



LABORATORY FOR ELEMENTARY-PARTICLE  
PHYSICS (LEPP)

# Theory Seminar



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**Stanford**

## **K3 metrics from little string theory**

Calabi-Yau manifolds have played a central role in both string theory and mathematics. However, in spite of this (and Yau's existence theorem), no Ricci-flat metric for a compact, non-toroidal Calabi-Yau manifold has ever been determined. In this talk, I will explain how for K3 — one of the simplest and most important such manifolds — one can reduce the problem in a neighborhood of the large complex structure limit to a simpler one. Physically, the latter problem is the determination of the BPS spectrum of a particular (1,0) supersymmetric little string theory compactified on  $T^2$ . Adapting ideas of Gaiotto-Moore-Neitzke in the context of 4d  $N=2$  field theory allows one to translate this spectrum into the metric on the moduli space of the theory compactified on an additional circle; for us, this moduli space is a K3 surface. The mathematical avatar of the little string theory BPS state counting problem is a computation in open string Gromov-Witten theory on the mirror K3 surface, as conjectured by Strominger-Yau-Zaslow. I will explain how these problems are related, using string theory dualities.

**Wednesday, March 20, 2019**

**2:00pm**

**401 Physical Sciences Building**