

# Workshop Schedule

Events for:  
**Wednesday, April 13th - Friday, April 15th**

<b>Wednesday, April 13th</b>
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8:30am **Breakfast - SCGP Cafe**

9:00am **Luis Alvarez-Gaume - SCGP 102**

**Title:** Welcome

9:05am **Martin Rocek - SCGP 102**

**Title:** Uses of (0,4) superspace

**Abstract:** TBD

9:45am **Mirjam Cvetič - SCGP 102**

**Title:** Gauge Symmetry Constraints in Consistent Quantum Gravity

**Abstract:** We present a consistency condition for 8D  $N=1$  supergravity theories with nontrivial global structure  $G/Z$  for the non-Abelian gauge group, based on an anomaly involving the  $Z$  1-form center symmetry. The interplay with other swampland criteria identifies the majority of 8D theories with gauge group  $G/Z$ , which have no string theory realization, as inconsistent quantum theories when coupled to gravity. While this condition is equivalent to geometric properties of elliptic K3 surfaces in F-theory compactifications, it constrains the unexplored landscape of gauge groups in other 8D string models.

10:25am **Zoom: Christopher Hull - Zoom**

**Title:** My Favourite Supermultiplet

**Abstract:** TBD

11:05am **Break - SCGP Cafe**

11:20am **Konstantinos Koutrolikos - SCGP 102**

**Title:** Electromagnetic interactions of Supergravity supermultiplet

**Abstract:** TBD

12:00pm **Ed Witten - SCGP 102**

**Title:** TBD

**Abstract:** TBD

12:40pm **Lunch - SCGP Cafe**

2:00pm **Delilah Gates - SCGP 102**

**Title:** Observable Emission from Circular Equatorial Kerr Orbiters

**Abstract:** TBD

**Thursday, April 14th**

8:30am **Breakfast - SCGP Cafe**

9:30am **Zoom: Gabriele Tartaglino-Mazzucchelli - Zoom**

**Title:** On  $TT\bar{t}$  deformations and supersymmetry

**Abstract:** In the last few years, there has been considerable interest in quantum field theories in two dimensions deformed by the irrelevant “ $TT\bar{t}$ ” operator (the determinant of the stress-energy tensor). In this talk, I will review some recent developments concerning the  $TT\bar{t}$  deformation of supersymmetric theories. I will also describe how interesting four-dimensional effective field theories, such as the (N=1 supersymmetric) Maxwell-Born-Infeld theory together with its ModMax extension, and the Goldstino theory for broken supersymmetry, satisfy  $TT\bar{t}$ -like flow equations.

10:10am **Zoom: Sergei Kuzenko - Zoom**

**Title:** Conformal higher spins and AdS (super)projectors

**Abstract:** TBD

10:50am **Zoom: Ulf Lindstrom - Zoom**

**Title:** TBD

**Abstract:** TBD

11:30am **Sergei Gukov - SCGP 102**

**Title:** Machine Learning in Mathematical Sciences

**Abstract:** TBD

12:15pm **Lunch - SCGP Cafe**

1:45pm **Charles Doran - SCGP 102**

**Title:**  $K_2$  and Quantum Curves

**Abstract:** I will discuss my preprint arXiv:2110.08482 with Matt Kerr and Soumya Sinha Babu in which we use integral regulators of  $K_2$ -classes on mirror curves of Calabi-Yau threefolds to provide evidence for a 2015 conjecture of Codesido-Grassi-Marino relating enumerative invariants to spectra of operators.

2:25pm **Vincent Rodgers - SCGP 102**

**Title:** From Virasoro to Thomas-Whitehead

**Abstract:** In 2D, Einstein's classical theory of general relativity becomes trivial. Yet when one studies the symmetries of 2D through string theory, a new field, dubbed the diffeomorphism field, arise from the Virasoro algebra. We show that this field has meaning in higher dimensions through the ubiquitous notion projective connections that is also present in the symmetry of geodesics. By using the Thomas-Whitehead connection, which is a natural connection for projective geometry, we construct an action that gives the diffeomorphism field dynamics in the accompaniment of the Einstein-Hilbert action. From there we are able to describe how this field augments gravitational interactions with fermions and how it might be a component of dark energy and dark matter in 4D.

3:05pm **Tristan Hubsch - SCGP 102**

**Title:** Laurent Mirror Models

**Abstract:** i-Yau hypersurfaces in toric spaces of general type are defined by Laurent polynomials and encoded by non-convex polytopes. Nevertheless, the phases of their gauged linear sigma models and an increasing number of their classical and quantum data are just as computable as for their 0.5 billion regular, convex siblings, and they all have transposition mirrors. Showcasing Calabi-Yau hypersurfaces in Hirzebruch scrolls shows this class of constructions to be infinitely vast, yet amenable to well-founded algebro-geometric analysis.

3:45pm **Break - SCGP Cafe**

4:05pm **Leopoldo Pando-Zayas - SCGP 102**

**Title:** TBD

**Abstract:** TBD

4:45pm **Kory Stiffler - SCGP 102**

**Title:** A Walk Down Memory Lane: The Life and Research of Jim Gates, 2006 - present, as Told From This Speaker's Perspective

**Abstract:** supersymmetry will be discussed. Likely there will be pictures of supersymmetry, known as adinkras, that have been the core of our research together. Expect a few jokes along the way, most of them good natured. Yes, there may be a small amount of roasting of Jim Gates, but hey, it's a party! The talk will conclude with a heartfelt toast to Jim Gates with beverages possibly provided by the Simons Center for said toast.

6:00pm **Dinner - SCGP Cafe**

<b>Friday, April 15th</b>
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8:30am **Breakfast - SCGP Cafe**

9:00am **Bernard de Wit - SCGP 102**

**Title:** Exact results for an STU-model

**Abstract:** TBD

9:40am **John Schwarz - SCGP 102**

**Title:** Flat Space Holography

**Abstract:** TBD

10:20am **Break - SCGP Cafe**

10:50am **Delilah Gates and Sylvester Gates III - SCGP 102**

**Title:** TBD

**Abstract:** TBD

11:35am **Jim Gates - SCGP 102**

**Title:** TBD

**Abstract:** TBD

12:35pm **Lunch - SCGP Cafe**