

US Physics Team Biography

Name: Daniel Jeon

Grade: Junior

Hobbies: Soccer, Climbing, Cooking

Clubs: Physics Club, Chemistry Club, Soccer Team, Francophone Society, Powerlifting, Photography

Competition Experience: USAMO (21,22), JMO (20), United States Physics Team (22), USNCO Semi-Finalist (21,22), USACO Platinum, Société Honoraire de Français Creative Writing Award

Bio:

First, I'd like to thank my parents for their continual support. I'd also like to thank Mr. Dicarlo and Mr. Gulick for their wonderful guidance and support through Advanced Physics, Modern Physics, and Quantum Mechanics. Last but not least, I'm grateful for my friends who inspire me everyday with their genuine passion, work ethic and kindness. It is an incredible honor to be part of the US Physics Team.

Before high school, physics was not yet on my radar. I went to a boarding middle school, and I remember being occupied filling out applications to secondary schools and playing soccer. In STEM, I was into olympiad math and especially Euclidean geometry. The numerous properties or lemmas that could be derived from certain constructions (mixtilinear circles, miquel point, etc) were captivating. When I got into Phillips Exeter Academy, I had the option to take either introductory biology or physics in my freshman year. I chose physics as I had already taken a lab-based biology before. In my second year, I took Advanced Physics (equivalent of AP Physics C). Throughout these two years, I realized that I enjoyed physics in the same way I enjoyed olympiad geometry: drawing diagrams, building intuition, and deriving interesting results.

At Exeter, I was surrounded by the smartest people across the globe. Along with my classmates, I strived to go beyond what we learned in physics class and tried to think outside the box. I learned about the F=ma Exam and the USAPhO from a physics club competition group meeting. In my first year of taking the F=ma, I did not make USAPhO. I was humbled and fascinated by the vast scope of physics, which prompted me to take a deep dive into the various topics I wasn't familiar with. I took advice from USAPhO Gold medalists and utilized Halliday and Resnick's book. I started with thermodynamics and kinetic theory of gases, enthralling topics which then guided me to

optics, fluid mechanics, etc. Through learning new concepts and practicing problem solving, I saw gradual improvement in intuition and applying approximation techniques. It was a long process that tested my patience and resilience. Though physics involves heavy approximation, I really like that it can sometimes explain weakly defined terms or principles from other sciences. For example, I'm currently taking quantum mechanics, and we recently learned that covalent bonds could be explained from the conditions imposed on a Schrödinger equation involving 2 delta functions. Another example would be deriving the Pauli Exclusion Principle. My chemistry textbook stated that two or more particles with the same spin cannot occupy an orbital, but did not give a justification. QM explained that 1. it comes from constraints put on an antisymmetric wave function and 2. it does not apply to particles like bosons.

I look forward to attending the camp in June and living and breathing physics with other members of the team.