

## **The Mathematics of Theoretical Physics.**

Requisites: 21ABCD, 22A/67, 22B — this course is suitable for any ambitious math or physics majors.

Description: Much of modern day mathematics grew from physics problems, yet many math majors are unaware of the weird and wonderful ways their mathematical skills can be applied to describe the universe around them. Conversely, many physics students struggle to connect mathematical concepts with physical models. This course will present a toolbox of mathematical concepts and explain how these are relevant to physics. Topics will include—what is a vector?, what is curvature?, symplectic geometry and classical mechanics, symmetry and representations, Einstein's equations, supersymmetry and cohomology.

Students will present homework problems in class in teams and help develop notes for the course.