APM 426 / 1700
Assignment 9

Prof. McCann — Due: Thursday Mar. 23

Wald # 5.4, 5.5

1. a) Find *all* Killing vector fields on the round 2-sphere $ds^2 = d\theta^2 + \sin^2\theta d\phi^2$.
b) Show that they span a finite dimensional vector space.
c) What is its dimension? Why?
d) Repeat part a) for the hyperbolic plane $ds^2 = d\theta^2 + \sinh^2\theta d\phi^2$ and for the Minkowski plane $ds^2 = -dt^2 + dx^2$.

NB: Written reports for independent projects are due in class Thursday March 30. To benefit from the 20% early submission bonus, they must be submitted in class March 23, and you must be prepared to present them by the following day. To benefit from the 10% early submission bonus they must be received by Diana Leonardo in BA 6290 during business hours on Monday March 27, and you must be prepared to present your project on Wednesday March 29.