Decomposition 2021

Report of Contributions

Contribution ID: **1** Type: **not specified**

Welcome / orientation

Saturday, May 22, 2021 8:50 AM (10 minutes)

Contribution ID: **2**   Type: **not specified**

Yuya Tanizaki: Modified instanton sum in 4d gauge theories

Saturday, May 22, 2021 9:00 AM (50 minutes)

Abstract: In the path integral formulation of quantum field theories (QFTs), we are supposed to sum up all possible field configurations to ensure the locality in the usual lore. In the case of 4d gauge theories, this would require us to sum up all the instanton sectors, which topologically classify the gauge-field configurations in the closed spacetime. However, it turns out that this is not mandatory, and there are other consistent choices to define QFTs. We show that restricting the instanton sectors can be consistent with locality as a consequence of "Decomposition". Starting from a brief review of the decomposition in 2d QFTs, we will tell how this interesting property can be generalized to higher-dimensional QFTs, and also explain the concrete example using 4d Yang-Mills theory.

Contribution ID: **3**

Type: **not specified**

Mauricio Romo: A GLSM view on Homological Projective Duality

Saturday, May 22, 2021 10:00 AM (50 minutes)

Abstract: I will present a rather general construction of homological projective dual (HPD) pairs using gauged linear sigma models. In mathematical terms, HPD can be viewed as a tool to generate semiorthogonal decompositions. In physical terms, HPD pairs are phases of GLSMs whose categories of B-branes are related in a very precise way (and if some conditions are met, equivalent). I will mostly focus on the abelian case and, if time permits, will present a few remarks for the nonabelian case. This is based on joint work with Z. Chen and J. Guo: 2012.14109.

Contribution ID: 4   Type: **not specified**

Daniel Robbins: Decomposition in orbifolds with discrete torsion

Saturday, May 22, 2021 3:00 PM (50 minutes)

Abstract: In the context of 2D CFT, decomposition occurs when we construct an orbifold of a theory by a group G that has a trivially-acting subgroup K. The resulting theory is a disjoint union of orbifolds by subgroups of the effective G/K symmetry. We'll describe how turning on discrete torsion in G affects the story, including opening the possibility that the disjoint union contains only a single term. We will also discuss some work in progress relating these ideas to quantum symmetries and anomalies.

Contribution ID: **5**   Type: **not specified**

Richard Eager: Elliptic genera of pure gauge theories in two dimensions

Sunday, May 23, 2021 9:00 AM (50 minutes)

Abstract: I will explain how to compute the elliptic genera of (2,2) supersymmetric gauge theories in two dimensions with gauge group G/Gamma (for G semisimple and simply-connected, Gamma a subgroup of the center of G) with various discrete theta angles. The two new ingredients are a systematic study of the moduli space of flat G/Gamma connections on the torus and an efficient organization of the supersymmetric localization computation using the classification of nilpotent orbits. The elliptic genera are consistent with expectations from decomposition of two-dimensional theories with finite global one-form symmetries and with computations of supersymmetry breaking for some discrete theta angles in pure gauge theories.

Contribution ID: **6**   Type: **not specified**

Hsian-Hua Tseng: On the Gromov-Witten theory of etale gerbes

Sunday, May 23, 2021 10:00 AM (50 minutes)

Abstract: We aim to give a review of results on how Gromov-Witten invariants of etale gerbes respect the decomposition conjecture, from the speaker's own perspective.

Contribution ID: **7**   Type: **not specified**

Zohar Komargodski

Sunday, May 23, 2021 3:00 PM (50 minutes)

Contribution ID: **8**   Type: **not specified**

Theodore Jacobson: Lifetimes of near-eternal false vacua

Saturday, May 22, 2021 2:00 PM (50 minutes)

Abstract: We consider examples of extremely long lived false vacua which arise in theories with approximate or emergent (d-1)-form symmetries. In the limit that these symmetries are exact, decomposition of the theory into 'universes' implies that certain false vacua are exactly stable. We look at cases where the false vacua in question arise near symmetric points in parameter space where the (d-1)-form symmetry participates in a 't Hooft anomaly with an ordinary global symmetry. The effects of explicit symmetry-breaking deformations, which obstruct exact decomposition, are considered in a simple quantum mechanical model and in the Schwinger model.