

## **PHY560**

### ***“Frontiers of Physics and Astrophysics”***

Barry Barish

Fall Semester – 2023

MW 4:00 – 5:20 PM

MELVILLE LBR W4535\*

(\*Note: This room may be changed to Physics D-122.)

Physics 560 is a topical course that covers frontier topics in fundamental physics, astrophysics and cosmology including experimental probes, new results and future plans. It is an experimentally oriented course that will emphasize important new experiments and results. Areas covered will include the physics, techniques and experiments in gravitational waves, dark matter searches, CMB measurements, neutrinos, Large Hadron Collider, etc. Lectures will cover the science, techniques, experiments and results for these topics with student reading assigned and active discussion expected. Minimal prior knowledge of these fields is required. The aim is to give students familiarity at their level with the most topical forefront problems in fundamental physics, emphasizing the most recent developments and future plans.

PHY560 is aimed at graduate students but will be accessible to advanced undergrads. Theory students are encouraged to take this course. Attendance is required, and students are expected to read assigned materials and then participate actively in class discussions. Student will do a term project at their academic level, researching a modern topic of their choice in physics, astrophysics and cosmology, writing a ~10 page paper and discussing the paper with the instructor at an one-on-one oral session.

There will be no final exam. Grades will be determined from the term projects and participation in class. Attendance is required, as this course will involve reading and active participation in discussions of each lecture topic.

This course can be taken for 0–3 credits.