Caleb Dastrup
Grade 11

Hobbies
Piano, Math, Running

Clubs
Math Team, Physics Team, Cross-Country and Track, Origami Club

Contest/Competition Experience or Honors
AIME qualifier (2020-2022), USAMTS Gold (2021), 5th place Maryland 2A cross-country championship (2021)

Autobiography

My first exposure to physics was through reading books about science as a child. I read about ideas such as Newton's theory of gravity and laws of motion, but they were explained informally, so although I was interested I did not know how to use them. Because of this I was more interested in math, and later, computer science.

In 9th grade I took my first physics class. I learned a more precise formulation of Newton's laws and studied basic mechanics. I enjoyed physics because I found it to be a source of interesting problems where I could use both mathematical skill and intuition. I also enjoyed how concepts from mechanics could explain everyday phenomena, and started doing mental fermi calculations, such as estimating the weight of a tree or the speed of a dentist's drill. However, I would sometimes get stuck on problems I posed for myself because of a lack of knowledge of calculus.

This year I took AP Physics C. I had taken calculus the year before and was enrolled in a class on ordinary differential equations, so I could solve more difficult problems in mechanics. I enjoyed deriving solutions to famous problems such as finding the paths taken by two masses attracted by gravity or finding (and solving) the differential equation governing the oscillations of a massive spring fixed at both ends. I started studying electricity and magnetism. This gave me greater insight into Gauss's theorem, Stokes' theorem, divergence, curl, and cross products, which I learned about in my multivariable calculus class. I enjoyed experimentally verifying the resistance of a network of resistors that could not be decomposed into series and parallel components and seeing demonstrations of effects such as induction. I joined the physics team and participated in f=ma, my first physics competition.

I enjoy sharing what I learn about physics and math with my classmates and family whenever they will listen. I like making music, playing games, and folding origami with my siblings. Recently I have learned a new prelude and fugue from the WTC book 2, broken 10 minutes in the 3200, and read *The Count of Monte Cristo* in the original French.