Final Project Proposal

Riley Sullivan

For my final project I will be diving into and investigating the possibility, potential properties and background of Magnetic Monopoles. Firstly I will be going over a published paper by Ice Cube. This paper uses 8 years of Ice Cube's research and data to analyze the limits of the cosmic flux of magnetic monopoles with certains constraints. I will also be going over a part of the Textbook that looks over what monopole properties would be like and look like when Faraday's Law changes to include monopoles. I will also be looking over and exploring the physical effects and properties of a supposed Monopole as well. Finally I would like to look over the evidence of the existence of these monopoles as well, and the reasons why we have not found one as of yet and what it would look like if we found evidence of them or if one was made somewhere like the LHC, or detected in Ice Cube.

Exploration and derivation of coupling strength, other properties of a supposed monopole:
http://www.physics.usu.edu/Wheeler/EMarchive/EMNotesMagneticMonopoles.pdf
Ice Cube Paper on Searching for Magnetic Monopoles:
https://arxiv.org/abs/2109.13719

I will also solve the below problem from chapter 5 in the book, which will then lead into a discussion of my first source, where there can be some profound investigations made by changing the maxwell's equations to include a monopole.

Problem 5.22 Suppose there *did* exist magnetic monopoles. How would you mod- ify Maxwell's equations and the force law to accommodate them? If you think there are several plausible options, list them, and suggest how you might decide experi- mentally which one is right.

I will be presenting powerpoint-style for most of this final project, but will be solving the problem from the book on the white board and will write out some derivations as well that are based on changing some of the Maxwell Equations.