

PHYSICS, MATH AND PUZZLES

Cumrun Vafa (Department of Physics)

Freshman Seminar 23P 4 credits (fall term) Enrollment: Limited to 12

Prerequisite: This seminar is recommended for students with a strong background in both math and physics and with keen interest in the relation between the two subjects.

Physics is a highly developed branch of science with a broad range of applications. Despite the complexity of the universe the fundamental laws of physics are rather simple, if viewed properly. This seminar will focus on intuitive as well as mathematical underpinnings of some of the fundamental laws of nature. The seminars will use mathematical puzzles to introduce the basic features of physical laws. Main aspects discussed include the role of symmetries as well as the power of modern math, including abstract ideas in topology, in unraveling the mysteries of the universe. Examples are drawn from diverse areas of physics including string theory. The issue of why the universe is so big, as well as its potential explanation is also discussed.

[courseOutline-2022.pdf](#)