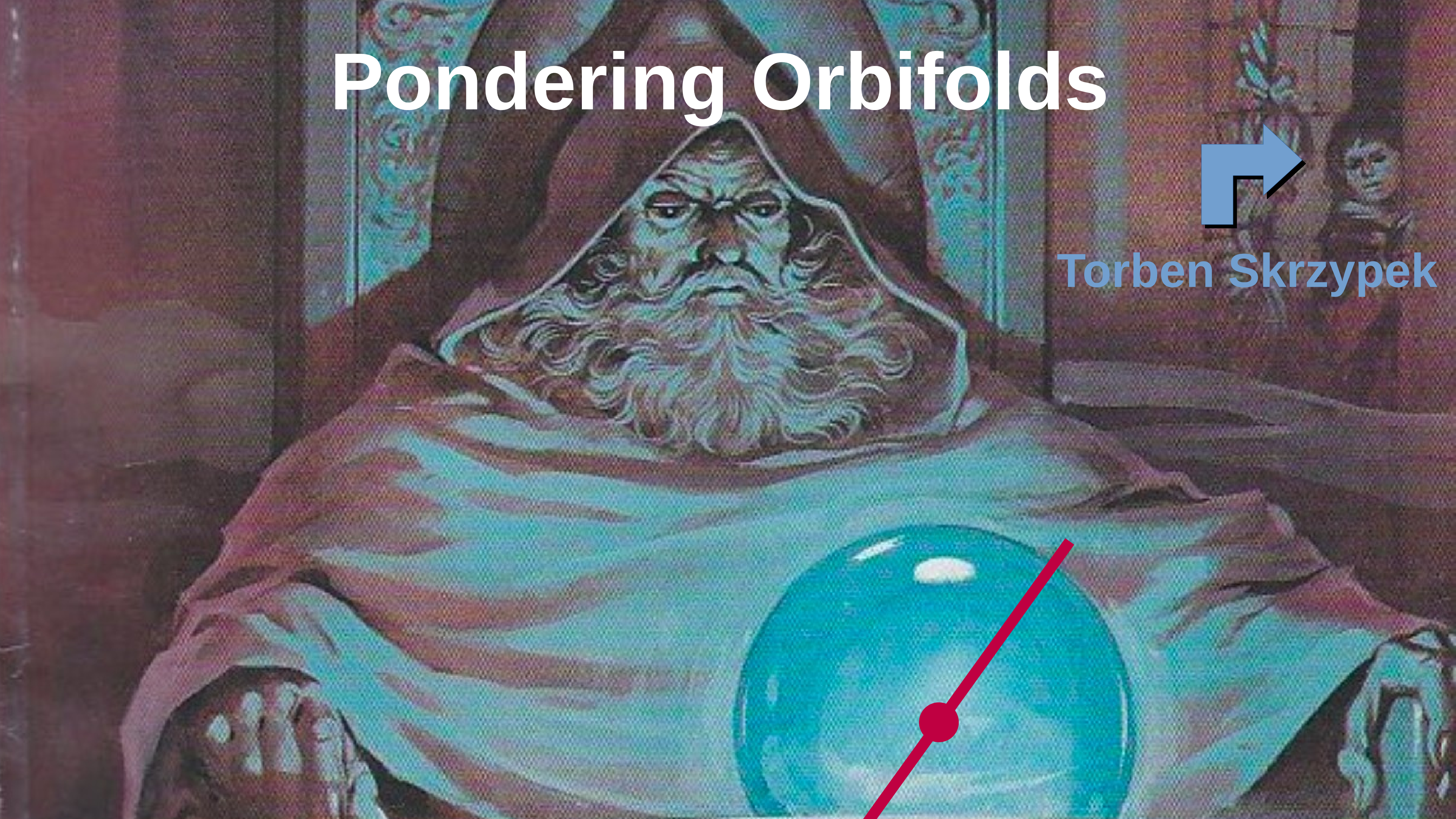
Pondering Orbifolds

Torben Skrzypek



About me

Marburg

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Marburg

Heidelberg

Master with
Arthur Hebecker

About me

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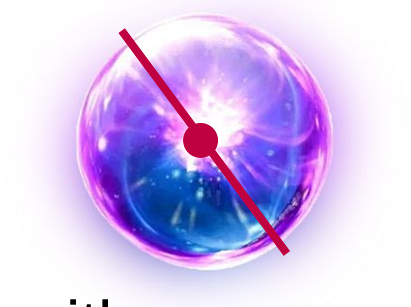
Heidelberg

London



PhD with
Arkady Tseytlin

Master with
Arthur Hebecker

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Heidelberg

Master with
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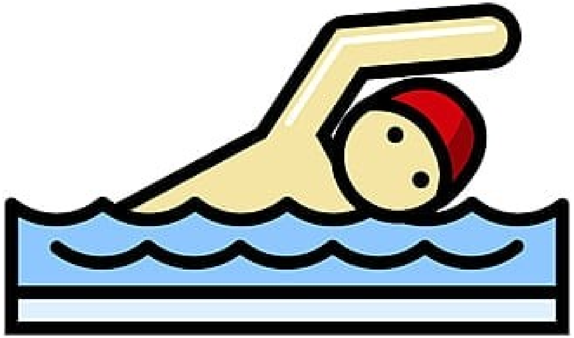
London

PhD with
Arkady Tseytlin

Hamburg

What I do (life edition)



What is…

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- Take spacetime M with discrete symmetry Γ

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⇒ Untwisted Sector

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Untwisted Sector

- Allow for strings closing up to *Γ*-action

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- Take spacetime *M* with discrete symmetry *Γ*
- Consider quotient space *M/Γ*
- Project field configurations in *M* to *Γ*-invariant states

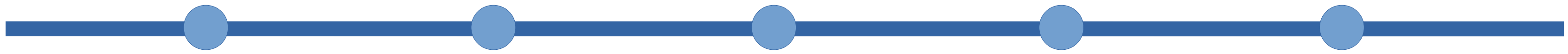
⇒ **Untwisted Sector**

- Allow for strings closing up to *Γ*-action

⇒ **Twisted Sector**

Example 1

- Take $\mathbb{R}$ with $\mathbb{Z}$-symmetry $x \to x + R$



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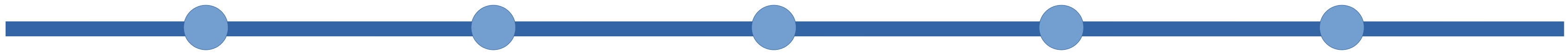

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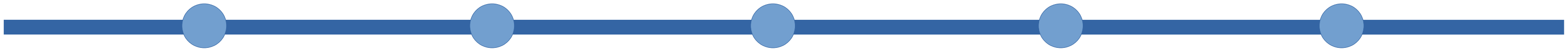
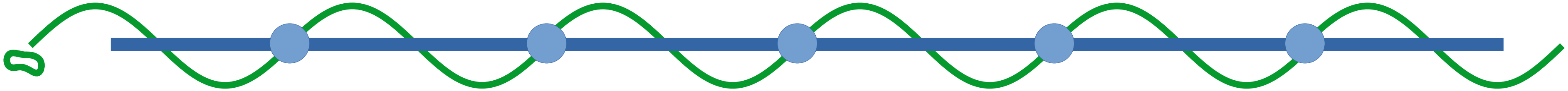


- Quotient space $\mathbb{R}/\mathbb{Z} = S^1$
- Untwisted sector $\phi(x) = \exp\left(i \frac{n}{R} x\right)$



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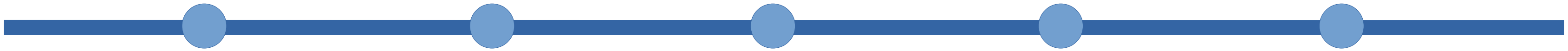

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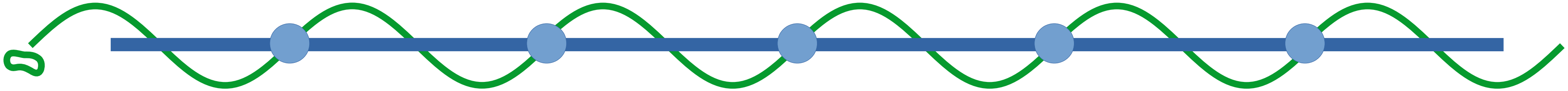
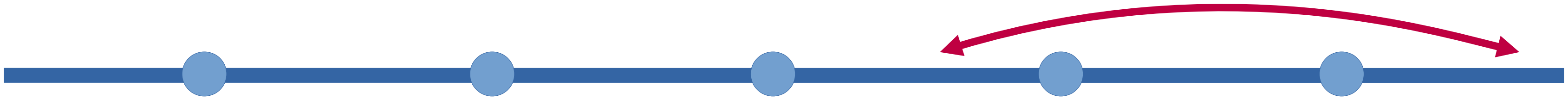
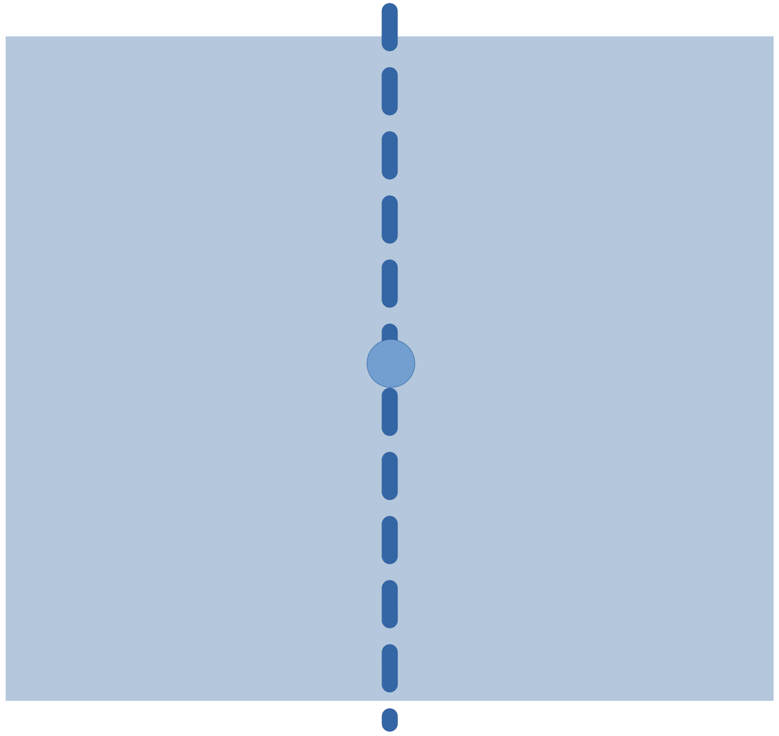


- Twisted sector $x(2\pi) = x(0) + mR$



Example 2

- Take $\mathbb{C}$ with $\mathbb{Z}_2$ rotational symmetry $x \to -x$



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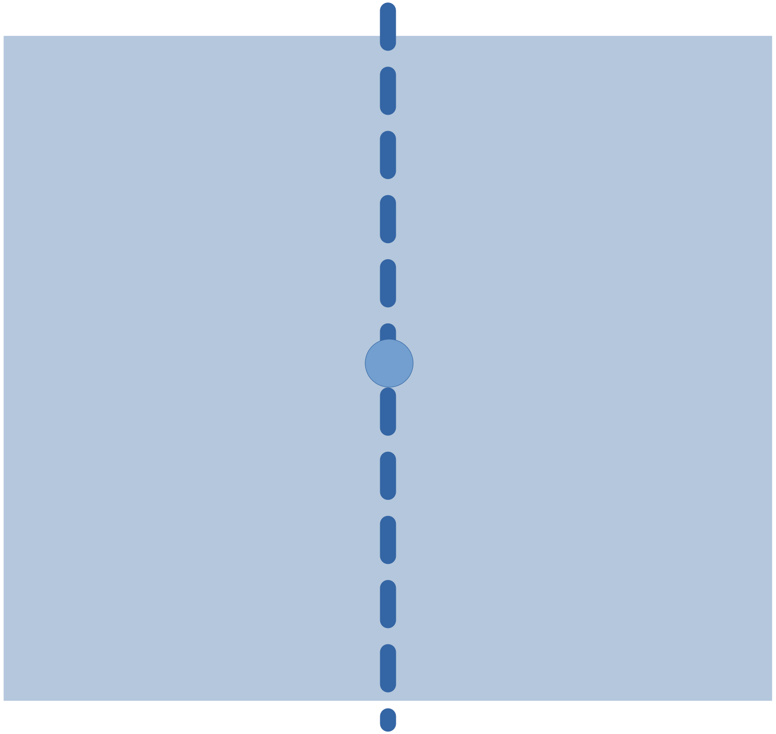

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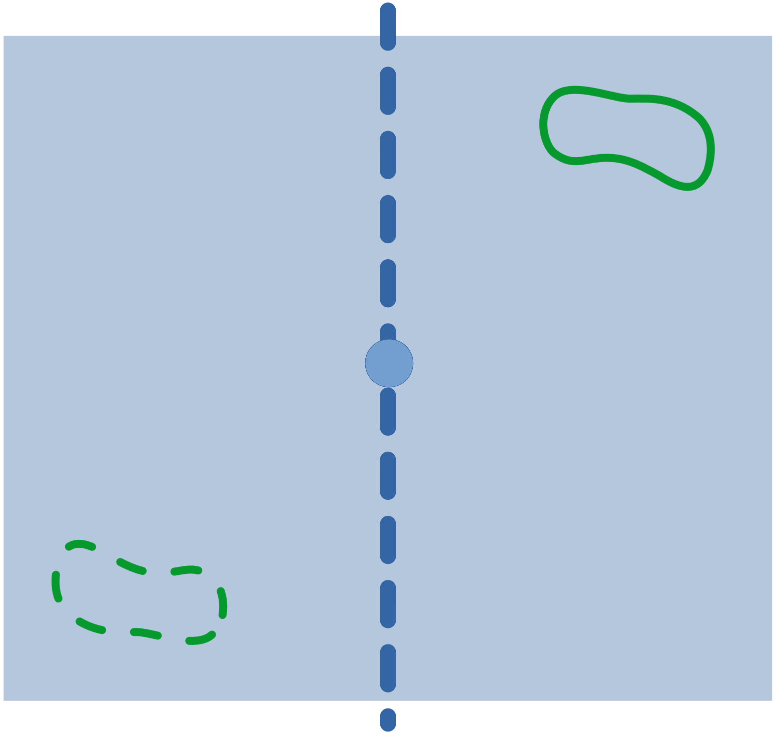

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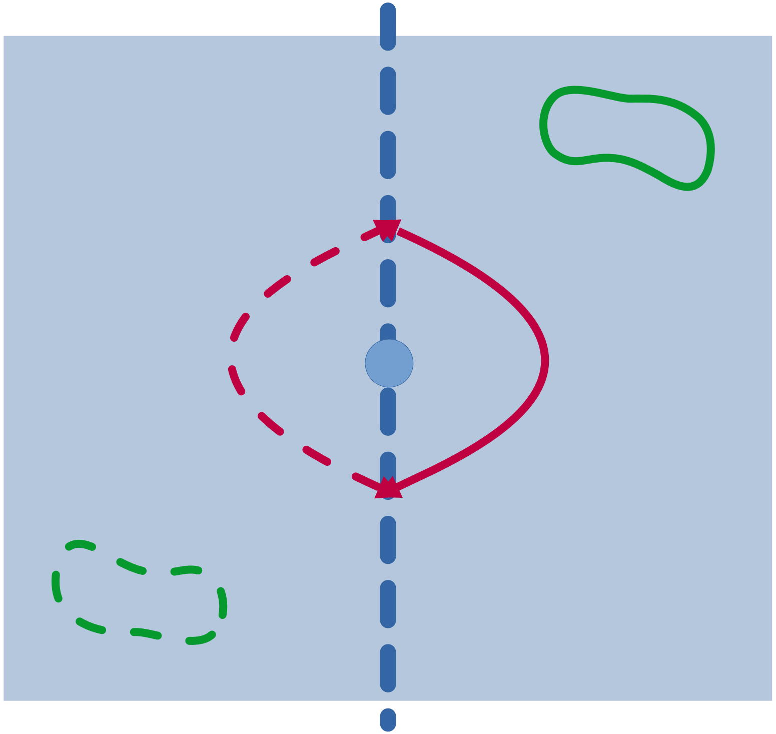

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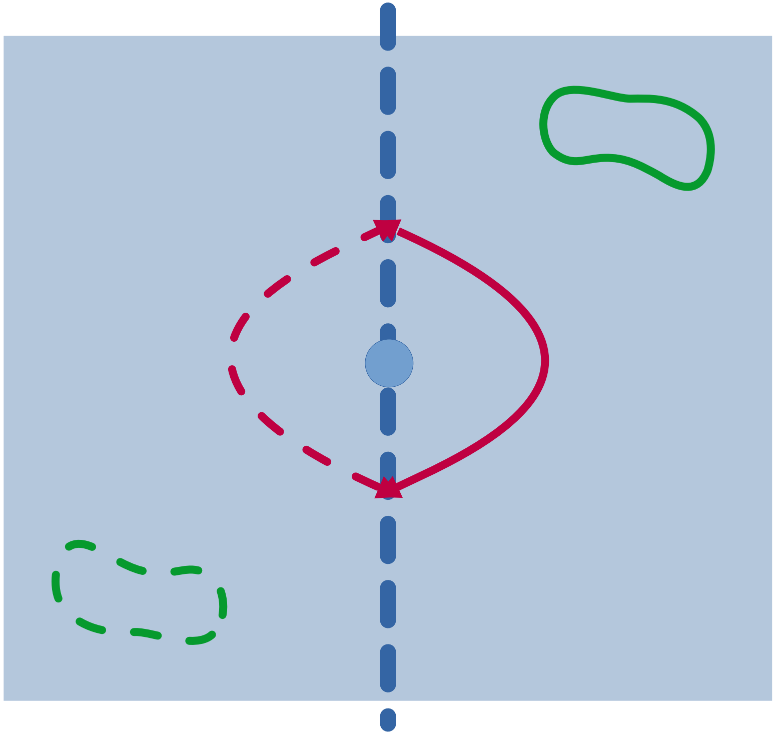
- Twisted sector localises on fixpoint



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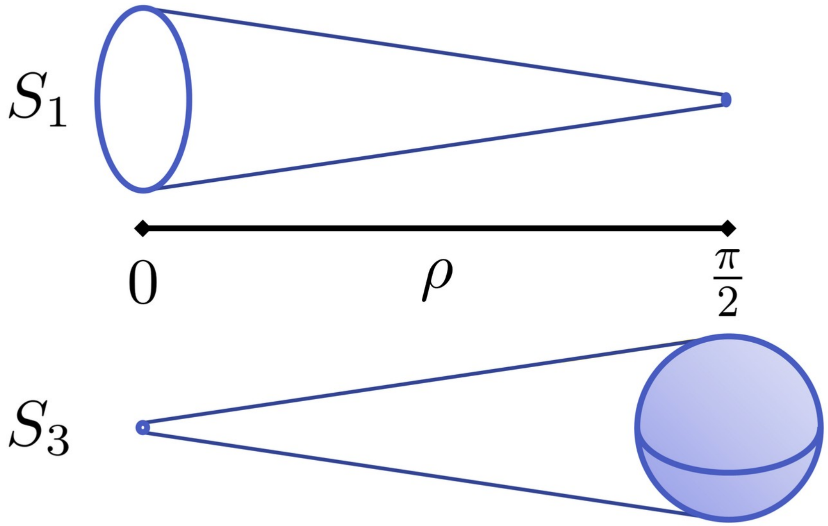

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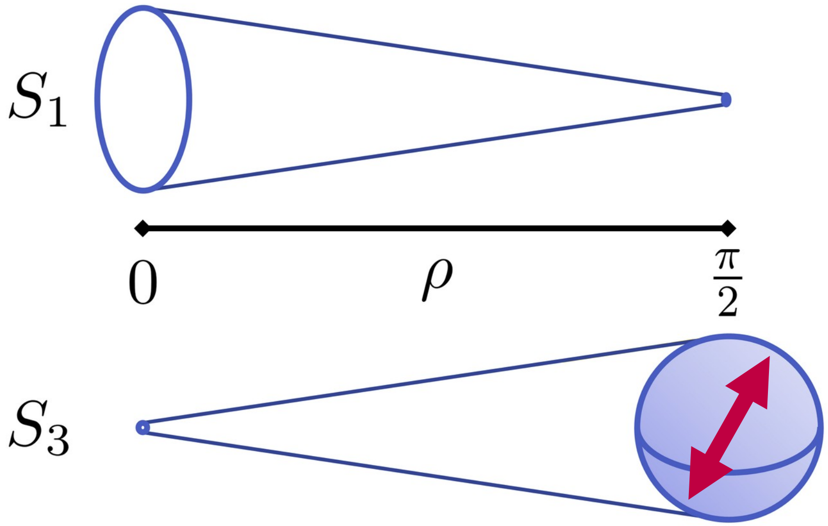

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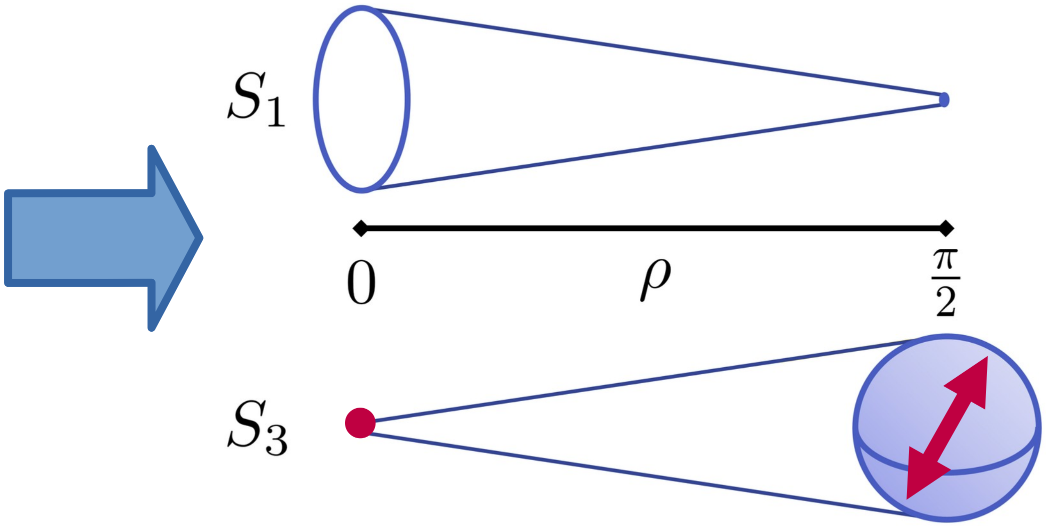

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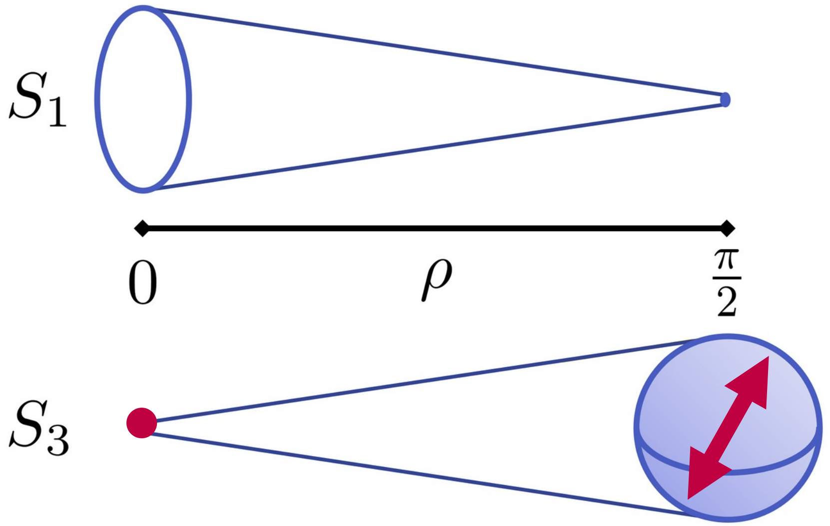
- Twisted sector localised on this circle



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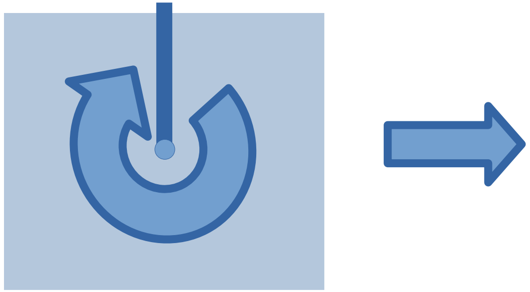

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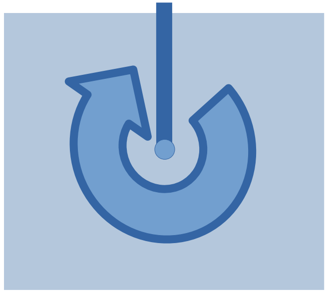

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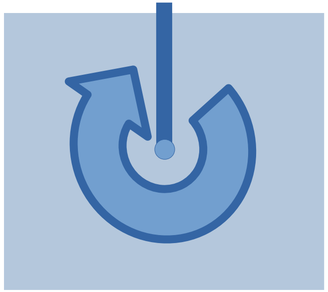

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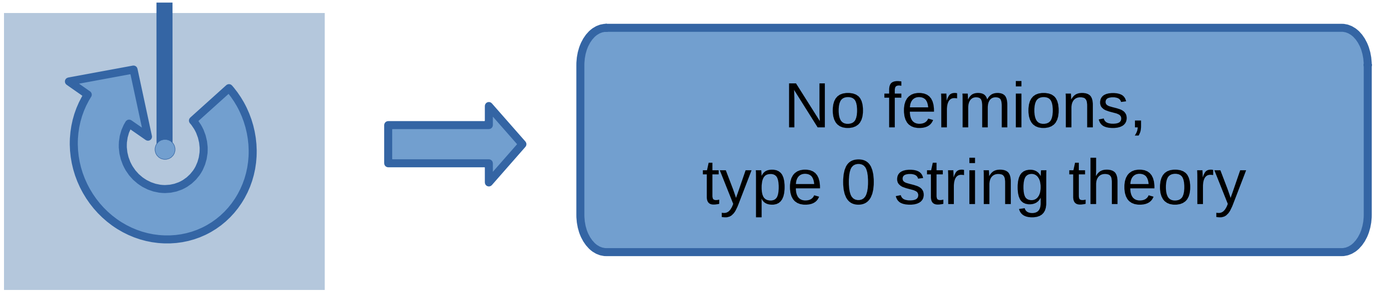

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- AdS/CFT to study orbifold CFTs
- Template for more advanced compactifications (original motivation was to understand K3)

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Use integrability, localisation, supergravity, witchcraft

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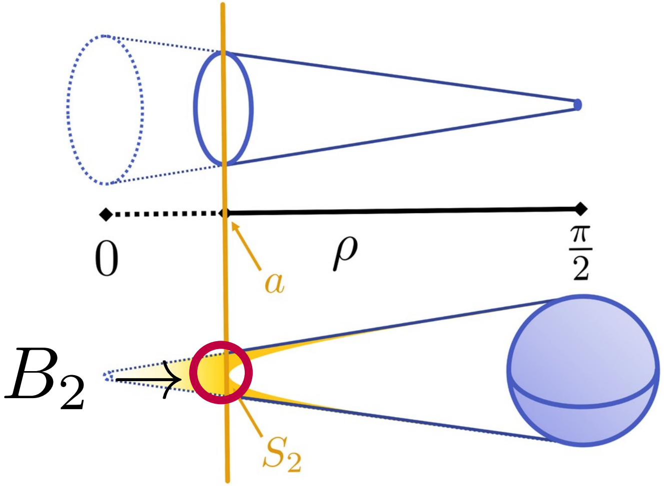

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- Type 0B string theory
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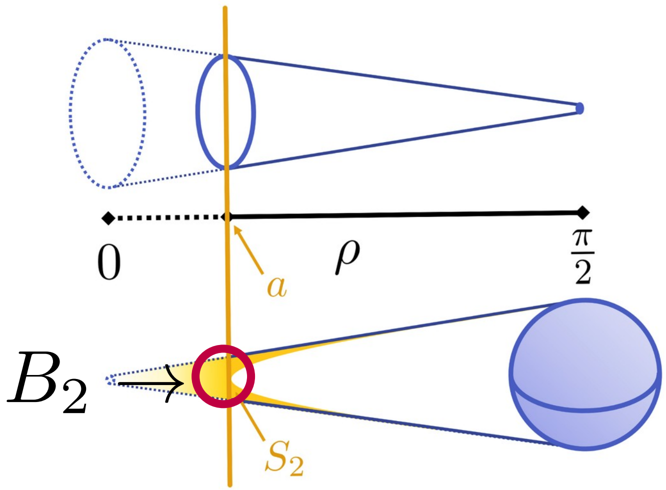
- Orientifolds theory (w/ open strings)



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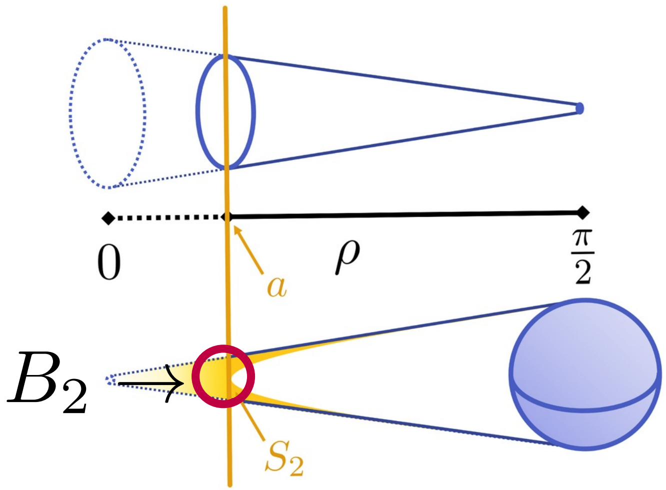

Side hustles: Symmetric orbifold CFT, SUGRA,...

Thank you !