Title: Session 1 - Changha Choi

Speakers: Changha Choi

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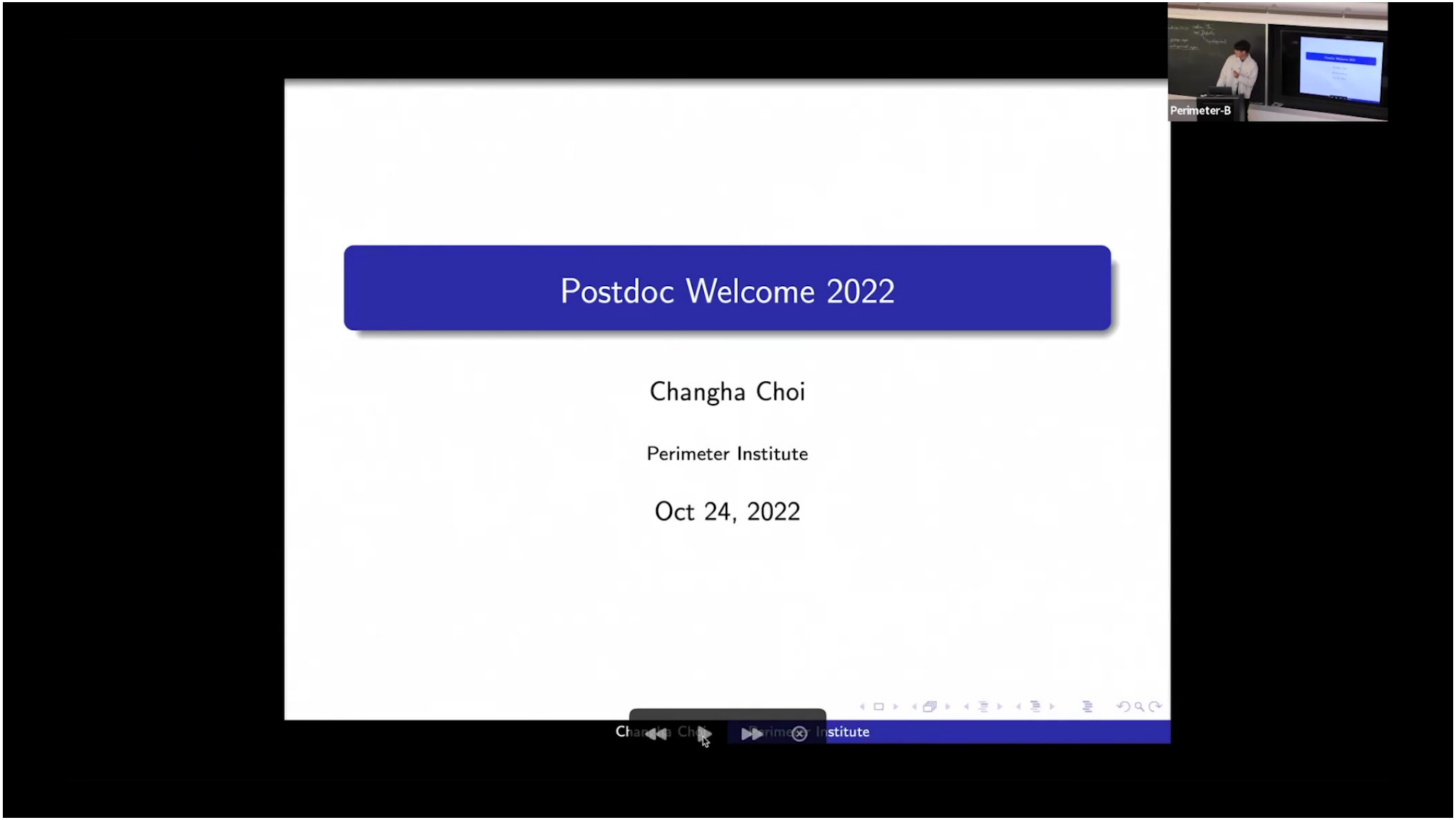
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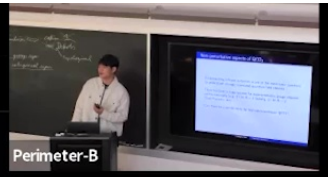
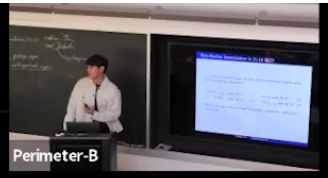


Non-perturbative aspects of QCD_3

Understanding infrared dynamics is one of the most basic questions to understand strongly correlated quantum field theories.

There has been a huge success for supersymmetric gauge theories with holomorphy (e.g. 3+1d $N = 1$ Seiberg, 2+1d $N = 2$ Given-Kutasov, etc)

Can there be a similar story for non-supersymmetric QFTs?



Non-Abelian bosonization in 2+1d QCD

In 2+1d non-abelian gauge theories with fundamental matters leads to the following conjuecture

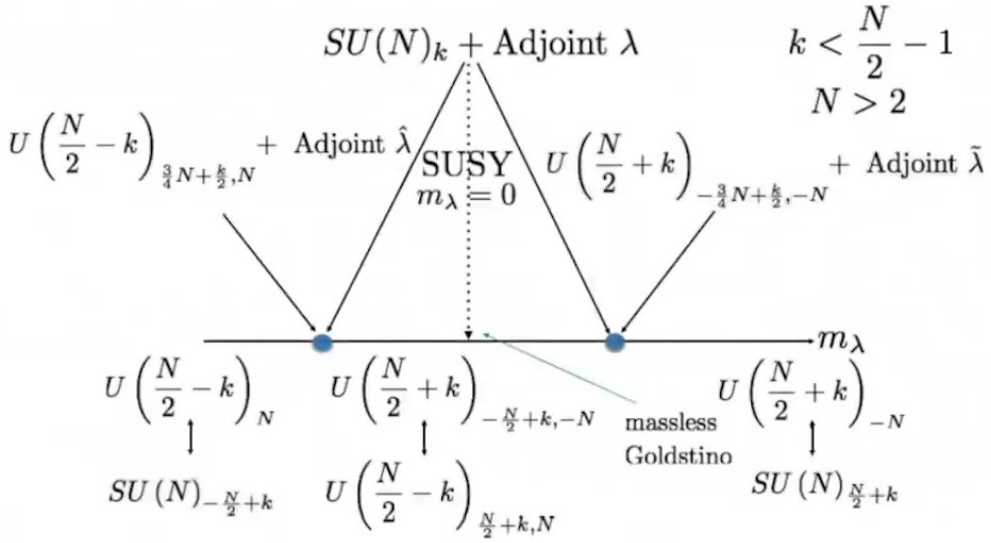
$$SU(N)_{-k+N_f/2} \text{ with } N_f\ \psi \quad \leftrightarrow \quad U(k)_N \text{ with } N_f\ \Phi, \tag{1}$$

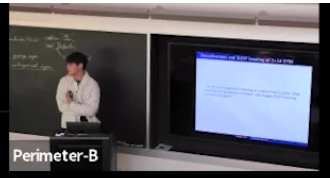
$$SU(N)_{-k} \text{ with } N_s\ \phi \quad \leftrightarrow \quad U(k)_{N-\frac{N_s}{2}} \text{ with } N_s\ \Psi, \tag{2}$$

There is a large body of evidences (phases, anomalies, operators, t' Hooft limit, ...)

Adjoint QCD_3

Similary story for the QCD_3 with a single adjoint fermion has been discovered by





Deconfinement and SUSY breaking of 2+1d SYM

This picture is especially surprising at supersymmetric point. What would be the dynamical mechanism that triggers SUSY breaking and deconfinement?

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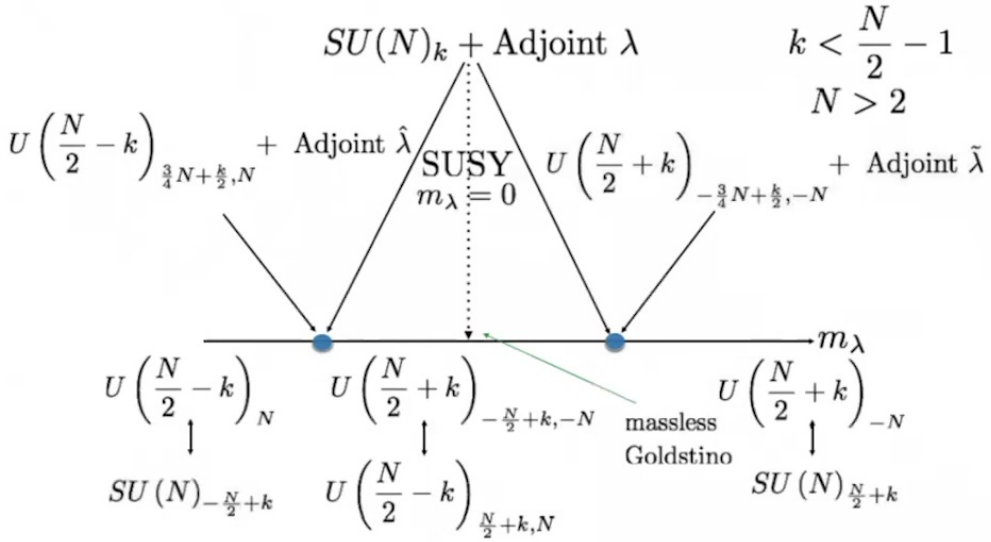

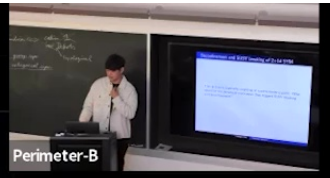

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