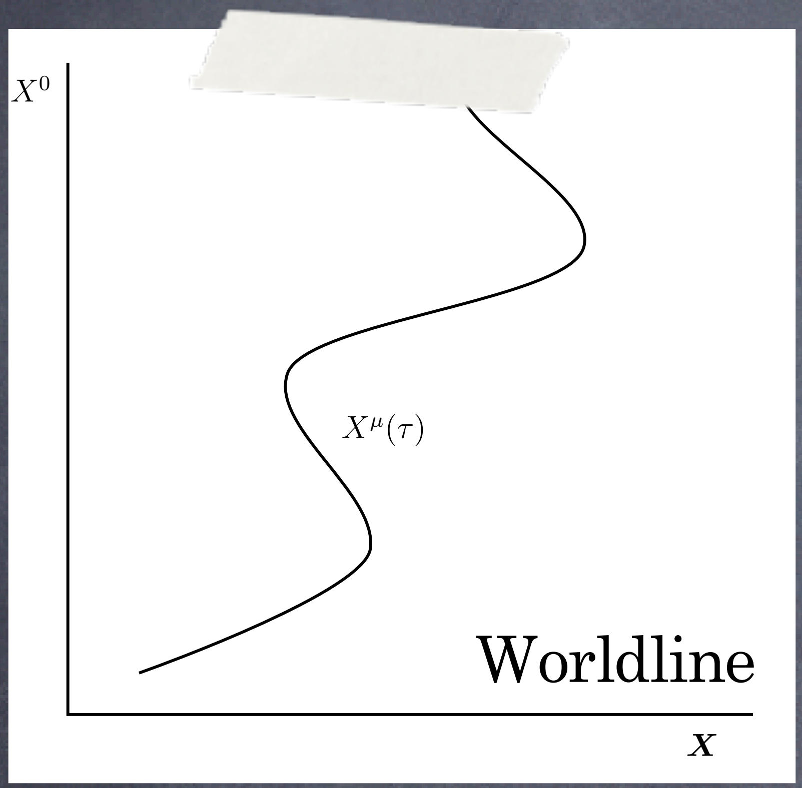

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$$S_{\rm pp} = -m \int \mathrm{d}\tau \sqrt{-\dot{X}^\mu \dot{X}_\mu}$$

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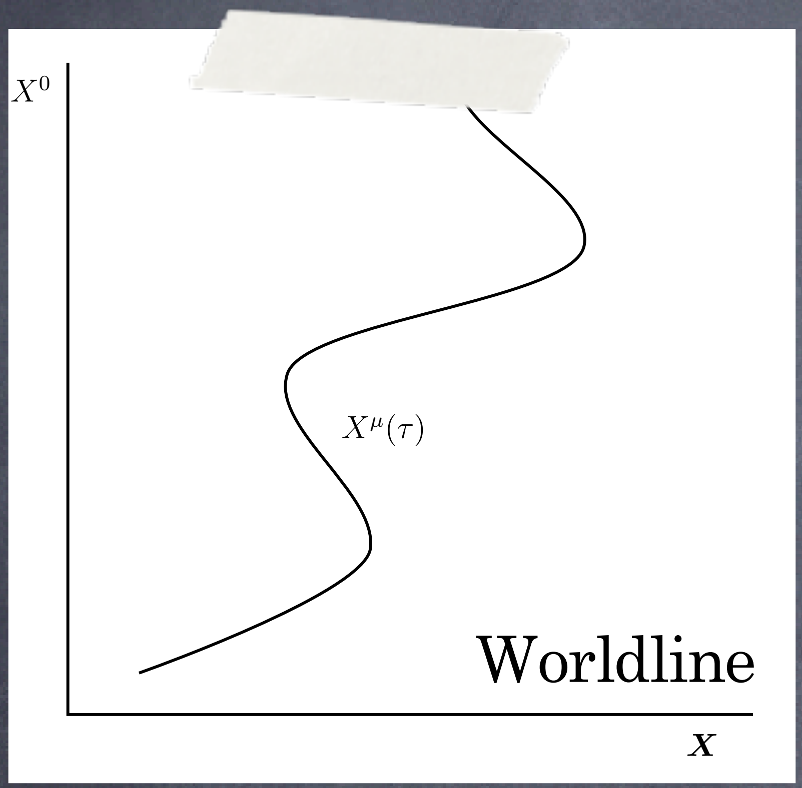

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⇨ Free Motion

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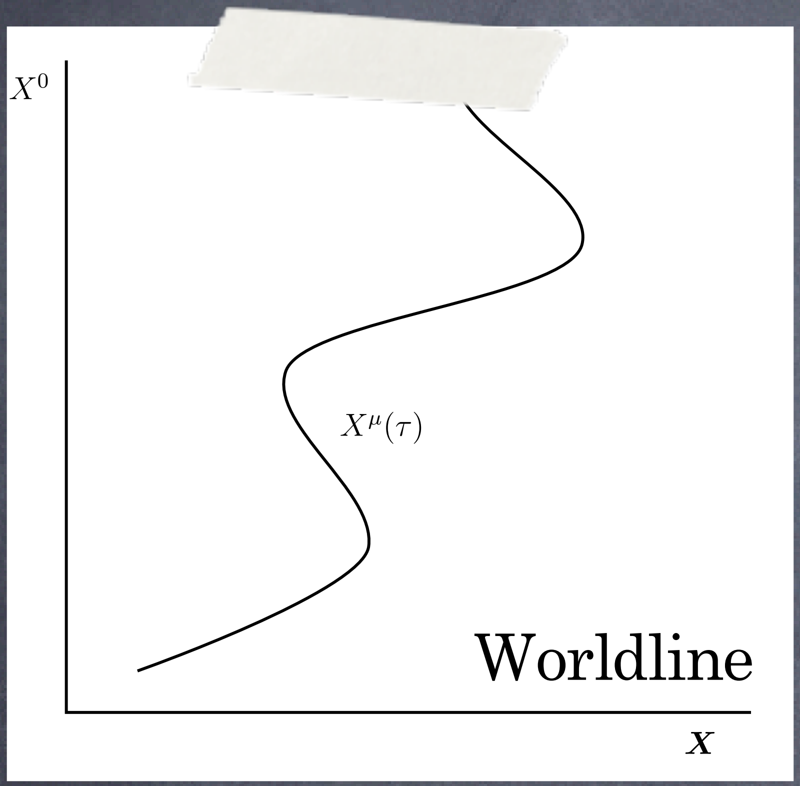

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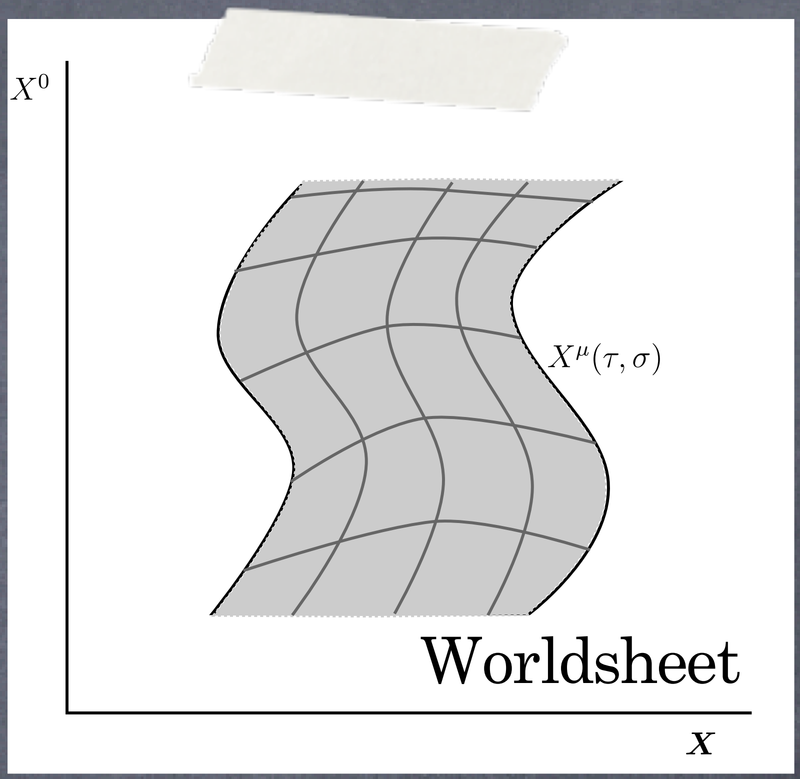

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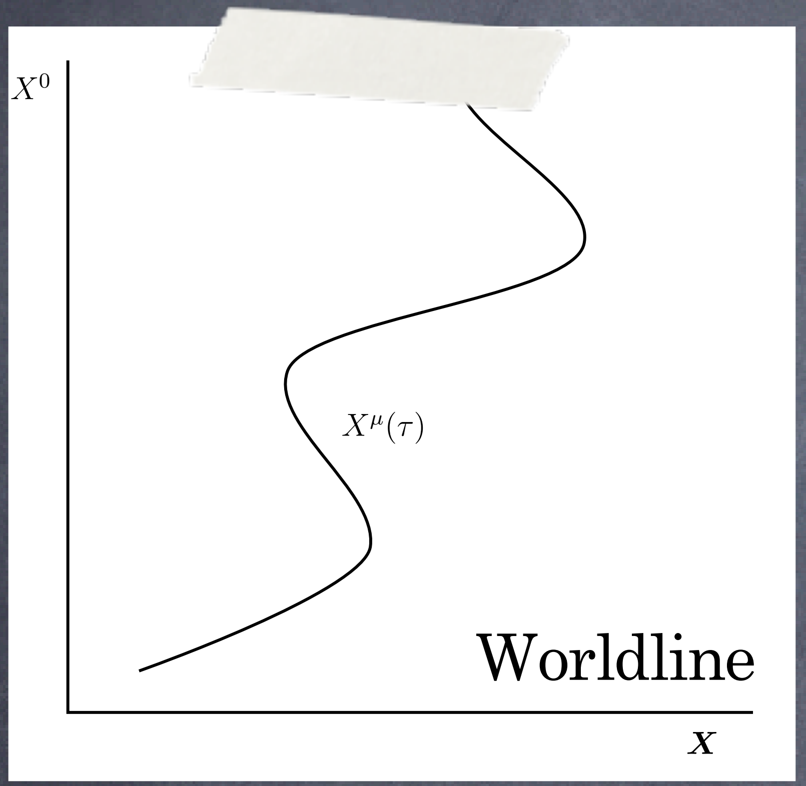

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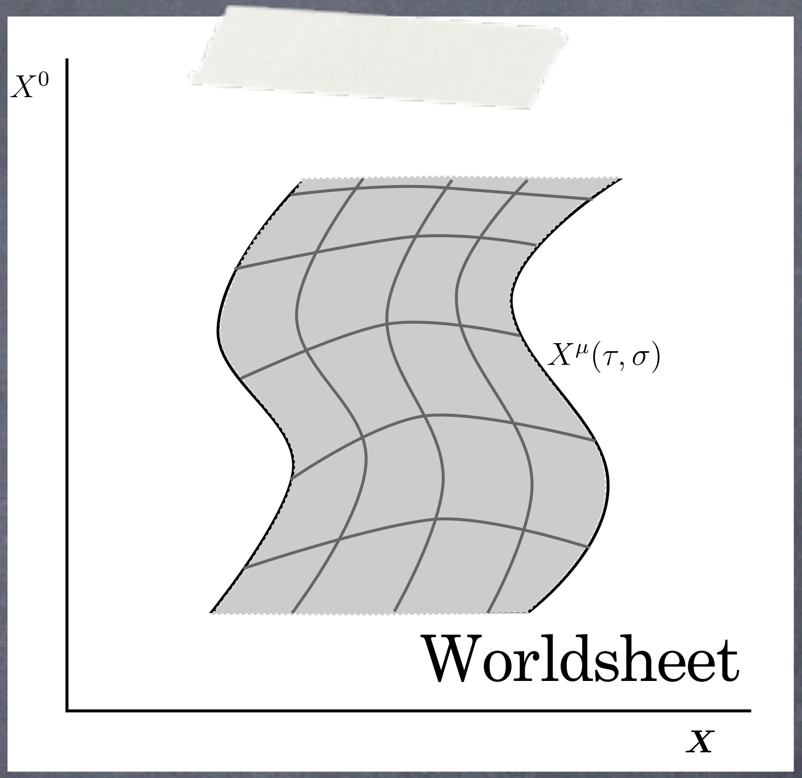

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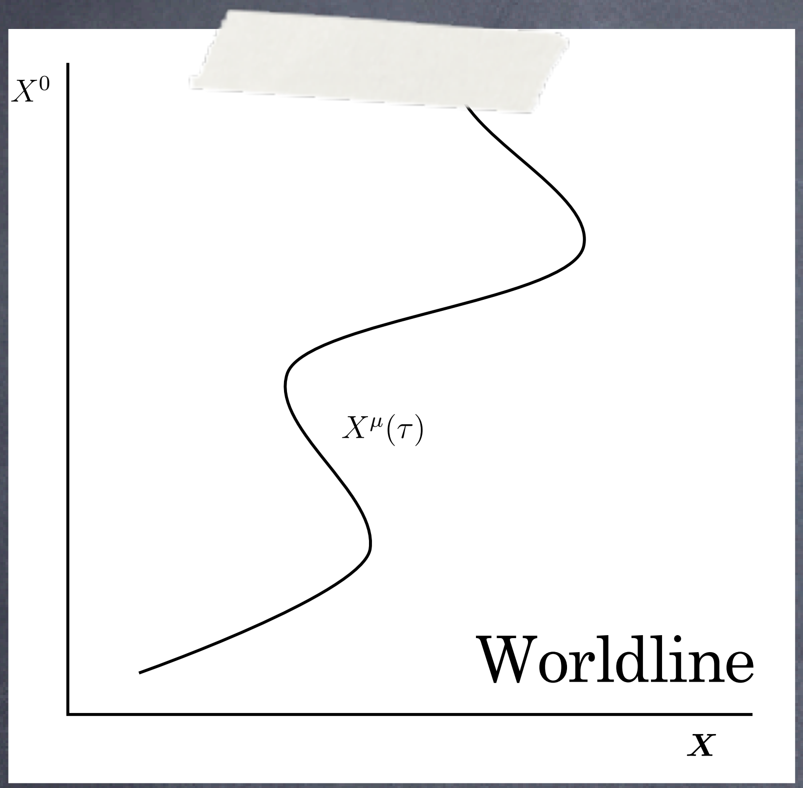

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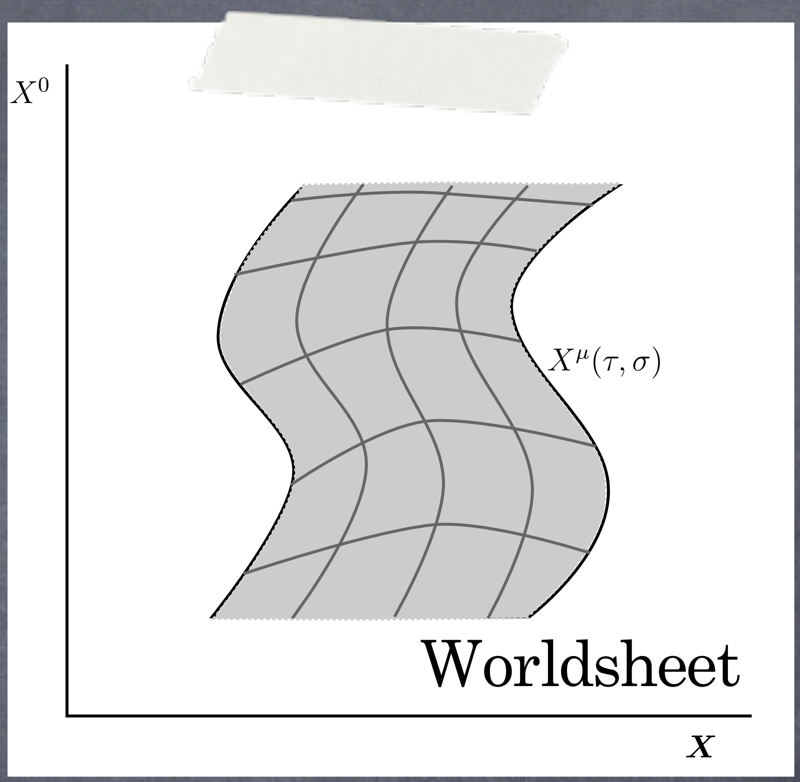

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  ⇨ Introduce dummy world-sheet metric

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Gauge field

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No Tachyons

Spacetime SUSY

Spacetime Fermions

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Non-linear sigma model ⇨ Interactions

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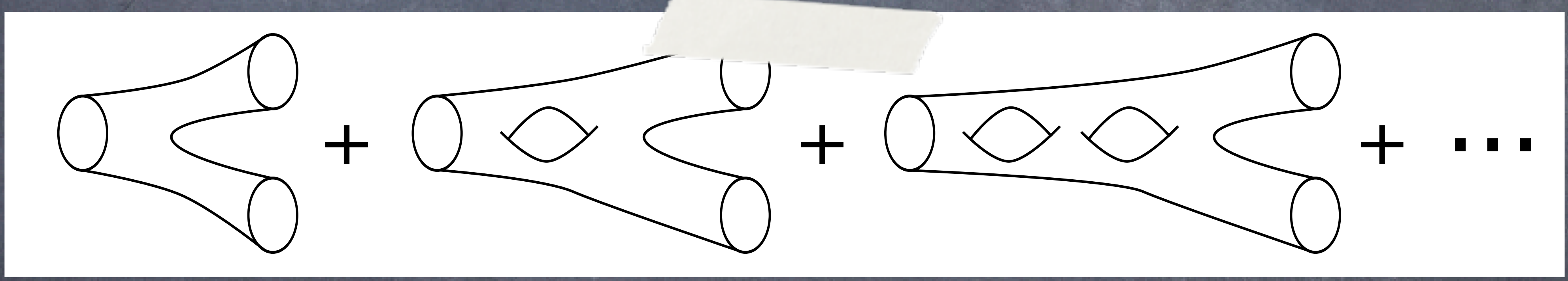

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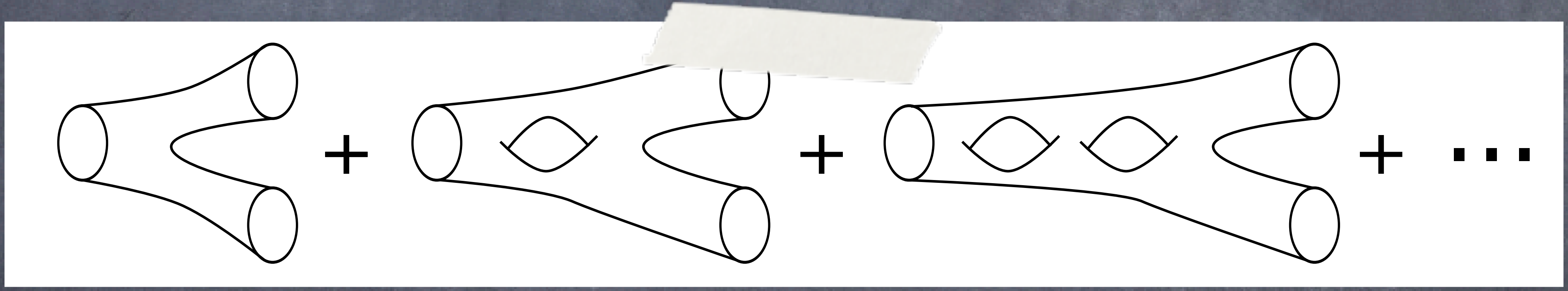

$$Z = \int_W \mathcal{D}X^\mu \mathcal{D}\gamma_{ab} \mathrm{e}^{-I'} = \sum_g \int_{W_g} \mathcal{D}X^\mu \mathcal{D}\gamma_{ab} \mathrm{e}^{-I'}$$

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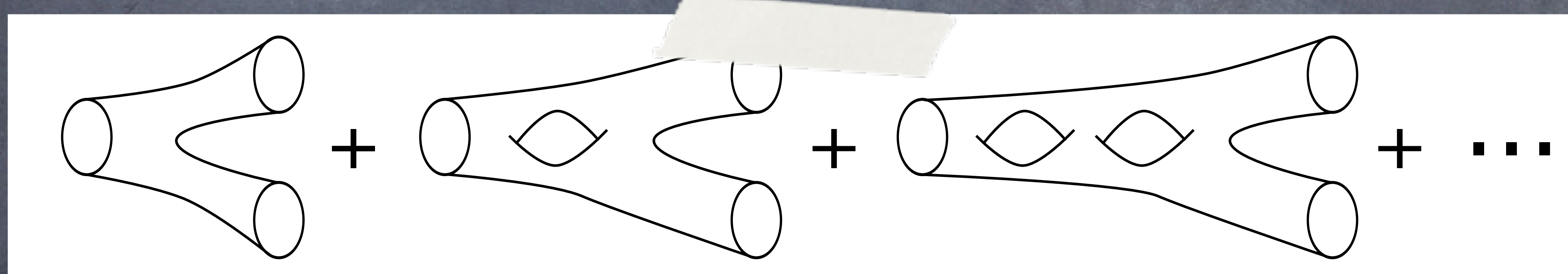

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Take Home Message

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