

THE MAXWELL MISSION

REFATH BARI

8/8/20

BREAKDOWN

HERE'S HOW I'M STAGING THE MAXWELL MISSION. IT IS DIVIDED INTO THREE CORE COMPONENTS:

1. EXPERIMENTS

A SERIES OF EXPERIMENTS THAT DEMONSTRATE BOTH THE INTEGRAL AND DIFFERENTIAL FORMS OF MAXWELL'S EQUATIONS, AS WELL AS THE TWO THEOREMS OF VECTOR CALCULUS NECESSARY TO MOVE BETWEEN THE TWO FORMS, NAMELY THE STOKES AND DIVERGENCE THEOREMS.

2. VISUALIZATIONS

I HOPE TO USE P5JS, PYTHON, OR C++ TO VISUALIZE VARIOUS CONCEPTS FROM THE ELECTRIC FIELD OR MAGNETIC FIELD. MY HOPE IS THAT THEY SERVE AS USEFUL ANALOGIES OR MODELS FOR CONCEPTS SUCH AS THE BIOT-SAVART LAW.

3. PROSPECTUS

I WILL FORMULATE A SERIES OF 20-40 PLAUSIBLE RESEARCH QUESTIONS THAT A) FIT MY AREA OF EXPERTISE (MULTIVARIABLE CALCULUS, LINEAR ALGEBRA, AND ELECTROMAGNETICS) AND B) MAKE FOR INTERESTING RESEARCH (BLACK HOLES, RELATIVITY, LORENTZ TRANSFORMATION, MAGNETIC MONOPOLES). ALONG WITH THESE RESEARCH QUESTIONS, I WILL ALSO FORMALLY STATE MY MATHEMATICAL BACKGROUND, AS WELL AS THE AREAS OF RESEARCH I HOPE TO FOCUS ON.

4. THESIS

THE PAPER ITSELF MAY BE OF VARIABLE LENGTH, BUT I HOPE THE PAPER WILL BRIDGE AND UTILIZE MY KNOWLEDGE OF VARIOUS FIELDS OF MATHEMATICS

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AND PHYSICS, WHILST SIMULTANEOUSLY SATISFYING MY CURIOSITY OF RELATIVITY AND THE GEOMETRY OF SPACE-TIME.