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Abstract:

Postdoc Welcome

Jonathan Wang

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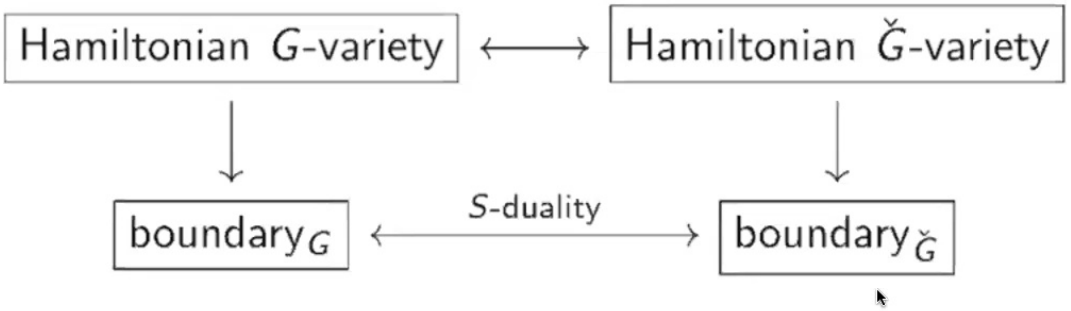
Mathematical physics

- S-duality in super Yang–Mills $d = 4$ $\mathcal{N} = 4$ TQFT[1] matches boundary theories
- Gaiotto–Witten: Hamiltonian G-variety $\rightsquigarrow$ boundary theory



[1] Kapustin–Witten: this is geometric Langlands TQFT

$$\boxed{T^*X \circlearrowleft G} \longleftrightarrow \boxed{M^\vee \circlearrowleft G^\vee}$$

Taking $\mathcal{A}$-twist on left and $\mathcal{B}$-twist on right of boundary theories predicts an equivalence:

$$\text{D-mod}(X(\mathbb{C}((t)))/G(\mathbb{C}[\![t]\!])) = \text{QCoh}^{[?]}(M^\vee/G^\vee)$$

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$G(\mathbb{C}[\![t]\!]) = \text{Maps}($  $, G)$

$X(\mathbb{C}((t))) = \text{Maps}($  $, X)$

$$\boxed{T^*X \circlearrowleft G} \longleftrightarrow \boxed{T^*X^\vee \circlearrowleft G^\vee}$$

C smooth projective curve over $\mathbb{C}$

$$\Pi^{\mathcal{A}} : \{G\text{-bundle with } X\text{-section}\} \to \mathrm{Bun}_G$$

$$\Pi^{\mathcal{B}} : \{G^\vee\text{-local system with } X^\vee\text{-flat section}\} \to \mathrm{LocSys}_{G^\vee}$$

$$\Pi^{\mathcal{A}}_! \mathbb{C} \in \text{D-mod}(\mathrm{Bun}_G) \cong \mathrm{QCoh}(\mathrm{LocSys}_{G^\vee}) \ni \Pi^{\mathcal{B}}_* \omega$$